



# **Workshop 03 - Productivity and System Tools**

**SLQ Wiki Fabrication Lab 2024/04/27 15:55**

~~REVEAL~~

# Workshop 03 - Productivity and System Tools

An operating system is only as useful as the software written for it. Fortunately, open source developers are incredibly productive and in this workshop we will highlight some of the unique and useful FOSS (Free and Open Source Software) available for Linux.

We will identify FOSS options for Microsoft Office, Photoshop and other Adobe products, and make sure that documents and files created on your Xubuntu system will be readable on Windows and Apple computers.

\* *Finding FOSS alternatives to common software*

\* *An introduction to the terminal (command line)*

\* *Cross-platform compatibility. How to create a seamless workflow between Windows, OSX and Xubuntu.*

\* *Customising your Web Browser.*

\* *Making a back-up.*

## FOSS Alternatives to common software

It's time to make a list of the software you want to use on your new computer so we can find FOSS alternatives where possible. Here are a few options to get you started. Non-FOSS software is marked.

Software	MS Windows/Apple OSX	Linux
Office	MS Office	Libreoffice
Email	Outlook (non-FOSS)	Thunderbird
Voicechat	Skype (non-FOSS)	Skype (non-FOSS)
Video playback	Windows Media Player/Quicktime (non-FOSS)	VLC
Web browser	Internet Explorer/Safari (non-FOSS)	Firefox, Chrome (non-FOSS)
DVD/Video tool	Handbrake	Handbrake
Publishing	pagemaker (non-FOSS)	Scribus
Vector graphics	Adobe Illustrator (non-FOSS)	Inkscape
Audio Editing	Audacity	Audacity

# Installing Software in Xubuntu

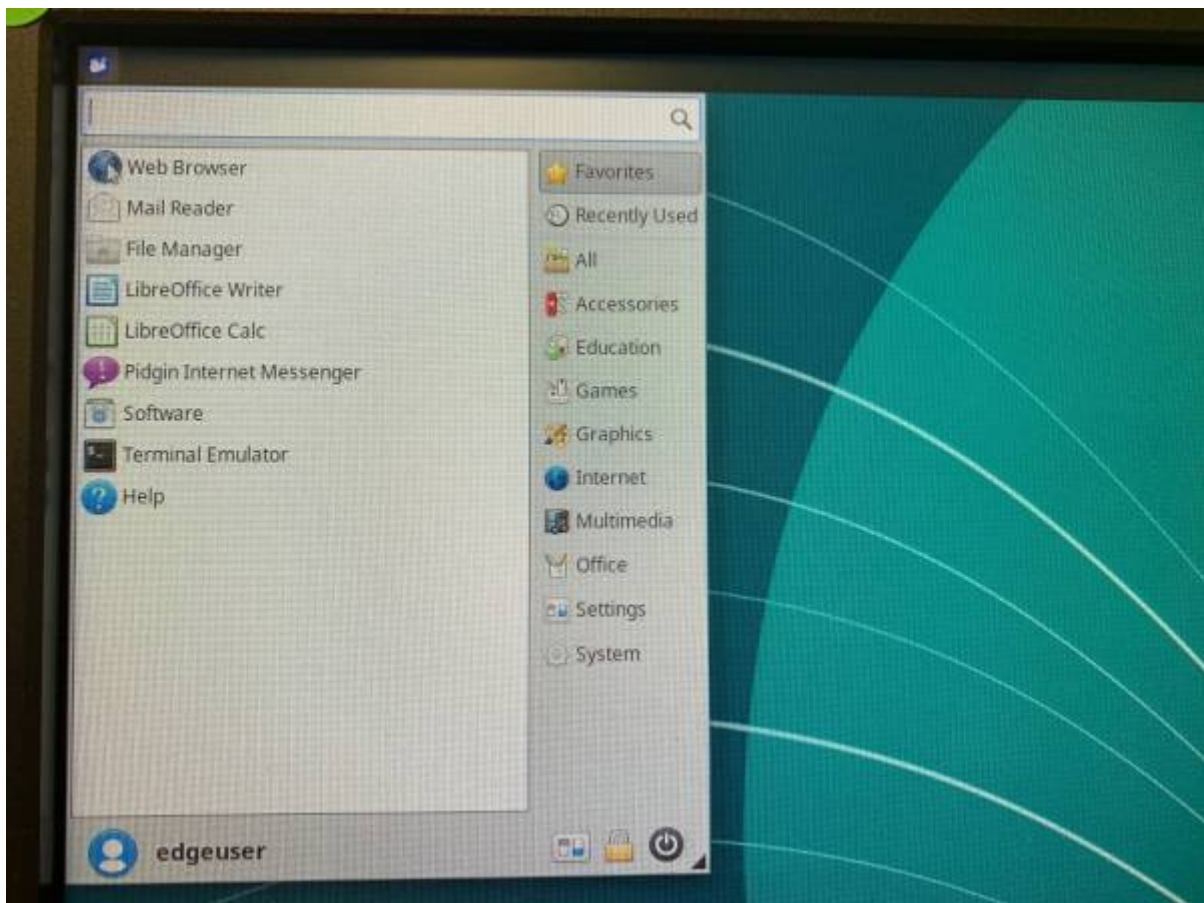
We will cover the various ways you can install software, update and upgrade your existing software. For Xubuntu, most software is made available as *packages* (just another word for program) in the Ubuntu repository. These are the main methods of installing packages:

1. 1. Ubuntu Software Centre
2. 2. From downloaded packages (.deb files)
3. 3. From an install script
4. 4. From the Command Line using a package manager
5. 5. Compiling from source code

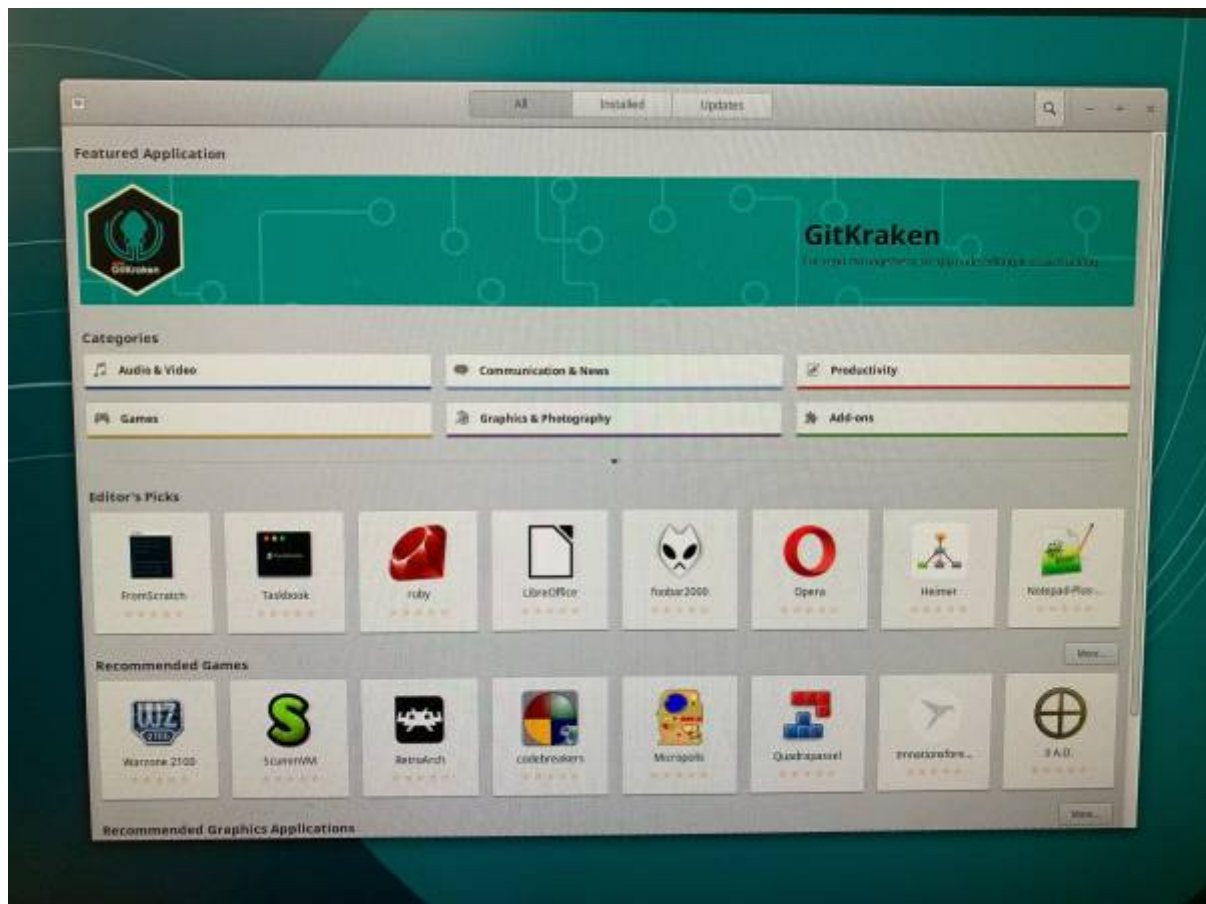
Methods one and two can be completed using a GUI. Methods three, four and five require some use of the terminal. Once you've taken this broad introduction to how to install software then we'll install the rest of your software however you like.

## Installing using the Ubuntu Software Centre

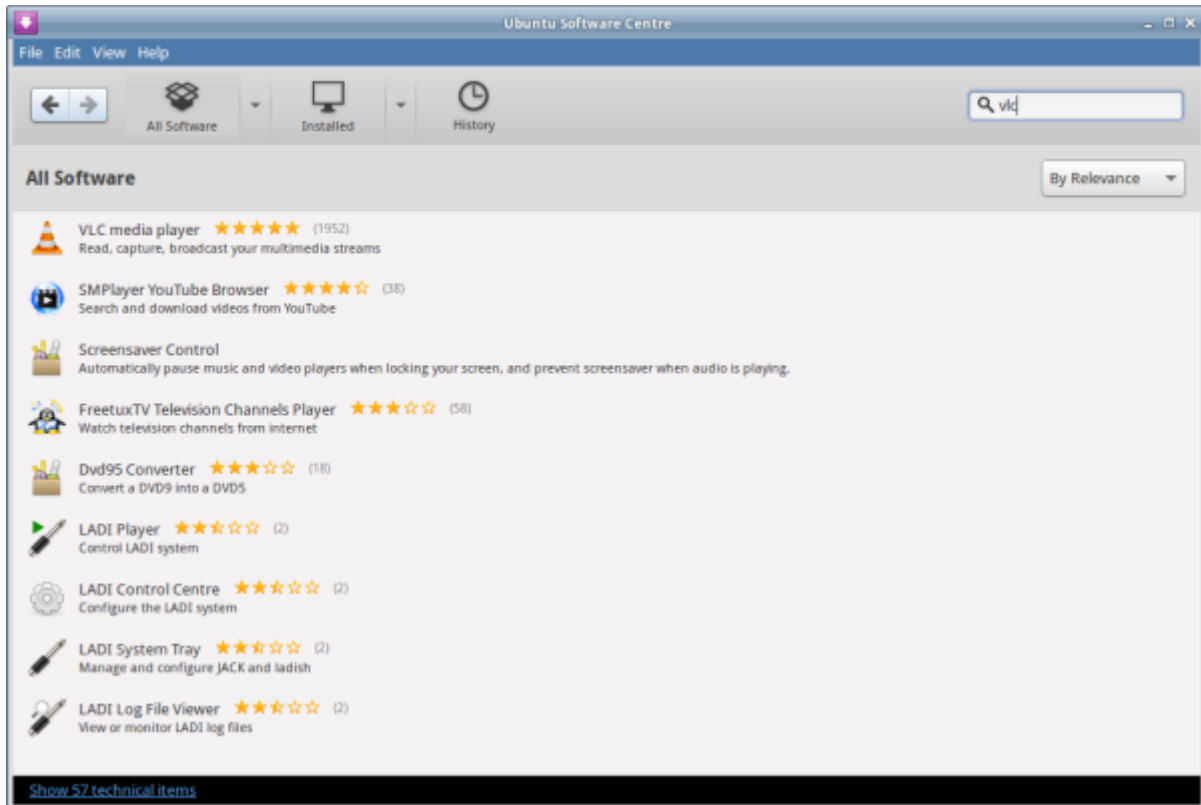
The Ubuntu Software Centre is a GUI for installing software in Ubuntu and related flavours. It's accessed from the whisker menu, in Xubuntu 18.04 it is just listed as 'Software';



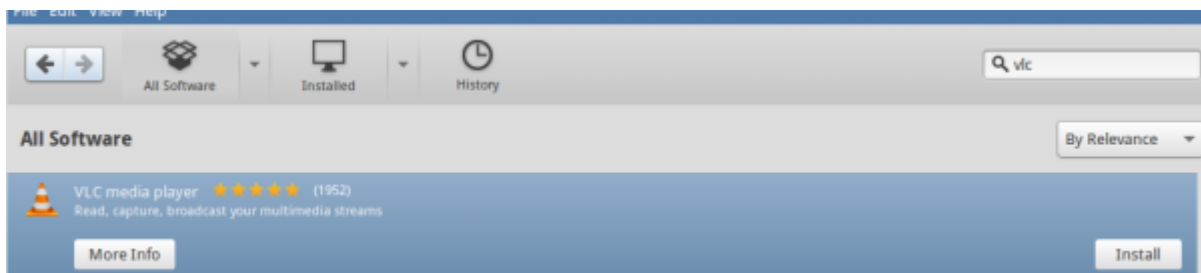
Here you can find and install FOSS and other software.



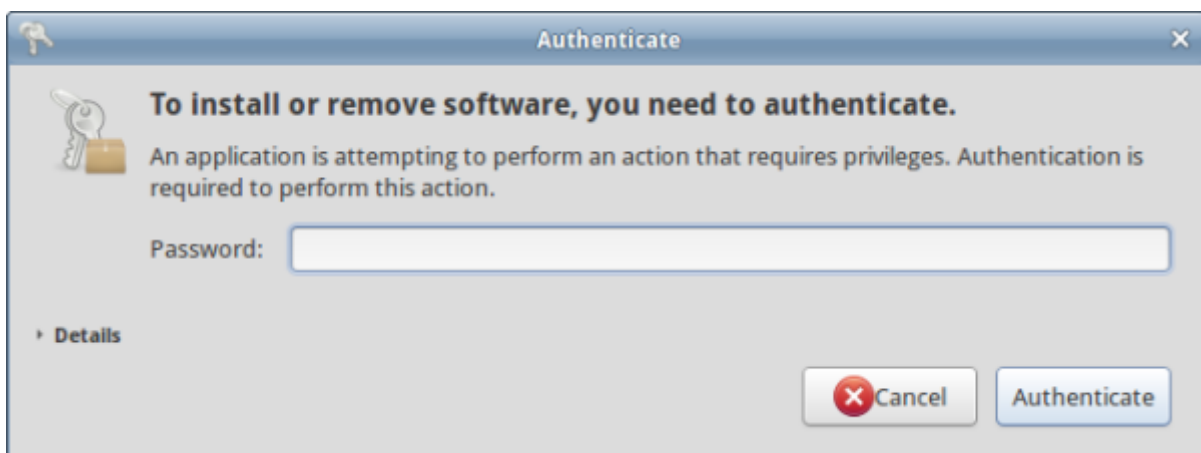
Let's do a search for VLC, our video player.



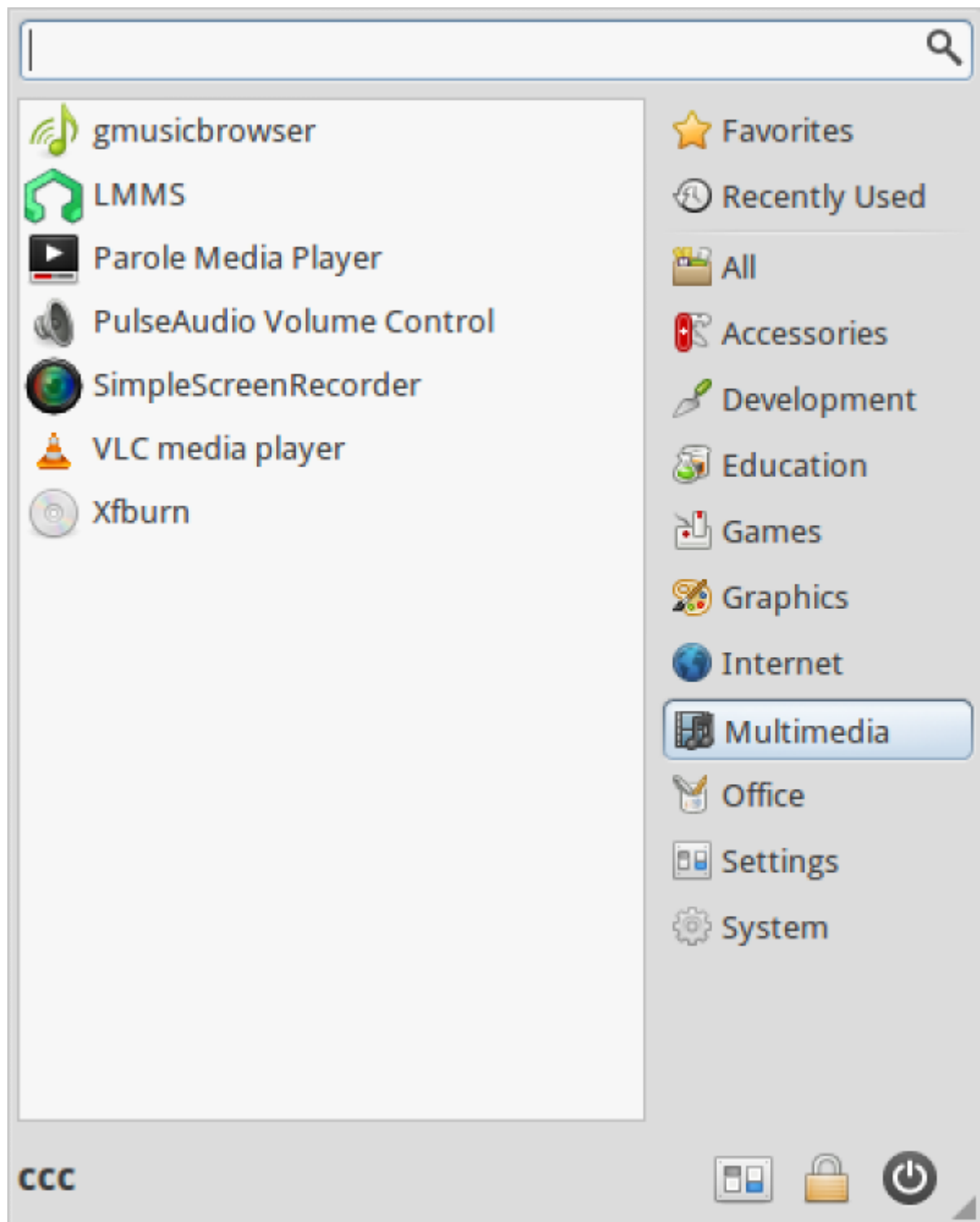
Then select and click install.



And authorise it with your admin password.

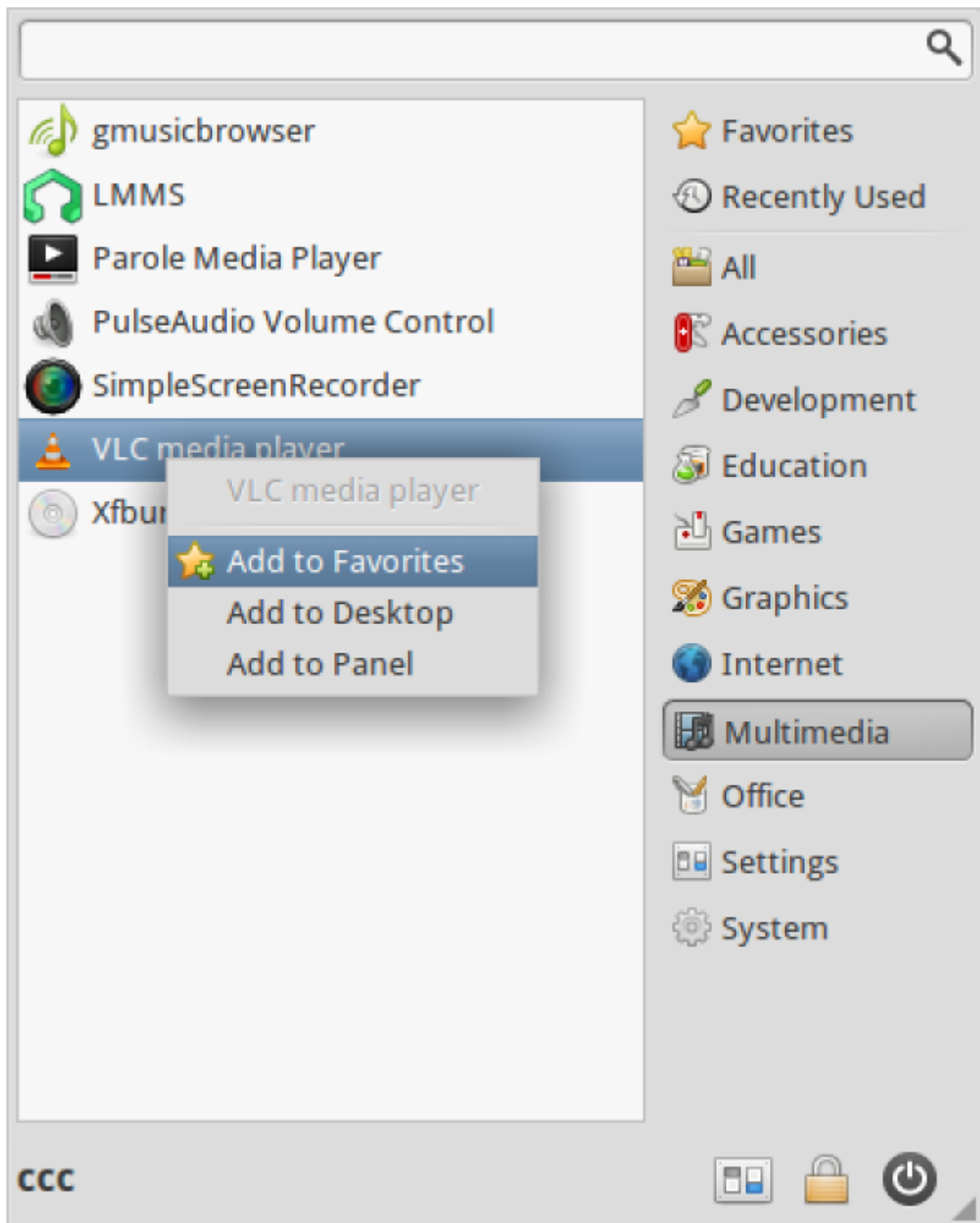


Once the install is done, you can find it in the whisker menu, under 'Multimedia'.

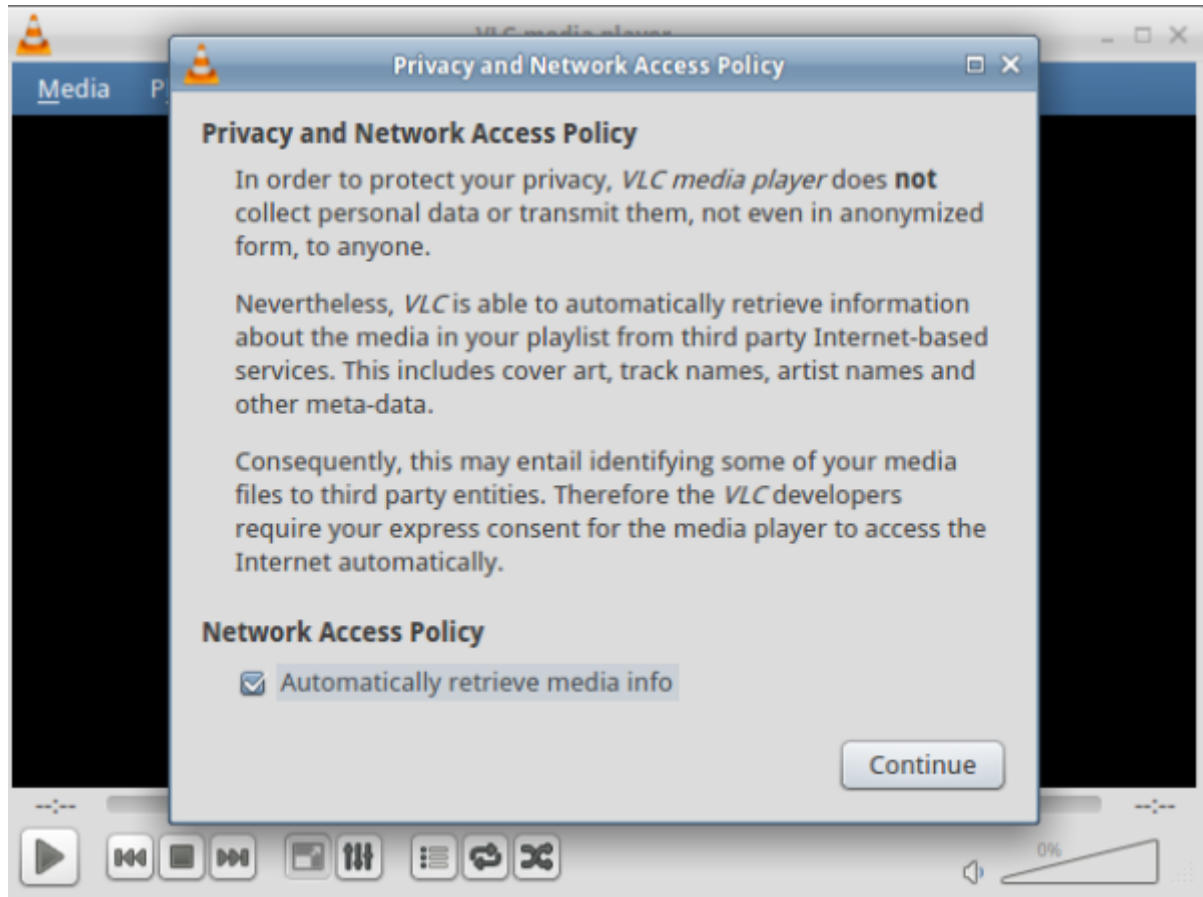


If you like you can add it to your favourites in the menu with a right click on your mouse or keyboard.



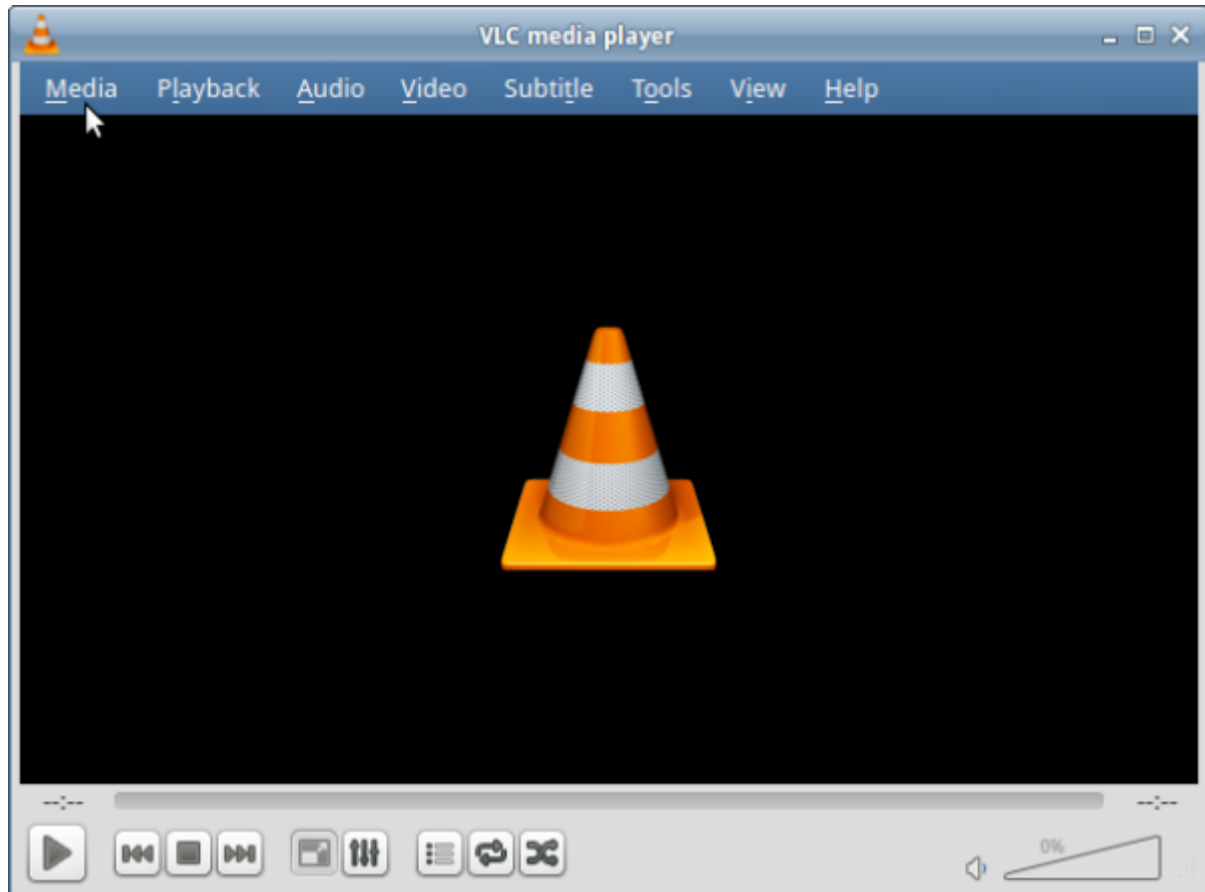


Once you launch VLC you will be asked if you want to allow VLC to search for media information.



And you are done!





## Installing software from .deb files

Ubuntu Software Centre simplifies the finding of software, but what if the software you want is not available in the Software Centre? Well, if you can find the right kind of package, called a .deb file, then you can download and install it.

Make sure you trust the source of the .deb file you are installing. There is not as much malicious software made for linux systems, but it does exist. You can be assured of the reliability of the sources in the official Ubuntu repos. A reliable source is usually well-known, popular, and well-maintained. If in doubt, [search](#) the [user](#) forums.

As an example we've uploaded an installer for a popular, well known media player called [clementine](#) here to show you how this works.

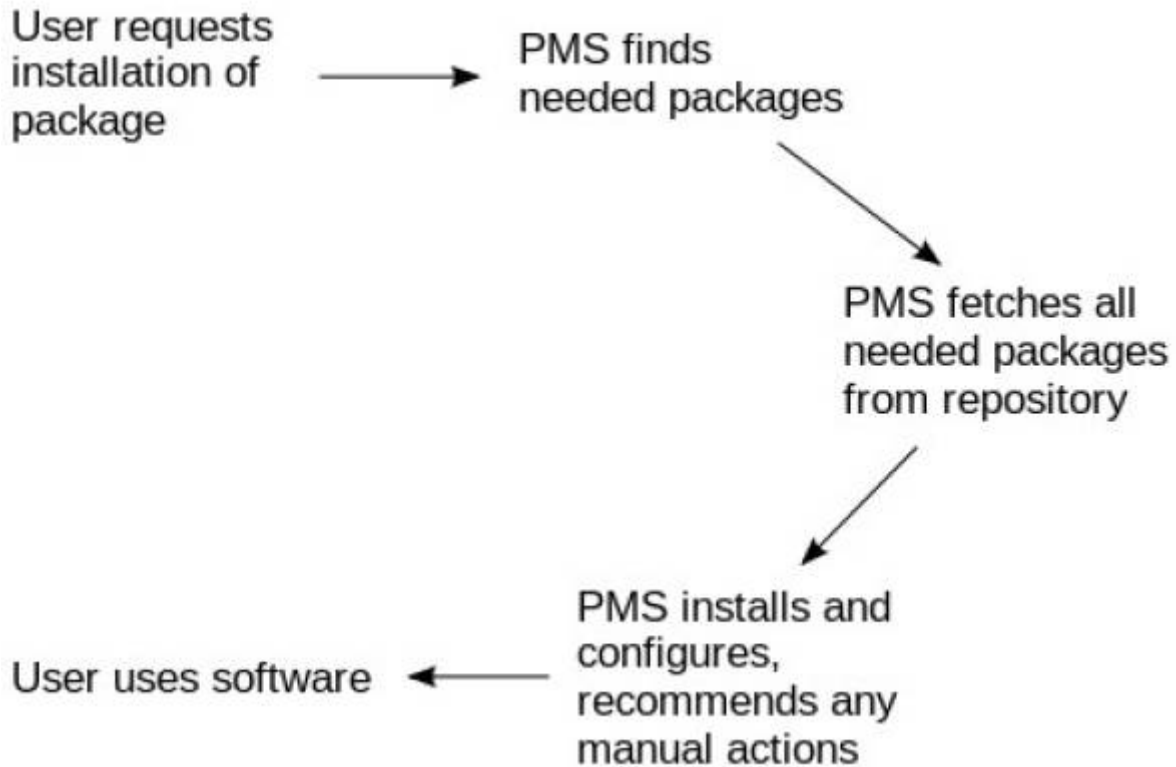
To make sure you get the right .deb, go directly to the [clementine.org downloads](#) section.

It's important to choose the right architecture for your system - this is usually shown either as amd64 (which is 64bit) or x86 (which is 32bit) in the .deb file. We use the 64bit amd64 version.

Once the download is done, it will open in Ubuntu Software Centre and you can install it the same way you installed VLC.

## Package Management System

Xubuntu, like almost all Linux systems, uses a *package management system* to find, install, update and upgrade software packages. A package management system (PMS) works like this;



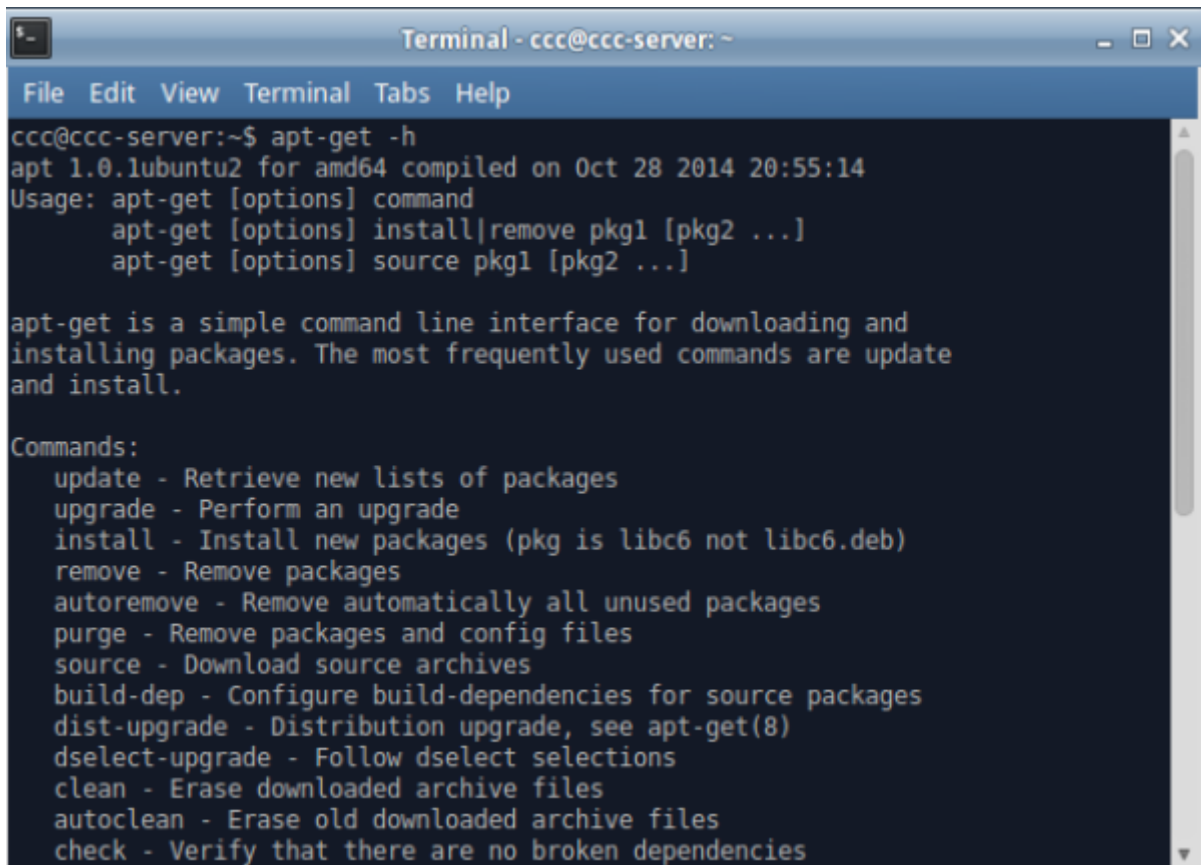
## Package Management in Xubuntu

Xubuntu uses the debian package system, which used `dpkg` to install and `apt-get` to search and download from repos. The most common way to use this system is with the terminal. We'll go into more detail about the terminal later but to start just follow the instructions below.

Open up a terminal emulator either from the whisker menu, or by pressing `ctrl+alt_t`. Now type:

```
apt-get -h
```

This displays the help for `apt-get`, a simple command line tool for package management. It gives a simple explanation of what `apt-get` does.



```
Terminal - ccc@ccc-server: ~
File Edit View Terminal Tabs Help
ccc@ccc-server:~$ apt-get -h
apt 1.0.1ubuntu2 for amd64 compiled on Oct 28 2014 20:55:14
Usage: apt-get [options] command
       apt-get [options] install|remove pkg1 [pkg2 ...]
       apt-get [options] source pkg1 [pkg2 ...]

apt-get is a simple command line interface for downloading and
installing packages. The most frequently used commands are update
and install.

Commands:
  update - Retrieve new lists of packages
  upgrade - Perform an upgrade
  install - Install new packages (pkg is libc6 not libc6.deb)
  remove - Remove packages
  autoremove - Remove automatically all unused packages
  purge - Remove packages and config files
  source - Download source archives
  build-dep - Configure build-dependencies for source packages
  dist-upgrade - Distribution upgrade, see apt-get(8)
  dselect-upgrade - Follow dselect selections
  clean - Erase downloaded archive files
  autoclean - Erase old downloaded archive files
  check - Verify that there are no broken dependencies
```

Because our system is newly installed, we would normally run an a update and upgrade to make sure we've got the latest list of packages in our sources. But we've already done this using the Software Updater in our system settings. Try it anyway and see what happens. First step is update.

```
$ sudo apt-get update
```

You will be prompted to enter your password. You won't see the letters being entered (this is for security), but if you press enter at the end of typing, your password will enter as usual. If you make a mistake you will be asked to enter it again.

Apt-get will search through its list of software available and give use some output. Next we try an upgrade.

```
$ sudo apt-get upgrade
```

Apt-get will now upgrade all the packages found in its update. There probably won't be any as we upgraded at the end of workshop 03.

## More about the Terminal

The terminal is a text only or *Command Line Interface (CLI)*. Combined with a shell, which is a program that interprets your commands, it is the most powerful and direct way of using a computer.

All OSs have something similar. In Windows there is powershell, in OSX there is also a terminal. Some

SDLW participants may remember MS-DOS, or using home computers like a Spectrum, Commodore 64 or Atari ST.

## Terminal Usage

The terminal is the most efficient way of controlling your computer. It requires the user (you!) to be accurate when entering commands, so you'll have to check and double check your entries into the terminal.

When using the terminal there are a few symbols you'll see over and over again. The first thing you'll see is a command prompt. It will display a lot of information in one line:

```
sdlw@sdlw-server:~$
```

This line tells me:

- Who I am
- What computer I'm on
- Where I am in that computer and
- What type of user I am

So in this case:

- User = sdlw
- Computer name = sdlw-server
- My location is your home directory (~ is a shortcut for your home directory)
- And I'm logged in as a standard user (\$)

## File & Directory Commands

Next we'll take a look at moving around in your computer using terminal commands. First we need to think about how your computer files are organised.

In Linux the / (forward slash) symbol is used to show which directory you are in. A directory is just another name for a folder.

A single forward slash / is the root directory this is the directory which holds all the other directories inside it.

Remember, the tilde (~) symbol stands for your home directory. If you are user, then the tilde (~) stands for /home/user where user is your username.

The pwd command will allow you to know in which directory you're located (pwd stands for "print working directory").

```
sdlw@sdlw-server:~$ pwd  
/home/sdlw
```

The `ls` or *list* command will show you the files in your current directory. Used with certain options, you can see sizes of files, when files were made, and permissions of files.

Try `ls -al` It will show you the files that are in the current directory, with more information about the file type and permissions.

The `cd` command will allow you to change directories. When you open a terminal you will be in your home directory. To move around the file system you will use `cd`. For example:

- To navigate into the root directory, use `cd /`
- To navigate to your home directory, use `cd` or `cd ~`
- To navigate up one directory level, use `cd ..`
- To navigate to the previous directory (or back), use `cd -`

To change more than one directory at a time, we can describe the path we need to take, separating the directory names with `/`.

For example `cd /var/www` to go directly to the `/www` subdirectory of `/var/`. Remember using the file manager in the last workshop? The path is also visible in the address bar of the desktop window. See if you can use `cd` and `~` to get to your desktop.

## Super User Do!

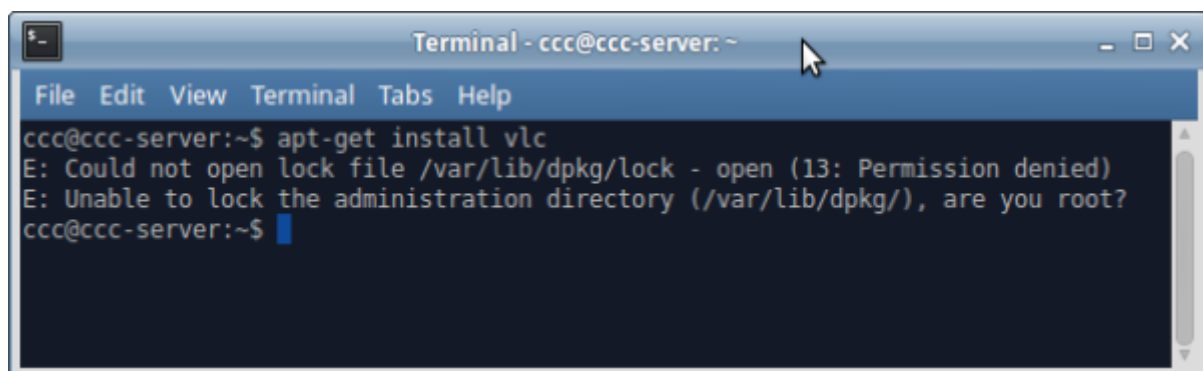
Many commands will need to have `sudo` at the start. In technical terms, this 'elevates privileges to the root-user administrative level temporarily'.

Which means that you are telling the computer 'I am the boss - do exactly as I say!' This is necessary when working with directories or files not owned by your user account.

For example, try running `apt-get install` without `sudo`:

```
$ apt-get install vlc
```

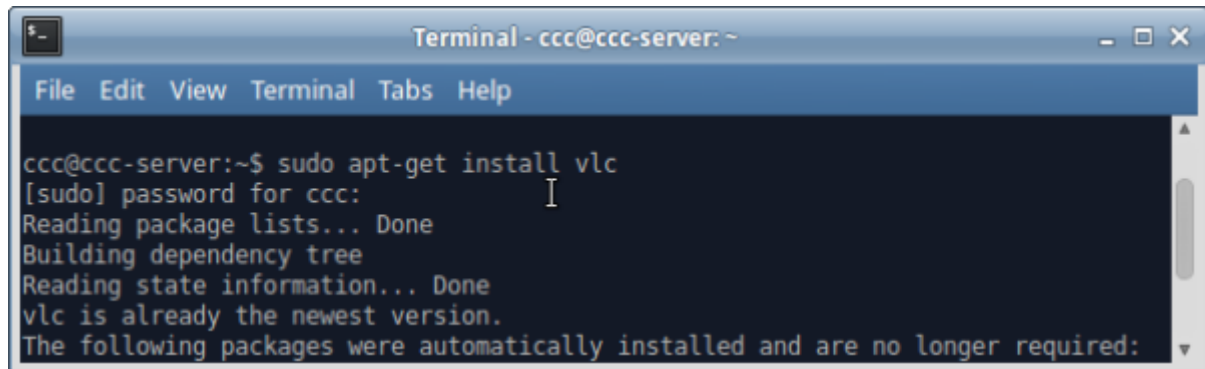
You'll get an error like this, asking 'are you root?'

A screenshot of a terminal window titled "Terminal - ccc@ccc-server: ~". The window has a menu bar with "File", "Edit", "View", "Terminal", "Tabs", and "Help". The terminal shows the command `ccc@ccc-server:~$ apt-get install vlc` being entered. Below the command, two error messages are displayed: `E: Could not open lock file /var/lib/dpkg/lock - open (13: Permission denied)` and `E: Unable to lock the administration directory (/var/lib/dpkg/), are you root?`. The prompt `ccc@ccc-server:~$` is shown again at the bottom with a blue cursor.

Try again with:

```
$ sudo apt-get install vlc
```

And you get a request for a password - and off apt-get goes..

A terminal window titled "Terminal - ccc@ccc-server: ~" with a menu bar (File, Edit, View, Terminal, Tabs, Help). The terminal output shows the command "ccc@ccc-server:~\$ sudo apt-get install vlc" being executed. It prompts for a password, then shows progress: "Reading package lists... Done", "Building dependency tree", and "Reading state information... Done". The final output states "vlc is already the newest version." and "The following packages were automatically installed and are no longer required:".

```
ccc@ccc-server:~$ sudo apt-get install vlc
[sudo] password for ccc:
Reading package lists... Done
Building dependency tree
Reading state information... Done
vlc is already the newest version.
The following packages were automatically installed and are no longer required:
```

In other words, sudo give you the power to force your OS to treat you with unquestioning obedience. Use it wisely...

### Installing software from an install script

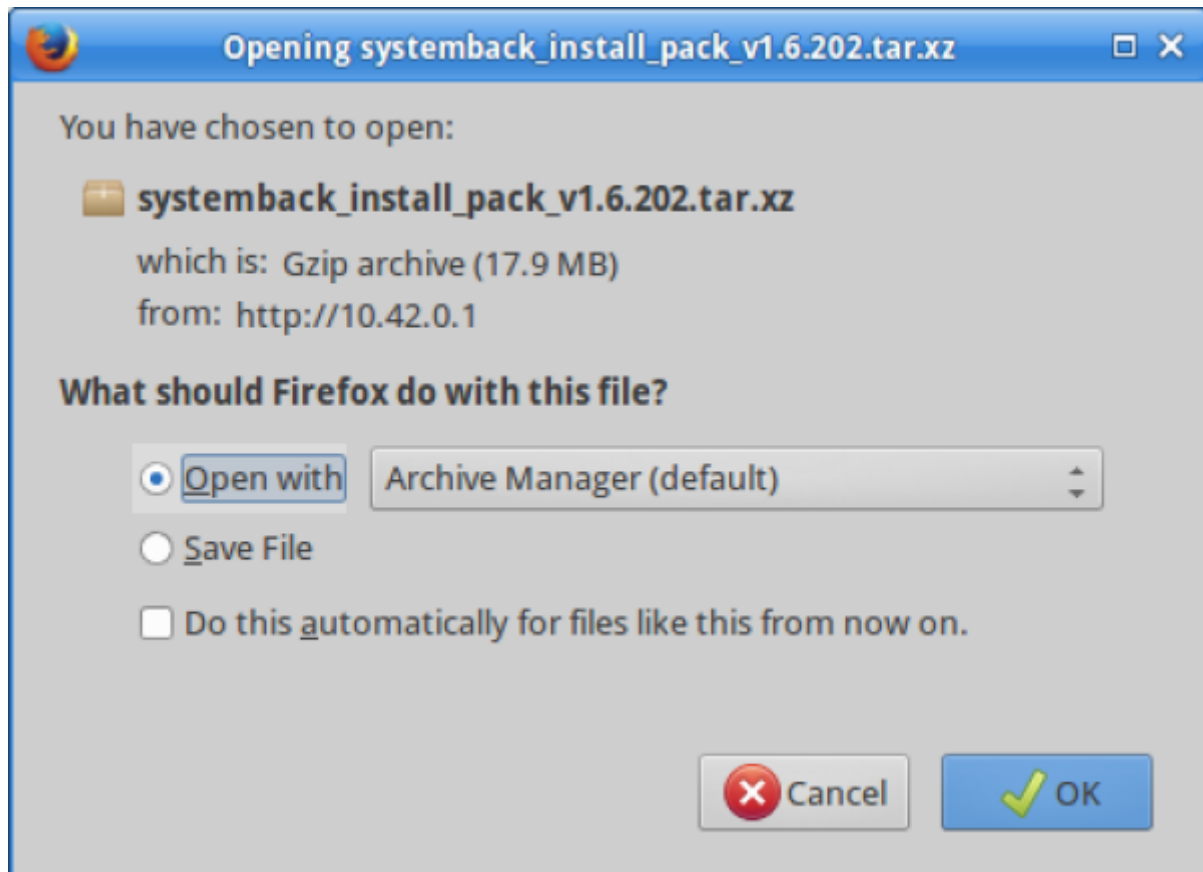
Now you will use your newfound terminal powers to install software from a script. A script is a text document called `.sh` with all the commands entered line by line, with a special first line `#!/bin/bash` that tells your computer 'I'm a script!'

Below is a link to the backup software we'll be using, it contains an install script and a few packages we need to make the install work.

`systemback_install_pack_v1.6.202.tar.xz`

Once you've downloaded it, you'll need to uncompress it using an archiving utility.

Xubuntu will automatically launch *Archive Manager* to do this.



Just extract the files to your download directory.

Now you need to navigate to your newly created directory in your Downloads folder in the terminal. Remember to replace

```
sdlw
```

with your own username.

```
$ cd /home/sdlw/Downloads/Systemback_Install_Pack_v1.6.202/
```

Type `ls -al` to list the files in the directory. Notice the file `install.sh` is green? This means it is executable.

If your version of `install.ch` is not executable, you can use the `chmod` command to make it so.

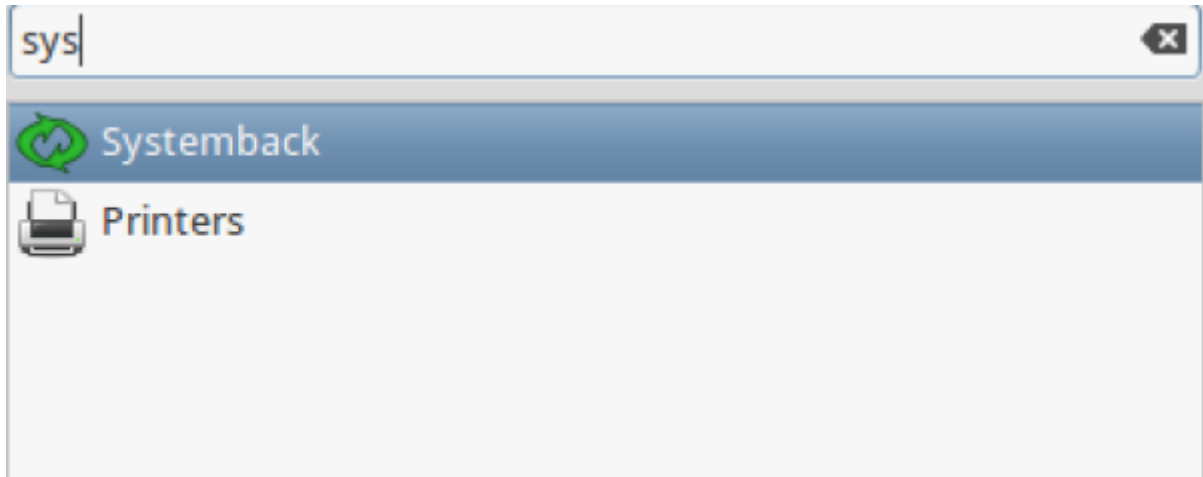
```
$ chmod 774 ./install.sh
```

Now you can run the script by telling the shell to execute the script.

```
$ sudo ./install.sh
```

Check if systemback is installed by going to the whisker menu and start typing 'sys...





## Compiling from Source

Compiling from source is usually the method to try if all else fails. <sup>1)</sup>

### Step 1: Prep your system for building packages

By default, Ubuntu does not come with the tools required. You need to install the package build - essential for making the package - and checkinstall for putting it into your package manager. These can be found in the repositories and installed with command-line apt-get:

```
sudo apt-get install build-essential checkinstall
```

You should then find a directory where you'll be building these packages. We recommend using /usr/local/src, but really you can put it anywhere you want. In this case we will just use your Downloads folder.

### Step 2: Getting the software you want

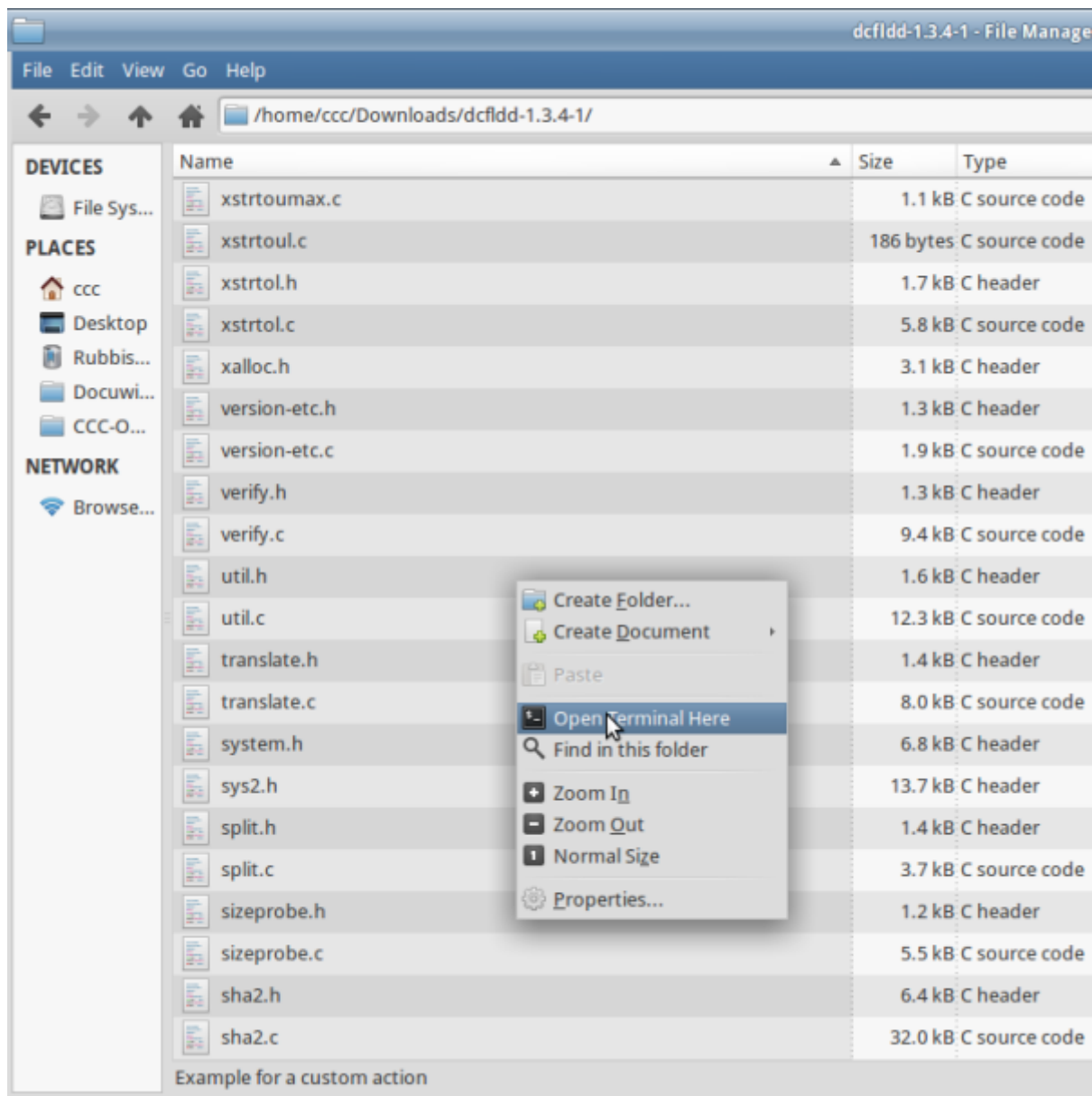
Most of the software you'll generally want comes from released tarballs. These are just compressed archives with extensions like .tar.gz or .tar.bz2 — they are just like .zip files on Windows or .sit on MacOS X.

We've got an example program to compile here, called 'dcfldd'. This program is what we originally used to make the USB installers for Xubuntu we used in workshop 02. We chose this because it's simple and quick to compile.

dcfldd

Click to download, then open with Archive Manager, and show the files when done. You will be in your downloads directory, look for the folder called dcfldd-1.3.4-1 and open it.

Now hold ctrl, then press your right mouse button. This will bring up a menu where you can select 'open terminal here'. We need to press Control due to the directory being full of files.



Now you need to use your terminal skills again. Begin with:

```
$. /configure
```

This is a script that checks to make sure you've got everything installed you need to compile. Now type:

```
$ make
```

Now the real work begins, and your computer will build (compile) the program from source. This might take a while. When it is done, you can turn it into proper install by running:

```
$ sudo make install
```

Once this is done you can open a terminal and check whether your compile and install works by typing:

```
$ man dcfldd
```

This will bring up the manual (man) for dcfldd, proving it is installed and exists as a command.

## Going further with the Command Line

That's all for the command line for now, but if you're interested in learning more about it check out the *linux Command Line* by William Shotts, which you can download from [here](#).

## Installing The Rest

It's time to install the rest of the software you want to use. Lets take a look at the software we've got left to install.

Software	MS Windows/Apple OSX	Xubuntu
Office	MS Office	Libreoffice
Email	Outlook	Thunderbird
Voicechat	Skype	Skype (non-FOSS)
Video playback	Windows Media Player/Quicktime	VLC
Web browser	Internet Explorer/Safari	Firefox, Chrome (non-FOSS)
DVD/Video tool	Handbrake	Handbrake
Publishing	Pagemaker	Scribus
Audio Editing	Audacity	Audacity

It's up to you find where and how to install the remaining software. If you've had enough of the command line, jump back into the Ubuntu Software Centre. Your facilitators will come around and help.

## A cross-platform Workflow

If you have tried to use the same portable hard drive between multiple operating systems, you will probably have come across incompatible formats and file types. In this section we will look at making your Xubuntu system capable of reading and writing to most common disk formats and customise LibreOffice for compatibility with Microsoft Office and Excel.

## Accessing Disks from Windows and OSX

By default your Xubuntu system can read and write to three common file systems used on Windows; FAT, FAT32 and NTFS.

### FAT

If you stick to the FAT or FAT32 you will have no troubles transferring most files between Windows, Xubuntu and OSX, as all three operation systems can read and write to this disk format by default.

However FAT can only use disks up to 4GB in size, making it really only suitable for USB drives.

### FAT32

FAT32 is better, it has a disk limit of 1000GB, but it has a file size limit of 4GB making it unsuitable for large media files.

### NTFS

NTFS is suitable to use between Windows and Xubuntu. It allows very large file sizes and disk limits. The problem with NTFS is that OSX can't write to the format without extra software.

### Exfat

The solution for transferring large files between all three OSs is to use the Exfat format. Both Windows and OSX will read and write to this. To install onto your system it's as simple as:

```
sudo apt-get install exfat-fuse exfat-utils
```

## Accessing OSX disk formats - HFS and HFS+

The most common OSX formats are HFS and HFS+. What if your friend has a Mac and wants to share some files off a HFS or HFS+ disk?

### Reading HFS

Just reading from these formats is easy. Make sure you install hfsprogs and you are ready to go.

```
sudo apt-get install hfsprogs
```

## Writing to HFS+

If you want to write to a HFS volume (what OSX calls a disk), then you are OK, but to write to HFS+ volumes you will need to use your command line skills.

We will use `fdisk` - a command line tool for managing disks to discover more about disks.

Disks in Linux appear as directories inside the `/dev` directory. For example, the first hard disk in your computer will likely be `/dev/sda`.

First up you'll need to discover the volume letter and partition number of your hfs+ drive using;

```
sudo fdisk -l
```

Now you can force the HFS+ volume to be mounted using the `mount` command. Before we do this, let's create a directory to mount it in.

```
sudo mkdir /media/macvolume
```

Now use `mount` and just replace `sdx#` with your drive details.

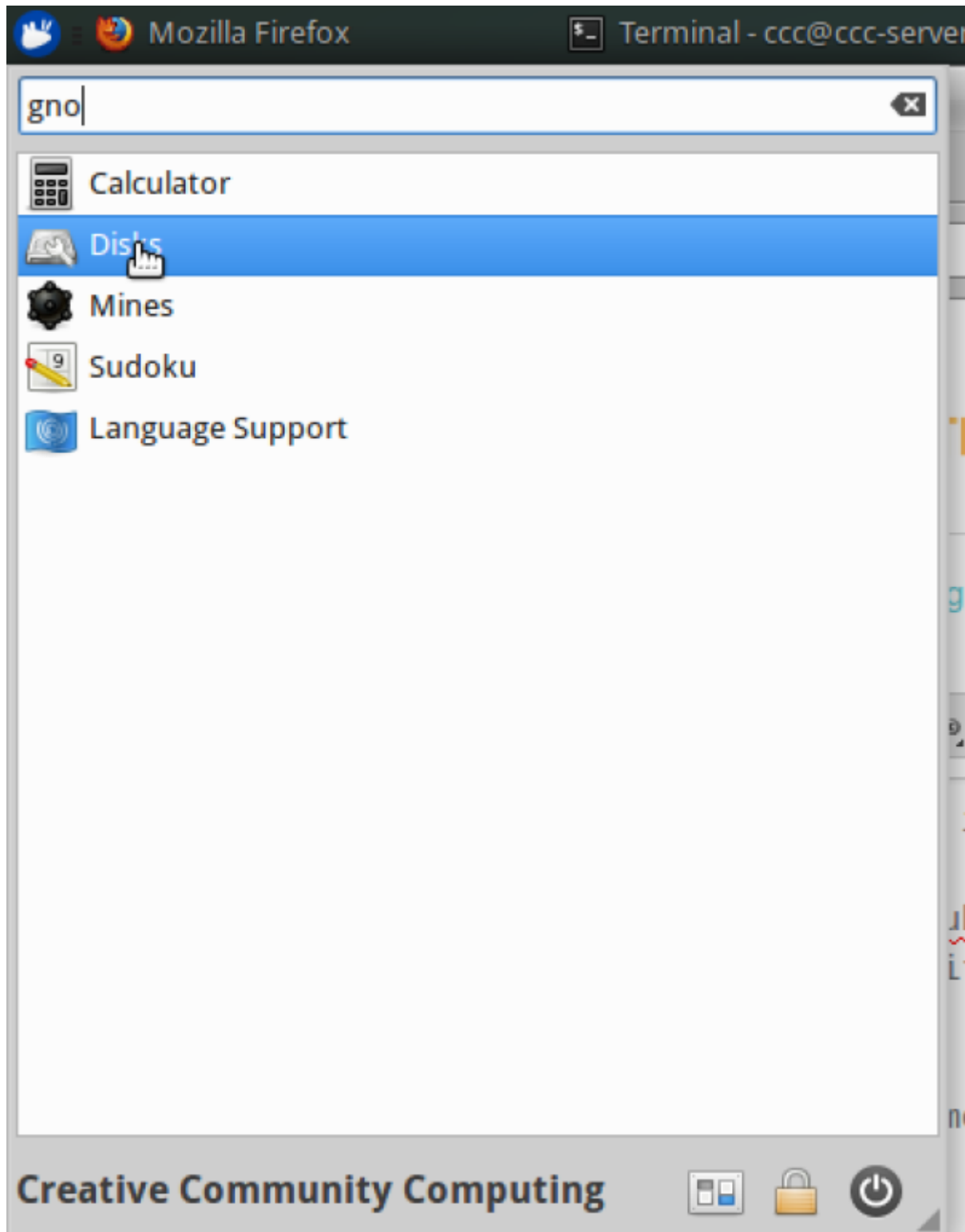
```
sudo mount -t hfsplus -o force,rw /dev/sdx# /media/macvolume
```

## Formatting External (or internal) Disks

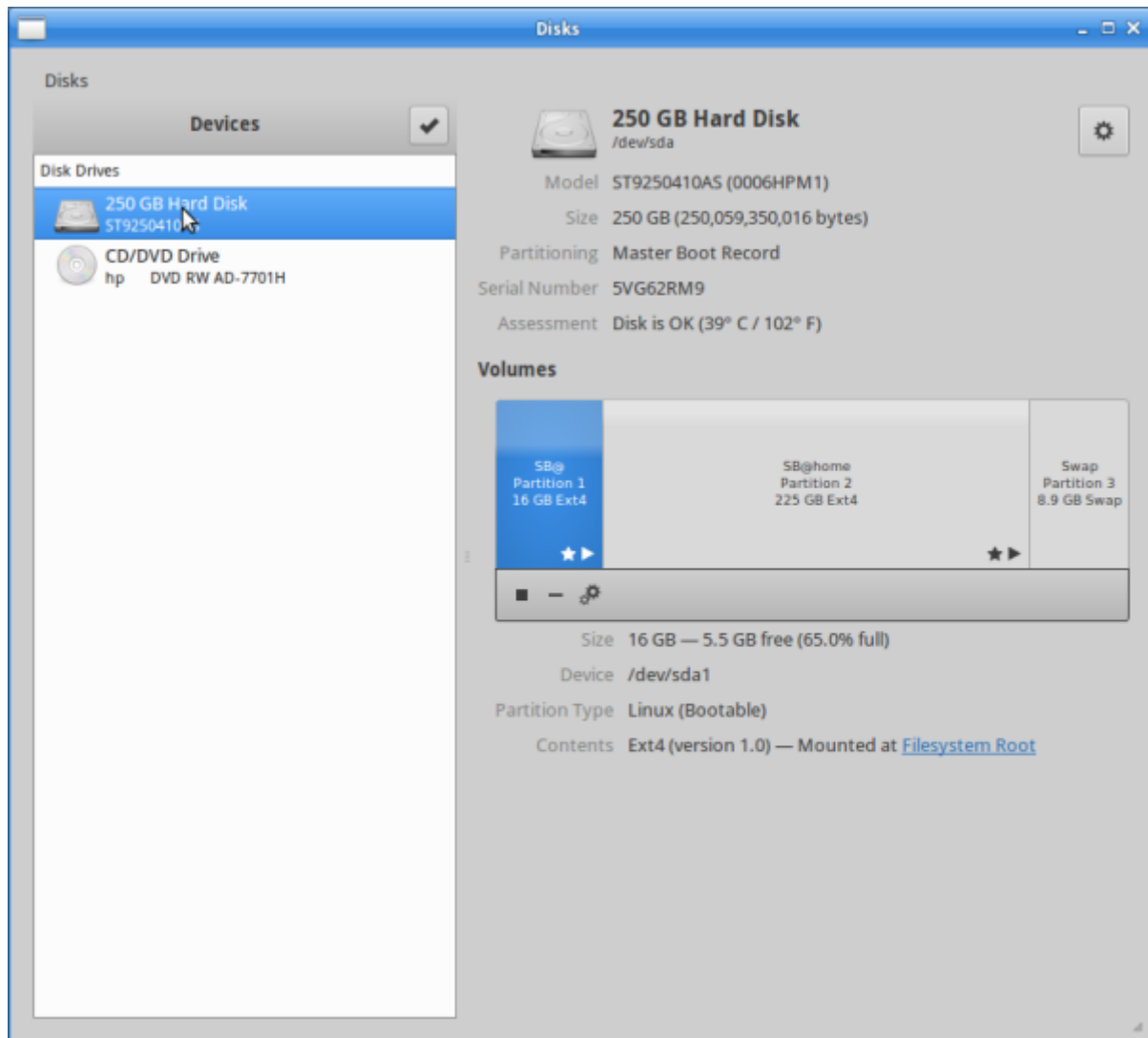
One of few missing tools in Xubuntu is a disk utility. Disk utilities are used to format drives or removable media. Let's format a USB stick compatible with Windows or OSX. We'll grab Gnome-Disk-Utility to do the job.

```
sudo apt-get install gnome-disk-utility
```

Once it installs, you can access it as 'Disks' from the whisker menu.

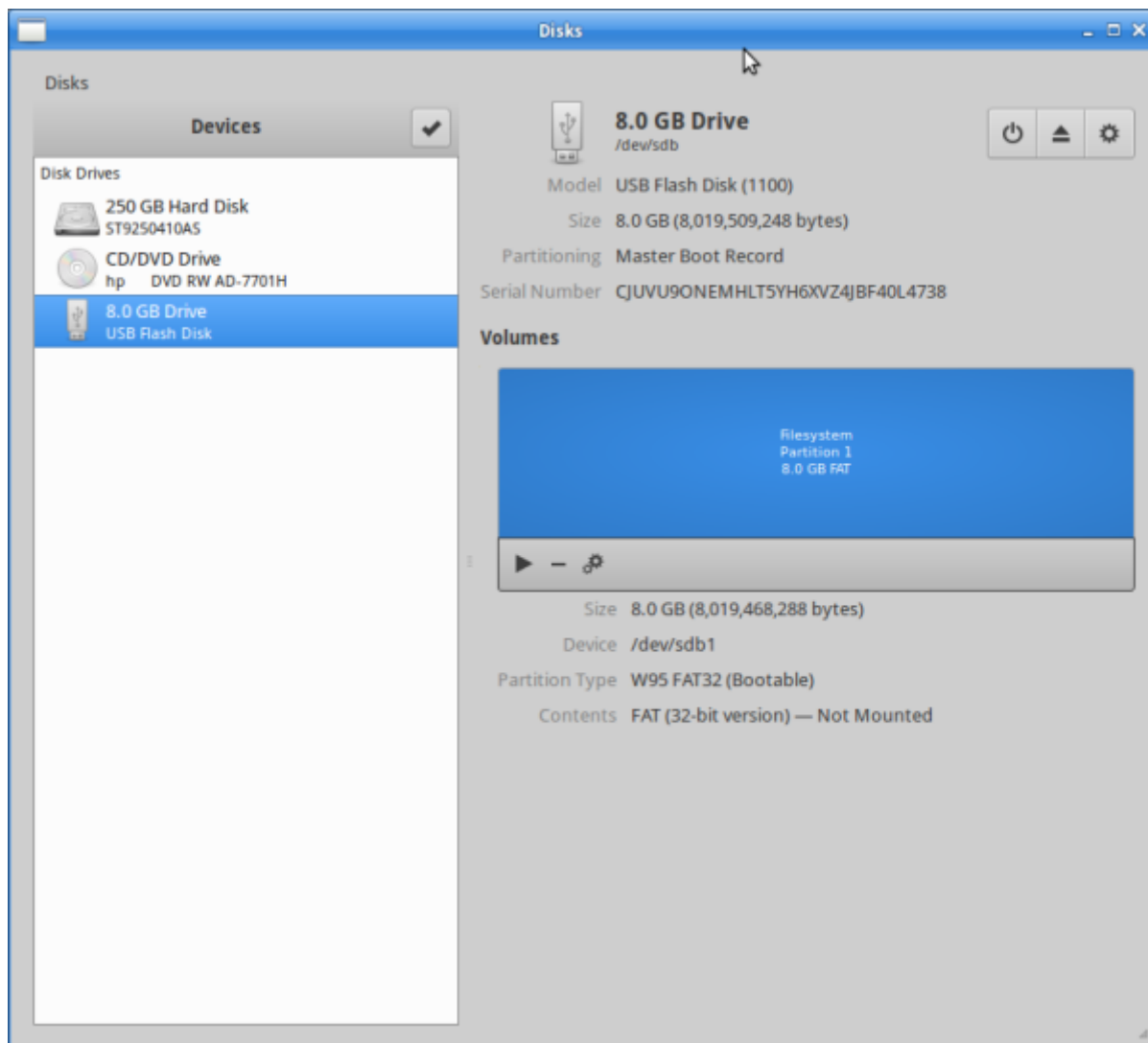


On open, Disks will show your internal hard drive, and your DVD drive.

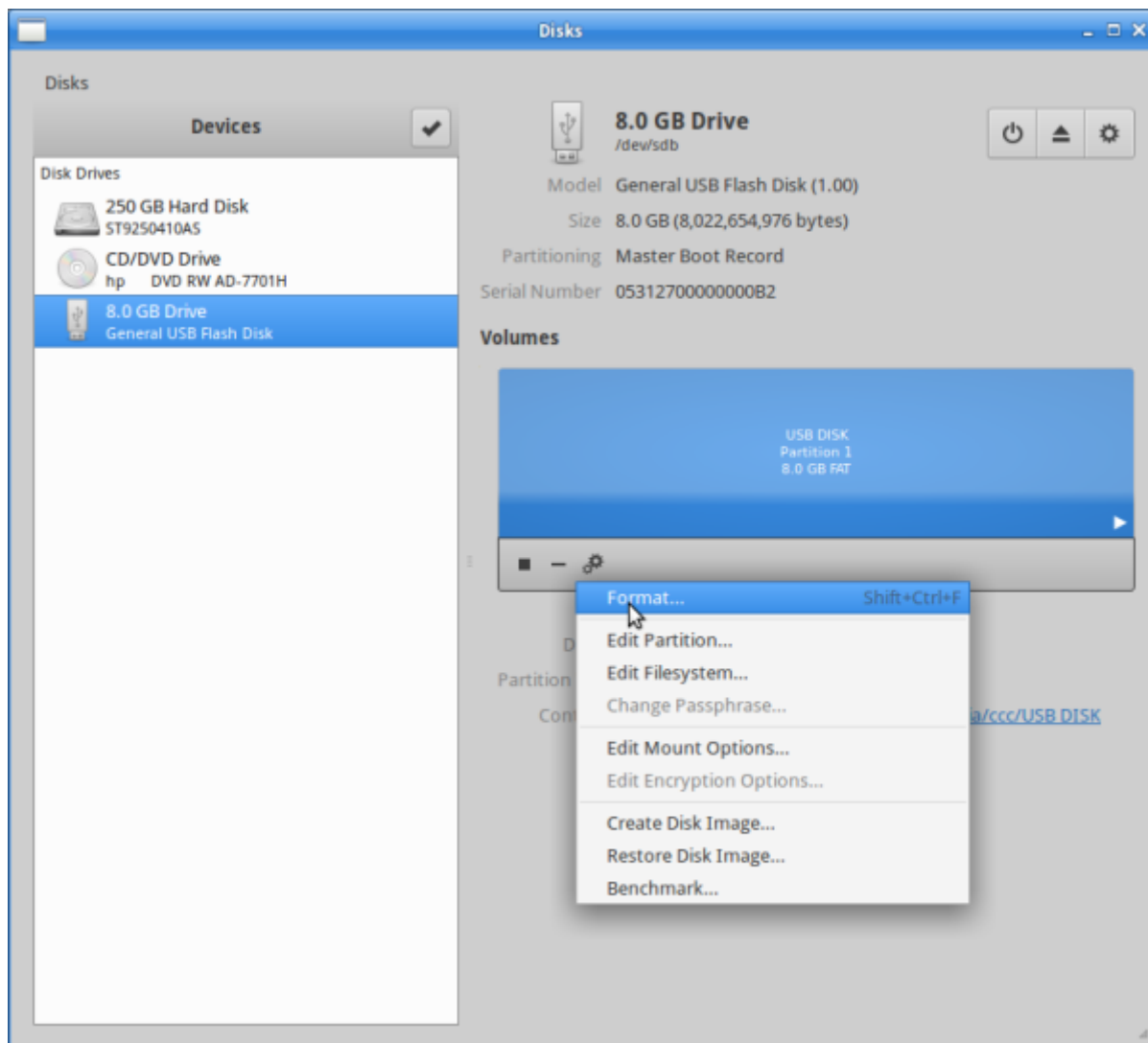


Plug in your USB stick and it will appear in Disks.

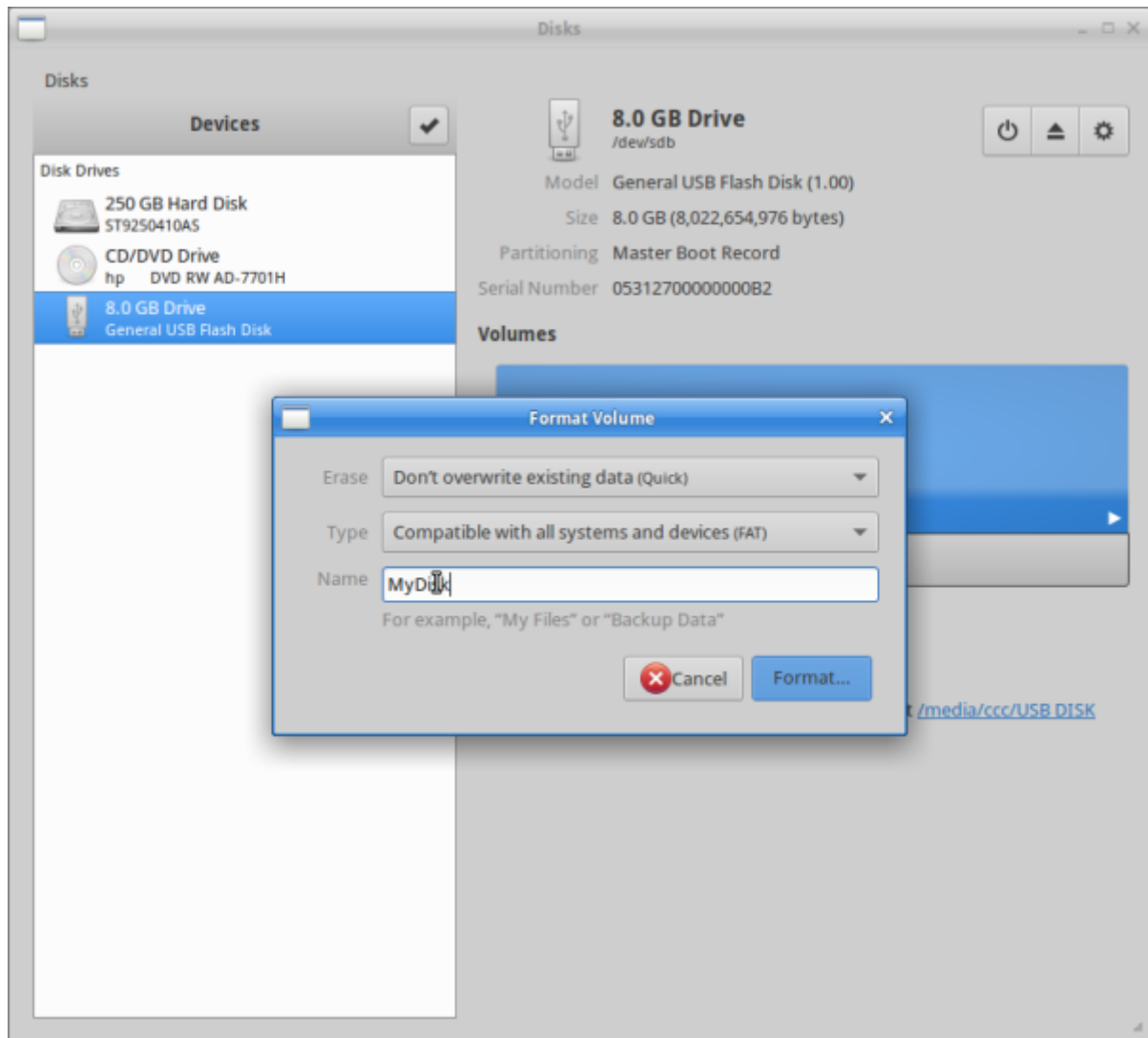




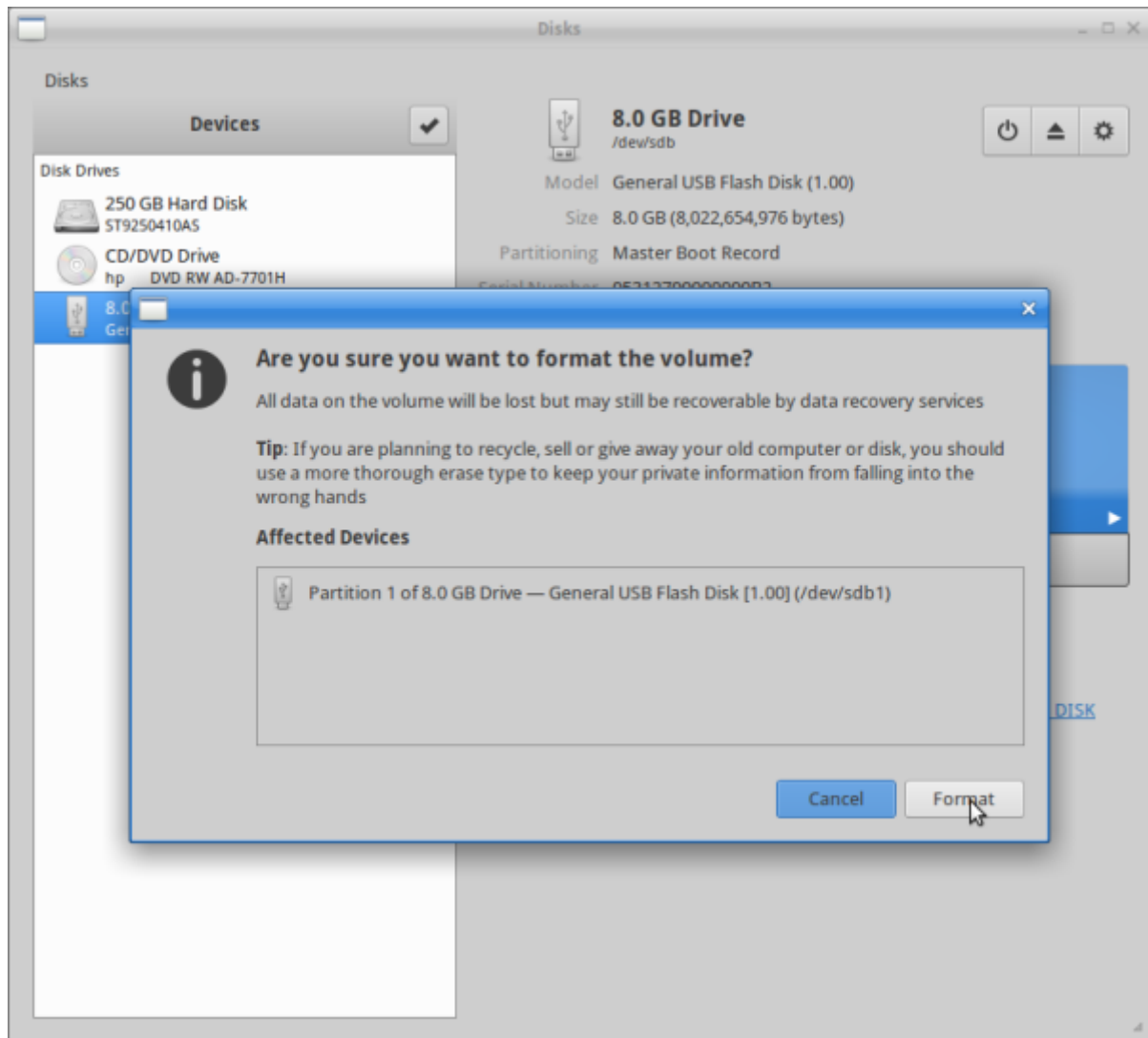
To wipe the disk - select format and give it a name.



We will use [FAT32](#) format, which is compatible across all operating systems.



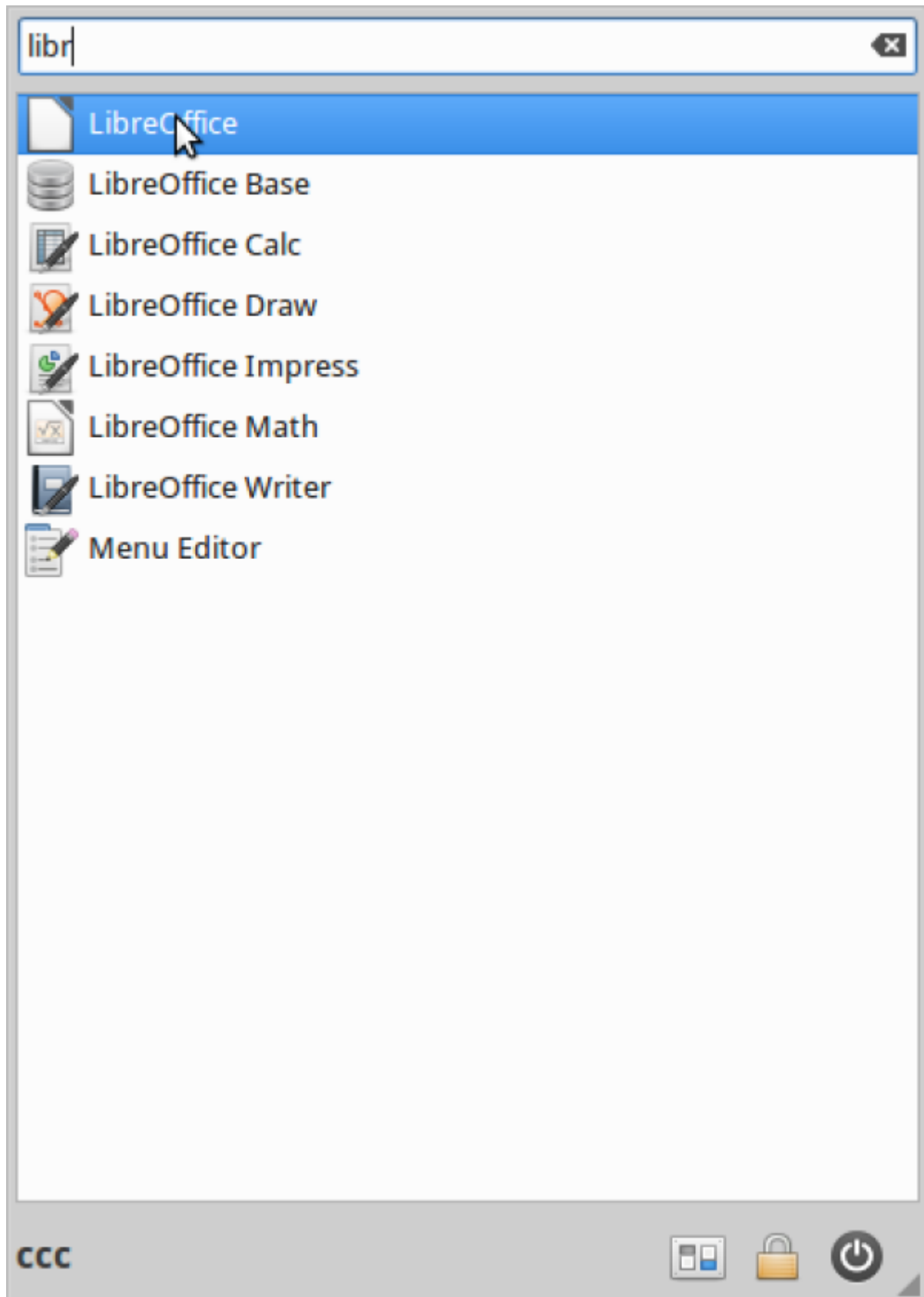
You will be asked to confirm whether you want to wipe the drive, confirm and your drive will be formatted.



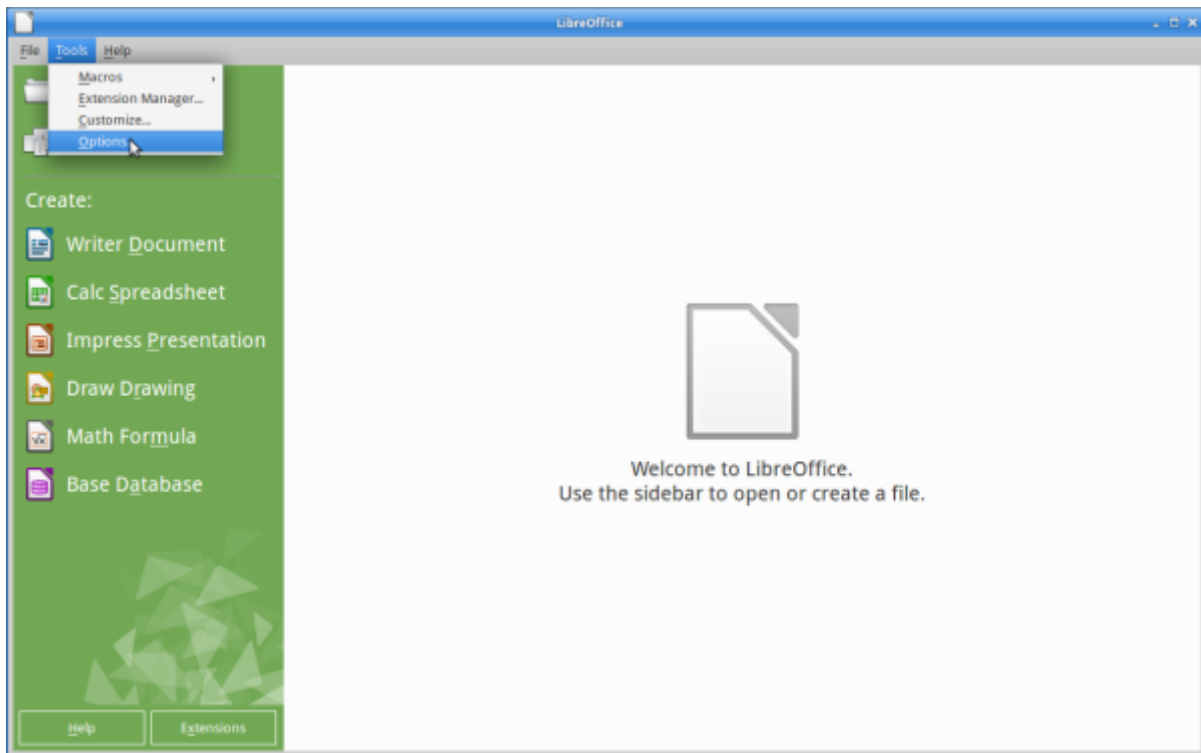
## Libre Office

LibreOffice is a free and open source office productivity suite. It can be used as a replacement for Microsoft Office, but it uses the Open Document Format. For compatibility with Microsoft Word and Excel, let's change the default format for LibreOffice Writer and Calc.

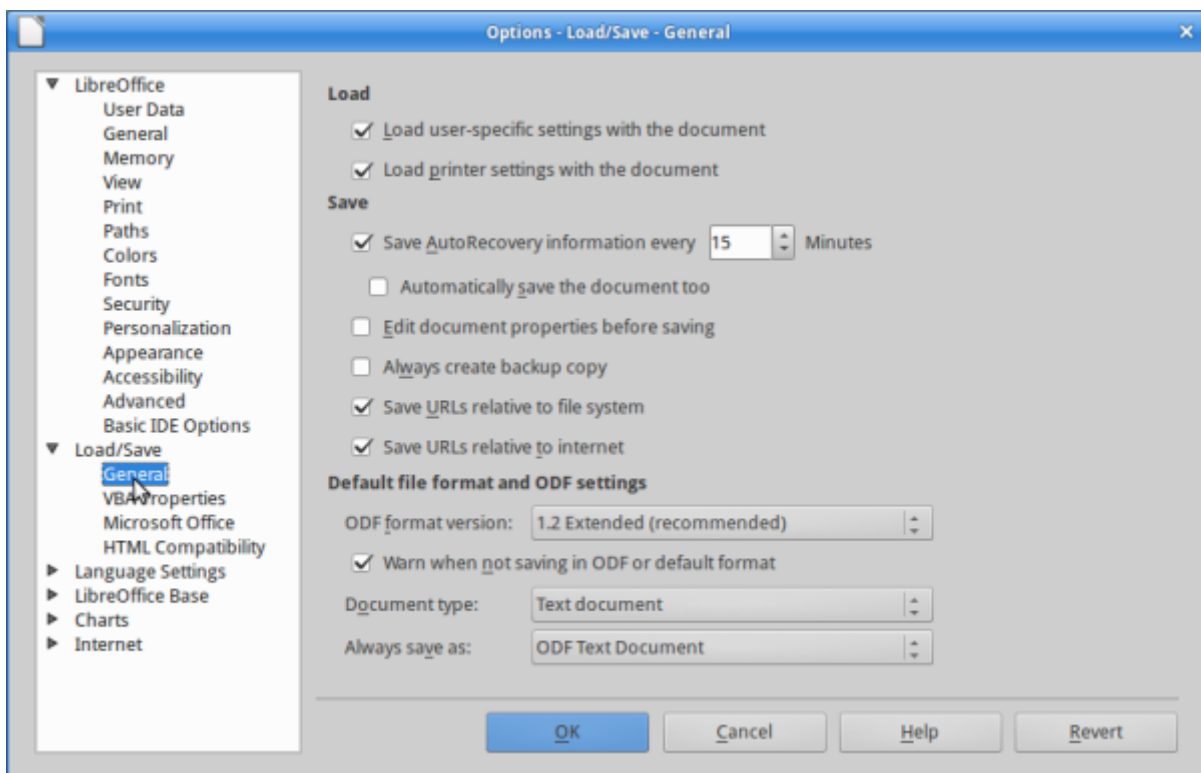
Open LibreOffice from the the whisker menu.



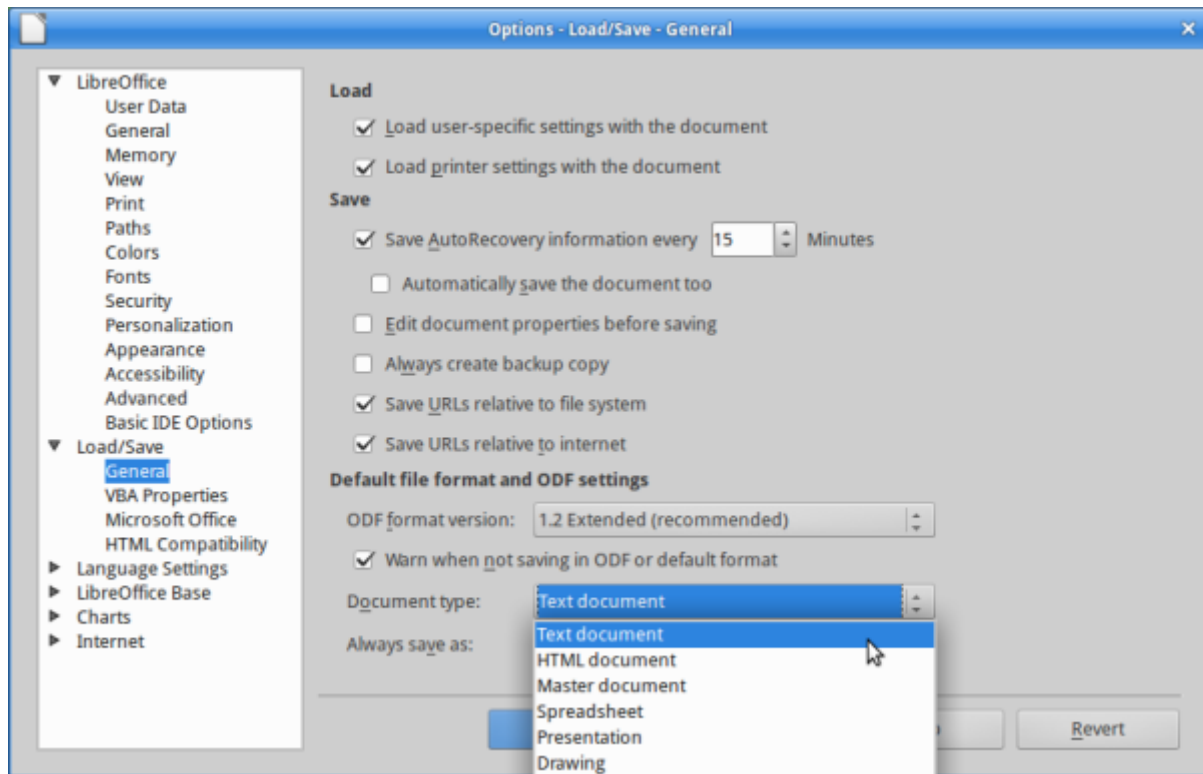
Go to options.



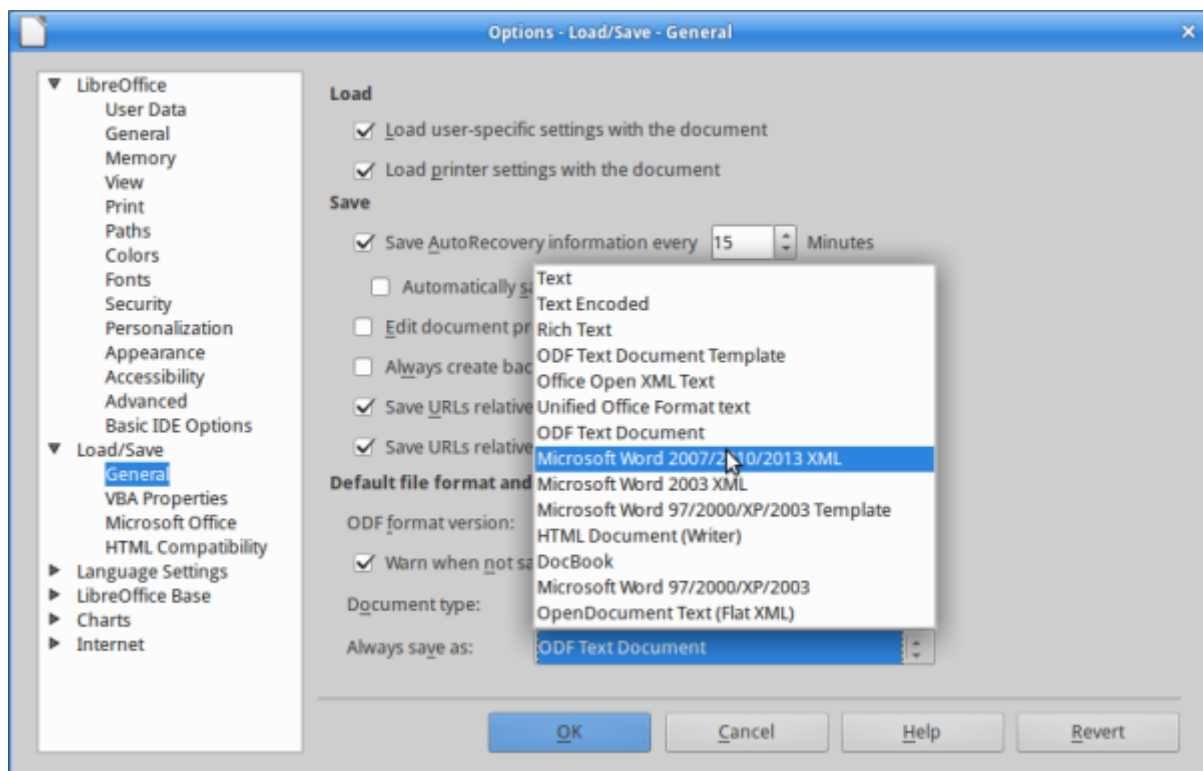
Select load/Save/General



In the document type select 'Text Document'



And change the type to 'Microsoft Word/2007/2010/2013 XML'



## Customising your Web Browser

Xubuntu installs Firefox by default. If you would like to use Google Chrome, you can download it [here](#).



Once you are up and running the browser of your choice, we will install an *extension* or *addon* that will increase what you can do with your browser.

Let's install an ad-blocker to make our browsing experience more pleasant. The best one we've found so far is called  $\mu$ Block, which can be found [here](#) for Firefox or [here](#) for Chrome.

Ad-blockers do exactly what you would expect - remove advertising from websites.  $\mu$ Block is particularly good and is less resource intensive, meaning it won't slow your browser.

To see what  $\mu$ Block does here is a page without it installed. Notice the advertising to the sides of the text and the video ad about to play in the video window.



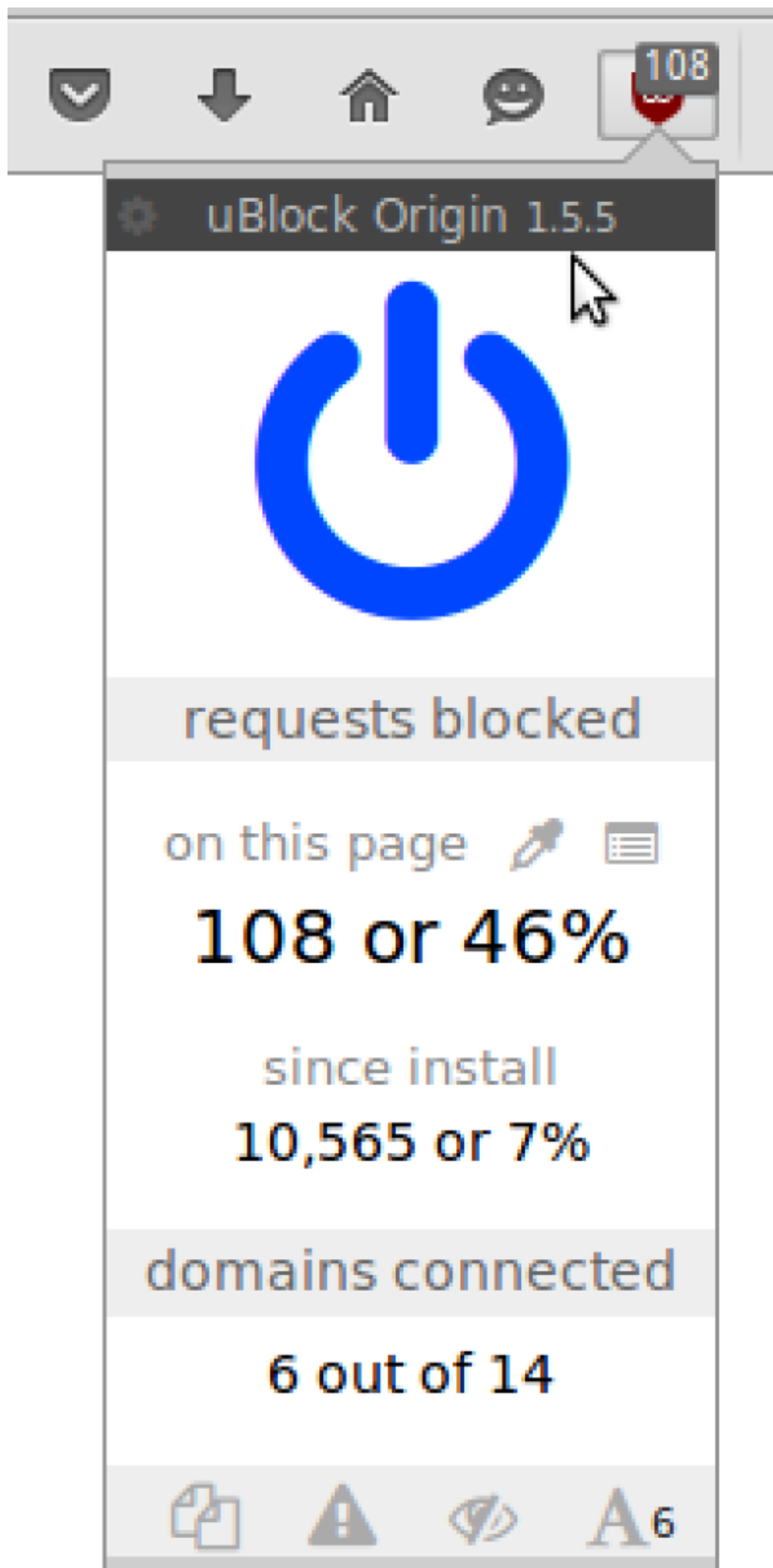
Now the same page with an  $\mu$ Block installed.



Notice the video has jumped straight to the monkey, and the advertising on the sides of the page is

gone?

You can check on what  $\mu$ Block is blocking by clicking on menu bar icon, and if you want to disable  $\mu$ Block for a site, just click the 'Power' button.



# Making a Backup

A *backup* is a copy of your files and other data that you can *recover* or *restore* if disaster strikes. To be really safe, your back-up needs to be outside of your computer, and you need to check that the backup works! You can use an external disk drive, USB stick or another computer on a network or the internet. We will demonstrate using a USB stick, with three different ways of backing up.

## Copy Your home directory

Remember Xubuntu (and all Linuxes) store all of your personal files in your home directory. If you want to back-up all your personal files, you can simply copy your entire home directory to a USB. Let's do this with the file manager to start with.

First open the file manager from the whisker menu.



Now select your home directory from the 'places' sidebar. Mine is 'sdlw'



We need to go up a directory to make a copy of your whole home directory.



Right click and copy.



Then select your backup USB from the 'Places' menu,



And paste your files in.



This may take a while....



Once your back-up is complete, its a good idea to at least check (or *verify*) your files have been

copied. Just open up the files on your backup disk make sure you copied what you wanted.

## Back-up with Archiving

What happens if your files are too big to fit on your back-up media? In my case, my home directory has too many files to fit on my USB, so I'll just grab a few folders and make an *archive*. An archive is a file format that makes files smaller using compression - in this case we will use [zip](#).

I'm going to archive my pictures folder, but first I will check the size by right clicking the folder and selecting 'Properties'



It's about 400MB. Next I make an archive to compress (make smaller) the folder. Right click and select 'create archive'.



Next I give it a name, select the *zip* format and save it to my external USB.



Your computer will take a while to compress all the files into and archive.



You can check the files size of the archive - it should be smaller that the original, depending on the type of files you have archived.



Once again, you should check your backup to make sure it has worked.

## Back Ups using Cronopete

An easy way to keep your data safe is to use a back-up program. There are a number of command line utilities that can be used, such and rsync or duplicity. We will install a GUI based utility that ties together these tools in an interface that is modelled on Apple's Time Machine app. You will need a USB stick or drive you can wipe and reformat to use cronopete.

## Installing Cronopete

Cronopete is not available in the main Ubuntu repositories, but you can use this

build

## cronopete settings

With cronopete installed its time to set our backup settings. Use the whisker menu find cronopete. just start typing 'cronopete' and select 'backup settings'



First up we need to prepare a backup disk - cronopete will erase as format the disk. Plug in your USB disk, and select 'change disk'



Select your USB stick (make sure its the one you want!) and click OK.



You will be asked to confirm format of this drive. Remember this will erase the entire contents!



Once the format is complete, its time to choose what you want to back up - click on 'options'



And add a folder to backup.



I'm going to add the 'Documents' folder in my home directory.



It should appear in cronopete like this. I can also set the backup interval here. This is how often cronopete will backup.



## Backup with cronopete

Now it's time to turn cronopete on and make sure it is in the menu bar.



Now you can open the menu bar



and select 'backup now'



The first backup will be started straight away, and you will see the information here.



## Oops! I've lost some files...

Now that we've done a backup, its time to test the restoring. To do this I'm going to delete some files from my documents back-up and then see if I can use cronopete to get them back. Here is the contents of my documents folder I've already backed up.



Now I'm going to 'accidentally' delete all these files and make a new one called 'oops'



And do another backup using the menu bar.

Oops! I've just lost all those files! Lets try to get them back with cronopete.

## Restoring with cronopete

To open the restore GUI use the cronopete menu bar.



and select 'Restore'.





You will see a window like this. The backups appear as windows going back in time. The front window is the latest backup.



Lets try to find our lost files by clicking on the back arrow. Here are the files I want.



Now select them all and click restore.



The files will be copied back into my Documents directory - we can tell they are backups as all the files have '.restored' in the file name.



And we are done!

#### [Workshop 04 - Social Media and Online Safety](#)

<sup>1)</sup>

This guide has been modified from the Ubuntu Community Documentation site.