System administration

8.1 The software sources

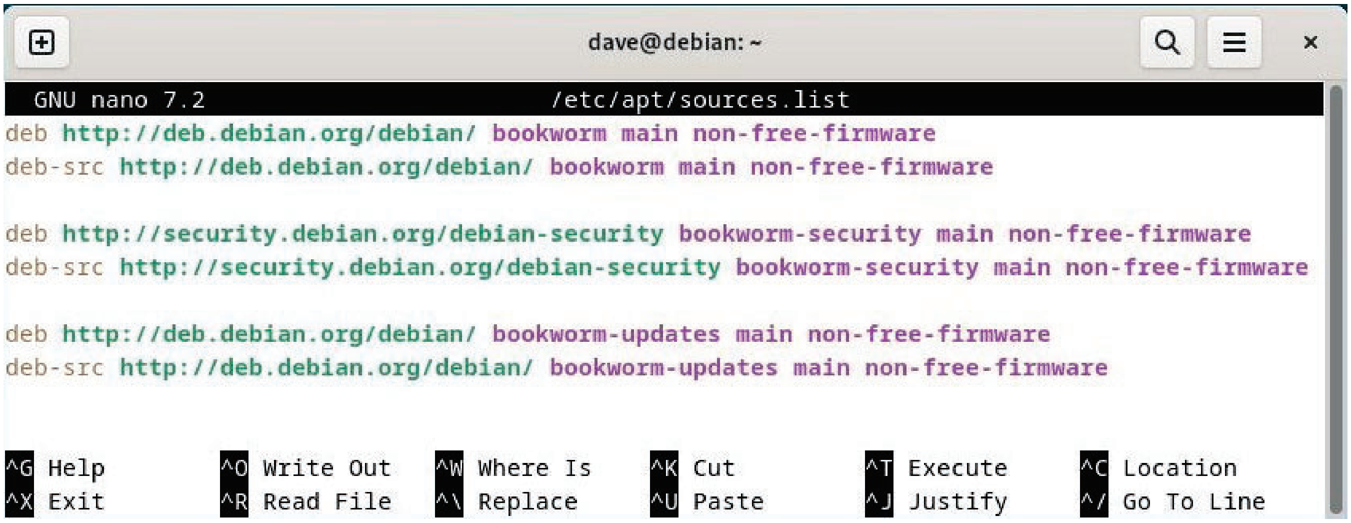
Debian GNU/Linux uses the repository methodology to distribute applications. This methodology allows the software centralization and the usage of simple interfaces to administrate and upgrade your system: you have no need to visit the software sites themselves.

8.1.1 The sources.list file

The Internet addresses of the Debian repositories are stored in the /**etc/apt/sources.list** file, as well as the files of the type /**etc/apt/sources.list.d/xxx.list**.

To edit and modify your *sources.list* file, you can use one of those commands (in administrator mode):

```
apt edit-sources
nano /etc/apt/sources.list
```



```
 GNU nano 7.2                    /etc/apt/sources.list
deb http://deb.debian.org/debian/ bookworm main non-free-firmware
deb-src http://deb.debian.org/debian/ bookworm main non-free-firmware

deb http://security.debian.org/debian-security bookworm-security main non-free-firmware
deb-src http://security.debian.org/debian-security bookworm-security main non-free-firmware

deb http://deb.debian.org/debian/ bookworm-updates main non-free-firmware
deb-src http://deb.debian.org/debian/ bookworm-updates main non-free-firmware


^G Help        ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location
^X Exit        ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line
```

The default ‘sources.list’ file on Debian 12

Details concerning the various information found in the ‘sources.list’ file (the lines beginning with a “#” are just comments):

- “deb”: means a *binary* repository (the compiled software itself)
- “deb-src”: means a *source* repository (the program code files used to compile the software)
- “http:...” or “https:...”: the Internet address of the repository server
- “bookworm” or “bookworm-security”: the branch in the repository tree
- “main” or “non-free-firmware”: the repository sections.

... why “bookworm” and not “stable” since the system is based on Debian Stable ??
“**bookworm**” is the precise version name of the installed system. It sets a given version of each packages included in the “bookworm” repository (the version of the generic kernel, for example).
“**stable**” is the generic name of the *currently* stable version.
For the time being, Debian 12 “bookworm” is the “stable” version, thus you could used either designation. But when the Debian “stable” version becomes Debian 13 “Trixie”, then Debian 12 “bookworm” attribute will change to “oldstable”.

Using the precise name of your version allows you to control **if and when** you want to upgrade your system to the next version, as opposed to some systems which want to impose their upgrades...
For more detailed information, I invite you to visit the dedicated Debian wiki https://www.debian.org/releases/index.html

8.1.2 About repositories, branches and sections/components

Debian organizes its software packages inside repositories. These repositories are divided into branches and sections/components. To learn more about the “testing” and “unstable” branches read the chapter 8.9. One word, however, about the sections/components inside the repositories.

There are 4 sections in the official Debian repositories:

- **main**: complies to the DFSG without any “non-free” dependency
- **non-free-firmware**: non-free firmwares included by default since Debian 12
- **contrib**: complies to the DFSG with some “non-free” dependencies
- **non-free**: does not comply to the DFSG

DFSG (**D**ebian **F**ree **S**oftware **G**uidelines) : philosophical principles of the “libre software” according to Debian (https://www.debian.org/social_contract.html#guidelines)

Only the packages within the **main** section/component are officially supported by the Debian project and are 100% free software. Rather, those proposed in *contrib*, *non-free* and *non-free-firmware* are partially or totally non-free.

Having said that, and depending on your type of hardware, it is very possible that some services won’t function correctly without using some specific (proprietary) drivers. In that case, you need to modify the /etc/apt/sources.list file (details in the following chapter)

- More details about the Debian versions in the Debian Wiki: https://wiki.debian.org/DebianReleases.
- For more details on sources.list, it's here: https://wiki.debian.org/SourcesList.
- For a complete documentation on the Debian package management, it's there: https://www.debian.org/doc/manuals/debian-reference/ch02.html.

8.1.3 Backport packages

Debian offers also some special repositories called **backports**, which contain **more recent versions** of some applications. These repositories are not activated by default, but do not present any particular risks for your system: **the "regular" repositories have the highest priority during the update process**, only the applications installed from the backports will look into these specific repositories.

... what do you mean exactly by "backports" ?
Nothing to do, in fact, with the "backdoors" used to spy on computers running proprietary systems...
The **backport** is a mechanism allowing an application currently hold in the Debian development repositories, to be *ported back* to the "stable" version.
For example, the Debian developers take from the development repositories the most recent version of LibreOffice, and re-compile (re-build) the package holding the application, while taking care of all the dependencies existing in the "stable" version.

More details about *Backports* in the dedicated page of the Debian wiki (https://wiki.debian.org/Backports).

If you are looking for specific application, you have two solutions:

- use the search package tool (https://backports.debian.org/Packages/)
- use the search by category (https://packages.debian.org/bookworm-backports/).

8.1.4 Modifying the Repositories

Before you start modifying the software sources of your system, you must be conscious of the risks your are taking by using the "contrib" or "non-free" components of the archived branch :

- the lack of freedom for this kind of packages
- the lack of support by the Debian project (you cannot maintain a piece of software without having the source code at your disposal)
- the contamination of your completely free Debian system.

Now, that you are aware that the non-free people kill the pink rabbits, let's move on:

To modify your software sources, it is enough to edit the 'sources.list' file. Open a terminal in administrator mode (chap.3.8.3), and enter:

```
apt edit-sources
```

This command opens the appropriate file with the default text editor (nano or vim). Once you are done with your modifications, save the file ("[Ctrl]+x" with nano, or ":wq" with vim https://www.vim.org/).

Example of line entry for the free packages:

```
deb http://deb.debian.org/debian/ bookworm main
```

Example of line entry for the free packages and the proprietary packages:

```
deb http://deb.debian.org/debian/ bookworm main contrib non-free non-free-firmware
```

Now you can pick in the 4 package sections and install the non-free codecs and drivers.

Note that you can also modify your software sources by using the graphical Synaptic package manager (chap.8.3).

8.2 APT in a terminal

The following sections present the basic commands to manage de Debian packages with **APT** (**A**dvanced **P**ackage **T**ool) within your terminal emulator.

Debian supports also "aptitude", another package manager, with a different syntax and behavior. This manual being intended for beginners, no need to explicit these commands here: to learn more about them, visit the dedicated Debian Aptitude Wiki: https://wiki.debian.org/Aptitude.

8.2.1 'User' command to search and display information

These commands can be executed as simple user, because they do not impact your system.

Command	Description
apt show *foo*	Display information about the package *foo*
apt search *foo*	Look for packages corresponding to the *foo*
apt-cache policy *foo*	Display the available version of *foo*

8.2.2 'Administrator' mode commands for system maintenance

These commands must be executed with the "root" administrator rights, because they impact the system. To move into the administrator mode from a terminal, type "**su -**": the administrator password is requested.

Command	Description
apt update	Update the repositories metadata
apt install *foo*	Install the *foo* package and its dependencies
apt upgrade	Secured update of the installed packages

Command	Description
apt full-upgrade	Update of the installed packet, by adding/removing other packages if necessary
apt remove *foo*	Remove the *foo* package, but not the configuratrion files
apt autoremove	Auto remove the unecessary packages
apt purge *foo*	Purge the *foo* package and its configuration files
apt clean	Clean the local cache of the installed package
apt autoclean	Clean the local cache of the obsolete packages
apt-mark showmanual	Mark a package as being “manually-installed”

For more detailed information and the apt/aptitude equivalence, visit the dedicated page of the Debian manual: https://www.debian.org/doc/manuals/debian-reference/ch02.html

All-in-One command line (in administrator mode) to update the repositories information + update your system + clean the packages in cache:

```
apt update && apt full-upgrade && apt autoclean
```

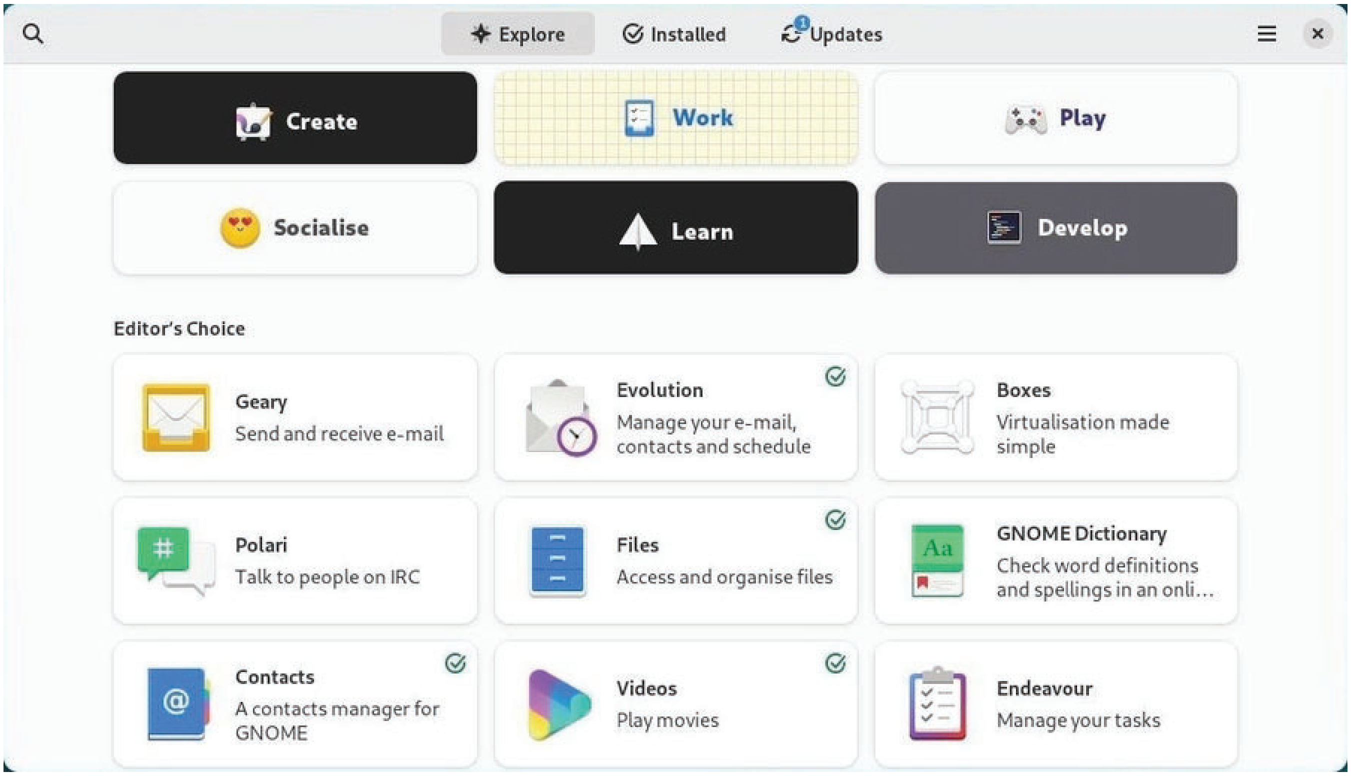
To delete useless packages, unecessary dependencies, and old configuration files in administrator mode:

```
apt autoremove --purge
```

Which goes to demonstrate that managing your system with a terminal is not that complex. 😉

8.3 Software : the simplified package manager

Software is a simplified manager for Debian applications. It allows you to search, install, delete or update packages containing your applications. You can find it in the “System” category of your menus or directly from the Gnome search box by typing “Software”.



Editor's Choice

Geary
Send and receive e-mail

Evolution
Manage your e-mail, contacts and schedule

Boxes
Virtualisation made simple

Polari
Talk to people on IRC

Files
Access and organise files

GNOME Dictionary
Check word definitions and spellings in an onli…

Contacts
A contacts manager for GNOME

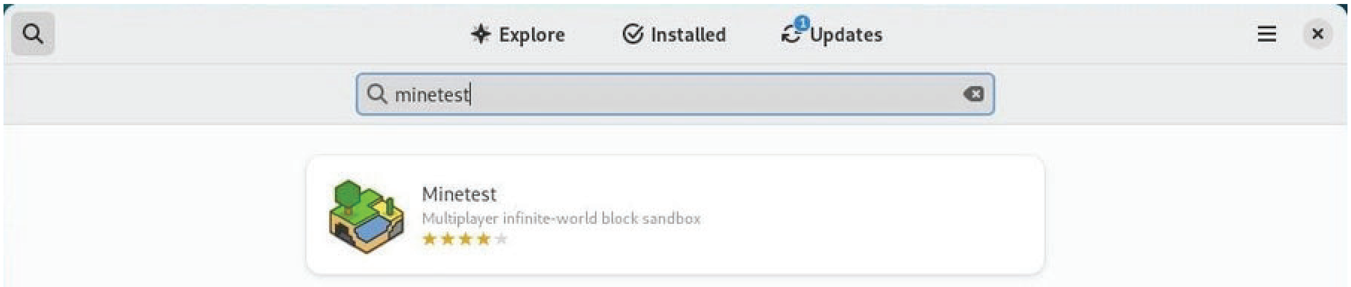
Videos
Play movies

Endeavour
Manage your tasks

Software: default Debian interface.

8.3.1 Software: searching an application

Directly by clicking on the search button (the magnifying glass symbol), or by selecting one of the displayed categories:



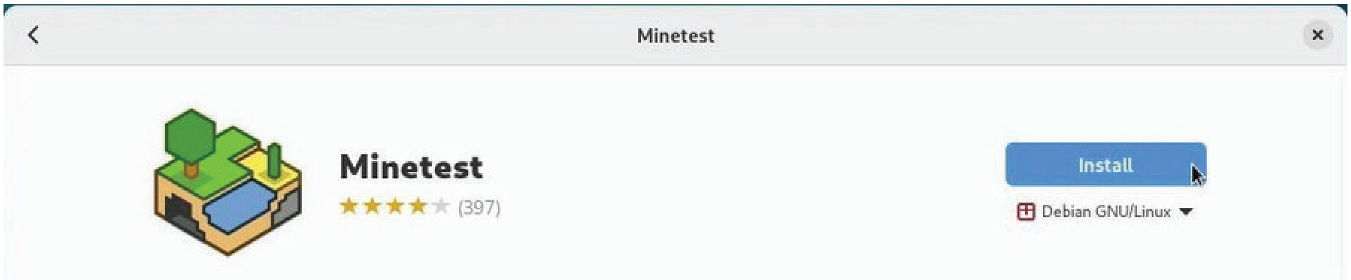
minetest

Minetest
Multiplayer infinite-world block sandbox

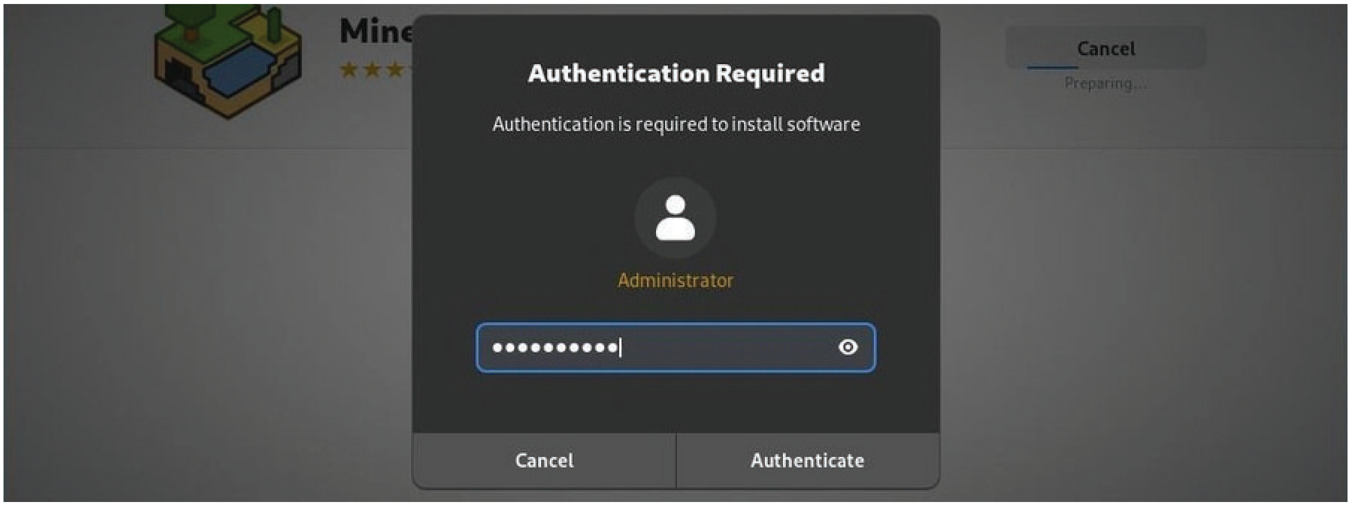
Software: searching an application by its name.

8.3.2 Software: installing an application

You can **Install an application** simply by clicking on its description area and then on the “Install” button. The administrator password will be requested. You can follow the installation progress in the main window and then launch directly the newly downloaded application.

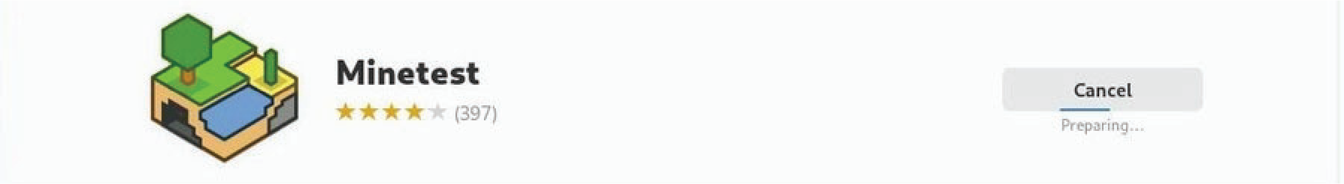


Software: selecting an application for installation.

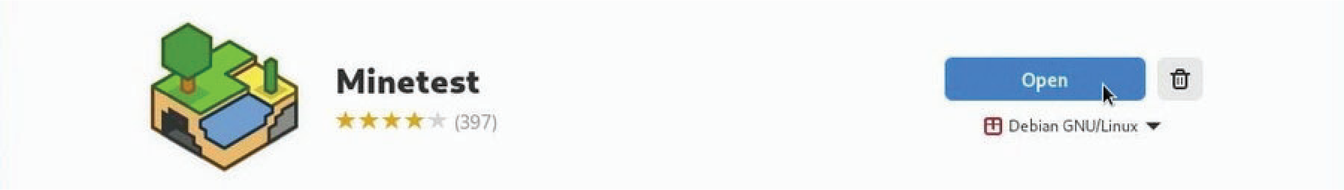


Authentication is required to install software

Software: authentication.



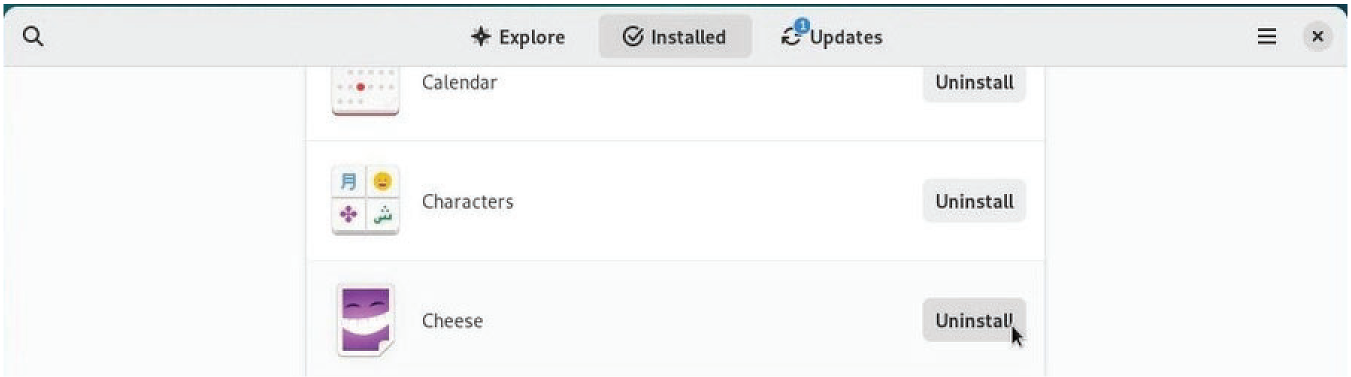
Software: you can follow the installation process.



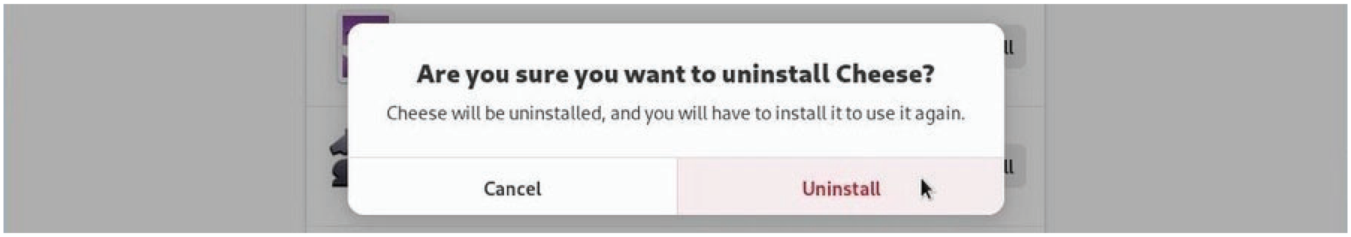
Software: the installation was successful, you can launch your application.

8.3.3 Software: removing an application

You can **Uninstall an application** simply by visiting the “Installed” category (at the top of the interface) and then by clicking on the “Remove” button. You will be asked for confirmation:



Software: selecting an application for removal.



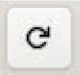
Are you sure you want to uninstall Cheese?

Cheese will be uninstalled, and you will have to install it to use it again.

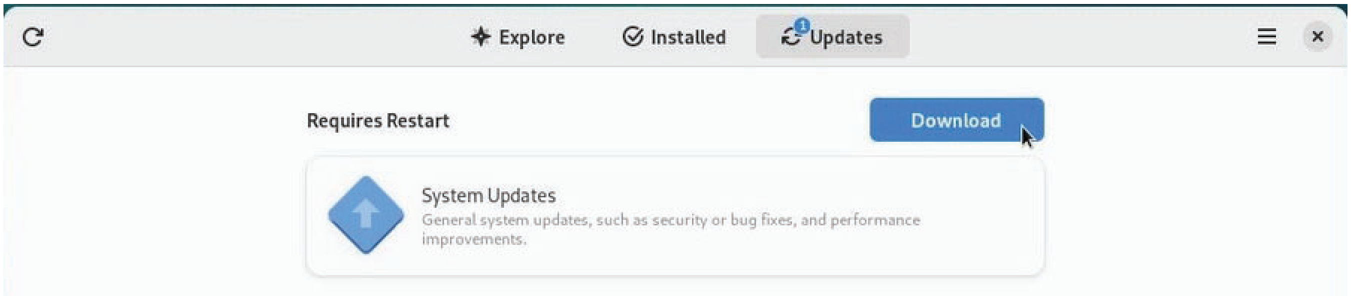
Software: confirmation

8.3.4 Software: upgrading your applications

You can **Update your system** from the dedicated section “Updates” which will indicate the available and/or already downloaded updates. If no update is available, you can check the repositories by using the dedicated button at the top left.



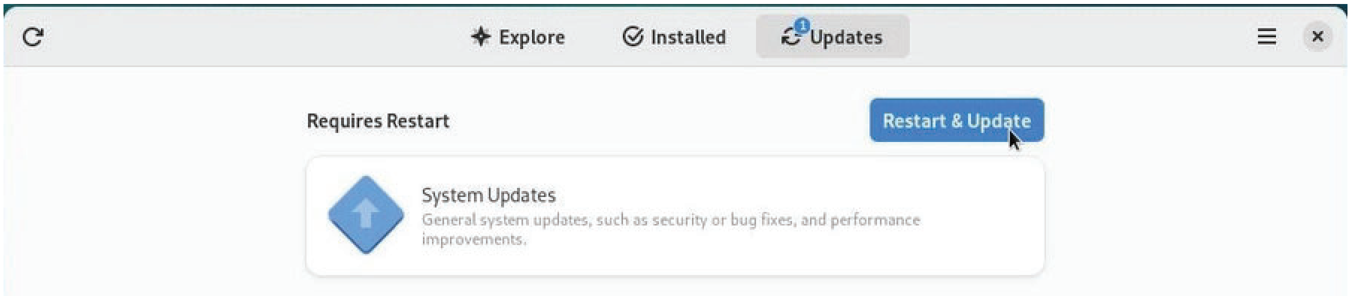
In our example, a set of updates including an “operating system update” requires a reboot. We start by downloading the packet to update:



General system updates, such as security or bug fixes, and performance improvements.

Software: updates tab

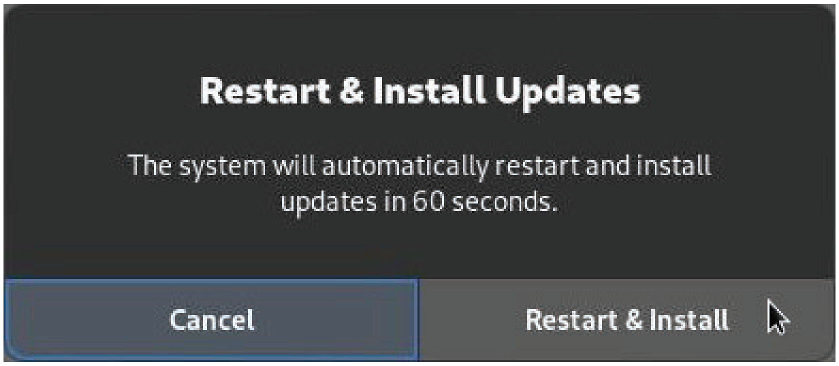
You then have to restart the system by clicking on the dedicated button.



System Updates

General system updates, such as security or bug fixes, and performance improvements.

Software: downloading updates

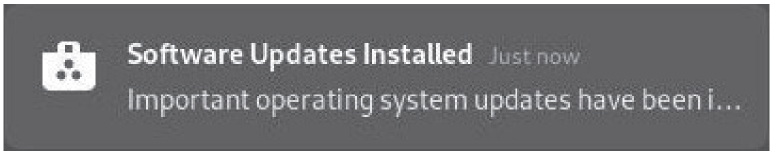

Restart & Install Updates

The system will automatically restart and install updates in 60 seconds.

Software: reboot to apply updates

Note that for lighter updates, restart is not necessary.

After reboot, a message window on the desktop informs you that the install was successful.

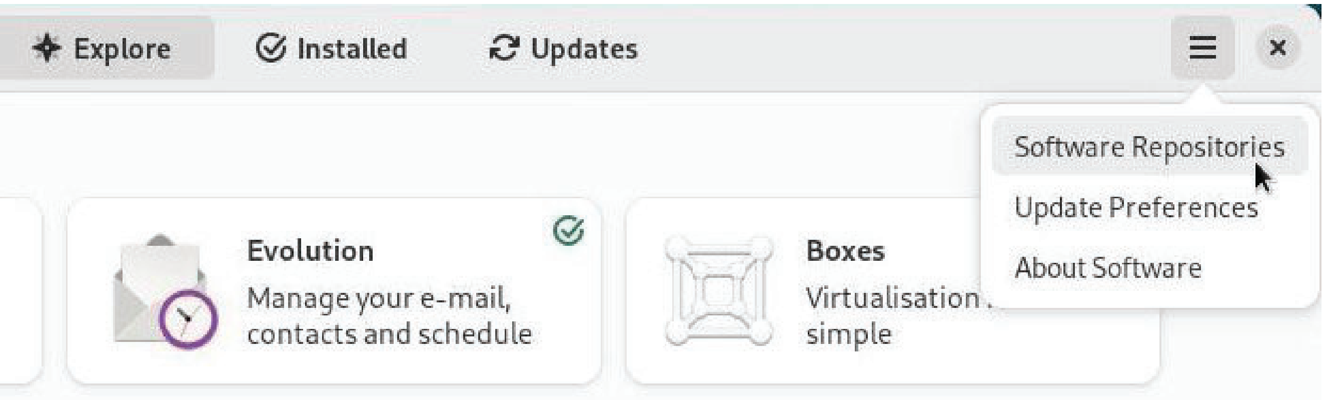

Software Updates Installed Just now

Important operating system updates have been i…

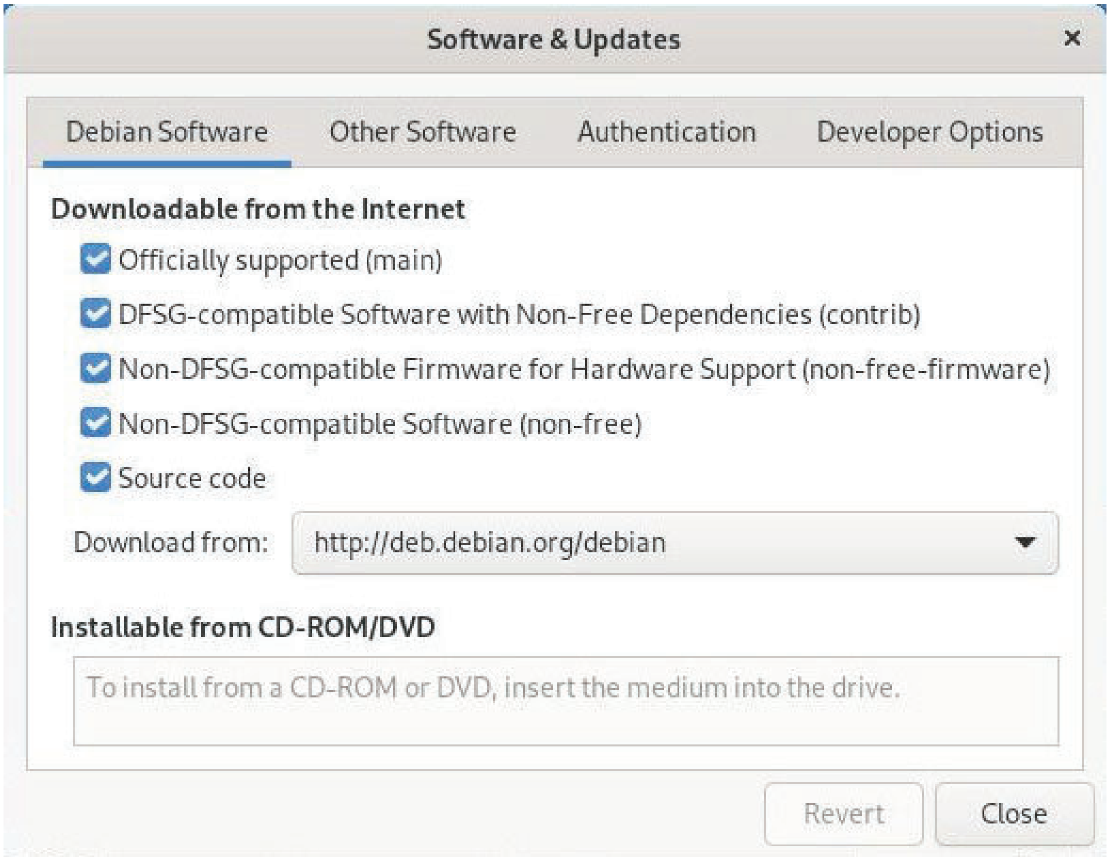
Software: successful update notification

8.3.5 Software: modify packages repositories

The “Software” application is rather simple, but still allows you to configure your repositories graphically. From the menu, choose “Repositories”. You can add “non-free” sources and/or define the frequency of the repositories updates. The repository adresse information on display are coming from your sources.list file (chap.8.1.1).



Software: repositories menu



Downloadable from the Internet

- ☑ Officially supported (main)
- ☑ DFSG-compatible Software with Non-Free Dependencies (contrib)
- ☑ Non-DFSG-compatible Firmware for Hardware Support (non-free-firmware)
- ☑ Non-DFSG-compatible Software (non-free)
- ☑ Source code

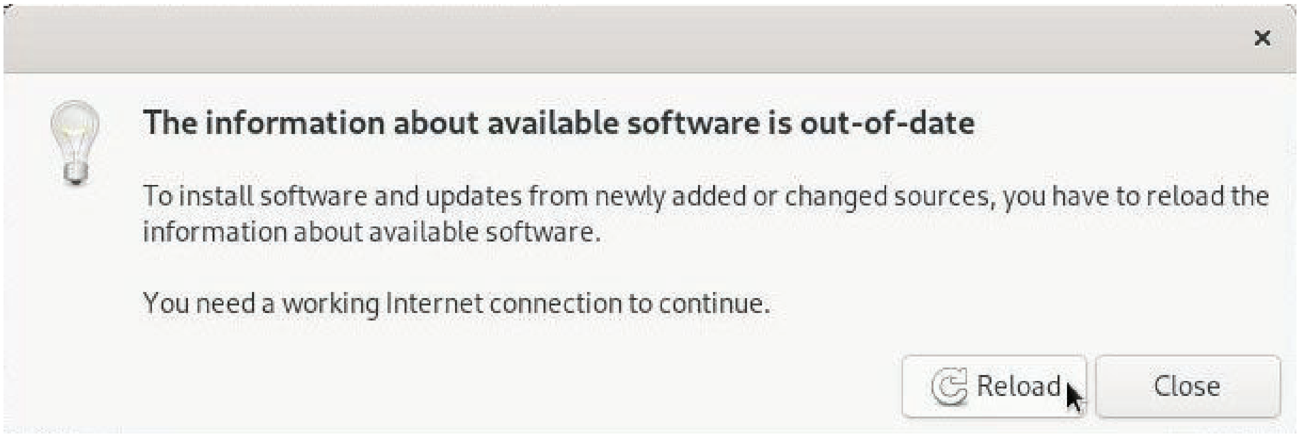
Download from: http://deb.debian.org/debian

Installable from CD-ROM/DVD

To install from a CD-ROM or DVD, insert the medium into the drive.

Software: repositories modification

Once your repositories have been modified, you must reload the information packages. A message prompts you:

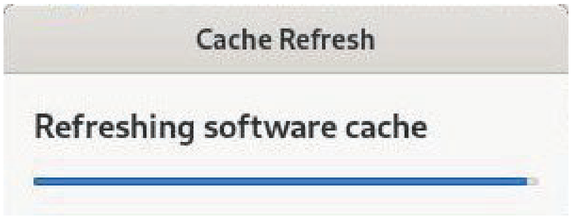


The information about available software is out-of-date

To install software and updates from newly added or changed sources, you have to reload the information about available software.

You need a working Internet connection to continue.

Software: refresh packages informations



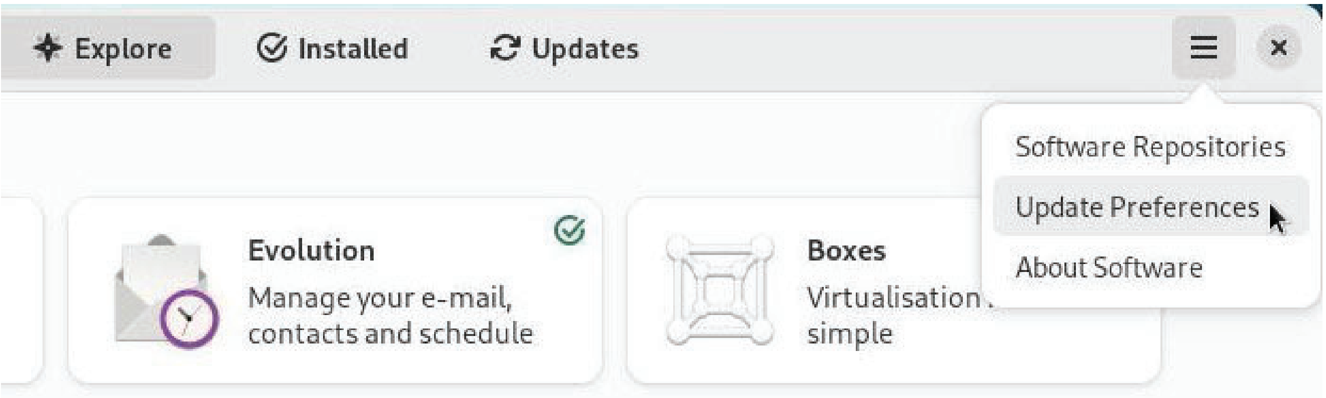
Cache Refresh

Refreshing software cache

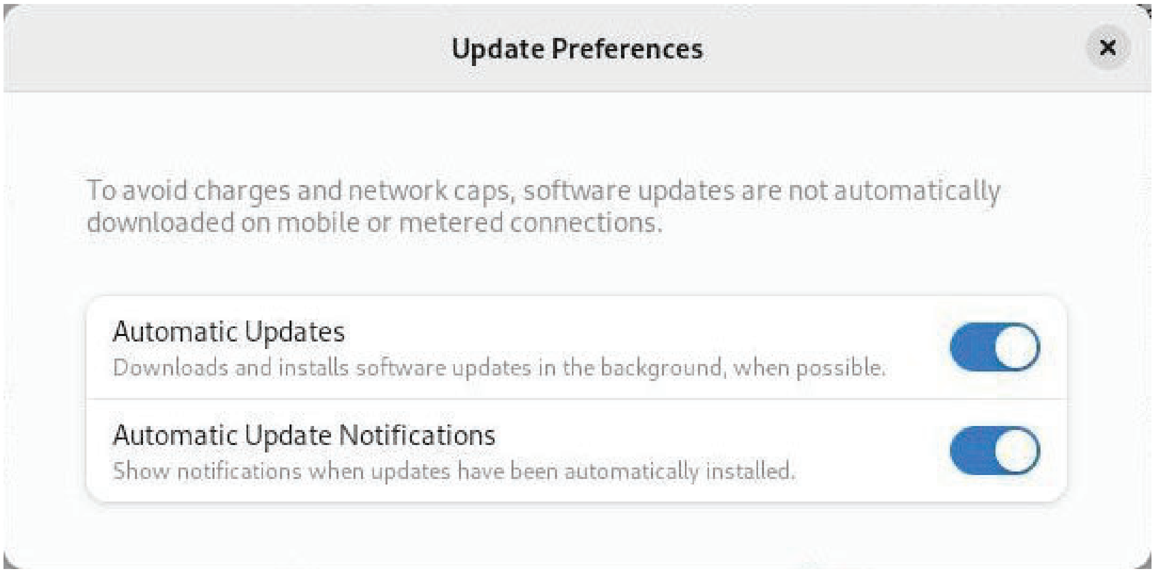
Software: cache refreshing

8.3.6 Automatic updates with Software

To take advantage of your system without worrying about updates, you can activate the **automatic updates** mechanism. From the “Software” menu, select “Update Preferences”. The entries are self-explanatory:



Software: preferences menu



Update Preferences

To avoid charges and network caps, software updates are not automatically downloaded on mobile or metered connections.

Automatic Updates
Downloads and installs software updates in the background, when possible.

Automatic Update Notifications
Show notifications when updates have been automatically installed.

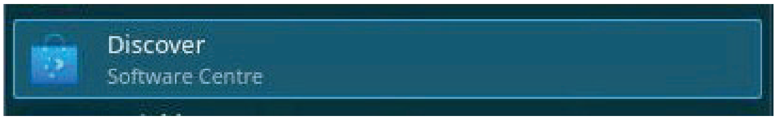
Software: automatic updates

8.4 Discover: the KDE package manager

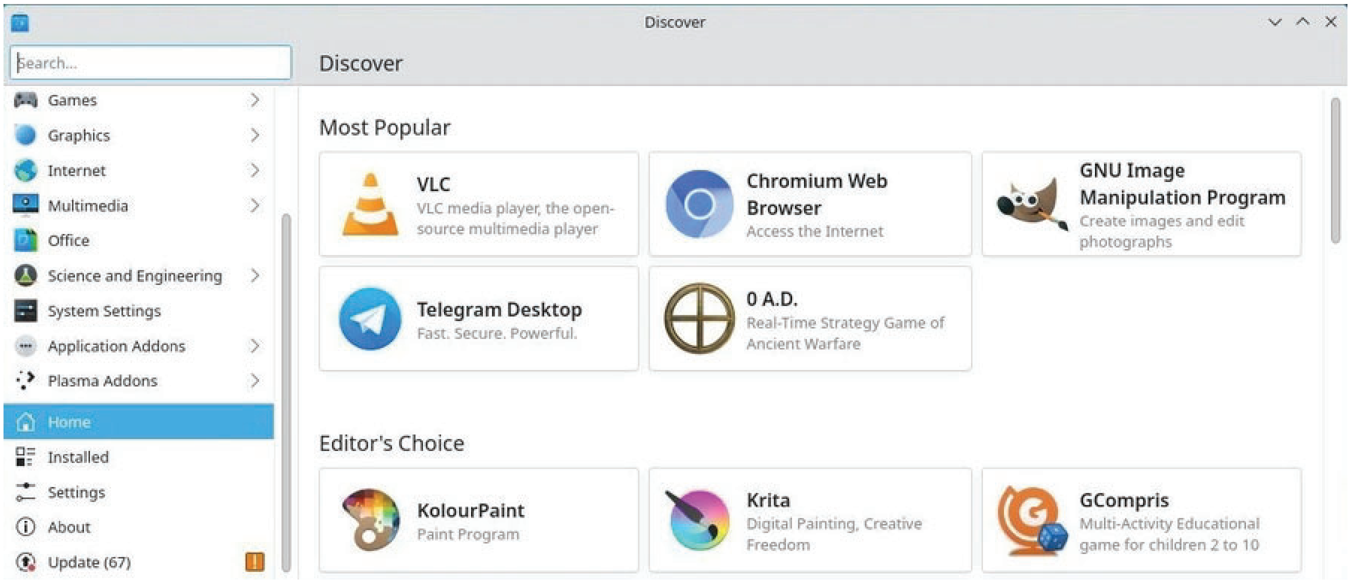
Gnome uses “Software” to manage applications in a simplified way, KDE integrates **Discover**, an intuitive and efficient program.

Discover allows you to search, install, remove or update your applications from a single interface. You can also modify your software sources in order to install - or not - some non-free applications.

Discover is launched simply from the KDE main menu > Applications> System > Software Center:



Discover launcher

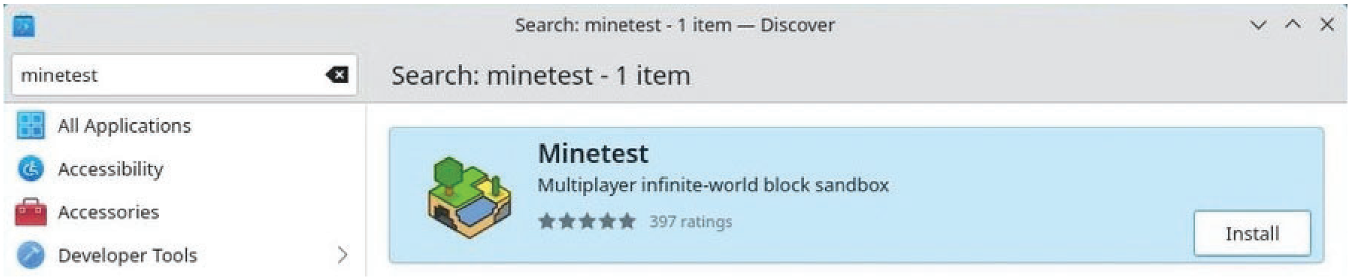


Discover: default interface

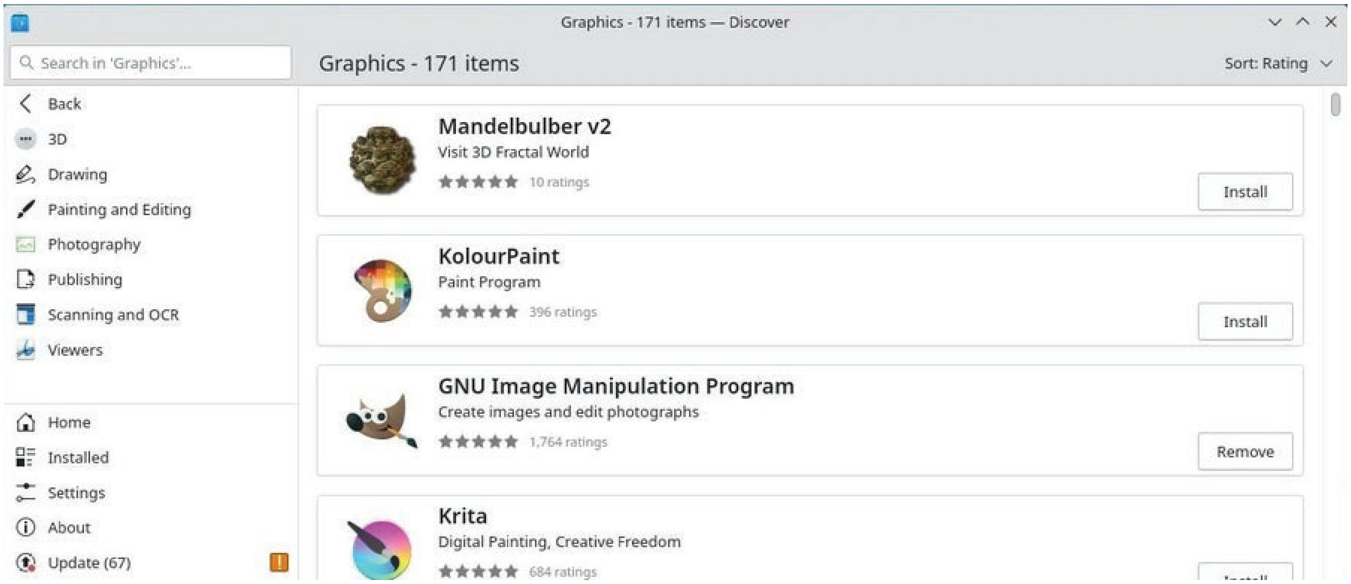
Don’t hesitate to browse though the application, you will be asked to confirm any modification done to your packages.

8.4.1 Search and install with Discover

To find an application, type its name in the dedicated search field or visit the various categories of Discover. Then a click on the “Install” button is enough:


Search: minetest - 1 item — Discover
minetest
Search: minetest - 1 item
All Applications
Accessibility
Accessories
Developer Tools
Minetest
Multiplayer infinite-world block sandbox
★★★★★ 397 ratings
Install

Searching an application with Discover



Graphics - 171 items

Mandelbulber v2
Visit 3D Fractal World
10 ratings

KolourPaint
Paint Program
396 ratings

GNU Image Manipulation Program
Create images and edit photographs
1,764 ratings

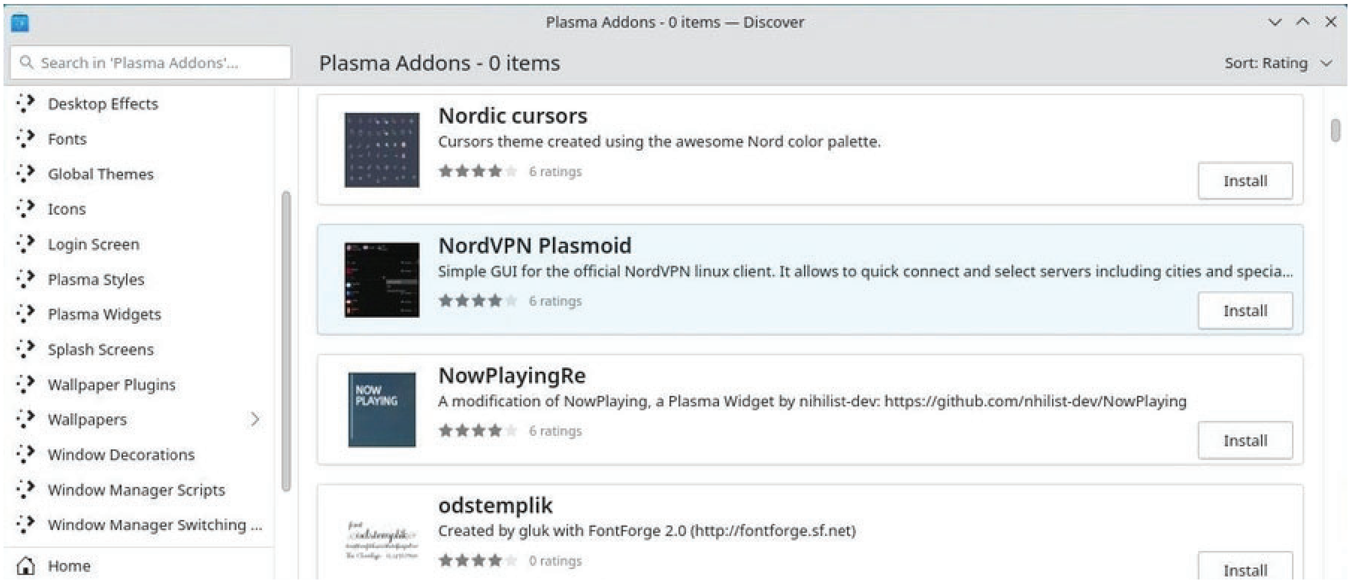
Krita
Digital Painting, Creative Freedom
684 ratings

Browsing through categories with Discover

You will be asked for confirmation for any action on the software together with the administrator password. The process will then be launched in the background. You can follow the progress of the modifications within the KDE notification area.

8.4.1.1 Install Plasma desktop widgets and addons

Discover allows you to add additional components to your Plasma environment. To achieve this, visit the “Plasma add-ons” section.



Plasma Addons - 0 items

Nordic cursors
Cursors theme created using the awesome Nord color palette.
6 ratings

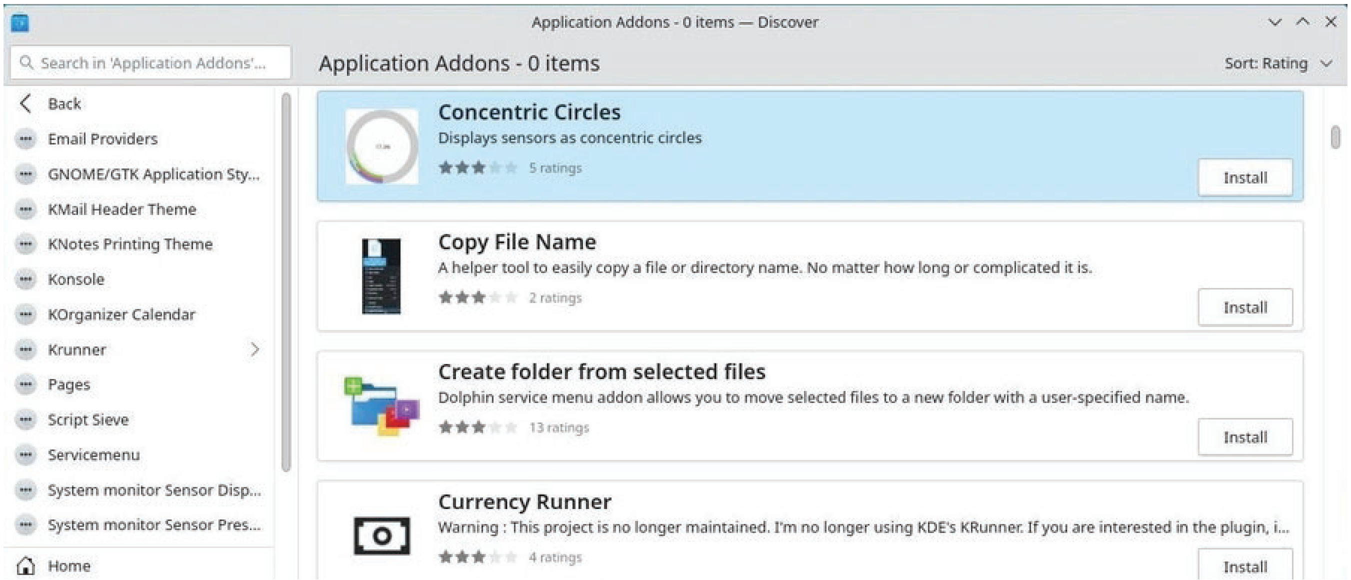
NordVPN Plasmoid
Simple GUI for the official NordVPN linux client. It allows to quick connect and select servers including cities and specia...
6 ratings

NowPlayingRe
A modification of NowPlaying, a Plasma Widget by nihilist-dev: https://github.com/nhilist-dev/NowPlaying
6 ratings

odstemplik
Created by gluk with FontForge 2.0 (http://fontforge.sf.net)
0 ratings

Discover: Plasma desktop addons

Some additional modules are also available for your applications:


Application Addons - 0 items — Discover
Search in 'Application Addons'...
Application Addons - 0 items
Sort: Rating
Back
Email Providers
GNOME/GTK Application Sty...
KMail Header Theme
KNotes Printing Theme
Konsole
KOrganizer Calendar
Krunner
Pages
Script Sieve
Servicemenu
System monitor Sensor Disp...
System monitor Sensor Pres...
Home

Concentric Circles
Displays sensors as concentric circles
★★★☆☆ 5 ratings
Install

Copy File Name
A helper tool to easily copy a file or directory name. No matter how long or complicated it is.
★★★☆☆ 2 ratings
Install

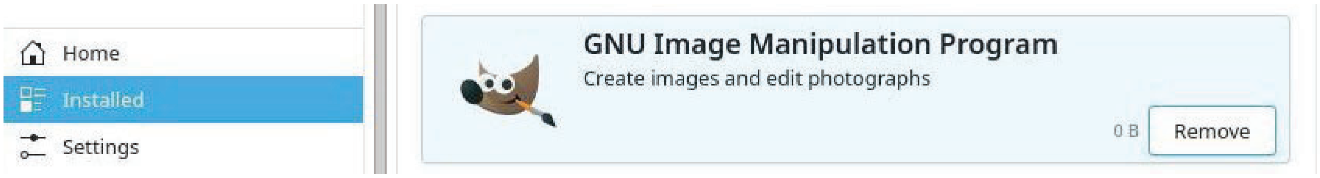
Create folder from selected files
Dolphin service menu addon allows you to move selected files to a new folder with a user-specified name.
★★★☆☆ 13 ratings
Install

Currency Runner
Warning : This project is no longer maintained. I'm no longer using KDE's KRunner. If you are interested in the plugin, i...
★★★☆☆ 4 ratings
Install

Discover: applications addons

8.4.2 Uninstalling an application with Discover

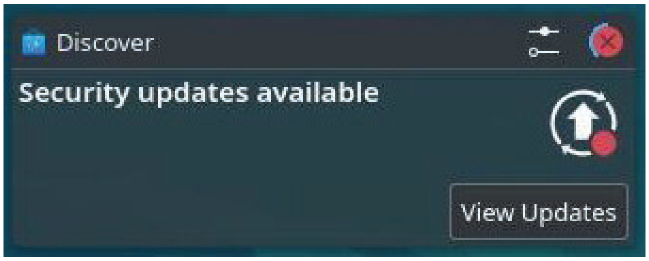
With Discover, simply visit the “Installed” category then click on “Remove”:



GNU Image Manipulation Program
Create images and edit photographs
0 B
Remove

Uninstalling with Discover

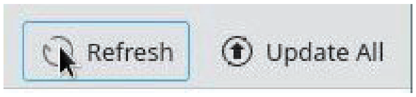
8.4.3 Discover: updating your applications



Security updates available

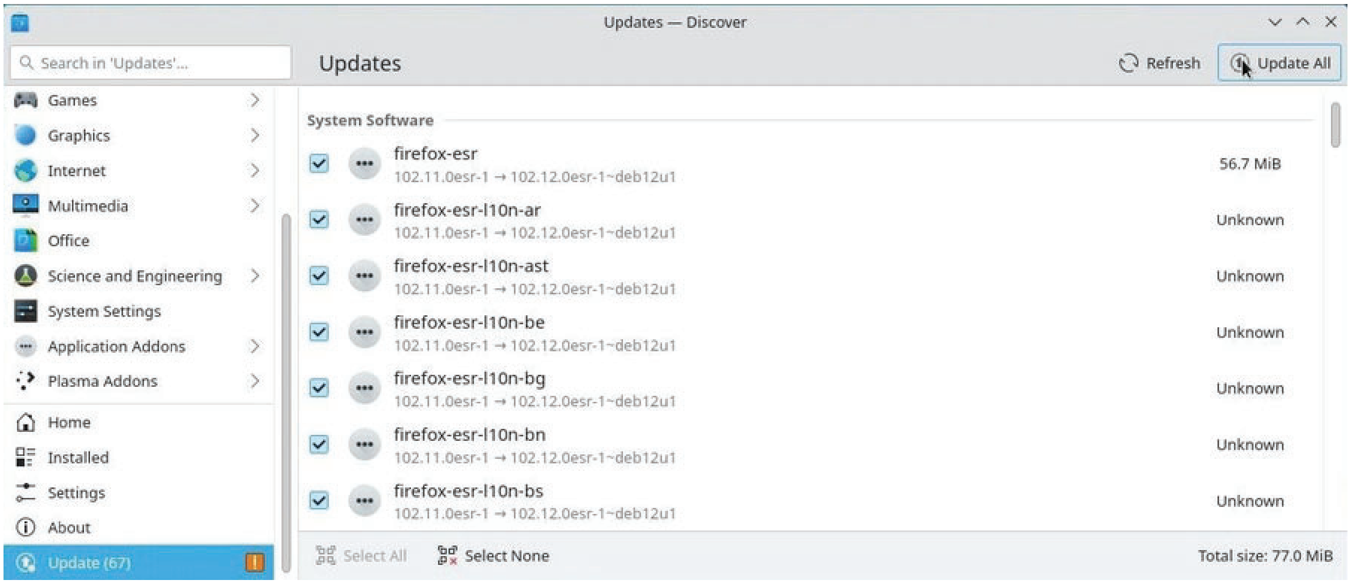
KDE update notification

When KDE notifies you of one or more updates, it is “Discover” which performs them. To check updates “manually”, click on the dedicated button:



Discover: check updates

Simply click on “Update all” and confirm with the administrator password.

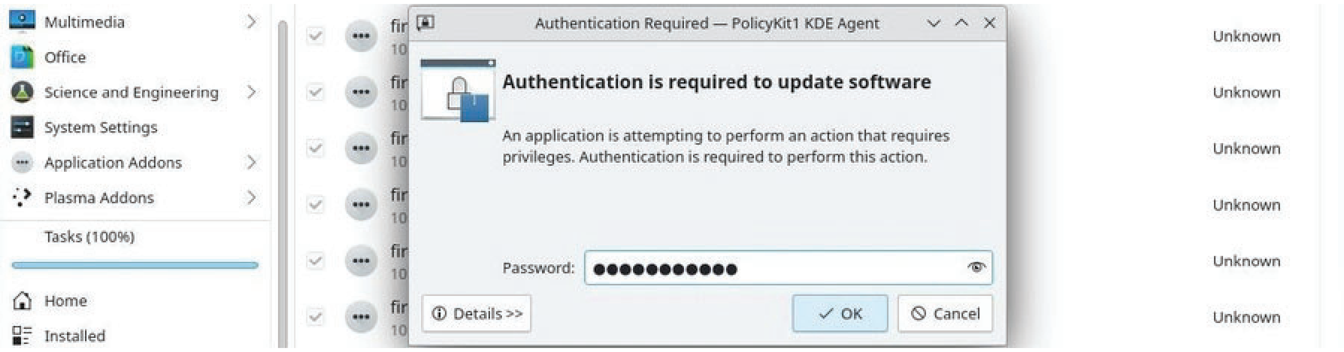


System Software

☑	firefox-esr 102.11.0esr-1 → 102.12.0esr-1~deb12u1	56.7 MiB
☑	firefox-esr-l10n-ar 102.11.0esr-1 → 102.12.0esr-1~deb12u1	Unknown
☑	firefox-esr-l10n-ast 102.11.0esr-1 → 102.12.0esr-1~deb12u1	Unknown
☑	firefox-esr-l10n-be 102.11.0esr-1 → 102.12.0esr-1~deb12u1	Unknown
☑	firefox-esr-l10n-bg 102.11.0esr-1 → 102.12.0esr-1~deb12u1	Unknown
☑	firefox-esr-l10n-bn 102.11.0esr-1 → 102.12.0esr-1~deb12u1	Unknown
☑	firefox-esr-l10n-bs 102.11.0esr-1 → 102.12.0esr-1~deb12u1	Unknown

Total size: 77.0 MiB

Discover: launching update

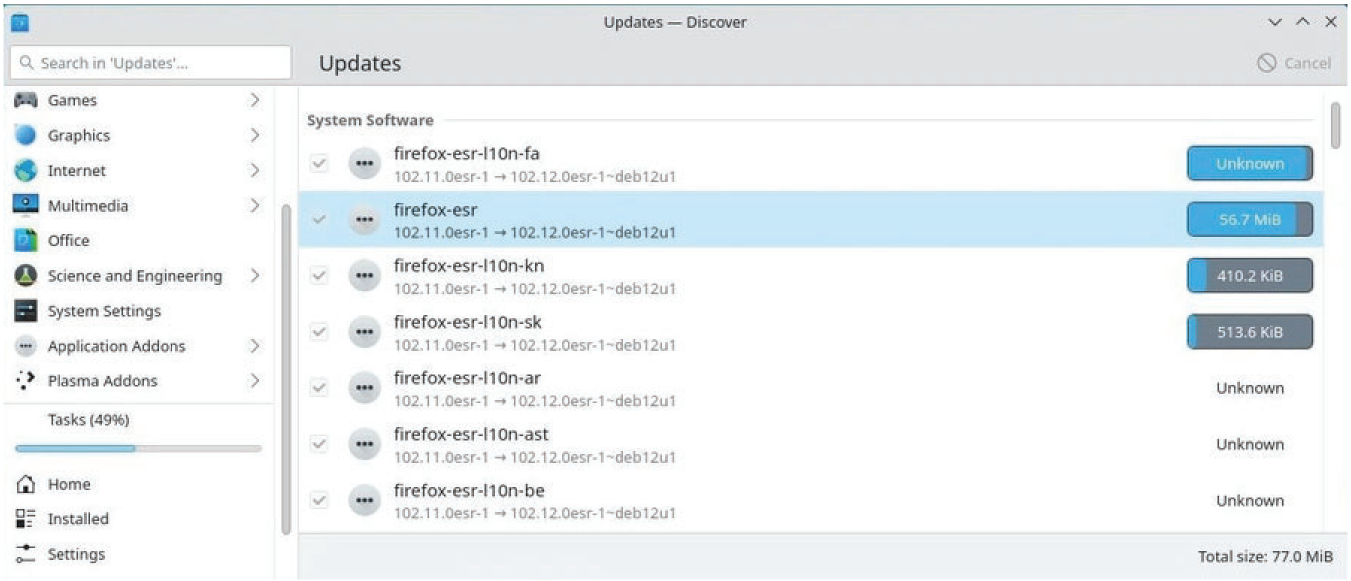


Authentication is required to update software

An application is attempting to perform an action that requires privileges. Authentication is required to perform this action.

Password: ●●●●●●●●●●●●

Discover: password requested for update



System Software

firefox-esr-l10n-fa 102.11.0esr-1 → 102.12.0esr-1~deb12u1	Unknown
firefox-esr 102.11.0esr-1 → 102.12.0esr-1~deb12u1	56.7 MiB
firefox-esr-l10n-kn 102.11.0esr-1 → 102.12.0esr-1~deb12u1	410.2 KiB
firefox-esr-l10n-sk 102.11.0esr-1 → 102.12.0esr-1~deb12u1	513.6 KiB
firefox-esr-l10n-ar 102.11.0esr-1 → 102.12.0esr-1~deb12u1	Unknown
firefox-esr-l10n-ast 102.11.0esr-1 → 102.12.0esr-1~deb12u1	Unknown
firefox-esr-l10n-be 102.11.0esr-1 → 102.12.0esr-1~deb12u1	Unknown

Total size: 77.0 MiB

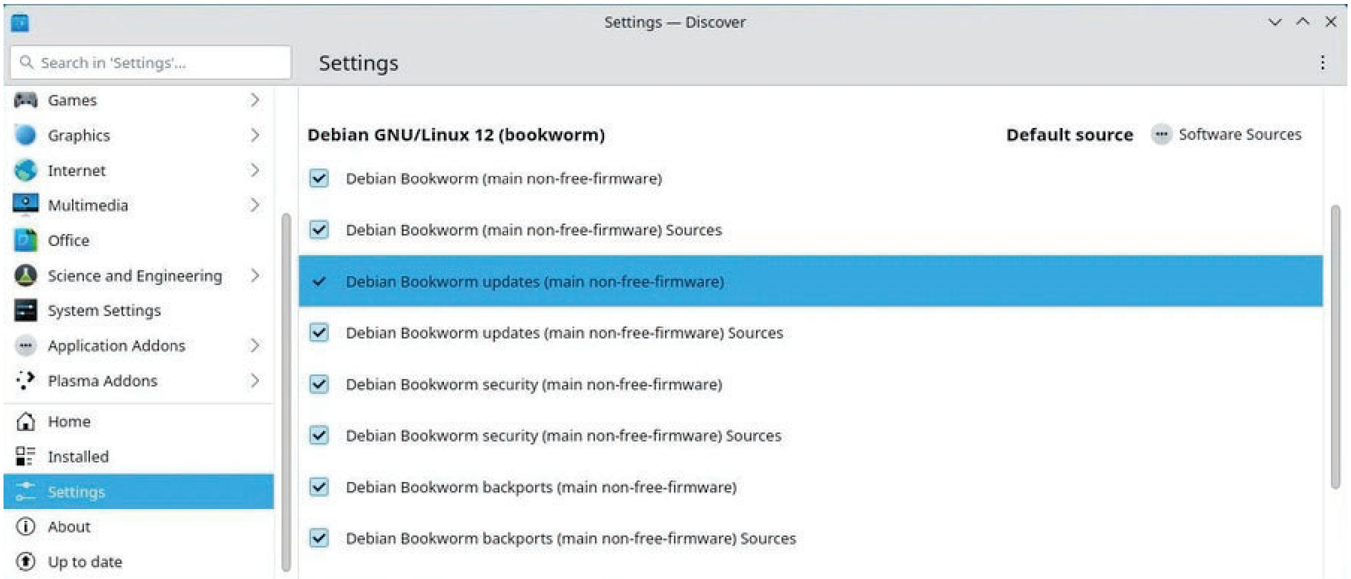
Discover: update progress

Likewise the software management, you can follow the process within the KDE notification area. And a message will inform you at the end of the process.

Discover: system updated

8.4.4 Discover: managing repositories

The KDE software library allows you to modify the sources of your applications without using the terminal. Go to the “Settings” section of Discover, the entries display the repositories adresses of your *sources.list*:



Debian GNU/Linux 12 (bookworm) Default source

- ☑ Debian Bookworm (main non-free-firmware)
- ☑ Debian Bookworm (main non-free-firmware) Sources
- ✓ Debian Bookworm updates (main non-free-firmware)
- ☑ Debian Bookworm updates (main non-free-firmware) Sources
- ☑ Debian Bookworm security (main non-free-firmware)
- ☑ Debian Bookworm security (main non-free-firmware) Sources
- ☑ Debian Bookworm backports (main non-free-firmware)
- ☑ Debian Bookworm backports (main non-free-firmware) Sources

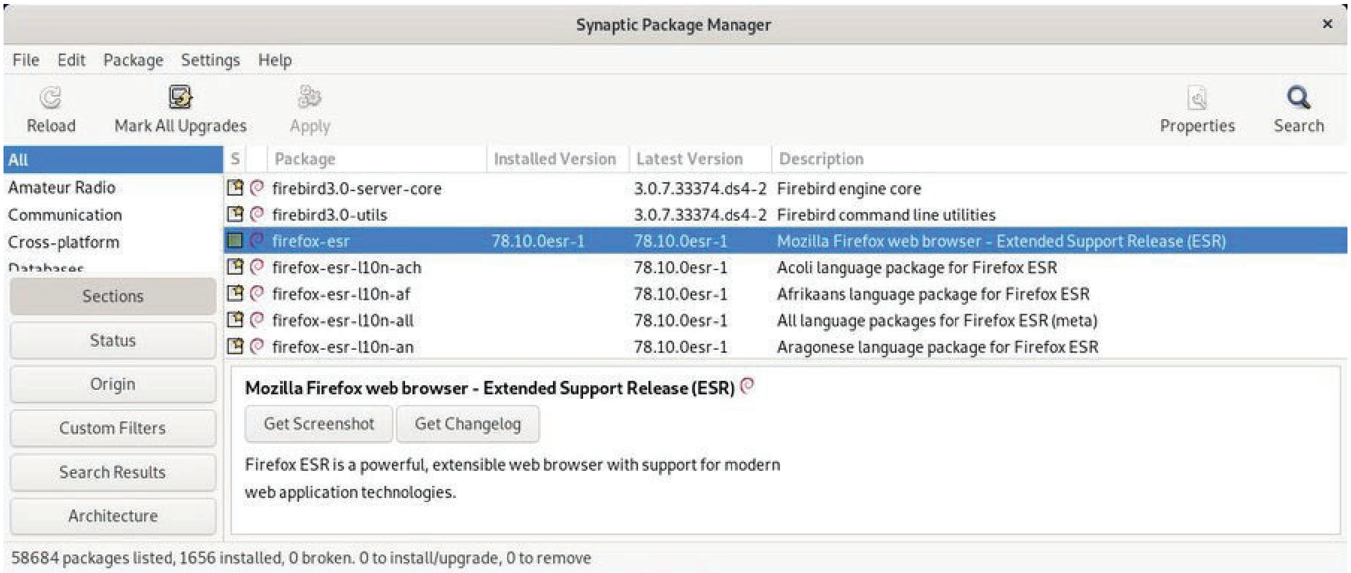
Discover: managing repositories

8.5 Synaptic: the comprehensive package manager

Synaptic is the comprehensive graphical interface of the Debian package manager. It allows a total vision of the proposed packages, whether installed or not. It is a lot more detailed than the Software Center, or Discover (see the previous chapters) since it displays the **full set** of available packages (including the libraries).

- It provides the same functionality as apt.
- You need to enter the administrator password to open and use Synaptic.
- An active Internet connection is also needed to install or update your software.

8.5.1 Synaptic: Main interface



S	Package	Installed Version	Latest Version	Description
□	firebird3.0-server-core		3.0.7.33374.ds4-2	Firebird engine core
□	firebird3.0-utils		3.0.7.33374.ds4-2	Firebird command line utilities
🟩	firefox-esr	78.10.0esr-1	78.10.0esr-1	Mozilla Firefox web browser - Extended Support Release (ESR)
□	firefox-esr-l10n-ach		78.10.0esr-1	Acoli language package for Firefox ESR
□	firefox-esr-l10n-af		78.10.0esr-1	Afrikaans language package for Firefox ESR
□	firefox-esr-l10n-all		78.10.0esr-1	All language packages for Firefox ESR (meta)
□	firefox-esr-l10n-an		78.10.0esr-1	Aragonese language package for Firefox ESR

Mozilla Firefox web browser - Extended Support Release (ESR)

Firefox ESR is a powerful, extensible web browser with support for modern web application technologies.

58684 packages listed, 1656 installed, 0 broken. 0 to install/upgrade, 0 to remove

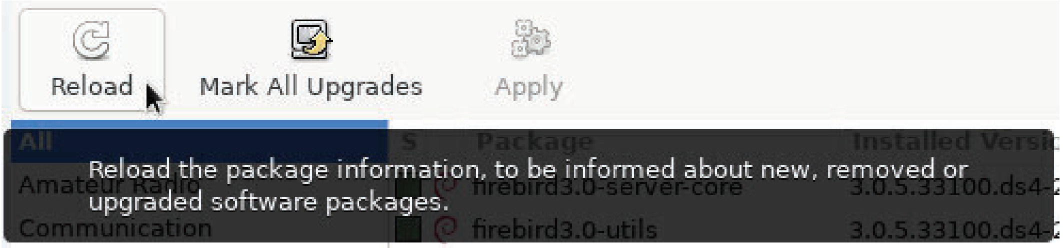
Synaptic: the default interface of the package manager

The Synaptic window is divided into 4 areas: the tool bar at the top, the left pane allowing different ways of sorting and selecting the packages, the center pane displaying the package list itself, and below it, the pane hosting the description of the currently selected package (the selection is done by a click).

In front of each package, you notice a little box (white for non-installed packages, green when they are installed, red when they are broken). Next to this status box, a Debian logo indicates that this package is “free” (as in freedom).

Don’t hesitate to click on all the different menus to explore Synaptic and become more familiar with it. It is a good way to discover its numerous functionalities.
Don’t be afraid to break your system since nothing will really happen until you click on the “Apply” button. On top of that, a message asking for confirmation will always be displayed first.

The very first thing to do when you launch Synaptic, is to **click on the “Reload” button** in order to update all the information (metadata) concerning the repositories, the packages and the available applications.



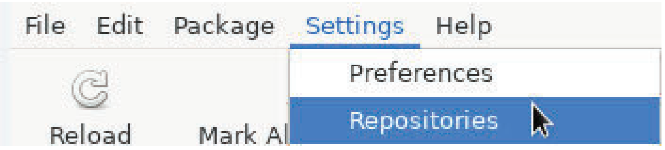
Reload the package information, to be informed about new, removed or upgraded software packages.

Synaptic: repository check

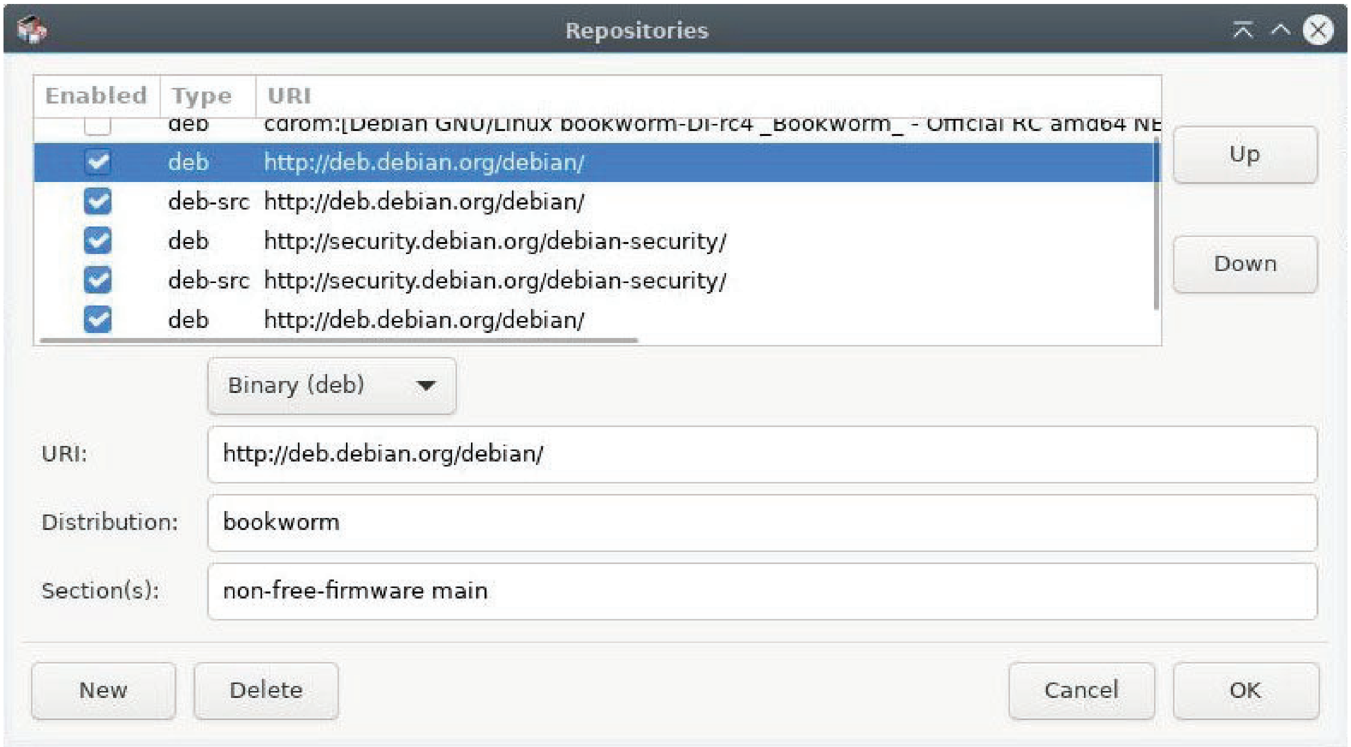
8.5.2 Managing the repositories with Synaptic

The repositories allow to update and install additional packages.
The repositories have been configured during the installation process but you can manage them at any

time, if you need to. Open the Synaptic package manager (menu System > Synaptic package manager). In the top menu bar, click on “Settings, and then”Repositories”.



Synaptic: repositories menu



Enabled	Type	URI
□	deb	cdrom:[Debian GNU/Linux bookworm-DI-rc4 _Bookworm_ - Official RC amd64 NE
☑	deb	http://deb.debian.org/debian/
☑	deb-src	http://deb.debian.org/debian/
☑	deb	http://security.debian.org/debian-security/
☑	deb-src	http://security.debian.org/debian-security/
☑	deb	http://deb.debian.org/debian/

Binary (deb)

URI: http://deb.debian.org/debian/

Distribution: bookworm

Section(s): non-free-firmware main

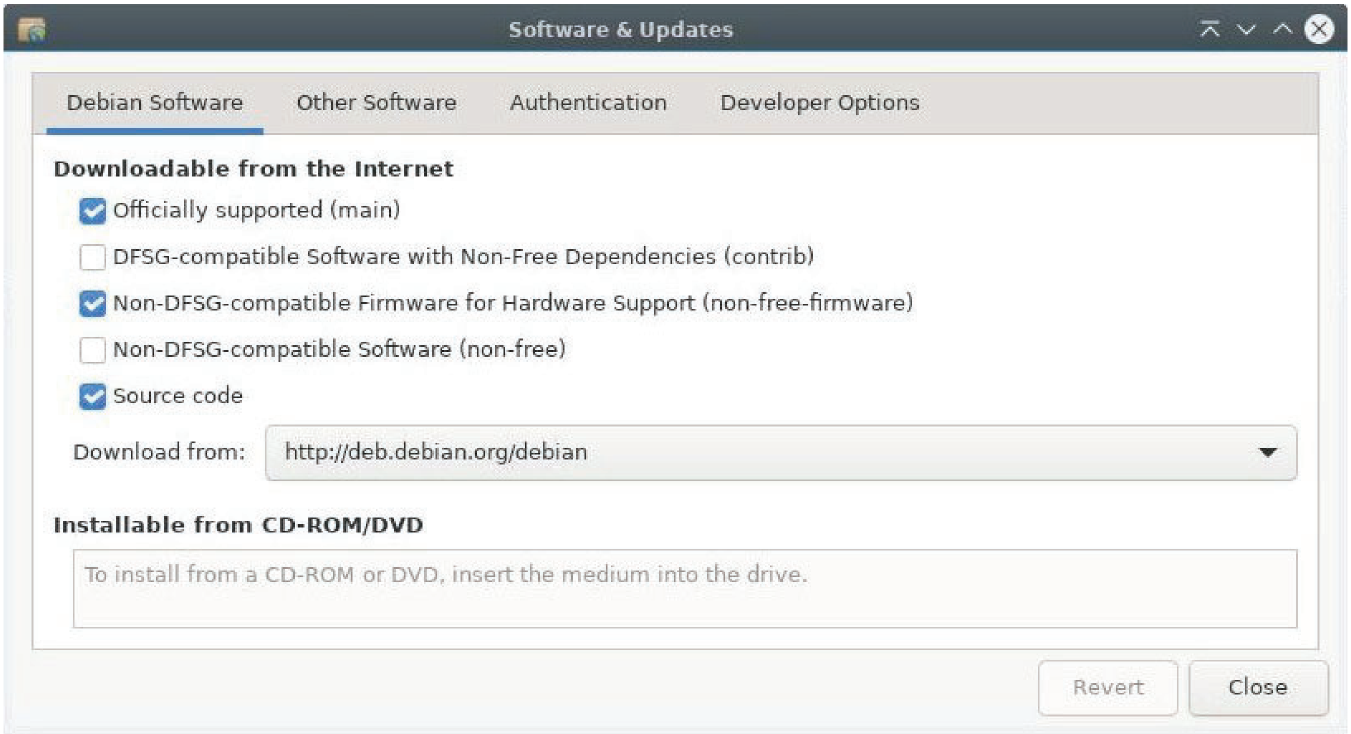
Synaptic: updates setting

You’ll notice that the list corresponds to the contents of the /etc/apt/sources.list file mentioned in chapter 8.1.1.

Now, you can modify your repository sources at your entire convenience. Simply click on a source to modify it, or on the “New” button to add another source.

Once your modifications are validated, the application will invite you to reload the repositories list in order to take your changes into account.

Note that if you want to use a “check-box-only” simplified interface on one of the Xfce, LXDE or LXQt desktops, you need to install the “software-properties-gtk” package.



Downloadable from the Internet

☑ Officially supported (main)

□ DFSG-compatible Software with Non-Free Dependencies (contrib)

☑ Non-DFSG-compatible Firmware for Hardware Support (non-free-firmware)

□ Non-DFSG-compatible Software (non-free)

☑ Source code

Download from: http://deb.debian.org/debian

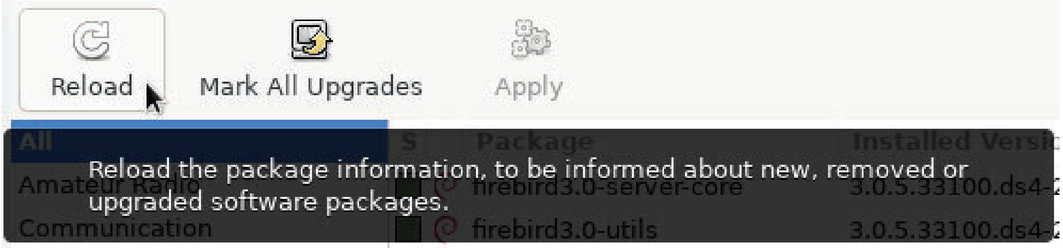
Installable from CD-ROM/DVD

To install from a CD-ROM or DVD, insert the medium into the drive.

Synaptic: graphical mode sources managment

8.5.3 Updating the system with Synaptic

Before updating the system, it is necessary to “Reload” the package list, by clicking on the corresponding button, or by going in the menu “Edit > Reload Packages Information” (or even [Ctrl]+r if you want to use a keyboard shortcut). This action checks if the version of the packages residing on your system is the most recent one or not.



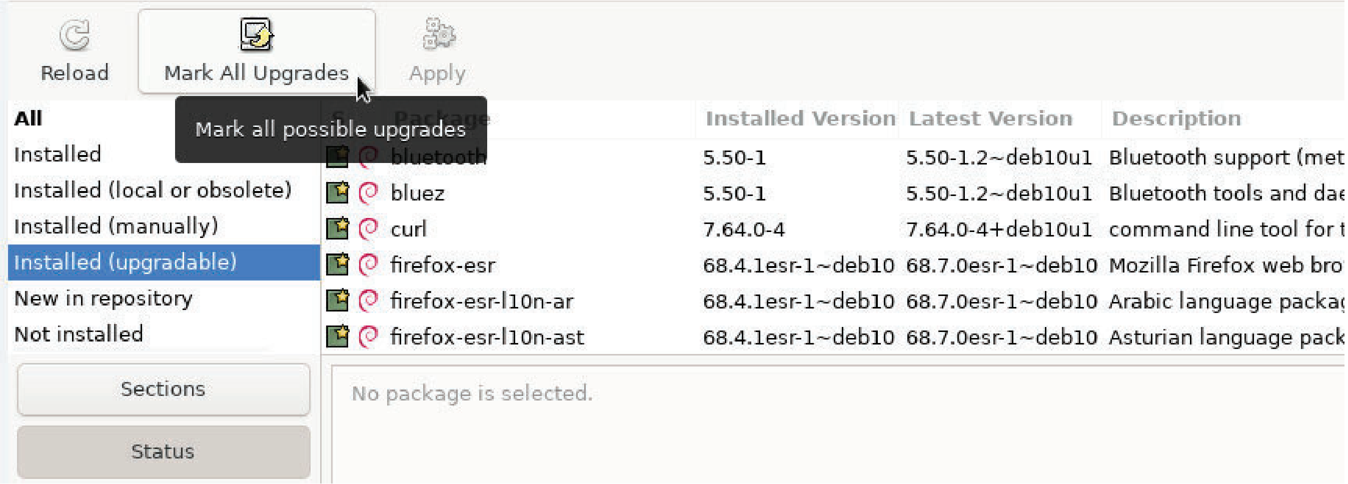
Reload the package information, to be informed about new, removed or upgraded software packages.

Synaptic: check repositories informations

Then click on “Mark All Upgrades” or goto menu “Edit > Mark All Upgrades...”.

If nothing happens, after you clicked on “Upgrade everything”, this means that your system is already up-to-date. You can close Synaptic.

If some packages to install or update are available, they are specified. You can view them by selecting the “Status” section > “installed (upgradable)”:

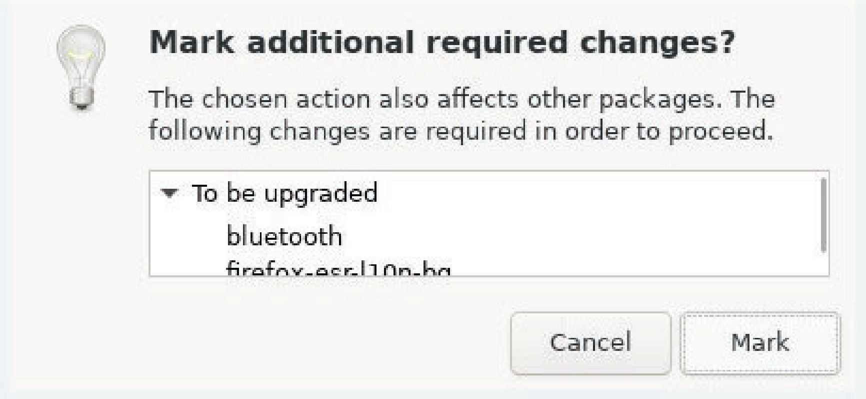


Package	Installed Version	Latest Version	Description
bluetooth	5.50-1	5.50-1.2~deb10u1	Bluetooth support (met
bluez	5.50-1	5.50-1.2~deb10u1	Bluetooth tools and dae
curl	7.64.0-4	7.64.0-4+deb10u1	command line tool for t
firefox-esr	68.4.1esr-1~deb10	68.7.0esr-1~deb10	Mozilla Firefox web bro
firefox-esr-l10n-ar	68.4.1esr-1~deb10	68.7.0esr-1~deb10	Arabic language packag
firefox-esr-l10n-ast	68.4.1esr-1~deb10	68.7.0esr-1~deb10	Asturian language pack

No package is selected.

Synaptic: upgradable packages list

A new window appears with the list of the packages to be upgraded as well as the additional dependencies, if some are required:



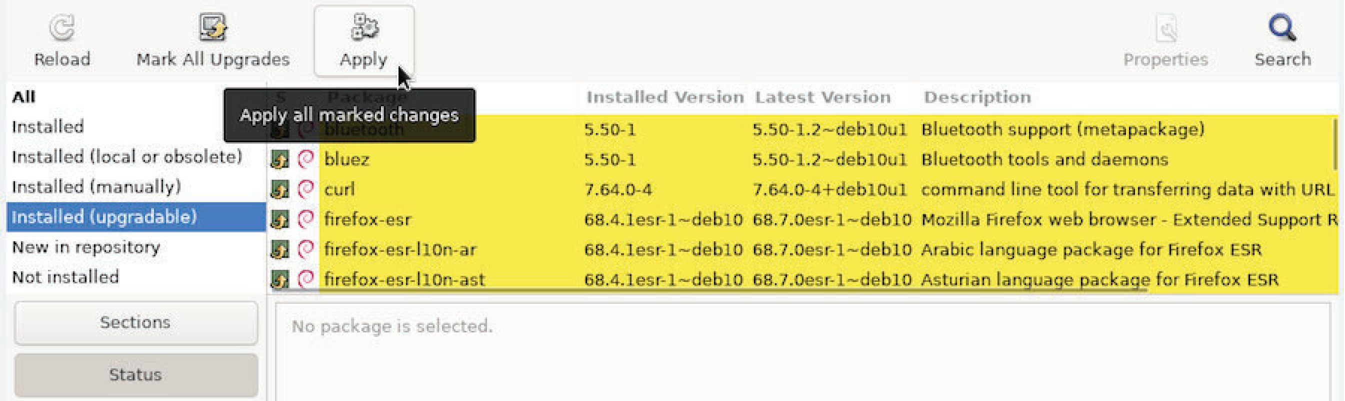
Mark additional required changes?

The chosen action also affects other packages. The following changes are required in order to proceed.

- To be upgraded
  - bluetooth
  - firefox-esr-l10n-bg

Synaptic: change request list

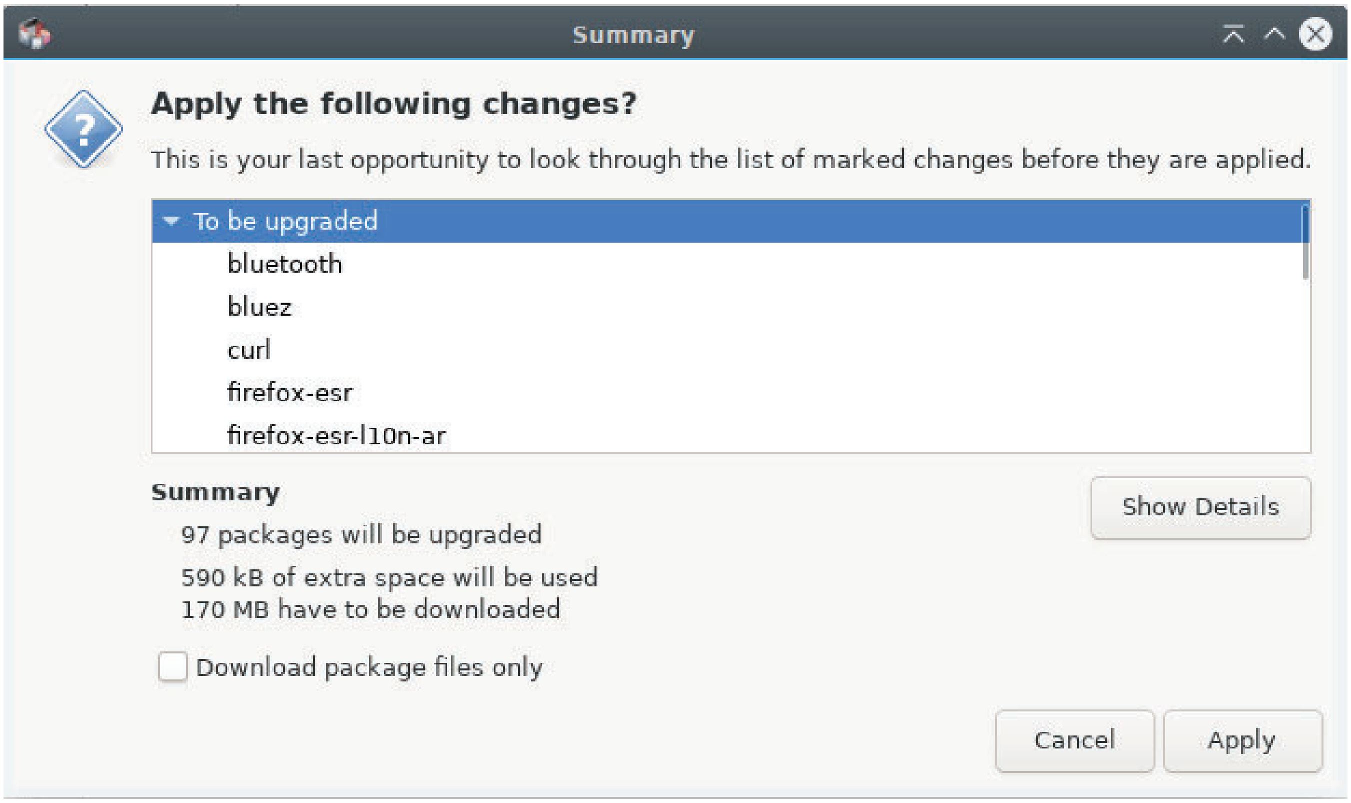
You only have to click on the “Add to selection” then “Apply” button, and accept the requested confirmation:



Package	Installed Version	Latest Version	Description
bluetooth	5.50-1	5.50-1.2~deb10u1	Bluetooth support (metapackage)
bluez	5.50-1	5.50-1.2~deb10u1	Bluetooth tools and daemons
curl	7.64.0-4	7.64.0-4+deb10u1	command line tool for transferring data with URL
firefox-esr	68.4.1esr-1~deb10	68.7.0esr-1~deb10	Mozilla Firefox web browser - Extended Support R
firefox-esr-l10n-ar	68.4.1esr-1~deb10	68.7.0esr-1~deb10	Arabic language package for Firefox ESR
firefox-esr-l10n-ast	68.4.1esr-1~deb10	68.7.0esr-1~deb10	Asturian language package for Firefox ESR

No package is selected.

Synaptic: apply update



Apply the following changes?

This is your last opportunity to look through the list of marked changes before they are applied.

- To be upgraded
  - bluetooth
  - bluez
  - curl
  - firefox-esr
  - firefox-esr-l10n-ar

Summary

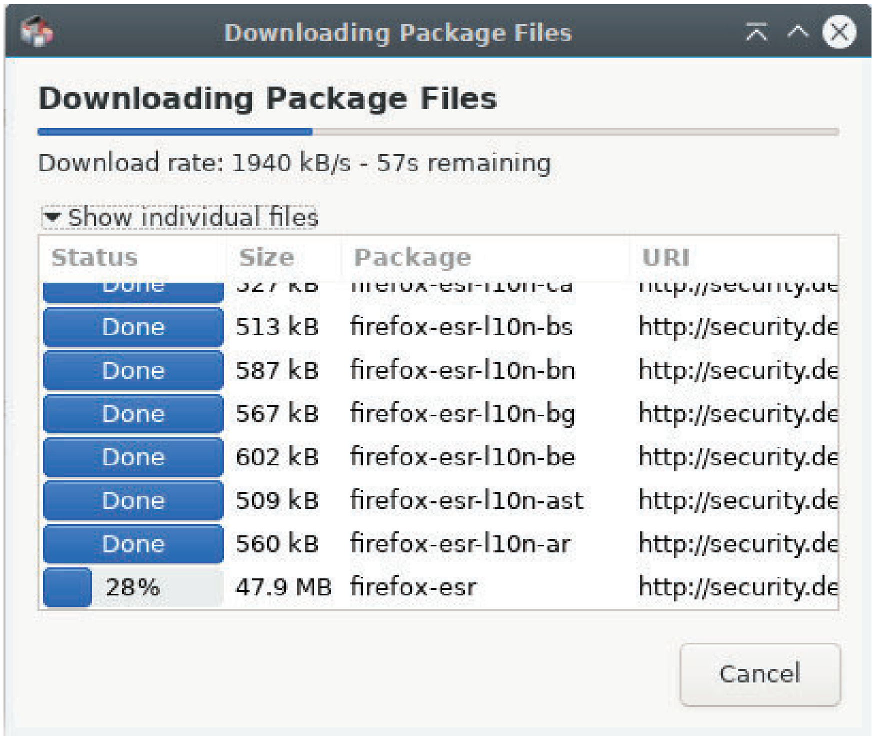
97 packages will be upgraded

590 kB of extra space will be used
170 MB have to be downloaded

□ Download package files only

Synaptic: confirm changes

The system updating process begins by downloading the packages, and continues with their installation.



Downloading Package Files

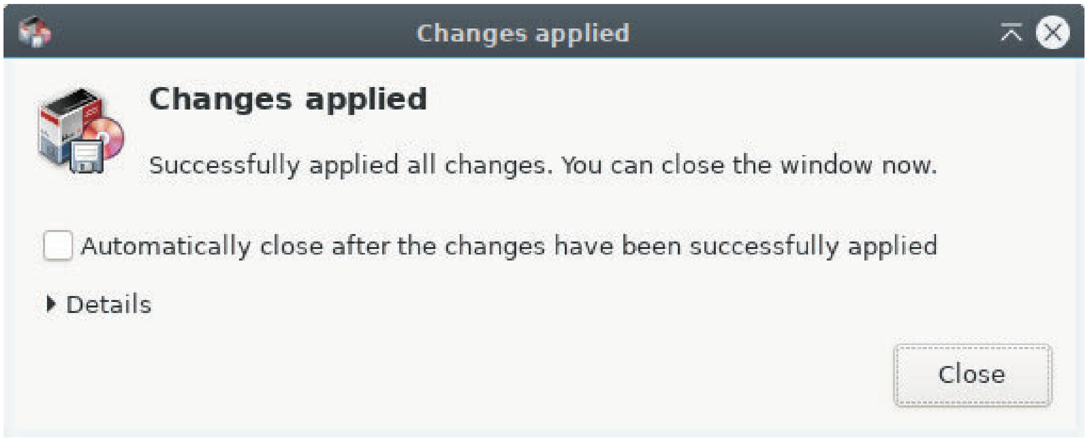
Download rate: 1940 kB/s - 57s remaining

Show individual files

Status	Size	Package	URI
Done	527 kB	firefox-esr-l10n-ca	http://security.de
Done	513 kB	firefox-esr-l10n-bs	http://security.de
Done	587 kB	firefox-esr-l10n-bn	http://security.de
Done	567 kB	firefox-esr-l10n-bg	http://security.de
Done	602 kB	firefox-esr-l10n-be	http://security.de
Done	509 kB	firefox-esr-l10n-ast	http://security.de
Done	560 kB	firefox-esr-l10n-ar	http://security.de
28%	47.9 MB	firefox-esr	http://security.de

Synaptic: downloading packages

A message informs you that all the changes were applied.



Changes applied

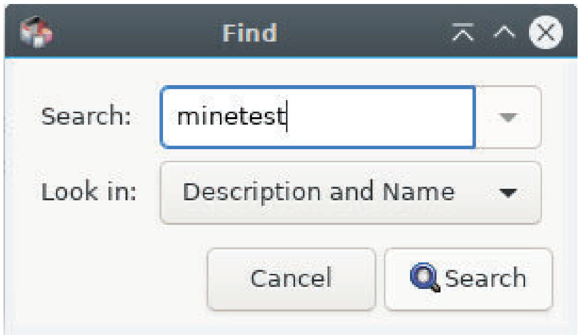
Successfully applied all changes. You can close the window now.

□ Automatically close after the changes have been successfully applied

Synaptic: system upgraded

8.5.4 Searching for a software

If you know the name of the package or if you are looking precisely for something, click on the search button (in the top bar) and enter the keywords of your search in the window which opens.



Search: minetest

Look in: Description and Name

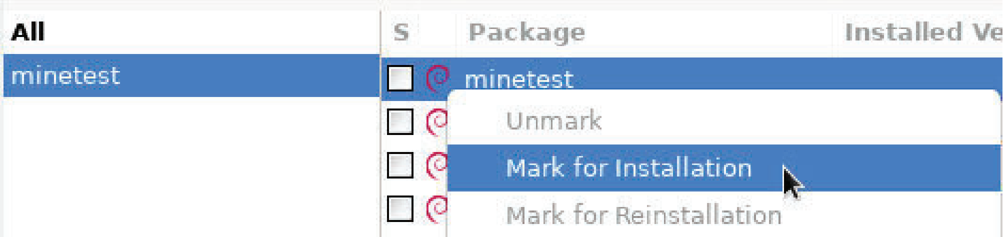
Synaptic: search for an application

If you don't know the name of the package you need, you can parse the list using the filtering by sections, status, origin, etc ...

For example, if you are looking for a game, click on Sections in the bottom part of the left pane, scroll down to the "Games and Amusement" section, click on it, and all the packages concerning games and amusement are showing up in the center pane.

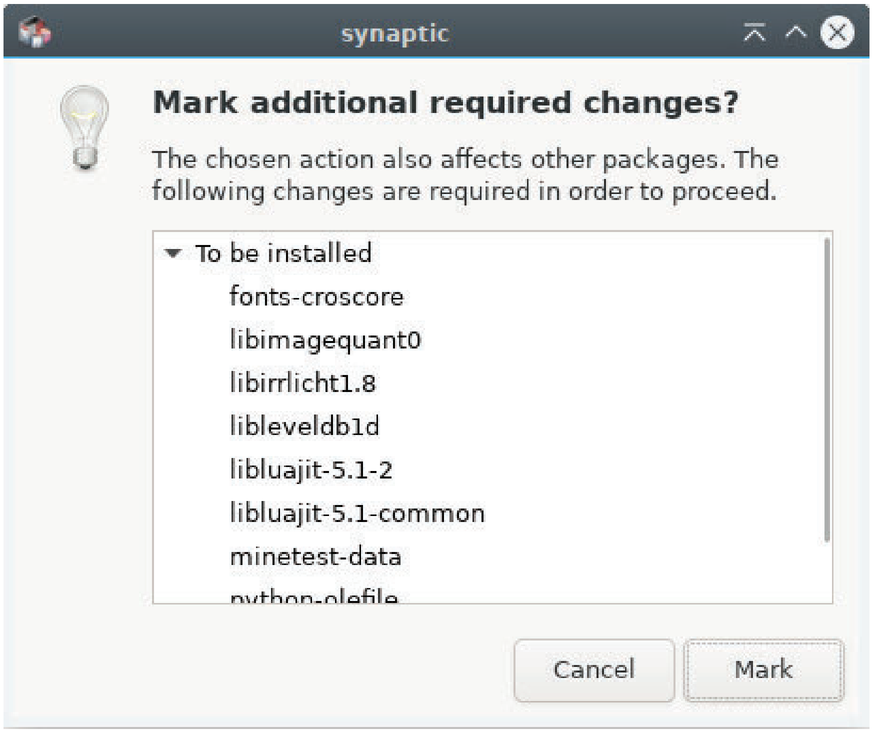
8.5.5 Installing a package with Synaptic

To install one or several packages, right-click on the little box in front of the package name, and select the "Mark for Installation" option.



Synaptic: marking a package for installation

If, in order to be functional, this package requires the installation of other packages (the famous dependencies) they are automatically added to the selection.



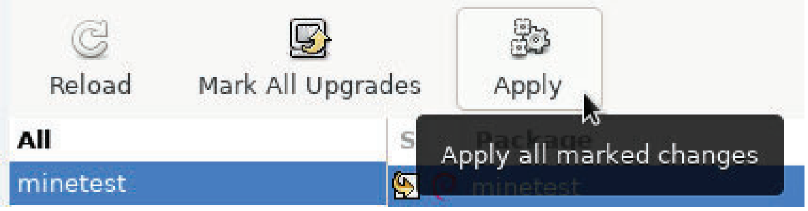
Mark additional required changes?

The chosen action also affects other packages. The following changes are required in order to proceed.

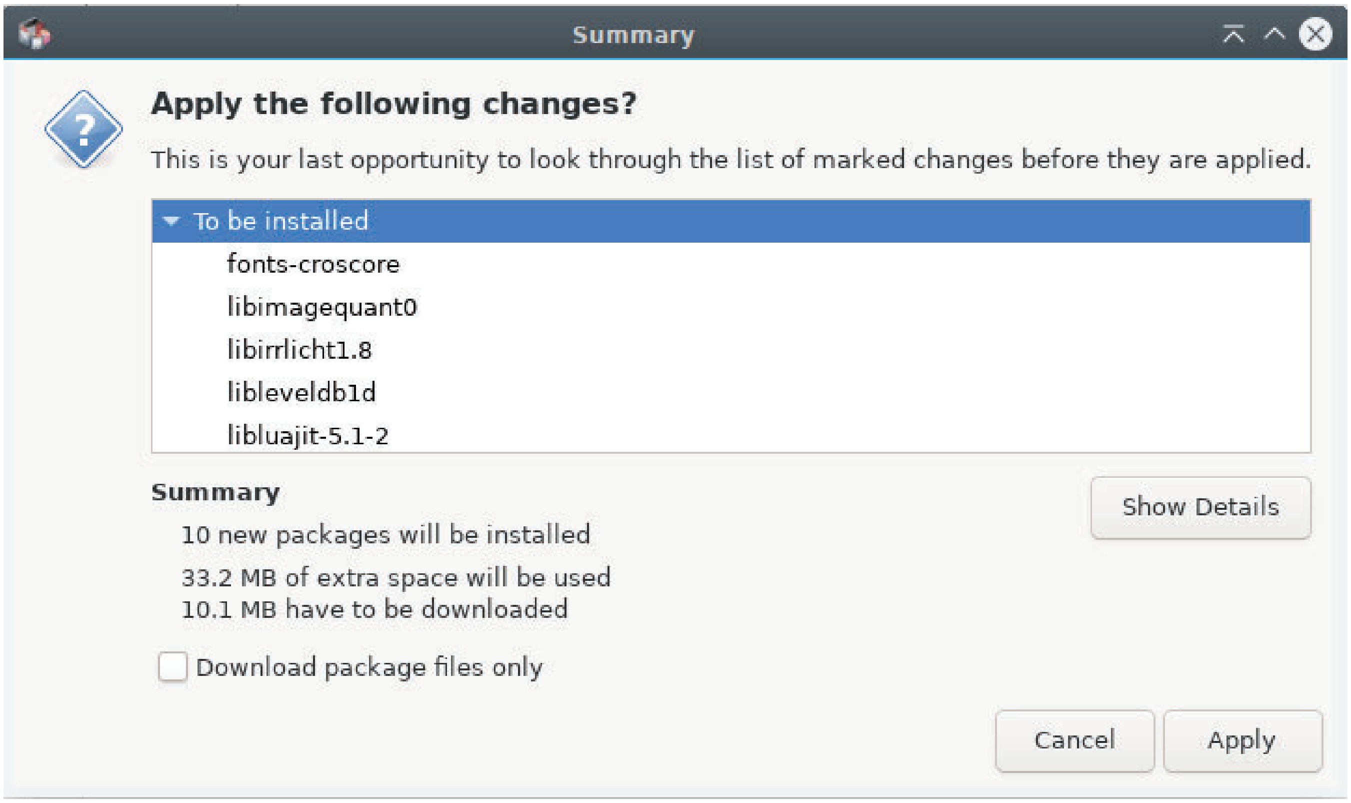
- To be installed
  - fonts-croscore
  - libimagequant0
  - libirrlicht1.8
  - libleveldb1d
  - libluajit-5.1-2
  - libluajit-5.1-common
  - minetest-data
  - python-olefile

Synaptic: dépendencies added

Then, you simply need to click on the “Apply” button, and confirm the summary of the changes to be applied.



Synaptic: apply changes



Apply the following changes?

This is your last opportunity to look through the list of marked changes before they are applied.

- To be installed
  - fonts-croscore
  - libimagequant0
  - libirrlicht1.8
  - libleveldb1d
  - libluajit-5.1-2

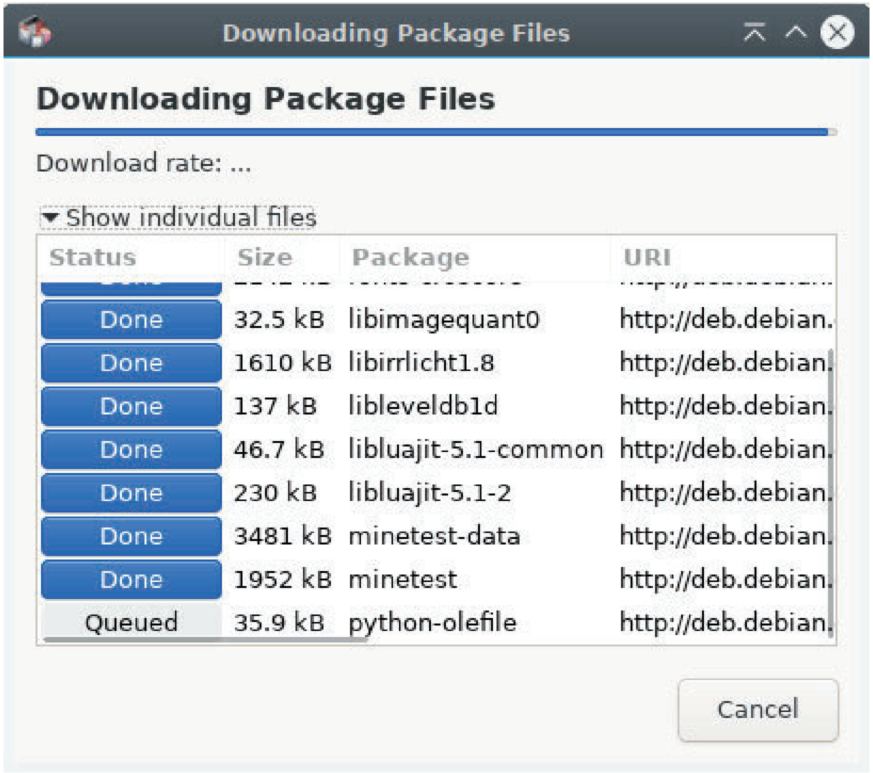
Summary

10 new packages will be installed
33.2 MB of extra space will be used
10.1 MB have to be downloaded

☐ Download package files only

Synaptic: summary of waiting changes

Packages are downloaded and installed. You can follow the whole process within the synaptic interface:



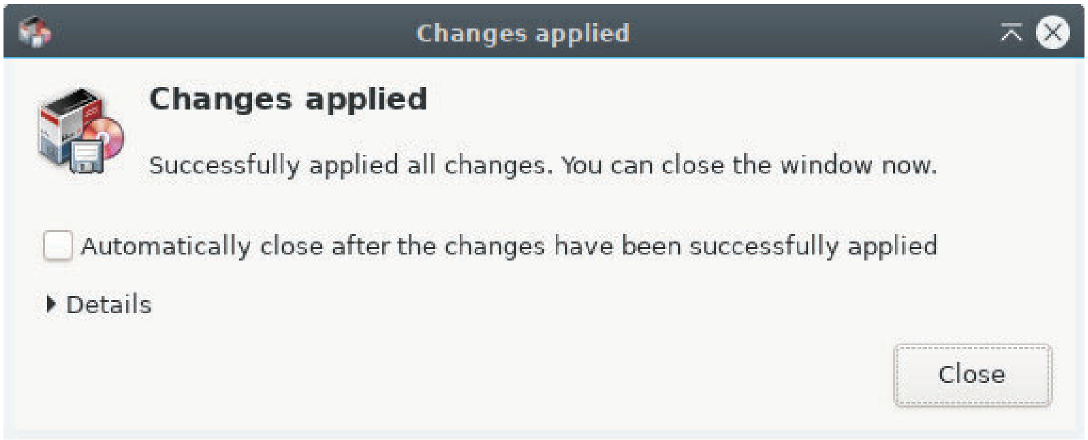
Downloading Package Files

Download rate: ...

Show individual files

Status	Size	Package	URI
Done	32.5 kB	libimagequant0	http://deb.debian.
Done	1610 kB	libirrlicht1.8	http://deb.debian.
Done	137 kB	libleveldb1d	http://deb.debian.
Done	46.7 kB	libluajit-5.1-common	http://deb.debian.
Done	230 kB	libluajit-5.1-2	http://deb.debian.
Done	3481 kB	minetest-data	http://deb.debian.
Done	1952 kB	minetest	http://deb.debian.
Queued	35.9 kB	python-olefile	http://deb.debian.

Synaptic: downloading the packages to be installed


Changes applied

Successfully applied all changes. You can close the window now.

□ Automatically close after the changes have been successfully applied

Synaptic: successful operation

8.5.5.1 Reinstall a package

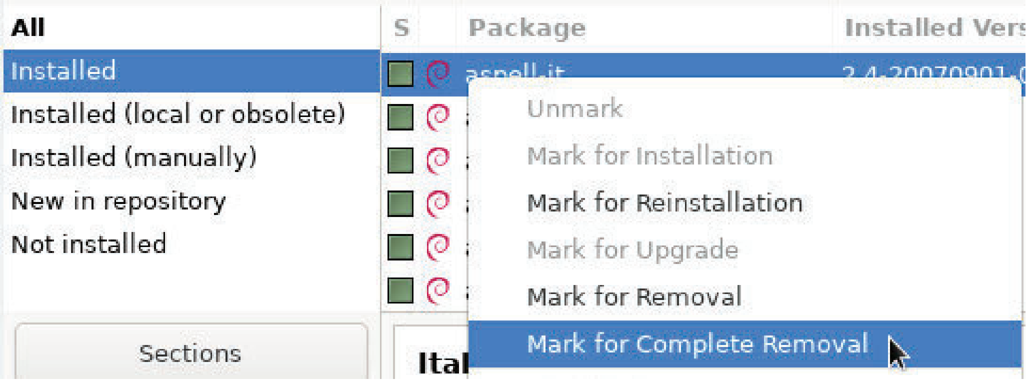
Sometimes we want to re-install a package which is already installed. In that case select the “Mark for Reinstall” option. This allows, for example, to restore the default configuration for the application if you modified it.

8.5.6 Uninstall a package with Synaptic

Like for the installation, right-click on the little box in front of the package name, and select the “Mark for Removal” option. Then click on “Apply”.

The simple removal keeps the package configuration files on your system, in case you would like to re-install it, later on.

To remove also the configuration files select the “Mark for Complete Removal” option (equivalent to the “purge” in a terminal command line)

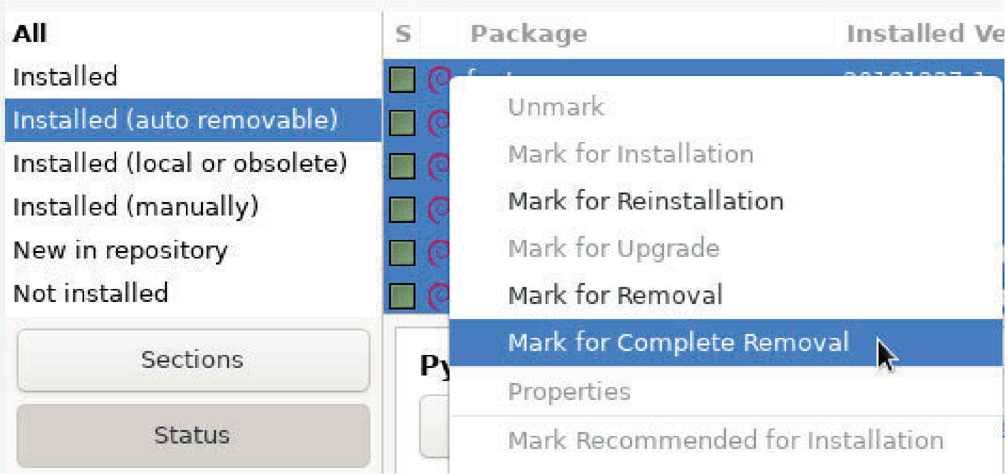


Synaptic: selecting a package for removal

8.5.6.1 Synaptic: cleaning useless packages

Often, when software is uninstalled, some packages (the dependencies) remain in the system while no longer useful, since all the packages needing them are gone. These useless packages can be easily removed with Synaptic.

When Synaptic is launched, click on the “Status” button at the bottom of the left pane. If the “Installed (Auto removable)” category shows up, click on it to display the corresponding package(s) (see image below):

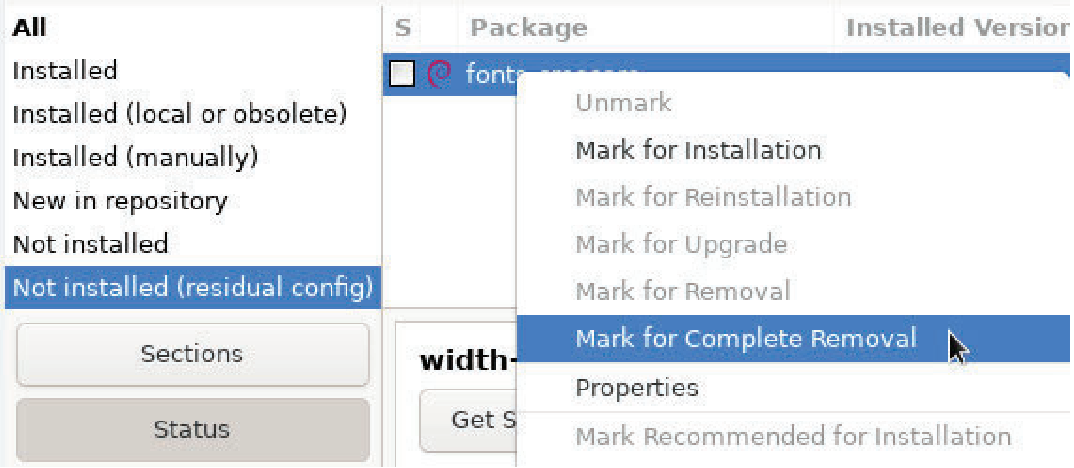


Synaptic: auto removable packages

All you have to do next is a right-click on each package in the center pane, and select the “Mark for Complete Removal” option. Once all the packages are marked, click on the “Apply” button.

8.5.6.2 Removing configuration residues

Although one choose to completely remove a software, some configuration residues might still remain in the system, but they can also be easily removed with Synaptic.
Click on the “Status” button at the bottom of the left pane. If the category “Not installed (residual config)” shows up, select it.
All you have to do next is a right-click on each package in the center pane, and select the “Mark for Complete Removal” option. Once all the packages are marked, click on the “Apply” button.



Synaptic: configuration residues

8.5.7 Look at detailed information on a package

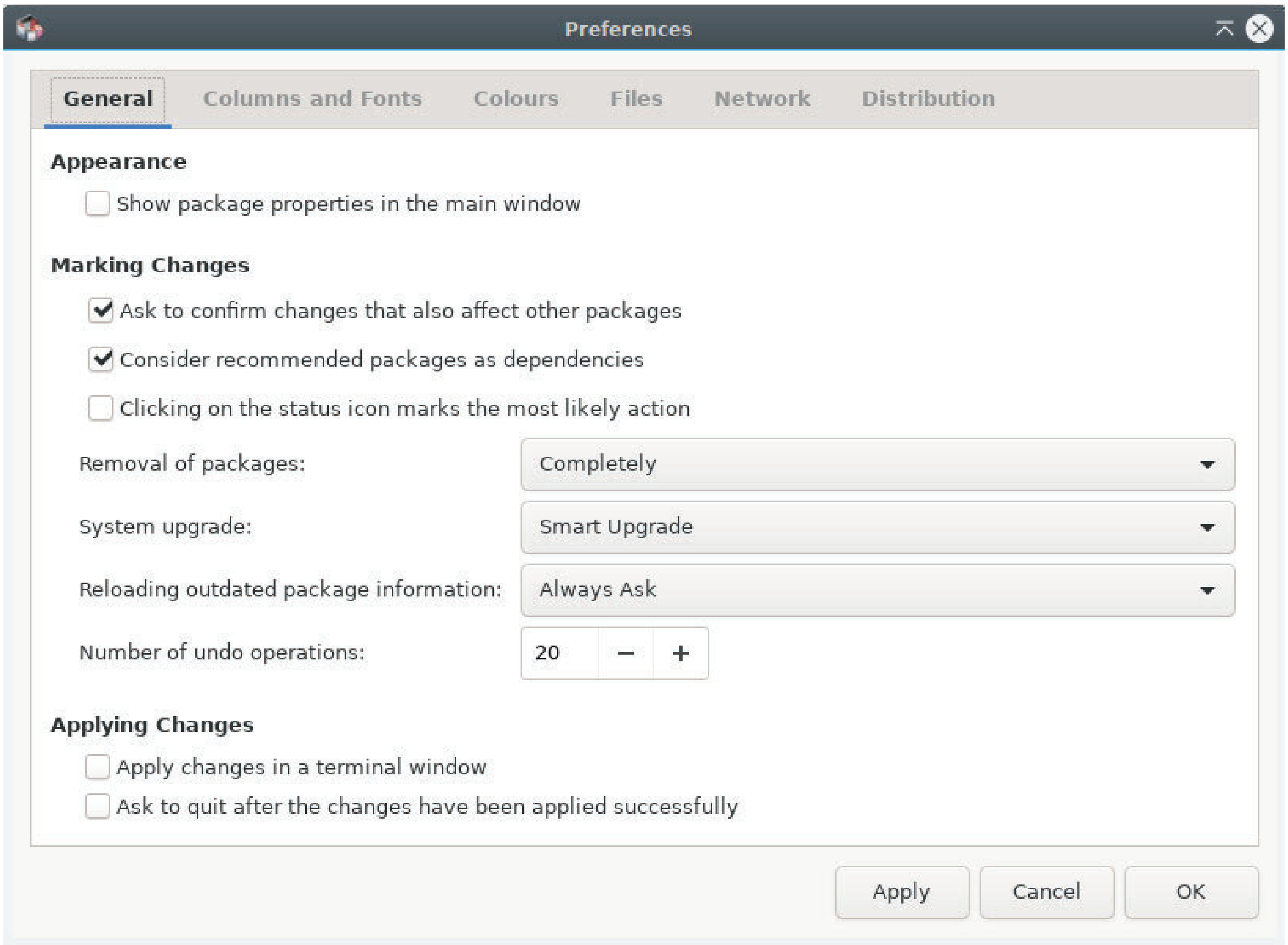
By clicking on a package, its description is displayed on the bottom center pane of Synaptic. To obtain even more information on a package, right-click on it, and select Properties, or go to menu “Packages > Properties”.

Then you will know everything - positively absolutely everything - on this package: dependencies, installed files, size and version.

8.5.8 Synaptic preferences

“Preferences” is a well-named category, existing in most applications, and which is also present here... **But keep in mind that Synaptic is a very special case**: it manages the full set of software installed on your system. When you remove a program, it does not go in the wastebasket (where you could have potentially retrieved it) !

After these scary warnings, let’s move to the settings available for Synaptic. the Preferences window (launched via menu Settings > Preferences) displays 6 different tabs:



Appearance

☐ Show package properties in the main window

Marking Changes

☑ Ask to confirm changes that also affect other packages

☑ Consider recommended packages as dependencies

☐ Clicking on the status icon marks the most likely action

Removal of packages: Completely

System upgrade: Smart Upgrade

Reloading outdated package information: Always Ask

Number of undo operations: 20

Applying Changes

☐ Apply changes in a terminal window

☐ Ask to quit after the changes have been applied successfully

Synaptic: Preferences window

- **General**: the options in there are rather explicit. Note: it is possible to un-check the option “Consider recommended packages as dependencies”, if that helps you keeping an ultra-light system. But this could induce problems when installing future new packages. Thus an option to be handled carefully.

- **Columns and Fonts**: allows you to display/mask some columns in the package list, and define the font, if necessary.
- **Colors**: you can define here the package colors according to their status.
- **Files**: When you install a piece of software, it is first stored in the *cache* (which is a specific folder of the file system) before being uncompressed and installed. These packages can occupy more and more disk space as you make usage of your computer. Here you can delete them immediately or configure an automatic action.
- **Network**: This is the way Synaptic connects to Internet. You should know if your situation requires a modification of these parameters.
- **Distribution**: Defines the package upgrade behavior and is very explicit. **In case of doubts, do not modify it!**

Remember: by using a terminal (chap.8.2) you can achieve the same results more quickly and with less manipulations.

8.6 Cleaning the system

Even if the capacity of hard disks increased dramatically during the last years, you might need some free space. Several scripts automate the disk cleaning process, however I must confess that I prefer to check before using the **rm** command (standing for **re**mo**v**e. chap.11.2).

8.6.1 Disk space information

The first thing to do, of course, is to find out the used space on your disk. Several tools are available to you, starting with your terminal:

– Disk space in terminal mode –

A summary of the disk space usage for each system mount points (disks and partitions) with th **df** command:

```
df -h
Filesystem     Size    Used Avail Use% MountPoint
udev           983M       0  983M   0% /dev
tmpfs          200M    8,1M  192M   5% /run
/dev/sda1       48G     16G   30G  35% /
tmpfs          998M       0  998M   0% /dev/shm
tmpfs          5,0M    4,0K  5,0M   1% /run/lock
```

– List your repertories sorted by decreasing size –

View your directories bulky thanks to **du** and **sort** (the unit is the megabytes):

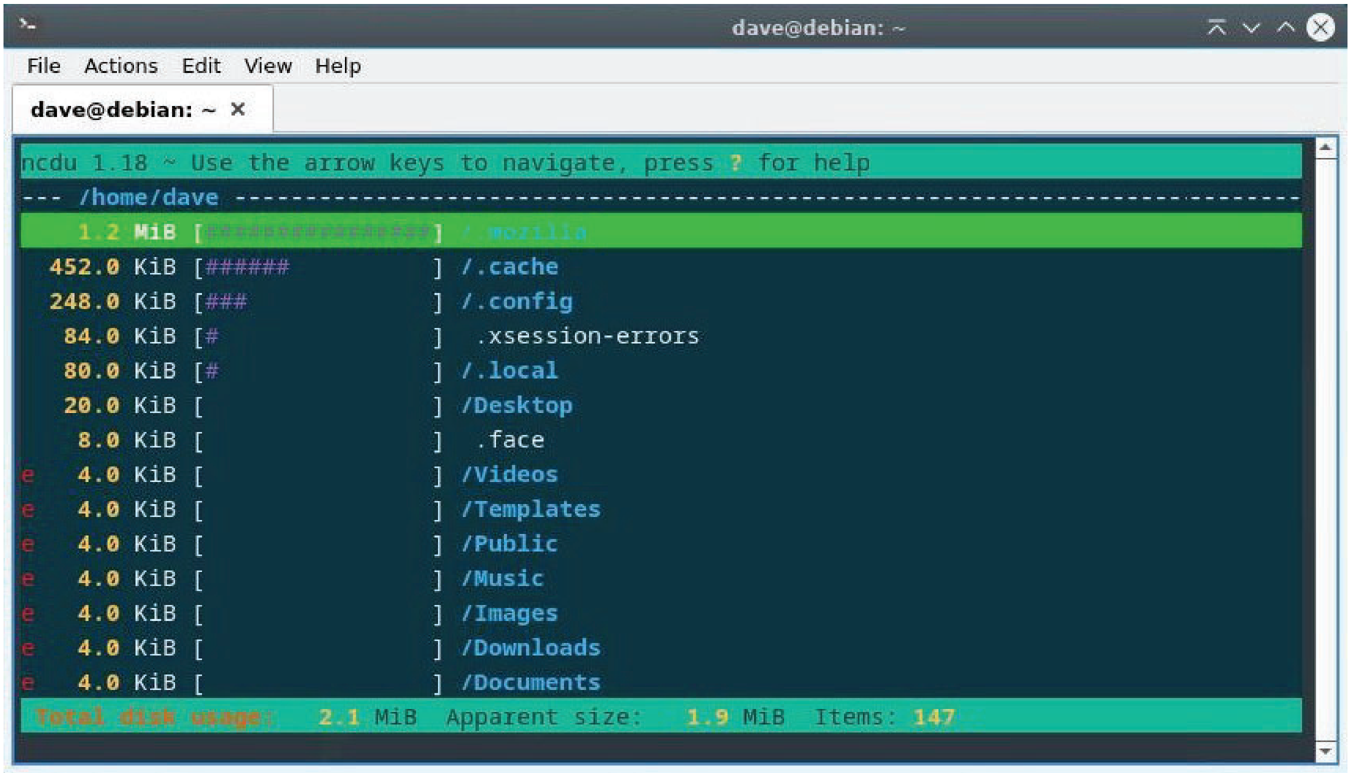
```
user@debian-pc:~$ du -ms * | sort -nr
585  Music
```

```
281  Videos
232  Documents
42   Pictures
26   Dowloads
```

– Ncdu –

A disk space analyzer in console mode. To launch it, simply type “ncdu” in your terminal. To install this software (in administrator mode):

```
apt update && apt install ncdu
```



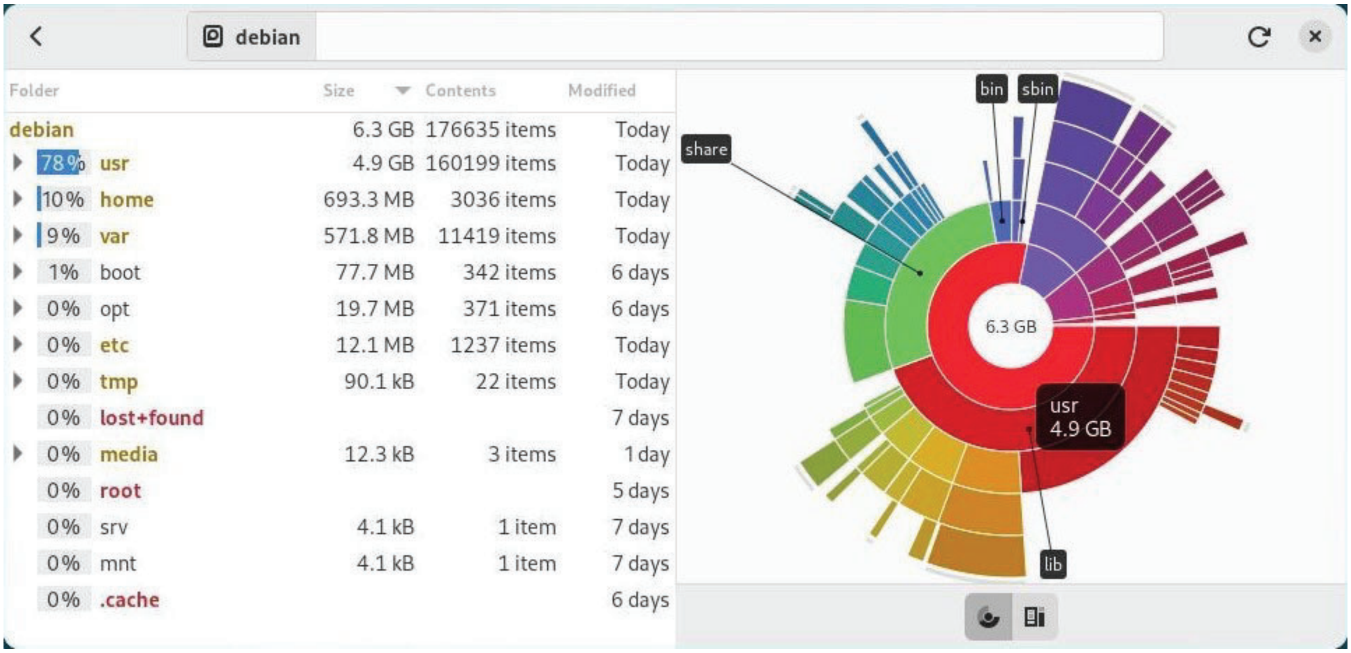
```
ncdu 1.18 ~ Use the arrow keys to navigate, press ? for help
--- /home/dave -------------------------------------------------------------------
    1.2 MiB [################] /.mozilla
  452.0 KiB [######          ] /.cache
  248.0 KiB [###             ] /.config
   84.0 KiB [#               ]  .xsession-errors
   80.0 KiB [#               ] /.local
   20.0 KiB [                ] /Desktop
    8.0 KiB [                ]  .face
e   4.0 KiB [                ] /Videos
e   4.0 KiB [                ] /Templates
e   4.0 KiB [                ] /Public
e   4.0 KiB [                ] /Music
e   4.0 KiB [                ] /Images
e   4.0 KiB [                ] /Downloads
e   4.0 KiB [                ] /Documents
 Total disk usage:   2.1 MiB  Apparent size:   1.9 MiB  Items: 147
```

Ncdu launched in the user personal folder

– Baobab –

A disk space analyzer in graphic mode, integrated in Gnome but available in other environments with:

```
apt update && apt install baobab
```



Folder		Size	Contents	Modified
debian		6.3 GB	176635 items	Today
78 %	usr	4.9 GB	160199 items	Today
10 %	home	693.3 MB	3036 items	Today
9 %	var	571.8 MB	11419 items	Today
1%	boot	77.7 MB	342 items	6 days
0%	opt	19.7 MB	371 items	6 days
0%	etc	12.1 MB	1237 items	Today
0%	tmp	90.1 kB	22 items	Today
0%	lost+found			7 days
0%	media	12.3 kB	3 items	1 day
0%	root			5 days
0%	srv	4.1 kB	1 item	7 days
0%	mnt	4.1 kB	1 item	7 days
0%	.cache			6 days

Baobab: disk space analyzer on Gnome

8.6.2 Cleaning the packages

Apt/aptitude/dpkg are the usual Debian package managers. When you install a package its archive-source/deb file is stored in your system (in the /var/cache/apt/archives/ folder) to enable a potential re-installation without Internet connection. To clean the “apt cache” use a simple command in administrator mode (chap.3.8.3):

```
apt clean
```

Once the cache of the installed packages is cleaned, you can also remove the useless packages from your system, as well as the configuration files. **Warning!** Remember to check carefully the list of the packages planed for removal, before accepting the operation:

```
apt autoremove --purge
```

If you have upgraded your system, it is possible that some packages are no longer available on the new repositories: they are obsolete. To list and remove these packages, use **apt** and remember **to check carefully** the list of packages planed for removal:

```
apt list '?obsolete'
apt remove '?obsolete'
```

Finally, to list and purge configuration files that have remained in place despite the removal of applications, you can use these commands:

```
dpkg --list | awk '/^rc/ {print $2}'
apt purge $(dpkg --list | awk '/^rc/ {print $2}')
```

For the more maniac, you can install the deborphan tool which lists the orphaned packages on your system: those that no other package depends on. **Warning!** Remember to check carefully the list of the packages planed for removal, before accepting the operation.

```
apt install deborphan                 # install deborphan
echo $(deborphan)                     # list orphaned packages
apt autoremove --purge $(deborphan)   # remove orphaned packages
```

8.6.3 Emptying the trash bins

Three different trash-bins (or wastebaskets) must be taken into account:

The user wastebasket : ~/.local/share/Trash/ . You can empty it with the system file manager (chap.3.6.2.5), or with a terminal:

```
rm -Rf ~/.local/share/Trash/*
```

The administrator wastebasket : /root/.local/share/Trash/ . To empty it with the proper manner, use a terminal in administrator mode:

```
rm -Rf /root/.local/share/Trash/*
```

The external wastebaskets : locates on your external disks, they are usually named '/media/your_id/your_disk/.Trash_1000', where your_id corresponds to your login name.

8.6.4 Purging application caches

Some applications use a "cache" folder, where they store images, videos, and miscellaneous information in order to run faster. Usually these data do not occupy too much disk space, however if (using the tools described above) you detect that a folder becomes too fat, don't hesitate to remove it.

```
rm -Rf ~/.cache/*
```

Each application has its own way to manage its own cache: some purge it systematically when they close, others store their data in the /tmp folder, which will be cleared during the session logout, others keep all their information in a specific folder.

For Firefox, as an example, you can purge the cache from the preferences menu, and even automate this action every time the application is closed.

8.6.5 Purging the thumbnails

Every time you open a folder containing pictures or videos, thumbnails are created to represent these graphic files. These thumbnails are stored in a specific folder to reuse them, rather than being forced to recompute them every time you access this kind of files.
The problem raises when you delete a graphic file, because its thumbnail is kept in the system, and this leads to a certain amount of disk space wasted to store obsolete thumbnails.
To purge them, it is enough to remove their corresponding folder:

```
rm -Rf ~/.thumbnails
```

This folder will be created again, the next time the system needs to store a newly generated thumbnail.

8.7 Installing external “.deb” packages

Debian GNU/Linux uses the package repository system to better manage the software and increase the security of your system. But it may happen that you need an external package of the “.deb” format.

... but who is this “deb” ??

deb is the short for “debian”, the mother company. To distribute its software, Debian uses a specific archive file format: “.deb”. It is a compressed format, like the “.zip” that you use to save your data. These “.deb” archives are recognized by the different Debian package managers (APT and its graphical interface Synaptic) and thus can be handled more easily.

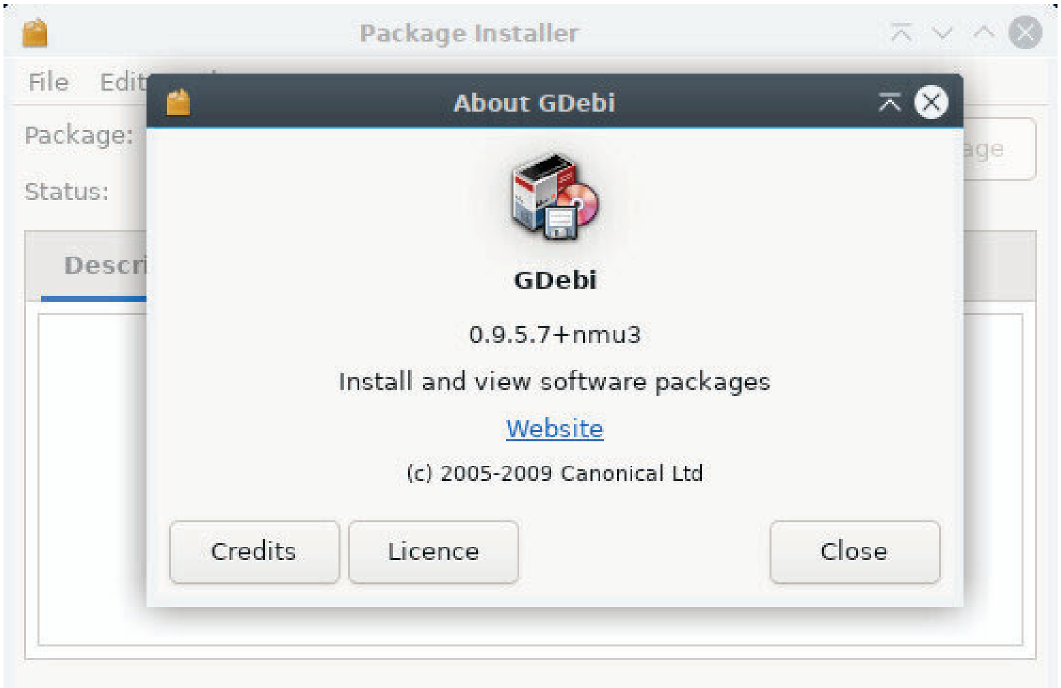
8.7.1 Installation in graphic mode with GDebi

GDebi is a graphical utility with allows the installation of external packages of the “.deb” format, while managing the dependencies.

To install it, look for “gdebi” in your favorite package manager (Synaptic, Discover, Software) or more simply from a terminal in administrator mode using “**su**” (chap.3.8.3):

```
apt update && apt install gdebi
```

When you download a Debian external package, right-click on it and select “Open with gdebi”.



0.9.5.7+nmu3

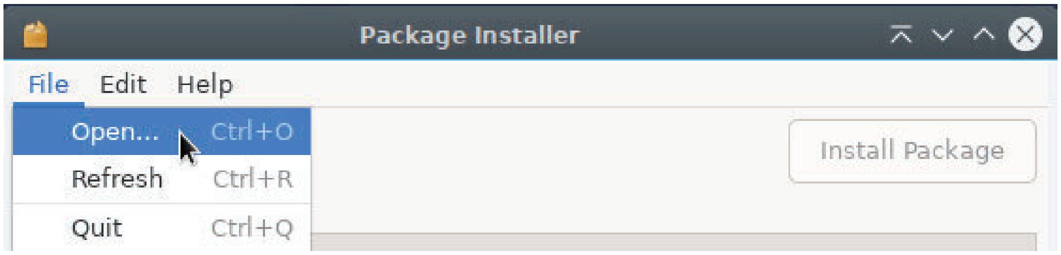
Install and view software packages

Website

(c) 2005-2009 Canonical Ltd

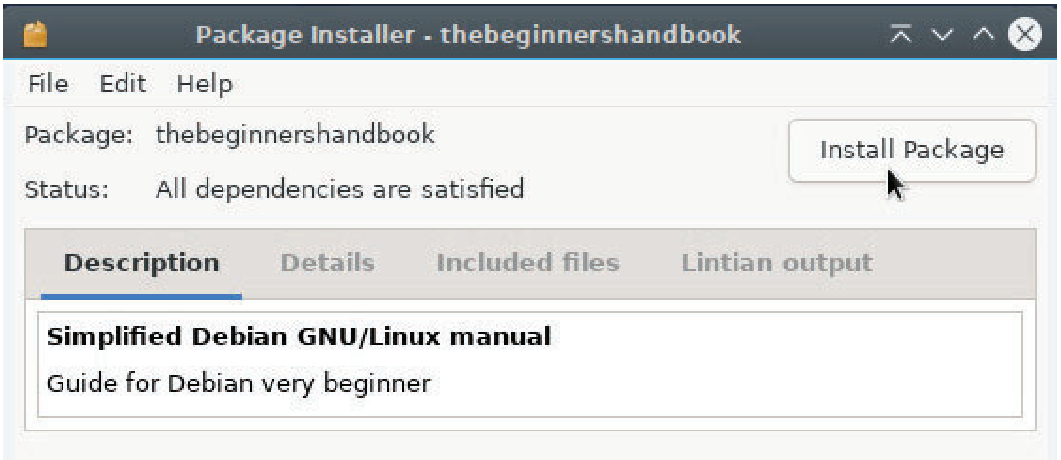
GDebi: the default interface

Within the menu, click on File > Open and enter the path of the “.deb” file:



GDebi: opening a .deb file

Then click on “Install Package”. Your password is requested to validate the install.



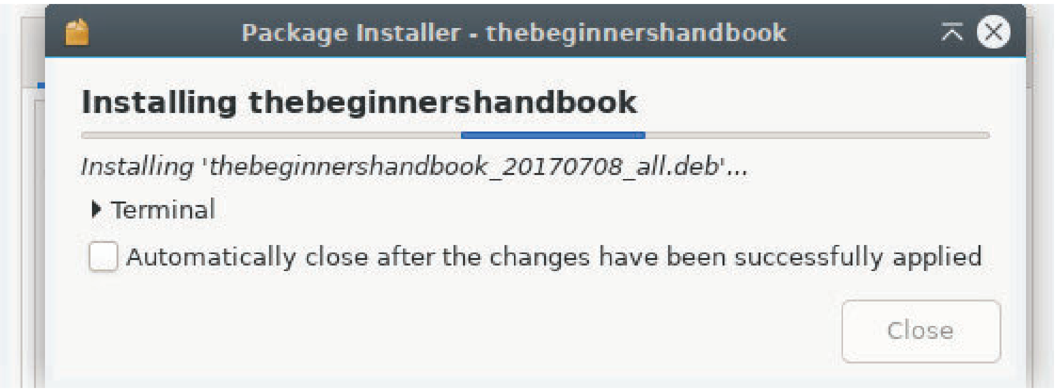
Package: thebeginnershandbook

Status: All dependencies are satisfied

Simplified Debian GNU/Linux manual

Guide for Debian very beginner

GDebi: installing a .deb file



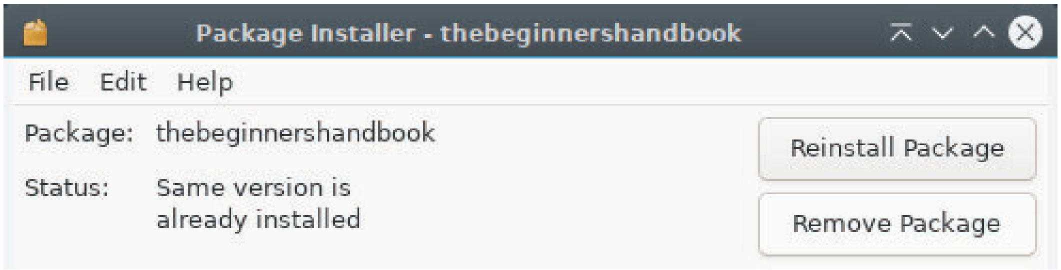
Installing thebeginnershandbook

Installing 'thebeginnershandbook_20170708_all.deb'...

□ Automatically close after the changes have been successfully applied

GDebi: installing a .deb file

To uninstall it, very easy : enough to click on “Remove Package”.



Package: thebeginnershandbook

Status: Same version is
already installed

GDebi: remove a .deb file

8.7.2 Installation in terminal mode with Dpkg

Dpkg is a software utility handling the packages, like does apt, but without managing the dependencies. This means that if you use dpkg to install external packages, you need to install the "dependent" packages one by one from your terminal. Dpkg is integrated in Debian by default, and must be used in administrative mode.

To install an external package:

```
dpkg -i package_name.deb
```

An error message will let you know if some dependencies are missing. Then simply install them the classic way with apt:

```
apt install dependency_1 dependency_2 ...
```

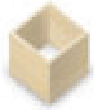
Then relaunch the installation of your external package.

```
dpkg -i package_name.deb
```

To remove an external package:

```
dpkg --purge package_name
```

8.8 Installing Flatpak applications



Flatpak (https://docs.flatpak.org/en/latest/getting-started.html) is a virtualization application system for GNU/Linux distributions. The objective is to provide a safe "sandbox" environment, isolated from the rest of the system, where users can run applications not validated by the distribution repositories (test versions, for example). *dixit Wikipedia*

... I virtualize in the sandbox ...?
The applications that you download from the Debian repositories are ".deb" formated archives containing the application itself. These applications use common dependencies, are linked to each other, and have access to your entire system. Debian repositories are secure, so no worries about this issue. But then why should we use Flatpak?
The Flatpak format works differently: the application is compressed with all its dependencies, making it completely independent of the system on which it is installed. So, here you can install and use a freshly updated application or even a brand new one, compared to the Debian repositories.

The second advantage of this format is the famous “sandbox”. The *sandbox* is a kind of secure box in which the application runs, without having access to the rest of the system (with exceptions, when the user gives its authorization), thereby preventing malicious software from going through your application to contaminate your system.
The last advantage is that it enables you to run multiple versions of the same application (very practical for Minetest and servers in different versions).
The downside of this format is that it is not verified by the Debian security: when installing *flatpaks*, you should prefer trusted referenced applications (Gimp, VLC, Blender ...).

8.8.1 Installing Flatpak

To take advantage of applications in Flatpak format, you must first install the corresponding package. From your terminal in administrator mode (chap.3.8.3) :

```
apt install flatpak
```

You can now download and install *flatpak* packages by visiting one of the websites grouping these applications like Flathub (https://flathub.org/home). But the simplest way consists to add a repository to your sources in order to take advantage of the full applications lists without having to search through the site.

8.8.2 Add a Flatpak repository

To add a repository like Flathub for example, and benefit from an easy search and a simplified installation, type in your terminal:

```
flatpak remote-add flathub https://flathub.org/repo/flathub.flatpakrepo
```

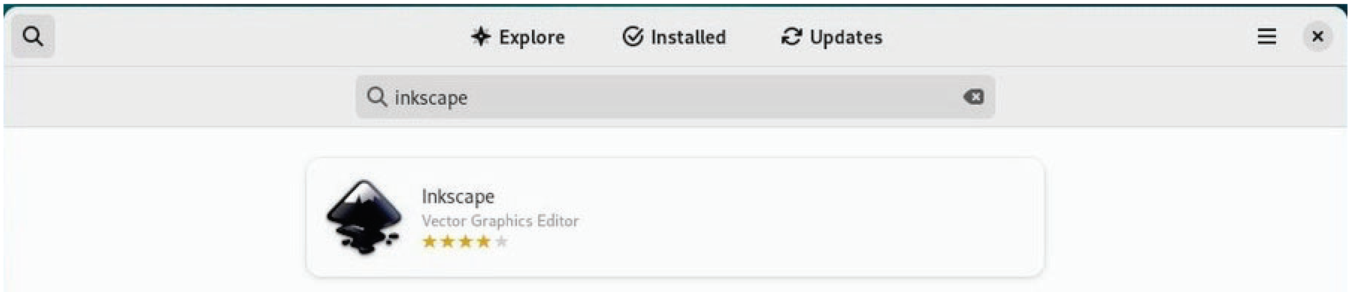
You will be asked for the administrator password. And you will have to restart your system to take the changes into account.

8.8.3 Manage Flatpak applications under Gnome with Software

To take advantage of managing *flatpaks* within your software manager, you must add the plugin corresponding to your environment. For Gnome and its simplified software manager, in a terminal and in administrator mode (chap.3.8.3) :

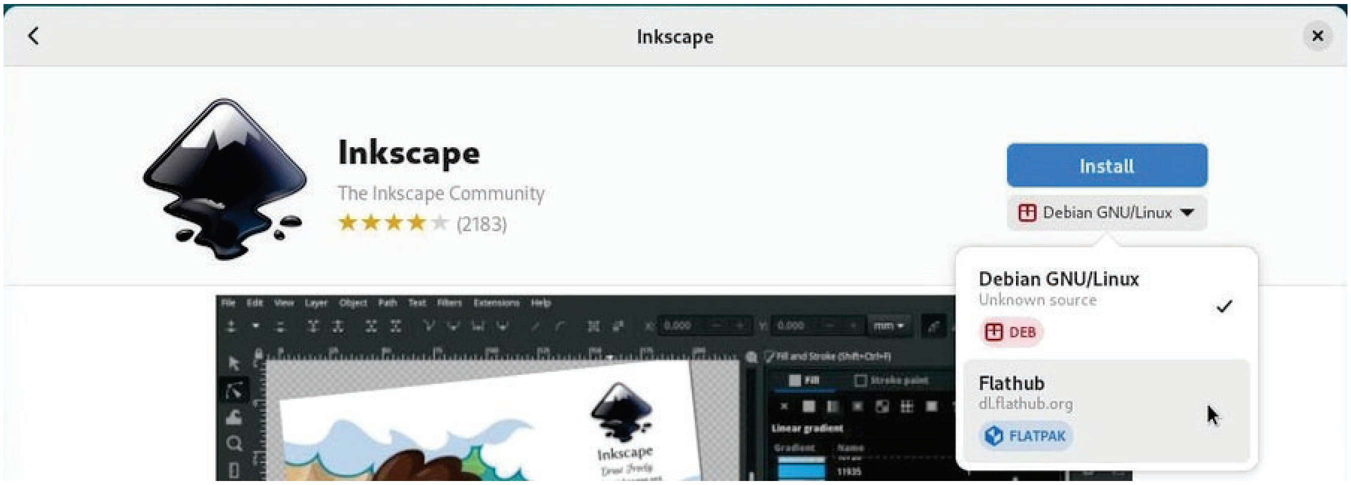
```
apt install gnome-software-plugin-flatpak
```

You can now manage your *flatpaks* like any other applications (*see* chap.8.3)



Looking at Flatpak application

Note the software source indicator at the bottom of the description.



Installing a Flatpak application

As with other applications, the administrator password will be requested for any installation. Your software will then be directly available in your applications menu.

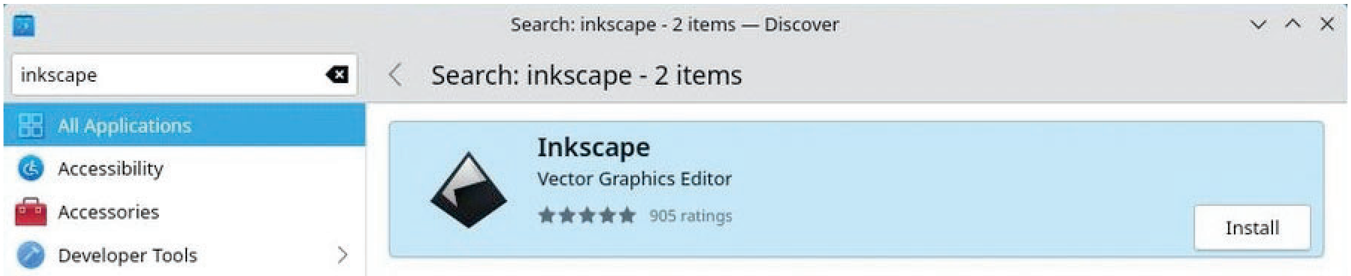
8.8.4 Manage Flatpak applications under KDE with Discover

To benefit from the management of *flatpaks* within Discover, under Kde, you must install the appropriate plugin. In a terminal and in administrator mode (chap.3.8.3):

```
apt install plasma-discover-backend-flatpak
```

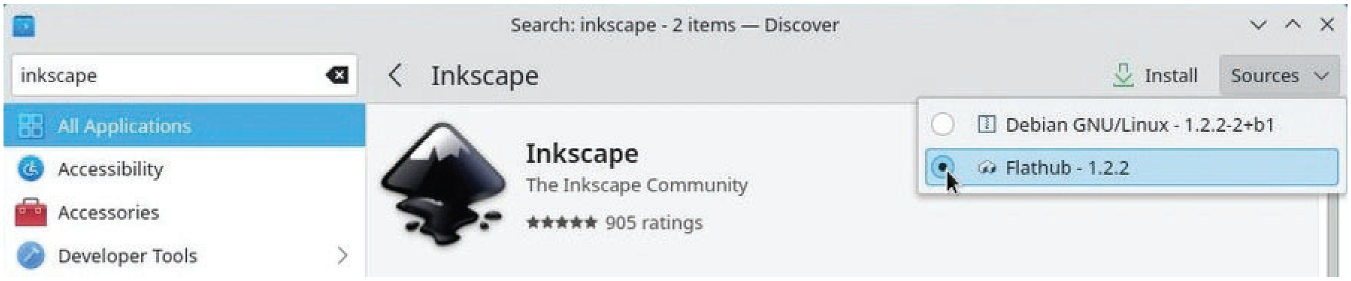
You can now manage your *flatpaks* like any other applications (*see* chap.8.4).

During your search, you must click on the software file. Don't click immediately on "Install" because Debian repositories have priority.



Looking for an application with Discover

Select the *flathub* repository from the Discover "Sources" menu. Then launch the installation by clicking on "Install":



○ Debian GNU/Linux - 1.2.2-2+b1
● Flathub - 1.2.2

Selecting the Flathub repository

As with other applications, the administrator password will be requested for any installation. Your software will then be directly available in your applications menu.

8.8.5 Manage Flatpak applications from your terminal

Here after, the basic commands to manage your *flatpaks* from your terminal:

Command	Action
flatpak search flatpak_name	Search for a flatpak in all repositories
flatpak install *repository* flatpak_name	Installing a flatpak from *repository*
flatpak uninstall flatpak_name	Remove a flatpak
flatpak uninstall --unused	Remove unused dependencies
flatpak update	Update all installed *flatpaks*
flatpak run flatpak_name	Launch a *flatpak*

Special case: install a flatpak **for the current user only** with the “--user” option. The files will be placed in the user directory ($HOME/.local/share/flatpak/).

```
flatpak --user install *repository* flatpak_name
```

Example with LibreOffice:

Installing LibreOffice from Flathub:

```
flatpak install flathub org.libreoffice.LibreOffice
```

To launch the flatpak version of LibreOffice:

```
flatpak run org.libreoffice.LibreOffice
```

8.8.6 Remove a Flatpak application

If you have installed your flatpak graphically from **Software** or **Discover**, just delete it from the installed applications menu from your software manager: look for the flatpak to uninstall then start the removal from the dedicated button.

Note that if you want to uninstall all dependencies (software installed in addition to the flatpak for its operation), you will have to launch this command in your terminal:

```
flatpak uninstall --unused
```

8.8.7 Some Flatpak repositories

To help you in your research, find hereafter some repositories using the Flatpak format and the commands to execute in order to add their repositories. You can use the “--if-no-exists” option to avoid errors generated by duplicates:

Flathub repository https://flathub.org/ gathering a large number of applications:

```
flatpak remote-add flathub https://flathub.org/repo/flathub.flatpakrepo
```

KDE Flatpak repository:

```
flatpak remote-add kdeapps https://distribute.kde.org/kdeapps.flatpakrepo
```

Gnome-nightly Flatpak repository:

```
flatpak remote-add gnome-nightly https://nightly.gnome.org/gnome-nightly.flatpakrepo
```

8.9 Who is this Sid guy?

First of all, one must know that **several Debian distribution branches** exist in parallel.

Namely the **oldstable**, **stable**, **testing** and **unstable** distributions, as well as an **experimental** branch.

The **Stable distribution** is the Debian official distribution, the one released at this moment, which is maintained and updated by the Debian teams. The only changes made to it concern the security updates and the bug fixes. It is recommended to favor this version.

The **Oldstable distribution** is the previous stable version. It is usually supported by the Debian teams during one year after the release of the new stable version. However it might live longer if enough individuals or companies continue to assure its maintenance. Then it is called a LTS (standing for Long Term Support) distribution: we extend its life span.

The **Testing distribution** is the future Stable version. It is used to prepared the next stable version. When everything is OK, when all the bit and pieces are functioning well together, when all the features targeted by the Debian teams are included, and after a period of software freeze and bug hunting, then the Testing version becomes the official new Stable distribution.

The **Unstable distribution**, *nicknamed Sid*, is the version which receives all the new packages versions, and sits at the cutting edge of innovation, but is not very stable: it’s a research lab. Nevertheless some brave adventurers use it on a daily basis.

The **Experimental distribution** is not a Debian distribution *per se*, but rather a repository where alpha or beta software versions are tested.

All these distributions are given a nickname picked among the characters of the Toy Story® cartoon. Currently, the name of the **stable version is Bookworm**, the name of the **testing version is Trixie**, the name of the **oldstable version is Bullseye**, the Experimental as no nickname.