RAST DISTRIBUTION

LINUX DISTRIBUTION FOR IIA STUDENTS

11 DE JUNIO DE 2021

OPERATING SYSTEM

CREATORS

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Introduction

In this work, the development of the Rast Distribution will be presented, from its objectives, the structure made before its formation, the explanation of the facilities or changes made to it, and the conclusions that were obtained after having carried out the project.

Rast Distribution

This section will detail all the processes that were carried out to create the Linux distribution, step by step. First, we will talk about the objectives that are tried to meet with the creation of this distribution.

Objectives

When designing this Linux distribution, the following two main goals were in mind:

1. Design a distribution designed for Artificial Intelligence Engineering students.
2. Create a Linux distribution without errors and with everything installed correctly.

The target audience of this distribution are students like us, who, at first, were inexperienced in programming issues and everything that may be needed in the Artificial Intelligence Engineering career. Therefore, this distribution is planned to have any necessary element that would have been useful to us from the beginning.

Name

One question that may arise is: "Why Rast?" Everything is due to a play on words from the Slovenian word "razviti", which translated into Spanish means "develop" (something we wanted to relate to our Linux distribution). From this name, some letters were simply removed and the word "Razt" remained, but for aesthetic purposes the "z" was changed to "s", finally remaining as "Rast" (pronounced from Spanish).

Specifications

As mentioned in the objectives, Rast is designed for Artificial Intelligence Engineering students, considering all the necessary factors that they may need during their first four semesters, from applications to programming languages. The members of the team that carried out this project, we tried to meet the needs that perhaps they, as students of A.I., would have liked to have from the beginning so as not to be spoiling their equipment, installing things without knowing their functionality.

Rast was planned, from the beginning, to be made on Ubuntu 20.04, but no recent and safe ways were found to build a distribution, so it was decided to switch to Ubuntu 18.04, a more stable version where there are more tools to create a distribution of effective way.

Therefore, Rast is made up of the following way:

- **Name:** Rast Distribution.
- **Topic:** Linux distribution dedicated for students of A.I.
- **Linux on which it was based:** Ubuntu.
- **Version:** 18.04.
- **Display Manager:** SDDM.
- **Package Manager:** Synaptic Package Manager.
- **Desktop Environment:** Plasma Desktop.
- **Installed user apps:**
    - Curl.
    - Visual Studio Code.
    - GNU Octave.
    - Geogebra.
    - Python.
    - Build-Essential.

    - C++ (g++-).
    - C (gcc).
    - Java (jdk).
    - NetBeans.
    - JavaScript (Node.js, npm).
    - Texlive-latex-extra (Ruby y LaTex).
    - Texmaker.
    - Gdebi.
- **Daemons:** Disabling and masking useless daemons.
- **Distribution creator program:** Pinguy Builder 5.1-8.

Structure

Next, the proposed structure to create Rast Distribution will be explained. This was the plan that was followed, in general, to install everything in a proper and organized way:

Name: Rast Distribution.

Topic: Linux distribution dedicated for students of A.I.

Ubuntu version: Ubuntu 18.04.

1. Update the system and upgrade it.
2. Install Synaptic Package Manager.
3. Install all the programs that we need.
4. **Build backup (screenshot).**
5. Install Pinguy Builder.
6. **Build backup (screenshot).**
7. Modify Daemons (stop useless services).
8. **Build backup (screenshot).**
9. Download Display Manager and Desktop Environment.
10. **Build backup (screenshot).**
11. Change the Display Manager and Desktop Environment.

12. **Build backup (screenshot).**
13. Install the Theme.
14. Modify the Theme.
15. Installation of the ubiquity-frontend.
16. **Build backup (screenshot).**
17. Delete useless applications.
18. Delete cache.
19. **Build backup (screenshot).**
20. **Build the final ISO distribution.**

Explanation of the installations

This section will detail all the processes carried out to install the applications and other software that was required for the culmination of this distribution.

Update and Upgrade

Once the installation of Ubuntu 18.04 was finished, the equipment was updated with the following command:

‘sudo apt update’

Once this operation was completed, the system was upgraded with this other command:

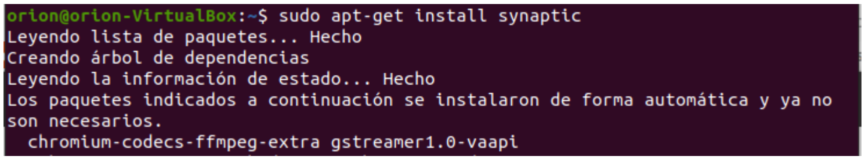
‘**sudo apt upgrade’**

After having done the above, the part of installing the Package Manager continues, followed to install packages in a faster and easier way.

Package Manager

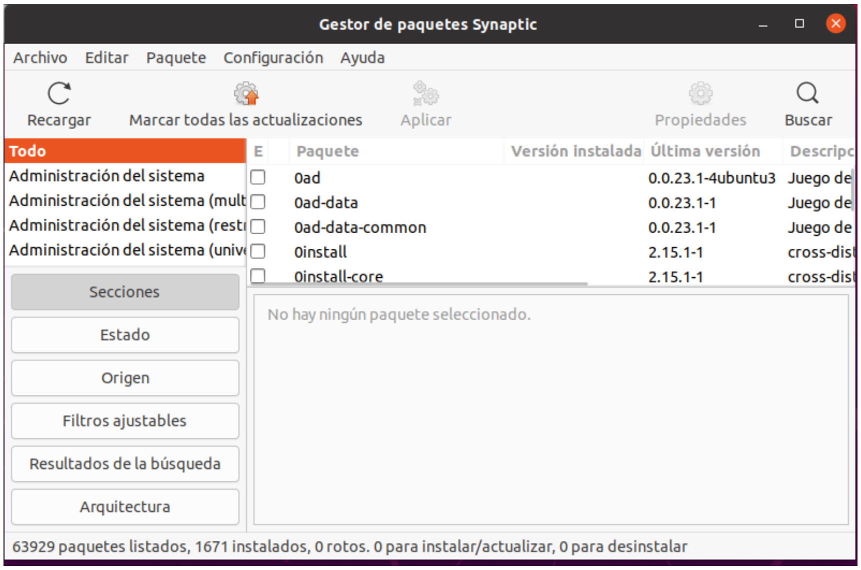
In this case, it was decided to install Synaptic Package Manager, due to its ease of use and the extensive collection of packages that it can handle, but more so because it contains the packages that Rast needed and because it is a very reliable Package Manager.

To install it, it was only necessary to place the following command line that is presented in the image:



```
orion@orion-VirtualBox:~$ sudo apt-get install synaptic
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
Los paquetes indicados a continuación se instalaron de forma automática y ya no
son necesarios.
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi
```

Once downloaded, we can access it, which has the following view:



Gestor de paquetes Synaptic
Archivo
Editar
Paquete
Configuración
Ayuda
Recargar
Marcar todas las actualizaciones
Aplicar
Propiedades
Buscar
Todo
Administración del sistema
Administración del sistema (mult
Administración del sistema (restı
Administración del sistema (unive
Secciones
Estado
Origen
Filtros ajustables
Resultados de la búsqueda
Arquitectura

E	Paquete	Versión instalada	Última versión	Descripc
□	0ad		0.0.23.1-4ubuntu3	Juego de
□	0ad-data		0.0.23.1-1	Juego de
□	0ad-data-common		0.0.23.1-1	Juego de
□	0install		2.15.1-1	cross-dist
□	0install-core		2.15.1-1	cross-dist

No hay ningún paquete seleccionado.

63929 paquetes listados, 1671 instalados, 0 rotos. 0 para instalar/actualizar, 0 para desinstalar

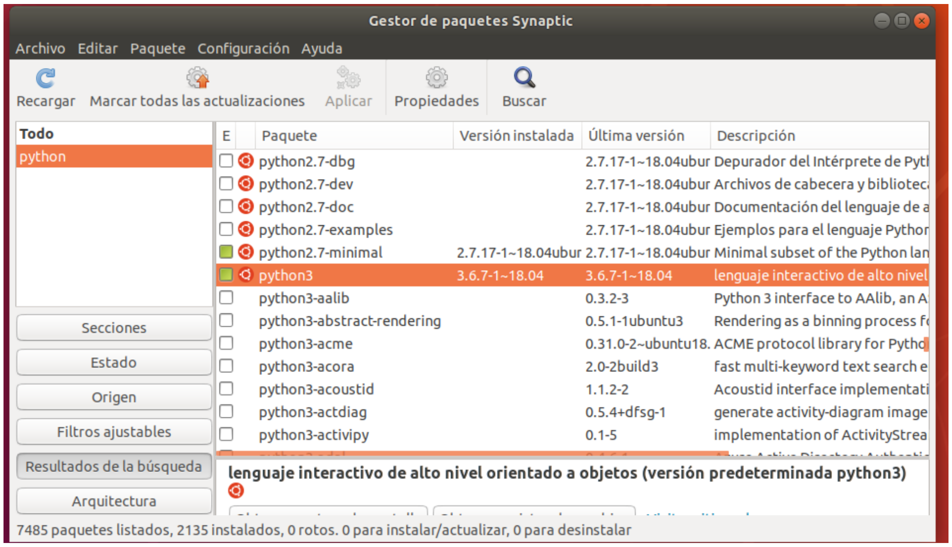
From this point, programs can be installed more efficiently.

User Applications

Python

Perhaps the simplest and most useful programming language. Python is a perfect language for newbies (such as those just entering the IIA career), since it allows you to work with a very simple and understandable lexicon, making it an important tool for new programmers to become familiar with this world.

Python was already installed by default by the Linux system, therefore, it did not need to be installed, but, when updating and upgrading, its version was updated to a more recent one. From our package manager we can verify that, indeed, it is installed and put in its most recent version (at least the one in the package manager).


Gestor de paquetes Synaptic
Archivo Editar Paquete Configuración Ayuda
Recargar
Marcar todas las actualizaciones
Aplicar
Propiedades
Buscar
Todo
python
Secciones
Estado
Origen
Filtros ajustables
Resultados de la búsqueda
Arquitectura

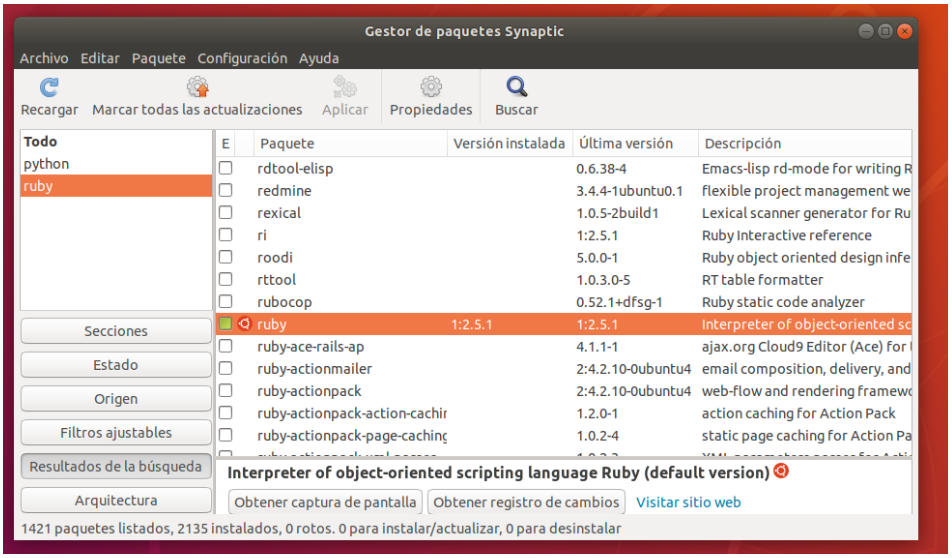
E	Paquete	Versión instalada	Última versión	Descripción
□	python2.7-dbg		2.7.17-1~18.04ubur	Depurador del Intérprete de Pytl
□	python2.7-dev		2.7.17-1~18.04ubur	Archivos de cabecera y bibliotec
□	python2.7-doc		2.7.17-1~18.04ubur	Documentación del lenguaje de a
□	python2.7-examples		2.7.17-1~18.04ubur	Ejemplos para el lenguaje Pythor
🟩	python2.7-minimal	2.7.17-1~18.04ubur	2.7.17-1~18.04ubur	Minimal subset of the Python lan
🟩	python3	3.6.7-1~18.04	3.6.7-1~18.04	lenguaje interactivo de alto nivel
□	python3-aalib		0.3.2-3	Python 3 interface to AAlib, an A
□	python3-abstract-rendering		0.5.1-1ubuntu3	Rendering as a binning process f
□	python3-acme		0.31.0-2~ubuntu18.	ACME protocol library for Pytho
□	python3-acora		2.0-2build3	fast multi-keyword text search e
□	python3-acoustid		1.1.2-2	Acoustid interface implementati
□	python3-actdiag		0.5.4+dfsg-1	generate activity-diagram image
□	python3-activipy		0.1-5	implementation of ActivityStrea

lenguaje interactivo de alto nivel orientado a objetos (versión predeterminada python3)

7485 paquetes listados, 2135 instalados, 0 rotos. 0 para instalar/actualizar, 0 para desinstalar

Ruby

Ruby, like Python, is a programming language that is already installed from the factory on the Linux system, all you have to do is access our package manager, which in this case is Synaptic Package Manager, and make sure that it is installed. Either way, it is always appropriate to select it, mark it and select the "Apply" button at the top of the Synaptic menu. Ruby is a slightly more complicated language than Python, but it can be a great help as it is a powerful and fast-developing language.


Gestor de paquetes Synaptic
Archivo Editar Paquete Configuración Ayuda
Recargar
Marcar todas las actualizaciones
Aplicar
Propiedades
Buscar
Todo
python
ruby
Secciones
Estado
Origen
Filtros ajustables
Resultados de la búsqueda
Arquitectura

E		Paquete	Versión instalada	Última versión	Descripción
□		rdtool-elisp		0.6.38-4	Emacs-lisp rd-mode for writing R
□		redmine		3.4.4-1ubuntu0.1	flexible project management we
□		rexical		1.0.5-2build1	Lexical scanner generator for Ru
□		ri		1:2.5.1	Ruby Interactive reference
□		roodi		5.0.0-1	Ruby object oriented design infe
□		rttool		1.0.3.0-5	RT table formatter
□		rubocop		0.52.1+dfsg-1	Ruby static code analyzer
☑		ruby	1:2.5.1	1:2.5.1	Interpreter of object-oriented sc
□		ruby-ace-rails-ap		4.1.1-1	ajax.org Cloud9 Editor (Ace) for
□		ruby-actionmailer		2:4.2.10-0ubuntu4	email composition, delivery, and
□		ruby-actionpack		2:4.2.10-0ubuntu4	web-flow and rendering framewo
□		ruby-actionpack-action-cachir		1.2.0-1	action caching for Action Pack
□		ruby-actionpack-page-cachinc		1.0.2-4	static page caching for Action Pa

Interpreter of object-oriented scripting language Ruby (default version)

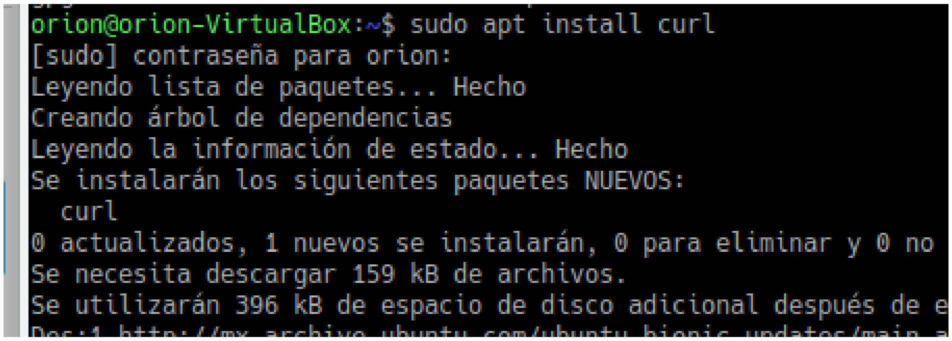
1421 paquetes listados, 2135 instalados, 0 rotos. 0 para instalar/actualizar, 0 para desinstalar

Visual Studio Code

Visual Studio Code is a useful program to edit code in a very simple and efficient way, all thanks to its great graphical interface that is highly optimized and can allow the user to develop projects in a simple way. It is an application that we (the team members) use constantly, due to its design and great functionality. Without a doubt, a program that we would have liked to know from the beginning of the race.

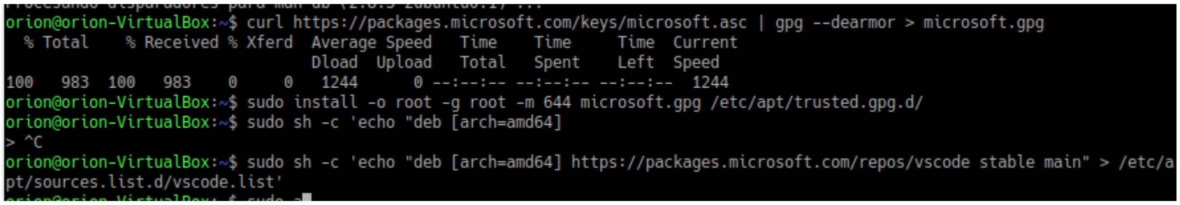
This program cannot be installed from Synaptic Package Manager, we have to install repositories and install the Curl command.

Before putting the repositories, we install the Curl command with the following command line (never mind the redundancy).



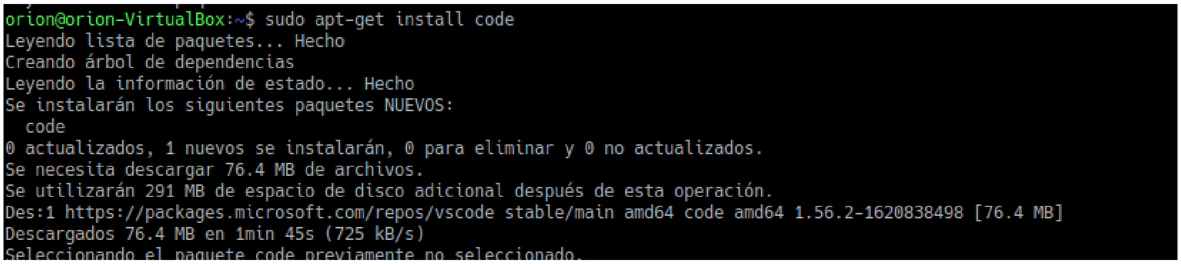
```
orion@orion-VirtualBox:~$ sudo apt install curl
[sudo] contraseña para orion:
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
Se instalarán los siguientes paquetes NUEVOS:
  curl
0 actualizados, 1 nuevos se instalarán, 0 para eliminar y 0 no
Se necesita descargar 159 kB de archivos.
Se utilizarán 396 kB de espacio de disco adicional después de e
Des:1 http://mx.archive.ubuntu.com/ubuntu bionic-updates/main a
```

Once the Curl is installed, we can put the repositories in the following way:



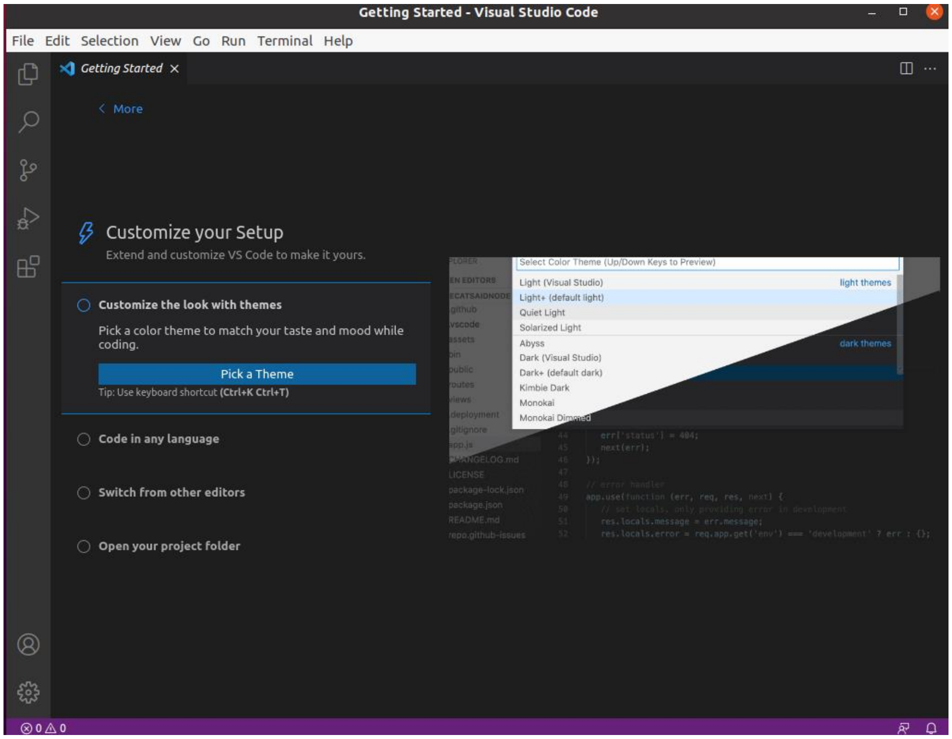
```
orion@orion-VirtualBox:~$ curl https://packages.microsoft.com/keys/microsoft.asc | gpg --dearmor > microsoft.gpg
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   983  100   983    0     0   1244      0 --:--:-- --:--:-- --:--:--  1244
orion@orion-VirtualBox:~$ sudo install -o root -g root -m 644 microsoft.gpg /etc/apt/trusted.gpg.d/
orion@orion-VirtualBox:~$ sudo sh -c 'echo "deb [arch=amd64]
> ^C
orion@orion-VirtualBox:~$ sudo sh -c 'echo "deb [arch=amd64] https://packages.microsoft.com/repos/vscode stable main" > /etc/a
pt/sources.list.d/vscode.list'
```

Once the repositories are in place, we continue to execute **"sudo-get install"** to install the Visual Studio Code permanently. The line that should be put after having done this is the following:



```
orion@orion-VirtualBox:~$ sudo apt-get install code
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
Se instalarán los siguientes paquetes NUEVOS:
  code
0 actualizados, 1 nuevos se instalarán, 0 para eliminar y 0 no actualizados.
Se necesita descargar 76.4 MB de archivos.
Se utilizarán 291 MB de espacio de disco adicional después de esta operación.
Des:1 https://packages.microsoft.com/repos/vscode stable/main amd64 code amd64 1.56.2-1620838498 [76.4 MB]
Descargados 76.4 MB en 1min 45s (725 kB/s)
Seleccionando el paquete code previamente no seleccionado.
```

Once everything is installed, we can access Visual Studio Code by looking for it among our files and there should be no problem, a window like this appears:



Getting Started - Visual Studio Code

Customize your Setup

Extend and customize VS Code to make it yours.

Customize the look with themes

Pick a color theme to match your taste and mood while coding.

Tip: Use keyboard shortcut (Ctrl+K Ctrl+T)

With this we can confirm that the software has been installed correctly.

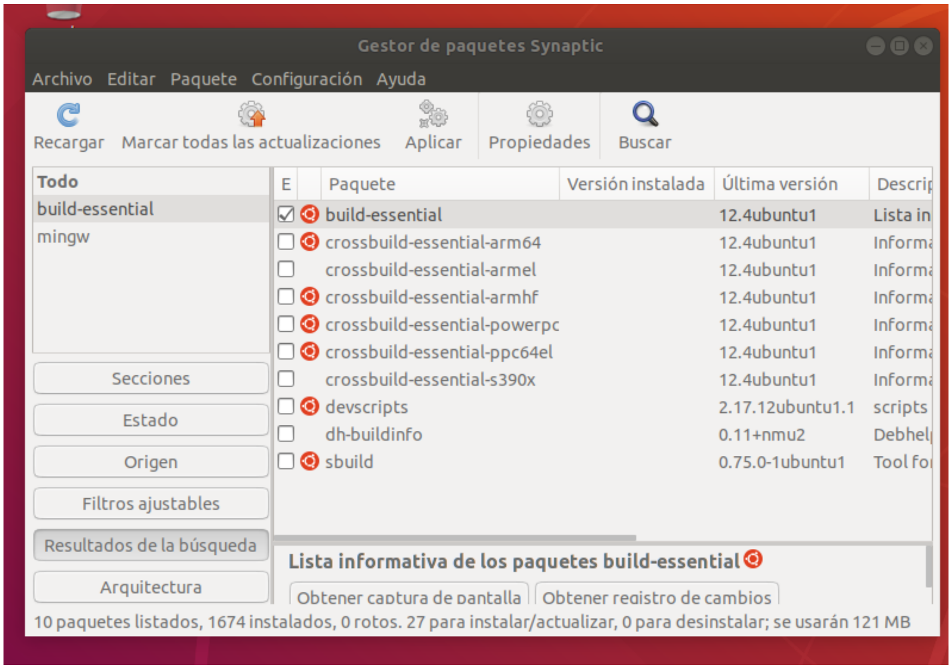
C/C++

C and C++ can be the most suitable programming languages to start with, since they are somewhat complex languages, but when you learn them, they can be of great help for the development of various projects in a fast way, in addition, when working with such low-level languages you can manipulate anything.

We installed it since it was a great help for us to enter the world of programming, thanks to being programming with these languages we have perfectly understood the syntax and operation of other simpler or more complex programming languages.

To download everything necessary for C++ we can do it directly from our package manager (Synaptic), we look for the package "build-essential", which has gcc and g++- (C and C++ compilers, respectively), which will allow us to program in this programming language.

When looking for it, it should look like this:



E	Paquete	Versión instalada	Última versión	Descrip
☑	build-essential		12.4ubuntu1	Lista in
☐	crossbuild-essential-arm64		12.4ubuntu1	Informa
☐	crossbuild-essential-armel		12.4ubuntu1	Informa
☐	crossbuild-essential-armhf		12.4ubuntu1	Informa
☐	crossbuild-essential-powerpc		12.4ubuntu1	Informa
☐	crossbuild-essential-ppc64el		12.4ubuntu1	Informa
☐	crossbuild-essential-s390x		12.4ubuntu1	Informa
☐	devscripts		2.17.12ubuntu1.1	scripts
☐	dh-buildinfo		0.11+nmu2	Debhel
☐	sbuild		0.75.0-1ubuntu1	Tool fo

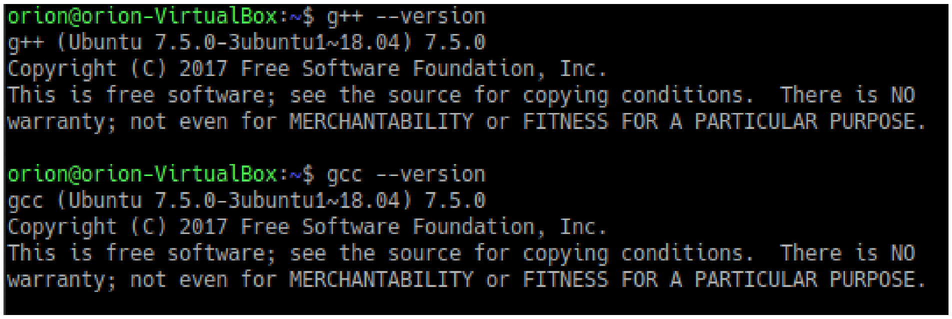
Lista informativa de los paquetes build-essential

Obtener captura de pantalla | Obtener registro de cambios

10 paquetes listados, 1674 instalados, 0 rotos. 27 para instalar/actualizar, 0 para desinstalar; se usarán 121 MB

We mark it and select the "Apply" button, in this way it will be installed automatically.

To verify that they have been installed properly, we can execute the following commands and the version of gcc and g ++ - will be output, like this:



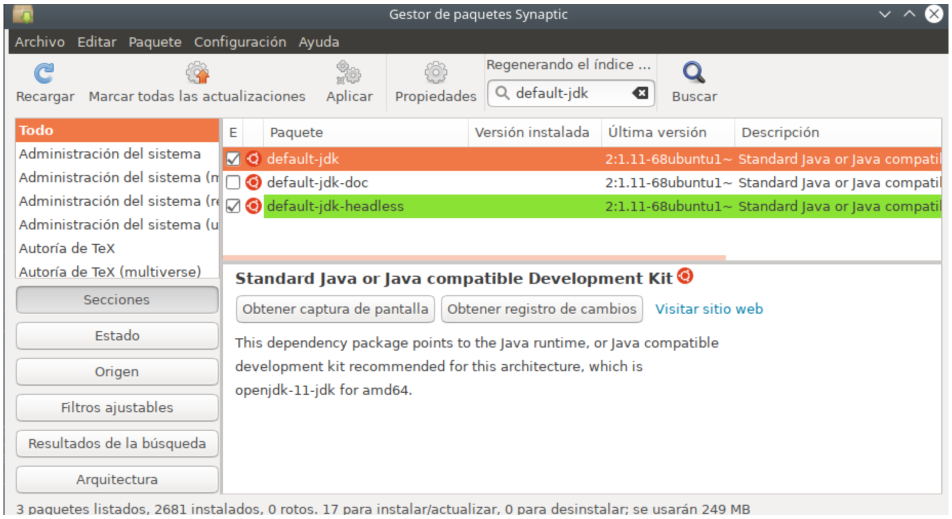
```
orion@orion-VirtualBox:~$ g++ --version
g++ (Ubuntu 7.5.0-3ubuntu1~18.04) 7.5.0
Copyright (C) 2017 Free Software Foundation, Inc.
This is free software; see the source for copying conditions.  There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

orion@orion-VirtualBox:~$ gcc --version
gcc (Ubuntu 7.5.0-3ubuntu1~18.04) 7.5.0
Copyright (C) 2017 Free Software Foundation, Inc.
This is free software; see the source for copying conditions.  There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
```

Having done this, it is certain that they are installed correctly.

Java

Another programming language of great relevance in the beginnings of any programmer is Java, a powerful programming language, where everything is an object and completely removes the responsibility for pointers. In addition, it will allow us to execute multiple threads to run different lines of code at the same time.

To obtain the Java programming language, it is enough to download the dependency package called: "default.jdk", from our package manager.


Gestor de paquetes Synaptic
Archivo Editar Paquete Configuración Ayuda
Recargar
Marcar todas las actualizaciones
Aplicar
Propiedades
Regenerando el índice ...
default-jdk
Buscar
Todo
Administración del sistema
Administración del sistema (n
Administración del sistema (re
Administración del sistema (u
Autoría de TeX
Autoría de TeX (multiverse)
Secciones
Estado
Origen
Filtros ajustables
Resultados de la búsqueda
Arquitectura
Obtener captura de pantalla
Obtener registro de cambios
Visitar sitio web

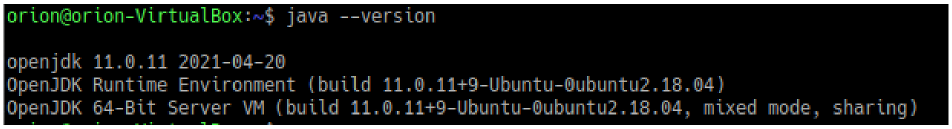
E	Paquete	Versión instalada	Última versión	Descripción
☑	default-jdk		2:1.11-68ubuntu1~	Standard Java or Java compati
□	default-jdk-doc		2:1.11-68ubuntu1~	Standard Java or Java compati
☑	default-jdk-headless		2:1.11-68ubuntu1~	Standard Java or Java compati

Standard Java or Java compatible Development Kit

This dependency package points to the Java runtime, or Java compatible development kit recommended for this architecture, which is openjdk-11-jdk for amd64.

3 paquetes listados, 2681 instalados, 0 rotos. 17 para instalar/actualizar, 0 para desinstalar; se usarán 249 MB

It is enough to mark it, select "Apply", and voila. Now to verify we execute the command to see its version.

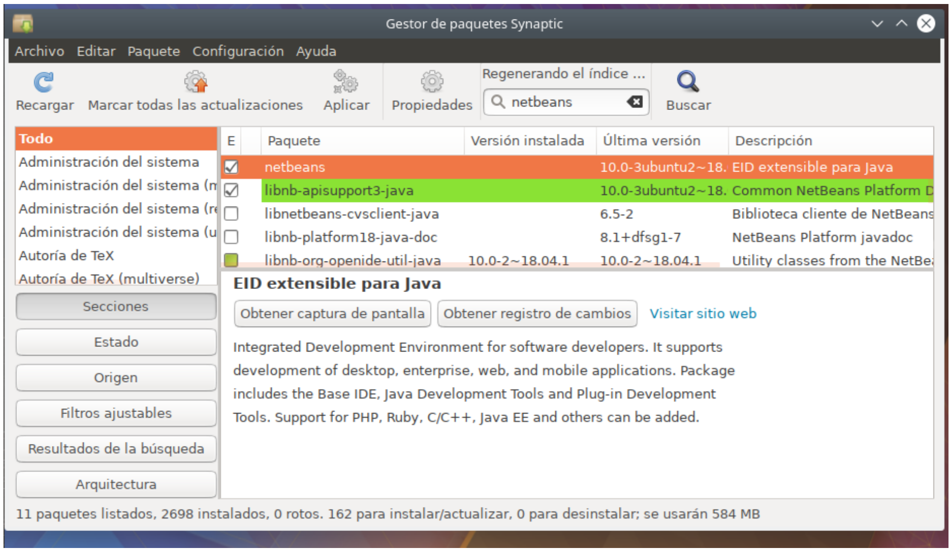


```
orion@orion-VirtualBox:~$ java --version

openjdk 11.0.11 2021-04-20
OpenJDK Runtime Environment (build 11.0.11+9-Ubuntu-0ubuntu2.18.04)
OpenJDK 64-Bit Server VM (build 11.0.11+9-Ubuntu-0ubuntu2.18.04, mixed mode, sharing)
```

This way you can confirm that java has been installed.

NetBeans

To program the previously installed programming language we need a development application, in this case it chose to use NetBeans, which can be downloaded from Synaptic Package Manager.


Gestor de paquetes Synaptic
Archivo Editar Paquete Configuración Ayuda
Recargar
Marcar todas las actualizaciones
Aplicar
Propiedades
Regenerando el índice ...
netbeans
Buscar
Todo
Administración del sistema
Administración del sistema (n
Administración del sistema (r
Administración del sistema (u
Autoría de TeX
Autoría de TeX (multiverse)
Secciones
Estado
Origen
Filtros ajustables
Resultados de la búsqueda
Arquitectura
Obtener captura de pantalla
Obtener registro de cambios
Visitar sitio web

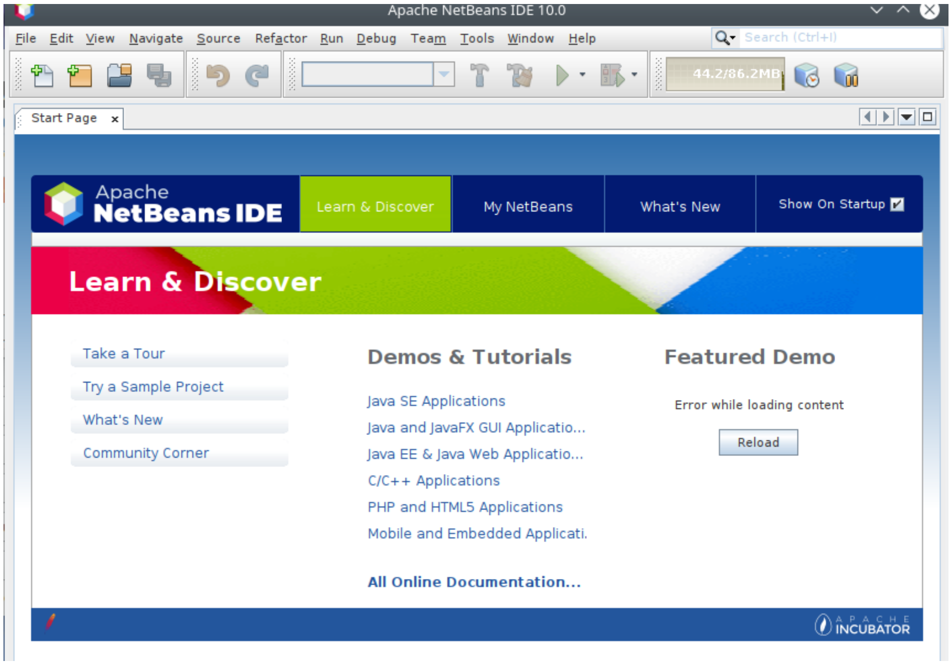
E	Paquete	Versión instalada	Última versión	Descripción
☑	netbeans		10.0-3ubuntu2~18.	EID extensible para Java
☑	libnb-apisupport3-java		10.0-3ubuntu2~18.	Common NetBeans Platform D
□	libnetbeans-cvsclient-java		6.5-2	Biblioteca cliente de NetBeans
□	libnb-platform18-java-doc		8.1+dfsg1-7	NetBeans Platform javadoc
🟩	libnb-org-openide-util-java	10.0-2~18.04.1	10.0-2~18.04.1	Utility classes from the NetBe

EID extensible para Java

Integrated Development Environment for software developers. It supports development of desktop, enterprise, web, and mobile applications. Package includes the Base IDE, Java Development Tools and Plug-in Development Tools. Support for PHP, Ruby, C/C++, Java EE and others can be added.

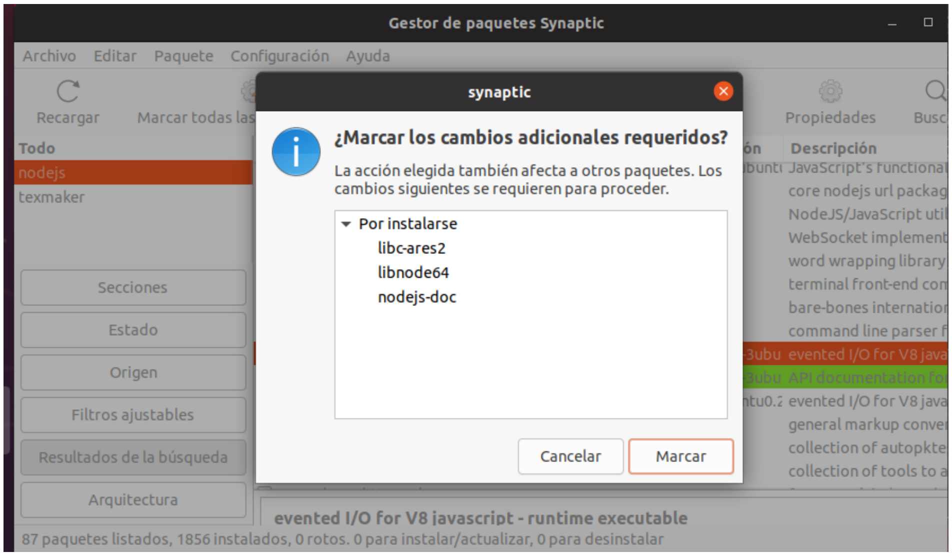
11 paquetes listados, 2698 instalados, 0 rotos. 162 para instalar/actualizar, 0 para desinstalar; se usarán 584 MB

Once installed we open it to ensure that it has been installed in an ideal way.



Node.js

It was decided to install Node.js due to the current need to have a JavaScript environment to run servers and because of its growth today. To install it, just go to Synaptic Package Manager, search for "nodejs", mark the corresponding package and click on "Apply".



¿Marcar los cambios adicionales requeridos?

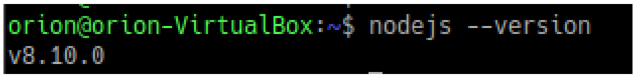
La acción elegida también afecta a otros paquetes. Los cambios siguientes se requieren para proceder.

- Por instalarse
  - libc-ares2
  - libnode64
  - nodejs-doc

evented I/O for V8 javascript - runtime executable

87 paquetes listados, 1856 instalados, 0 rotos. 0 para instalar/actualizar, 0 para desinstalar

Once this is done, we must make sure that it has been installed properly, for this the following line will be executed.

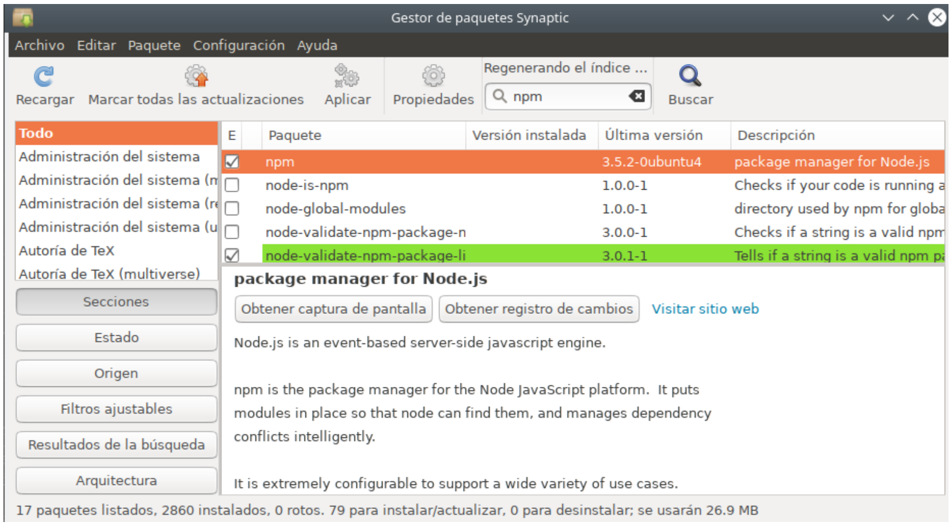


```
orion@orion-VirtualBox:~$ nodejs --version
v8.10.0
```

npm

Node Package Manager (npm), is the default package management system for Node.js, therefore it is important to have it available if Node.js was installed.

Here it will be done the same as in the previous installations, we look for npm in the search engine of our package manager, we mark the pertinent package and we press "Apply".


Gestor de paquetes Synaptic
Archivo Editar Paquete Configuración Ayuda
Recargar
Marcar todas las actualizaciones
Aplicar
Propiedades
Regenerando el índice ...
npm
Buscar
Todo
Administración del sistema
Administración del sistema (m
Administración del sistema (re
Administración del sistema (u
Autoría de TeX
Autoría de TeX (multiverse)
Secciones
Estado
Origen
Filtros ajustables
Resultados de la búsqueda
Arquitectura
Obtener captura de pantalla
Obtener registro de cambios
Visitar sitio web

E	Paquete	Versión instalada	Última versión	Descripción
☑	npm		3.5.2-0ubuntu4	package manager for Node.js
☐	node-is-npm		1.0.0-1	Checks if your code is running a
☐	node-global-modules		1.0.0-1	directory used by npm for globa
☐	node-validate-npm-package-n		3.0.0-1	Checks if a string is a valid npm
☑	node-validate-npm-package-li		3.0.1-1	Tells if a string is a valid npm pa

package manager for Node.js

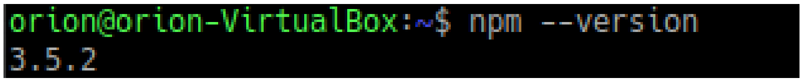
Node.js is an event-based server-side javascript engine.

npm is the package manager for the Node JavaScript platform. It puts modules in place so that node can find them, and manages dependency conflicts intelligently.

It is extremely configurable to support a wide variety of use cases.

17 paquetes listados, 2860 instalados, 0 rotos. 79 para instalar/actualizar, 0 para desinstalar; se usarán 26.9 MB

Once installed we open the terminal and execute its version to check that it has been done correctly.

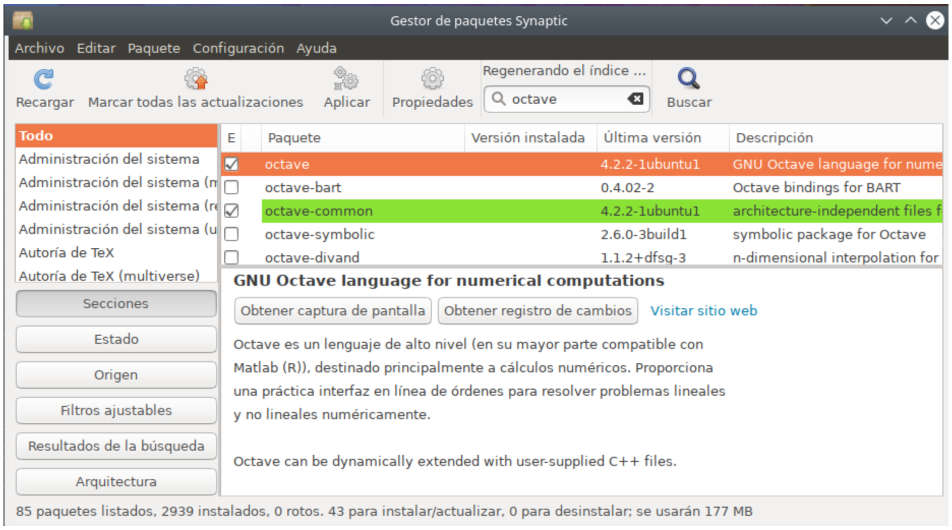


```
orion@orion-VirtualBox:~$ npm --version
3.5.2
```

GNU Octave

GNU Octave is a free program useful to perform various numerical calculations easily and quickly, in addition to the fact that various types of projects can be developed within this program. It is an alternative to Matlab, which requires less space consumption and whose function is similar.

Its installation can be done from our package manager, looking for its name, selecting the packages and dependencies, and clicking the "Apply" button.


Gestor de paquetes Synaptic
Archivo Editar Paquete Configuración Ayuda
Recargar
Marcar todas las actualizaciones
Aplicar
Propiedades
Regenerando el índice ...
octave
Buscar
Todo
Administración del sistema
Administración del sistema (m
Administración del sistema (r
Administración del sistema (u
Autoría de TeX
Autoría de TeX (multiverse)
Secciones
Estado
Origen
Filtros ajustables
Resultados de la búsqueda
Arquitectura
Obtener captura de pantalla
Obtener registro de cambios
Visitar sitio web

E	Paquete	Versión instalada	Última versión	Descripción
☑	octave		4.2.2-1ubuntu1	GNU Octave language for nume
□	octave-bart		0.4.02-2	Octave bindings for BART
☑	octave-common		4.2.2-1ubuntu1	architecture-independent files f
□	octave-symbolic		2.6.0-3build1	symbolic package for Octave
□	octave-divand		1.1.2+dfsg-3	n-dimensional interpolation for

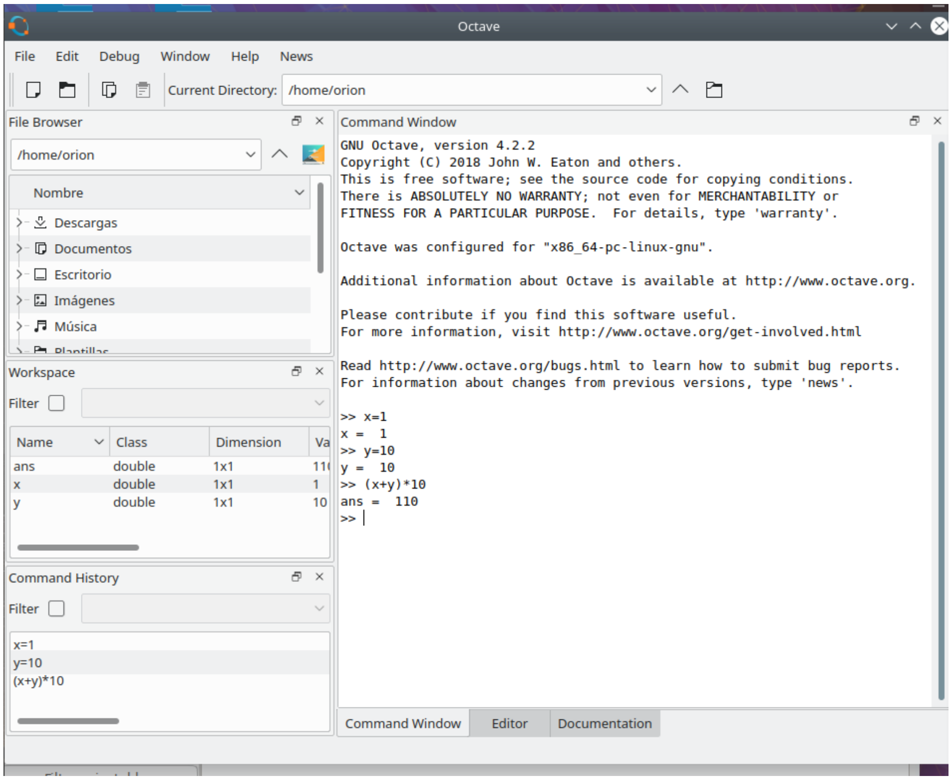
GNU Octave language for numerical computations

Octave es un lenguaje de alto nivel (en su mayor parte compatible con Matlab (R)), destinado principalmente a cálculos numéricos. Proporciona una práctica interfaz en línea de órdenes para resolver problemas lineales y no lineales numéricamente.

Octave can be dynamically extended with user-supplied C++ files.

85 paquetes listados, 2939 instalados, 0 rotos. 43 para instalar/actualizar, 0 para desinstalar; se usarán 177 MB

Once installed, we can have access to its operation and its documentation, where the user can learn all the functions that said program has.



Name	Class	Dimension	Va
ans	double	1x1	11(
x	double	1x1	1
y	double	1x1	10

```
x=1
y=10
(x+y)*10
```

```
GNU Octave, version 4.2.2
Copyright (C) 2018 John W. Eaton and others.
This is free software; see the source code for copying conditions.
There is ABSOLUTELY NO WARRANTY; not even for MERCHANTABILITY or
FITNESS FOR A PARTICULAR PURPOSE.  For details, type 'warranty'.

Octave was configured for "x86_64-pc-linux-gnu".

Additional information about Octave is available at http://www.octave.org.

Please contribute if you find this software useful.
For more information, visit http://www.octave.org/get-involved.html

Read http://www.octave.org/bugs.html to learn how to submit bug reports.
For information about changes from previous versions, type 'news'.

>> x=1
x =  1
>> y=10
y =  10
>> (x+y)*10
ans =  110
>> |
```

LaTeX

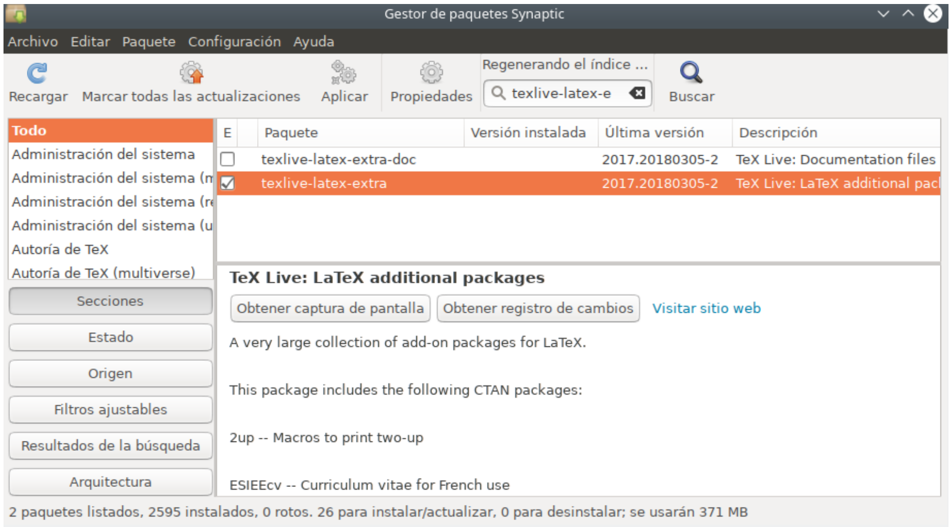
With this program, a wide variety of documents can be prepared in a formal and professional way, which is very useful for those university students who are preparing their thesis or simply developing professional research that requires an optimal format.

The search for this package in the file manager is different, since there are up to five versions of it that we can download:

- texlive-base (160 MB).
- texlive-latex (203 MB).
- texlive (269 MB).
- texlive-latex-extra (464 MB).
- texlive-full (5903 MB).

Any of these versions can be found within Synaptic, but for storage reasons and considering that this distribution is dedicated to students between the first and fourth semester, it was decided to choose the fourth available option, which is "texlive-latex-extra", which has everything you need to work with LaTeX, but without exaggerating and downloading unnecessary packages as it is in the "texlive-full" version.

We head over to Synaptic and download it.


Gestor de paquetes Synaptic
Archivo Editar Paquete Configuración Ayuda
Recargar
Marcar todas las actualizaciones
Aplicar
Propiedades
Regenerando el índice ...
texlive-latex-e
Buscar
Todo
Administración del sistema
Administración del sistema (m
Administración del sistema (re
Administración del sistema (u
Autoría de TeX
Autoría de TeX (multiverse)
Secciones
Estado
Origen
Filtros ajustables
Resultados de la búsqueda
Arquitectura
Obtener captura de pantalla
Obtener registro de cambios
Visitar sitio web

E	Paquete	Versión instalada	Última versión	Descripción
□	texlive-latex-extra-doc		2017.20180305-2	TeX Live: Documentation files
☑	texlive-latex-extra		2017.20180305-2	TeX Live: LaTeX additional pacl

TeX Live: LaTeX additional packages

A very large collection of add-on packages for LaTeX.

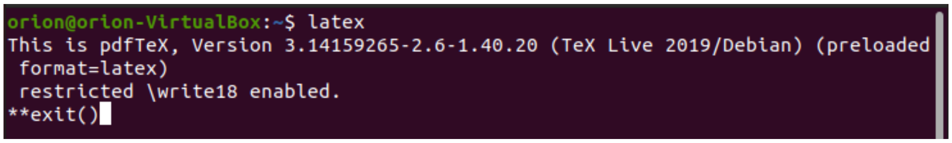
This package includes the following CTAN packages:

2up -- Macros to print two-up

ESIEEcv -- Curriculum vitae for French use

2 paquetes listados, 2595 instalados, 0 rotos. 26 para instalar/actualizar, 0 para desinstalar; se usarán 371 MB

Once everything is downloaded, we can type the following and thereby verify if it has been installed.



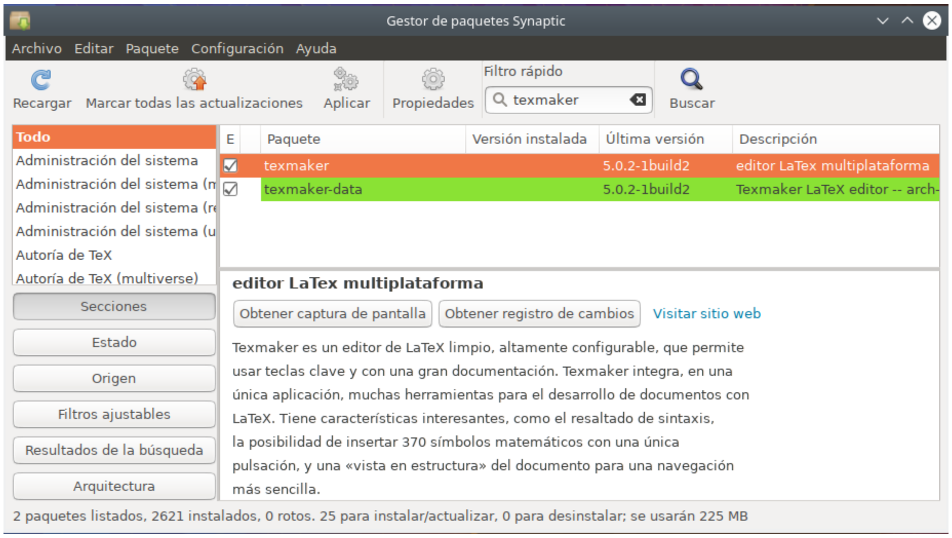
```
orion@orion-VirtualBox:~$ latex
This is pdfTeX, Version 3.14159265-2.6-1.40.20 (TeX Live 2019/Debian) (preloaded
 format=latex)
 restricted \write18 enabled.
**exit()
```

Or simply do the same as with the previous packages exposed above and execute the command: **"latex --version"**.

Texmaker

Once LaTeX is installed, we need to have a LaTeX editor to be able to work with it. For this, the multiplatform editor "Texmaker" was installed, which has various useful functions to carry out our work, such as spell checking, code auto-completion and hundreds of mathematical symbols that will be useful to us.

Its installation, in the same way, can be done from Synaptic for greater comfort.


Gestor de paquetes Synaptic
Archivo Editar Paquete Configuración Ayuda
Recargar
Marcar todas las actualizaciones
Aplicar
Propiedades
Filtro rápido
texmaker
Buscar
Todo
Administración del sistema
Administración del sistema (m
Administración del sistema (re
Administración del sistema (u
Autoría de TeX
Autoría de TeX (multiverse)
Secciones
Estado
Origen
Filtros ajustables
Resultados de la búsqueda
Arquitectura
Obtener captura de pantalla
Obtener registro de cambios
Visitar sitio web

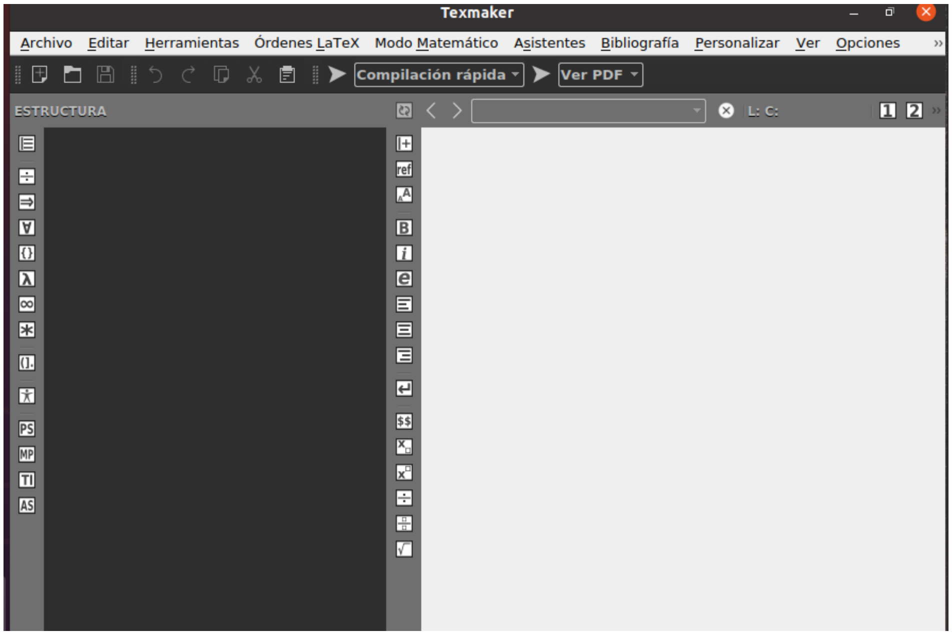
E	Paquete	Versión instalada	Última versión	Descripción
☑	texmaker		5.0.2-1build2	editor LaTex multiplataforma
☑	texmaker-data		5.0.2-1build2	Texmaker LaTeX editor -- arch-

editor LaTex multiplataforma

Texmaker es un editor de LaTeX limpio, altamente configurable, que permite usar teclas clave y con una gran documentación. Texmaker integra, en una única aplicación, muchas herramientas para el desarrollo de documentos con LaTeX. Tiene características interesantes, como el resaltado de sintaxis, la posibilidad de insertar 370 símbolos matemáticos con una única pulsación, y una «vista en estructura» del documento para una navegación más sencilla.

2 paquetes listados, 2621 instalados, 0 rotos. 25 para instalar/actualizar, 0 para desinstalar; se usarán 225 MB

Now it only remains to open it and hope that it has been installed as it should.

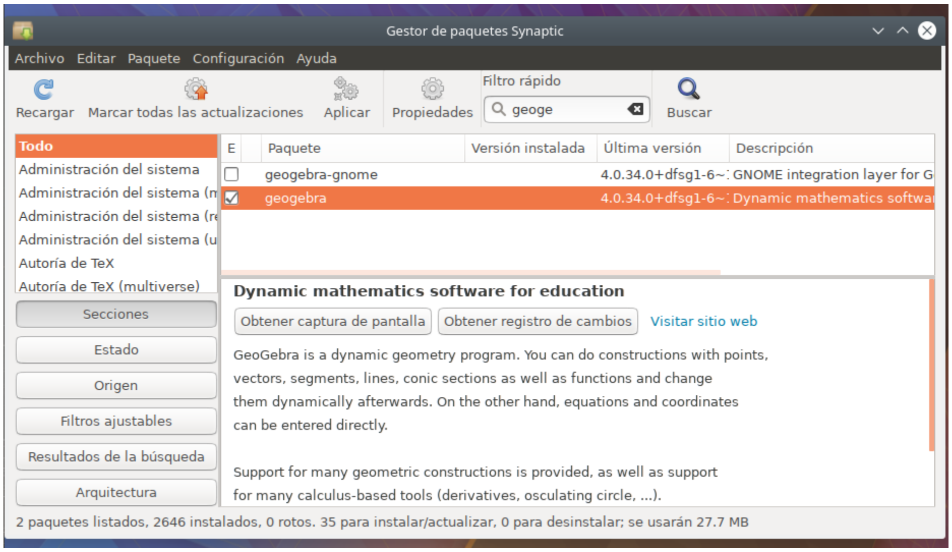

Texmaker
Archivo Editar Herramientas Órdenes LaTeX Modo Matemático Asistentes Bibliografía Personalizar Ver Opciones
Compilación rápida
Ver PDF
ESTRUCTURA
L: C:

Geogebra Classic 4

Geogebra will be the ideal tool for the first four semesters of the Artificial Intelligence Engineering career, due to the large number of subjects that require some calculation. It will allow the student to graph expressions of any mathematical nature for a better understanding of the topic that has been explained.

It is always good to be able to have software of these characteristics to visualize problems from all angles, something that is of great help when you do not yet understand some mathematical concepts.

The installation of the program is carried out from our package manager, in this case, the most recent version supported by this version of Ubuntu is Geogebra Classic 4. From the search engine it is enough to put "geogebra" and it will return the result.


Gestor de paquetes Synaptic
Archivo Editar Paquete Configuración Ayuda
Recargar
Marcar todas las actualizaciones
Aplicar
Propiedades
Filtro rápido
geoge
Buscar
Todo
Administración del sistema
Administración del sistema (n
Administración del sistema (re
Administración del sistema (u
Autoría de TeX
Autoría de TeX (multiverse)
Secciones
Estado
Origen
Filtros ajustables
Resultados de la búsqueda
Arquitectura
Obtener captura de pantalla
Obtener registro de cambios
Visitar sitio web

E	Paquete	Versión instalada	Última versión	Descripción
□	geogebra-gnome		4.0.34.0+dfsg1-6~	GNOME integration layer for G
☑	geogebra		4.0.34.0+dfsg1-6~	Dynamic mathematics softwa

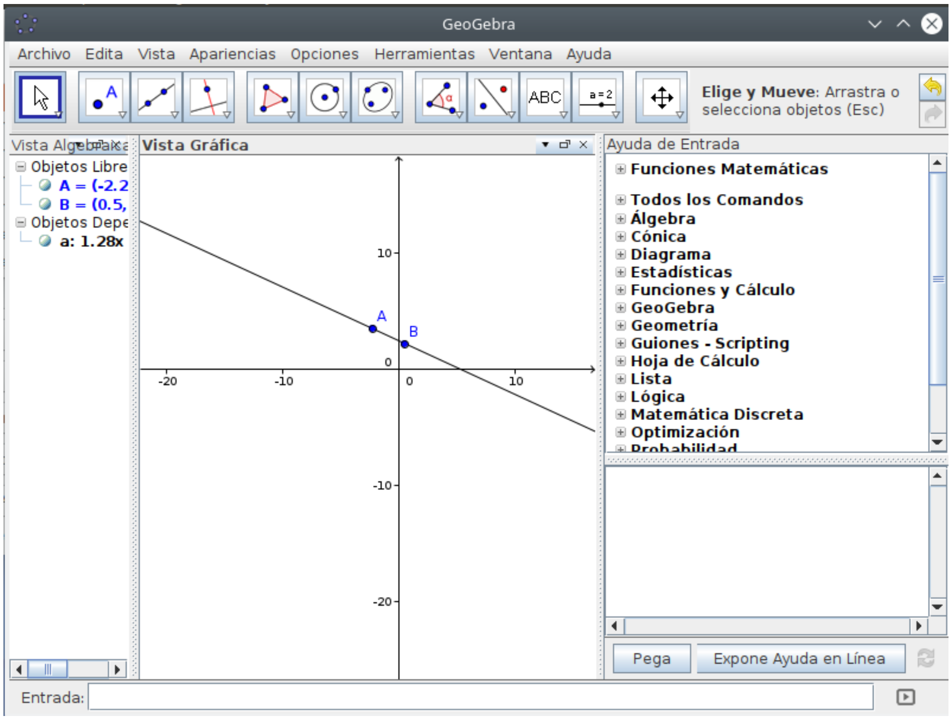
Dynamic mathematics software for education

GeoGebra is a dynamic geometry program. You can do constructions with points, vectors, segments, lines, conic sections as well as functions and change them dynamically afterwards. On the other hand, equations and coordinates can be entered directly.

Support for many geometric constructions is provided, as well as support for many calculus-based tools (derivatives, osculating circle, ...).

2 paquetes listados, 2646 instalados, 0 rotos. 35 para instalar/actualizar, 0 para desinstalar; se usarán 27.7 MB

Once installed, you can do countless things related to mathematics seen in a graphical way.



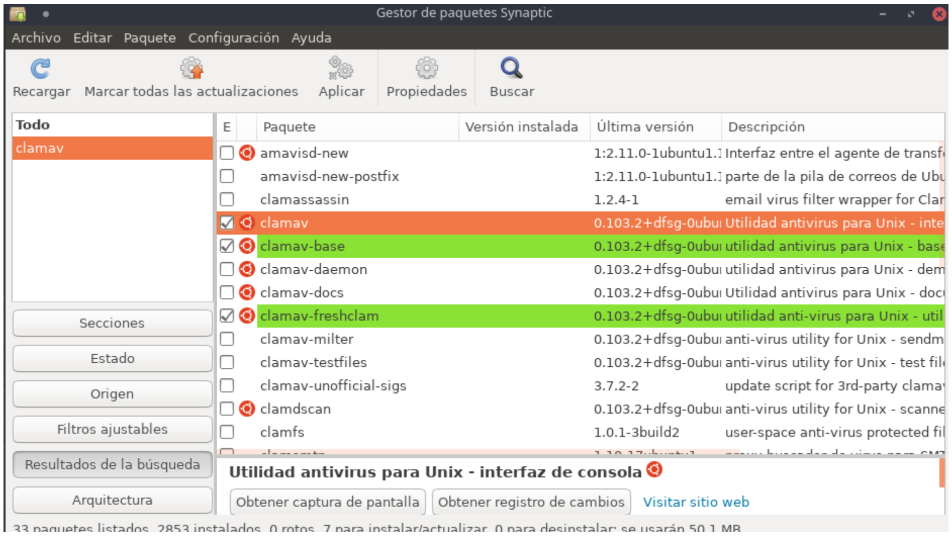
ClamAV

To finish with the programs installed in the Rast distribution, we have ClamAV, an open-source antivirus that works from the terminal. User safety is important;

therefore, it is necessary to have an antivirus that can identify and block any malware.

The installation of ClamAV was chosen because it is free and one of the most used by the Ubuntu community, in addition to the fact that its large number of users always provide information on multiple threats, all thanks to the fact that they provide a registry of scanned viruses.

The ClamAV installation can be given in the same way by Synaptic, therefore, we select it, mark it and choose the "Apply" option.



E		Paquete	Versión instalada	Última versión	Descripción
□	●	amavisd-new		1:2.11.0-1ubuntu1.1	Interfaz entre el agente de transf
□		amavisd-new-postfix		1:2.11.0-1ubuntu1.1	parte de la pila de correos de Ubu
□		clamassassin		1.2.4-1	email virus filter wrapper for Clar
☑	●	clamav		0.103.2+dfsg-0ubu	Utilidad antivirus para Unix - inte
☑	●	clamav-base		0.103.2+dfsg-0ubu	utilidad antivirus para Unix - base
□	●	clamav-daemon		0.103.2+dfsg-0ubu	utilidad antivirus para Unix - dem
□	●	clamav-docs		0.103.2+dfsg-0ubu	Utilidad antivirus para Unix - doc
☑	●	clamav-freshclam		0.103.2+dfsg-0ubu	utilidad anti-virus para Unix - util
□		clamav-milter		0.103.2+dfsg-0ubu	anti-virus utility for Unix - sendm
□		clamav-testfiles		0.103.2+dfsg-0ubu	anti-virus utility for Unix - test fil
□		clamav-unofficial-sigs		3.7.2-2	update script for 3rd-party clama
□	●	clamdscan		0.103.2+dfsg-0ubu	anti-virus utility for Unix - scanne
□		clamfs		1.0.1-3build2	user-space anti-virus protected fil

Utilidad antivirus para Unix - interfaz de consola

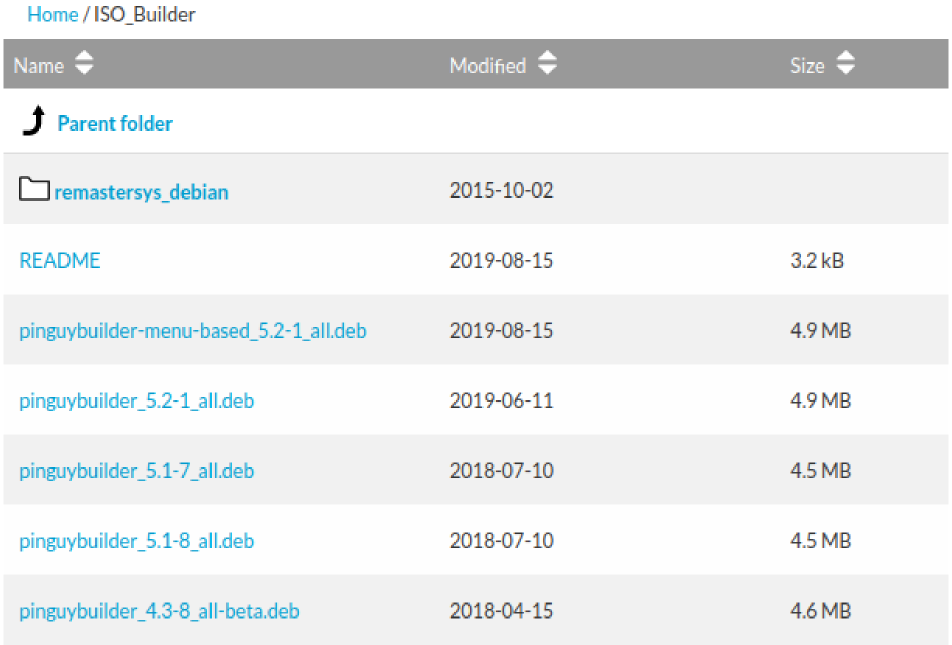
33 paquetes listados, 2853 instalados, 0 rotos, 7 para instalar/actualizar, 0 para desinstalar; se usarán 50,1 MB

Pinguy Builder

Once all the elements that Rast Distribution needed had been downloaded, we proceeded to install Pinguy Builder (a software dedicated to creating distributions). One of the reasons why it was decided to change from Ubuntu 20.04 to Ubuntu 18.04 is because of how this tool works, since in version 20.04 it is not available and makes the task of developing a distribution more complicated (there are very few options in version 20.04 and are very unreliable for making distributions).

To install it, we must first go to the official Pinguy Builder page at Sourceforge (**https://sourceforge.net/projects/pinguy-os/files/ISO_Builder/**) and download the available and functional package for our version of Ubuntu. In this case, for

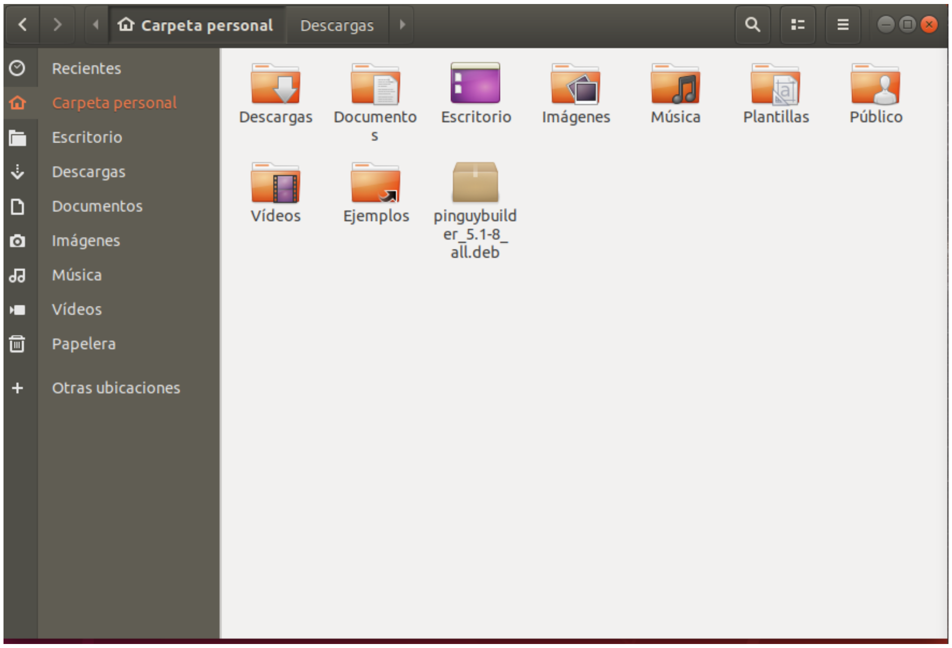
18.04, we can choose between **pinguybuilder_5.1-7_all.deb** and **pinguybuilder_5.1-8_all.deb**, we will choose the latter and download it.



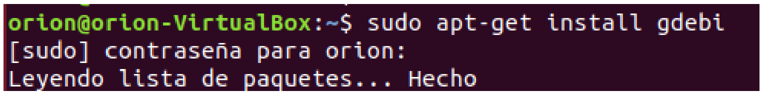
Home / ISO_Builder

Name	Modified	Size
Parent folder		
remastersys_debian	2015-10-02	
README	2019-08-15	3.2 kB
pinguybuilder-menu-based_5.2-1_all.deb	2019-08-15	4.9 MB
pinguybuilder_5.2-1_all.deb	2019-06-11	4.9 MB
pinguybuilder_5.1-7_all.deb	2018-07-10	4.5 MB
pinguybuilder_5.1-8_all.deb	2018-07-10	4.5 MB
pinguybuilder_4.3-8_all-beta.deb	2018-04-15	4.6 MB

Once this file is downloaded, we locate the folder in which it is located and relocate it to the / home folder.

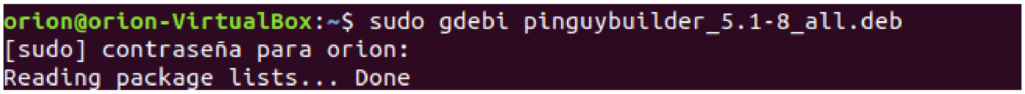


Once this is done, we can open our terminal and download the deb package manager, called "GDebi".



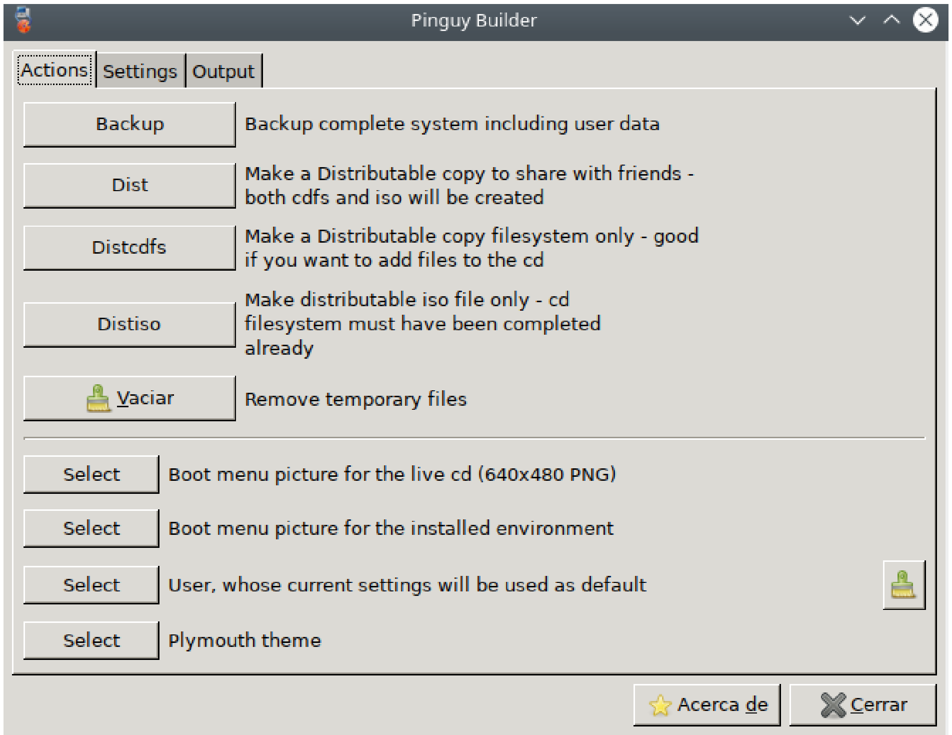
```
orion@orion-VirtualBox:~$ sudo apt-get install gdebi
[sudo] contraseña para orion:
Leyendo lista de paquetes... Hecho
```

Later, we proceed to execute the following command to permanently install Pinguy Builder.



```
orion@orion-VirtualBox:~$ sudo gdebi pinguybuilder_5.1-8_all.deb
[sudo] contraseña para orion:
Reading package lists... Done
```

Finally, we will have access to the Linux distribution creation tool, “Pinguy Builder”.



Backup complete system including user data

Make a Distributable copy to share with friends - both cdfs and iso will be created

Make a Distributable copy filesystem only - good if you want to add files to the cd

Make distributable iso file only - cd filesystem must have been completed already

Remove temporary files

Boot menu picture for the live cd (640x480 PNG)

Boot menu picture for the installed environment

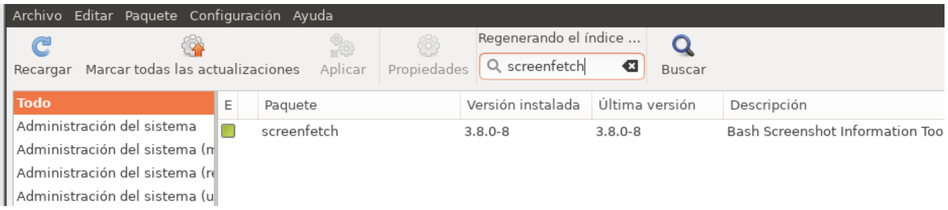
User, whose current settings will be used as default

Plymouth theme

Screenfetch

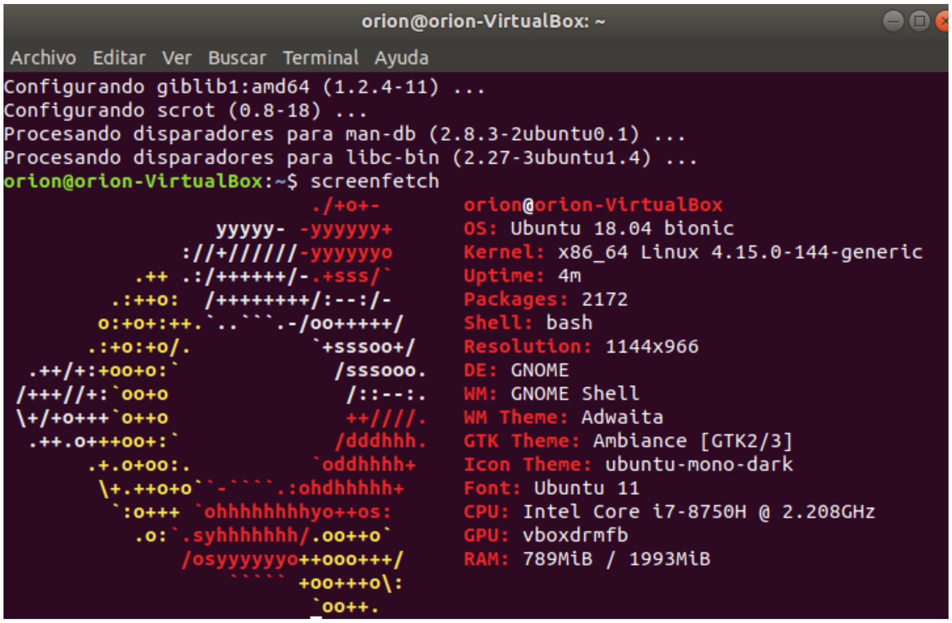
A tool that can be useful to know what our distribution contains is Screenfetch, which, when executing the **"screenfetch"** command from the terminal, will display an information panel with all the characteristics that define our distribution.

To download it, we can do it from our package manager or from a command, in this case it will be done from Synaptic Package Manager.


Archivo
Editar
Paquete
Configuración
Ayuda
Recargar
Marcar todas las actualizaciones
Aplicar
Propiedades
Regenerando el índice ...
screenfetch
Buscar
Todo
Administración del sistema
Administración del sistema (m
Administración del sistema (re
Administración del sistema (u

E	Paquete	Versión instalada	Última versión	Descripción
🟩	screenfetch	3.8.0-8	3.8.0-8	Bash Screenshot Information Too

Once it has been downloaded and installed, we can execute the previously mentioned command and the following will be shown.

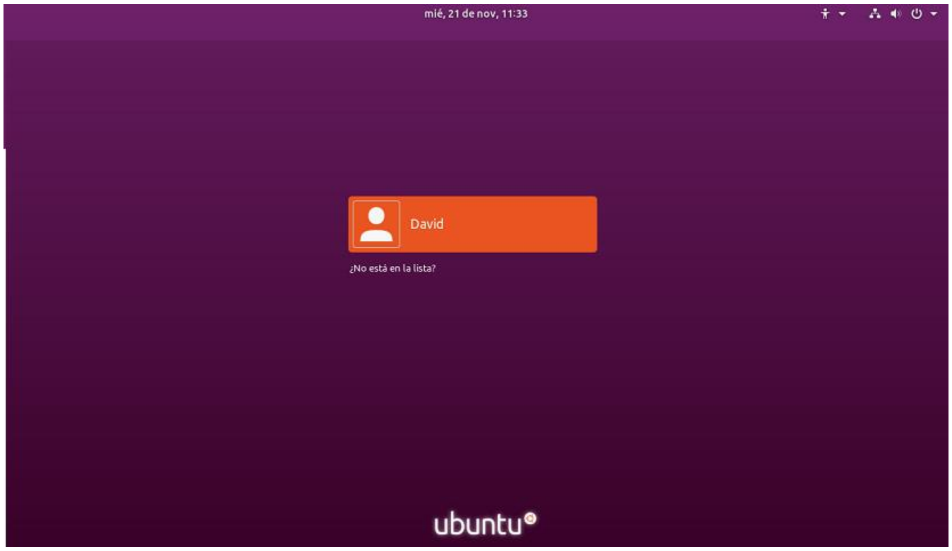


~~~
Configurando giblib1:amd64 (1.2.4-11) ...
Configurando scrot (0.8-18) ...
Procesando disparadores para man-db (2.8.3-2ubuntu0.1) ...
Procesando disparadores para libc-bin (2.27-3ubuntu1.4) ...
orion@orion-VirtualBox:~$ screenfetch
                          ./+o+-       orion@orion-VirtualBox
                  yyyyy- -yyyyyy+      OS: Ubuntu 18.04 bionic
               ://+//////-yyyyyyo      Kernel: x86_64 Linux 4.15.0-144-generic
           .++ .:/++++++/-.+sss/`      Uptime: 4m
         .:++o:  /++++++++/:--:/-      Packages: 2172
        o:+o+:++.`..```.-/oo+++++/     Shell: bash
       .:+o:+o/.          `+sssoo+/    Resolution: 1144x966
  .++/+:+oo+o:`             /sssooo.   DE: GNOME
 /+++//+:`oo+o               /::--:.   WM: GNOME Shell
 \+/+o+++`o++o               ++////.   WM Theme: Adwaita
  .++.o+++oo+:`             /dddhhh.   GTK Theme: Ambiance [GTK2/3]
       .+.o+oo:.          `oddhhhh+    Icon Theme: ubuntu-mono-dark
        \+.++o+o``-````.:ohdhhhhh+     Font: Ubuntu 11
         `:o+++ `ohhhhhhhhyo++os:      CPU: Intel Core i7-8750H @ 2.208GHz
           .o:`.syhhhhhhh/.oo++o`      GPU: vboxdrmfb
               /osyyyyyyo++ooo+++/     RAM: 789MiB / 1993MiB
                   ````` +oo+++o\:
                          `oo++.
~~~

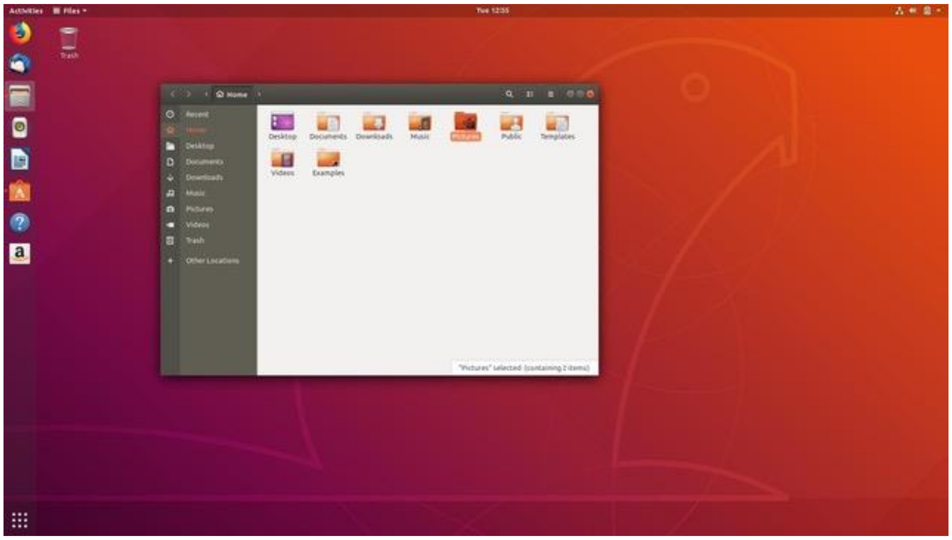
From here, we can monitor all the changes that we are making to Ubuntu 18.04 (especially issues of the Display Manager and the Desktop Environment, as well as the themes that have been installed).

Display Manager and Desktop Environment

By default, Ubuntu 18.04 brings Display Manager to gdm3 (GNOME Display Manager), which presents the user with a certain login screen when they log in. This Display Manager looks like the following on Ubuntu 18.04:



Also, Ubuntu 18.04, brings GNOME by default as Desktop Environment, which looks like this:



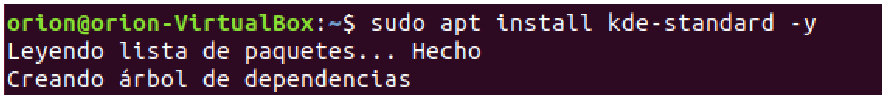
It was decided to install sddm (Simple Desktop Manager) instead of gdm3 as Display Manager, since it is simple to use, very fast, light, offers a lot of customization and a wide variety of themes. In addition to changing the GNOME Desktop for Plasma Desktop (KDE desktop) since it surpasses the functionalities of GNOME Desktop, it includes image cropping functions, visual properties of the advantages of applications, independent audio control of the devices that are connected, an excellent and advanced graphic manager configuration (perfect for customizing), desktop effects, lightness, visual cleanliness, and so on.

To incorporate them, KDE provides different facilities to be able to integrate sddm and Plasma Desktop:

- kde-plasma-desktop.
- kde-standard.
- kde-full.

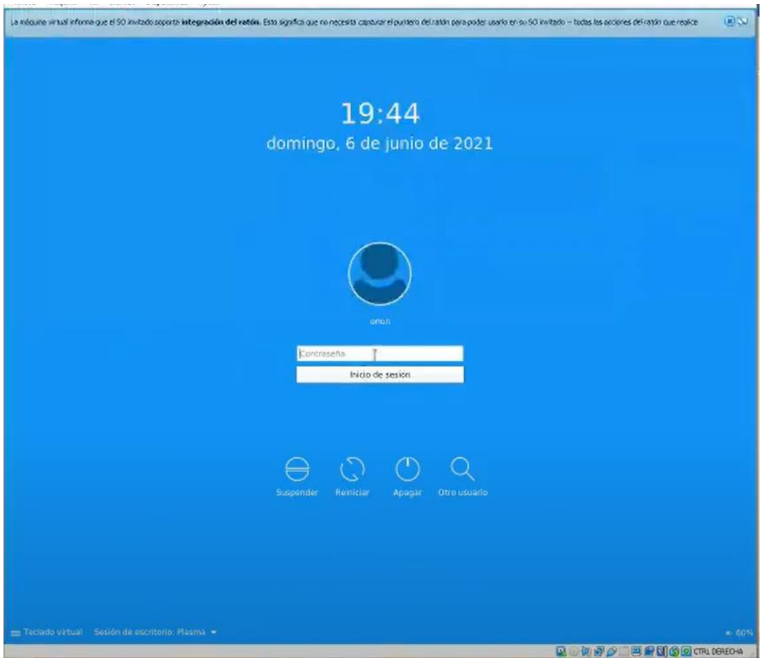
As the first option indicates, it only includes the plasma desktop, but it does not include any basic application, we cannot even use a simple terminal. The second option includes the Plasma desktop and basic tools or applications that KDE provides, and the last option includes the Plasma desktop plus all the tools that KDE has provided (all this affects the size of the file).

For reasons of limited size (for the correct creation of the Rast distribution) the second option was chosen: **"kde-standard"**, to install it we simply have to open the terminal and write the following command to start its installation instantly:



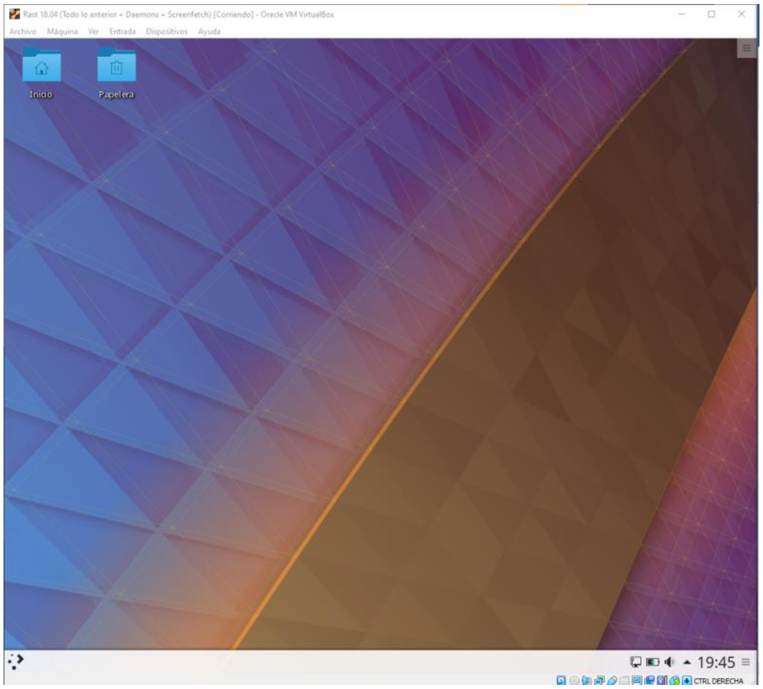
```
orion@orion-VirtualBox:~$ sudo apt install kde-standard -y
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
```

Once downloaded and installed, we only have to apply the command: **“sudo reboot”** to restart the machine, and when we log in, we will have noticed that the Display Manager has changed and that below, in the left section, it tells us that we can choose the desktop that we want (in this case it is Plasma).



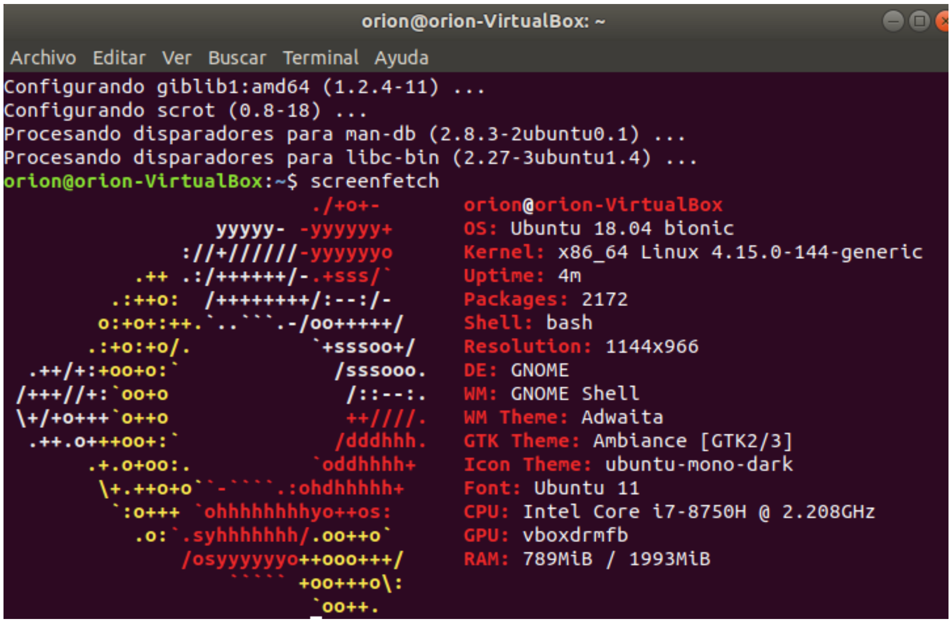
La máquina virtual informa que el SO invitado soporta **integración del ratón.** Esto significa que no necesita capturar el puntero del ratón para poder usarlo en su SO invitado -- todas las acciones del ratón que realice

We log in and we will also notice that the desktop has changed, now looking neater:



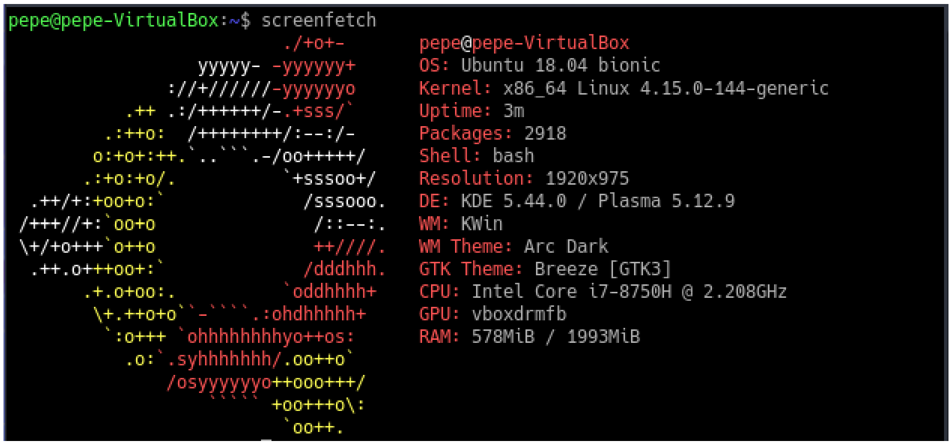
Rast 18.04 (Todo lo anterior + Daemons + Screenfetch) [Corriendo] - Oracle VM VirtualBox

If we run Screenfetch, we will see that it has passed from these default specifications (in Ubuntu 18.04 without modifying):


orion@orion-VirtualBox: ~
Archivo Editar Ver Buscar Terminal Ayuda

~~~
Configurando giblib1:amd64 (1.2.4-11) ...
Configurando scrot (0.8-18) ...
Procesando disparadores para man-db (2.8.3-2ubuntu0.1) ...
Procesando disparadores para libc-bin (2.27-3ubuntu1.4) ...
orion@orion-VirtualBox:~$ screenfetch
                          ./+o+-       orion@orion-VirtualBox
                  yyyyy- -yyyyyy+      OS: Ubuntu 18.04 bionic
               ://+//////-yyyyyyo      Kernel: x86_64 Linux 4.15.0-144-generic
           .++ .:/++++++/-.+sss/`      Uptime: 4m
         .:++o:  /++++++++/:--:/-      Packages: 2172
        o:+o+:++.`..```.-/oo+++++/     Shell: bash
       .:+o:+o/.          `+sssoo+/    Resolution: 1144x966
  .++/+:+oo+o:`             /sssooo.   DE: GNOME
 /+++//+:`oo+o               /::--:.   WM: GNOME Shell
 \+/+o+++`o++o               ++////.   WM Theme: Adwaita
  .++.o+++oo+:`             /dddhhh.   GTK Theme: Ambiance [GTK2/3]
       .+.o+oo:.          `oddhhhh+    Icon Theme: ubuntu-mono-dark
        \+.++o+o``-````.:ohdhhhhh+     Font: Ubuntu 11
         `:o+++ `ohhhhhhhhyo++os:      CPU: Intel Core i7-8750H @ 2.208GHz
           .o:`.syhhhhhhh/.oo++o`      GPU: vboxdrmfb
               /osyyyyyyo++ooo+++/     RAM: 789MiB / 1993MiB
                   ````` +oo+++o\:
                          `oo++.
~~~

To these other specifications (once Ubuntu 18.04 has been modified):



~~~
pepe@pepe-VirtualBox:~$ screenfetch
                          ./+o+-       pepe@pepe-VirtualBox
                  yyyyy- -yyyyyy+      OS: Ubuntu 18.04 bionic
               ://+//////-yyyyyyo      Kernel: x86_64 Linux 4.15.0-144-generic
           .++ .:/++++++/-.+sss/`      Uptime: 3m
         .:++o:  /++++++++/:--:/-      Packages: 2918
        o:+o+:++.`..```.-/oo+++++/     Shell: bash
       .:+o:+o/.          `+sssoo+/    Resolution: 1920x975
  .++/+:+oo+o:`             /sssooo.   DE: KDE 5.44.0 / Plasma 5.12.9
 /+++//+:`oo+o               /::--:.   WM: KWin
 \+/+o+++`o++o               ++////.   WM Theme: Arc Dark
  .++.o+++oo+:`             /dddhhh.   GTK Theme: Breeze [GTK3]
       .+.o+oo:.          `oddhhhh+    CPU: Intel Core i7-8750H @ 2.208GHz
        \+.++o+o``-````.:ohdhhhhh+     GPU: vboxdrmfb
         `:o+++ `ohhhhhhhhyo++os:      RAM: 578MiB / 1993MiB
           .o:`.syhhhhhhh/.oo++o`
               /osyyyyyyo++ooo+++/
                   ````` +oo+++o\:
                          `oo++.
~~~

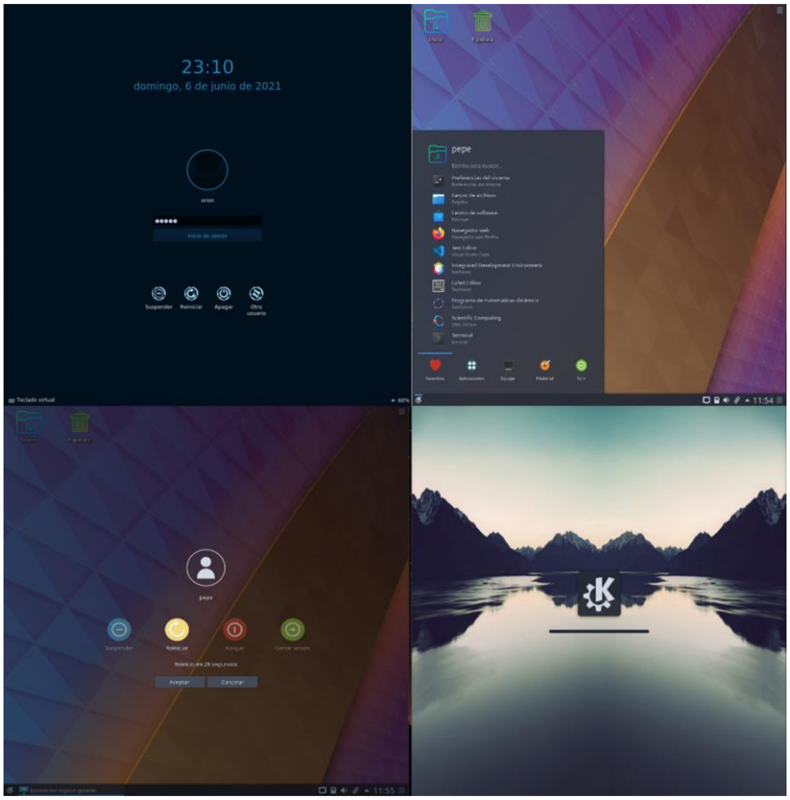
As you can see, in the DE (Desktop Environment) part, it has changed from GNOME to KDE Plasma; in WM (Window Manager), it has changed from GNOME Shell to KWin; in addition, the themes have changed from the default Ubuntu 18.04 to those of the KDE Plasma (in this case they are modified, because a modification has been made to the Themes).

Based on this, we can make sure that the changes have been applied correctly, and that the Display Manager and Desktop Environment have been changed.

Once we have the Plasma Desktop, we can freely modify the themes from the **"System Preferences"** section. Here, we will download the themes that we like the most and modify the visual environment to our liking. In this case, the following modifications were made:

- The general theme of the graphical environment was changed.
- Appearance of the sddm boot manager has been changed.
- The loading screen at the beginning has been changed for another design and with new animations.
- The cursor was changed.
- A new design of more striking and modern icons was put in place.
- The design of the windows was modified.
- The colors were changed.
- Aspects of desktop behavior were touched.

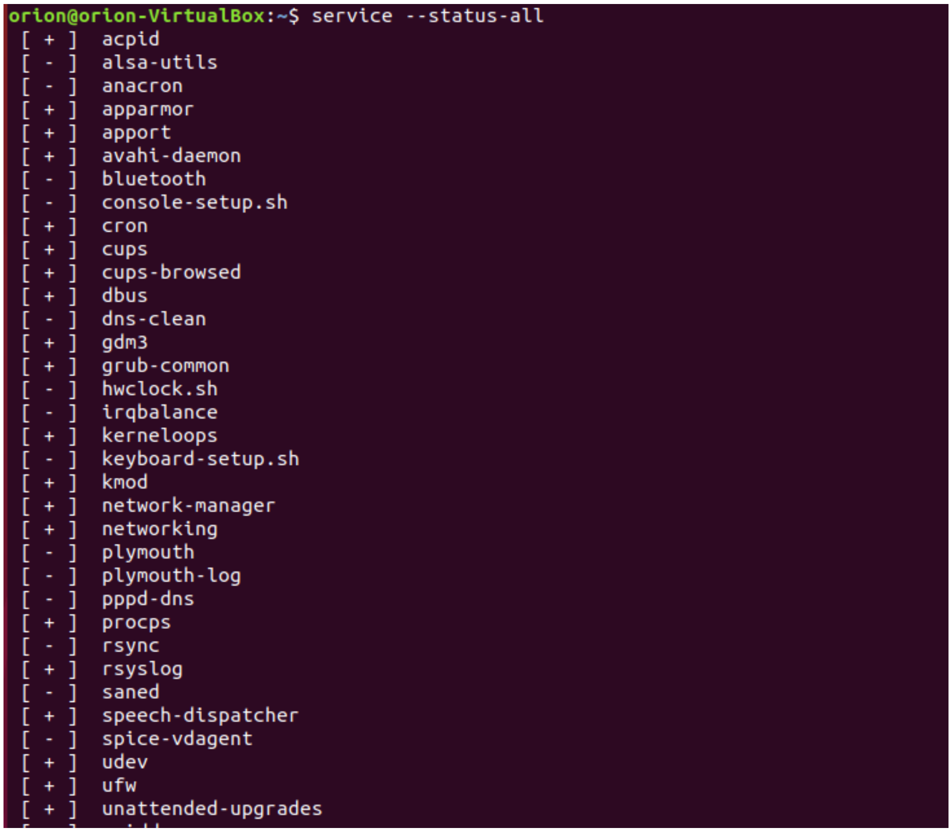
All of these changes made the Rast Distribution graphical environment look like the following this custom:



Daemons

The members of this team do not have the necessary knowledge to be able to create services, but what we were able to carry out is to manage them and disable those services that are useless (at least for Rast Distribution).

First, it was investigated which services are in operation and which of them are useless. To know which services are present we execute the following command:

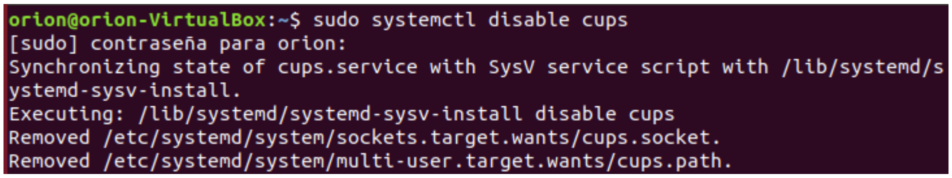


```
orion@orion-VirtualBox:~$ service --status-all
 [ + ]  acpid
 [ - ]  alsa-utils
 [ - ]  anacron
 [ + ]  apparmor
 [ + ]  apport
 [ + ]  avahi-daemon
 [ - ]  bluetooth
 [ - ]  console-setup.sh
 [ + ]  cron
 [ + ]  cups
 [ + ]  cups-browsed
 [ + ]  dbus
 [ - ]  dns-clean
 [ + ]  gdm3
 [ + ]  grub-common
 [ - ]  hwclock.sh
 [ - ]  irqbalance
 [ + ]  kerneloops
 [ - ]  keyboard-setup.sh
 [ + ]  kmod
 [ + ]  network-manager
 [ + ]  networking
 [ - ]  plymouth
 [ - ]  plymouth-log
 [ - ]  pppd-dns
 [ + ]  procps
 [ - ]  rsync
 [ + ]  rsyslog
 [ - ]  saned
 [ + ]  speech-dispatcher
 [ - ]  spice-vdagent
 [ + ]  udev
 [ + ]  ufw
 [ + ]  unattended-upgrades
```

It will not display the names of the services that our operating system has. In this case, those that we consider to be useless were listed, such as:

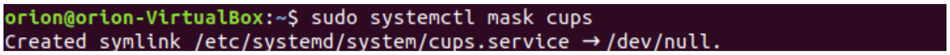
- Cups and Cups-Browsed (services dedicated to managing printers).
- Bluetooth.
- Services dedicated to the operation of touch screens.
- ColorCorrect geolocation updater.

Once identified, just execute the following command to disable them when the computer starts up, in this case the “Cups” service was used as an example, but this must be done with all of them.



```
orion@orion-VirtualBox:~$ sudo systemctl disable cups
[sudo] contraseña para orion:
Synchronizing state of cups.service with SysV service script with /lib/systemd/s
ystemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install disable cups
Removed /etc/systemd/system/sockets.target.wants/cups.socket.
Removed /etc/systemd/system/multi-user.target.wants/cups.path.
```

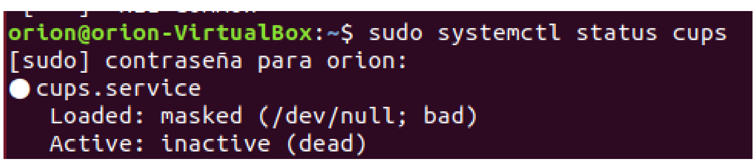
Systemctl is a system administrator that helps us control services, therefore it is used. Now, once this is done, it is not synonymous with the fact that it can no longer be activated, it can be activated after the computer has started (manually or automatically), to avoid this we simply execute the following command.



```
orion@orion-VirtualBox:~$ sudo systemctl mask cups
Created symlink /etc/systemd/system/cups.service → /dev/null.
```

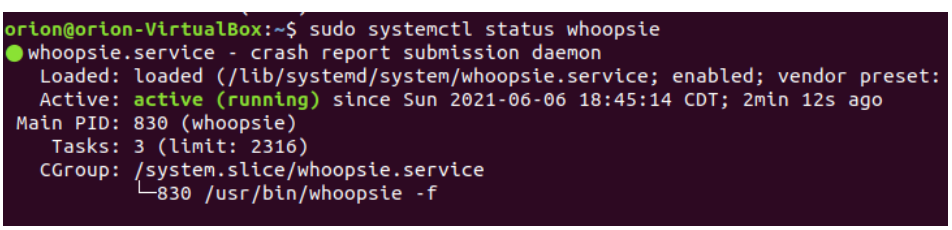
With this command the service is masked and the user is prevented from activating it, both manually and automatically. If the user wants to use it, he must first unmask the service and then activate it again.

To verify that this has worked, we turn off the computer and turn it on again and execute this other command.



```
orion@orion-VirtualBox:~$ sudo systemctl status cups
[sudo] contraseña para orion:
○ cups.service
   Loaded: masked (/dev/null; bad)
   Active: inactive (dead)
```

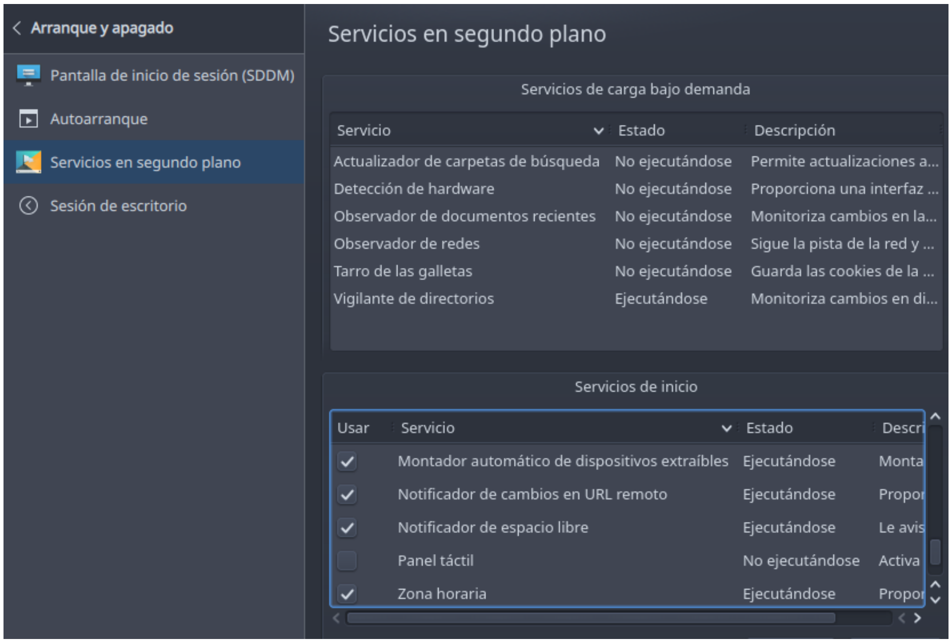
What it will do is show the status of that service, in this case it exposes that the service is inactive (dead). We can do the same with a service that is active, to verify that there is no error, in this case we will use the whoopsie service (service responsible for reporting system crash) and execute the same command.



```
orion@orion-VirtualBox:~$ sudo systemctl status whoopsie
● whoopsie.service - crash report submission daemon
   Loaded: loaded (/lib/systemd/system/whoopsie.service; enabled; vendor preset:
   Active: active (running) since Sun 2021-06-06 18:45:14 CDT; 2min 12s ago
 Main PID: 830 (whoopsie)
    Tasks: 3 (limit: 2316)
   CGroup: /system.slice/whoopsie.service
           └─830 /usr/bin/whoopsie -f
```

As you can see, in this case it mentions that the service is active (running). With this we confirm that we have killed those unnecessary services.

Apart from this, we can also go to "System Preferences" and manage those services that we do not want, from here we can deactivate the touch panel function and the geolocation updater, since for a programmer it is unnecessary.


Arranque y apagado
Pantalla de inicio de sesión (SDDM)
Autoarranque
Servicios en segundo plano
Sesión de escritorio

Servicios en segundo plano

Servicios de carga bajo demanda

Servicio	Estado	Descripción
Actualizador de carpetas de búsqueda	No ejecutándose	Permite actualizaciones a...
Detección de hardware	No ejecutándose	Proporciona una interfaz ...
Observador de documentos recientes	No ejecutándose	Monitoriza cambios en la...
Observador de redes	No ejecutándose	Sigue la pista de la red y ...
Tarro de las galletas	No ejecutándose	Guarda las cookies de la ...
Vigilante de directorios	Ejecutándose	Monitoriza cambios en di...

Servicios de inicio

Usar	Servicio	Estado	Descri
☑	Montador automático de dispositivos extraíbles	Ejecutándose	Monta
☑	Notificador de cambios en URL remoto	Ejecutándose	Propor
☑	Notificador de espacio libre	Ejecutándose	Le avis
□	Panel táctil	No ejecutándose	Activa
☑	Zona horaria	Ejecutándose	Propor

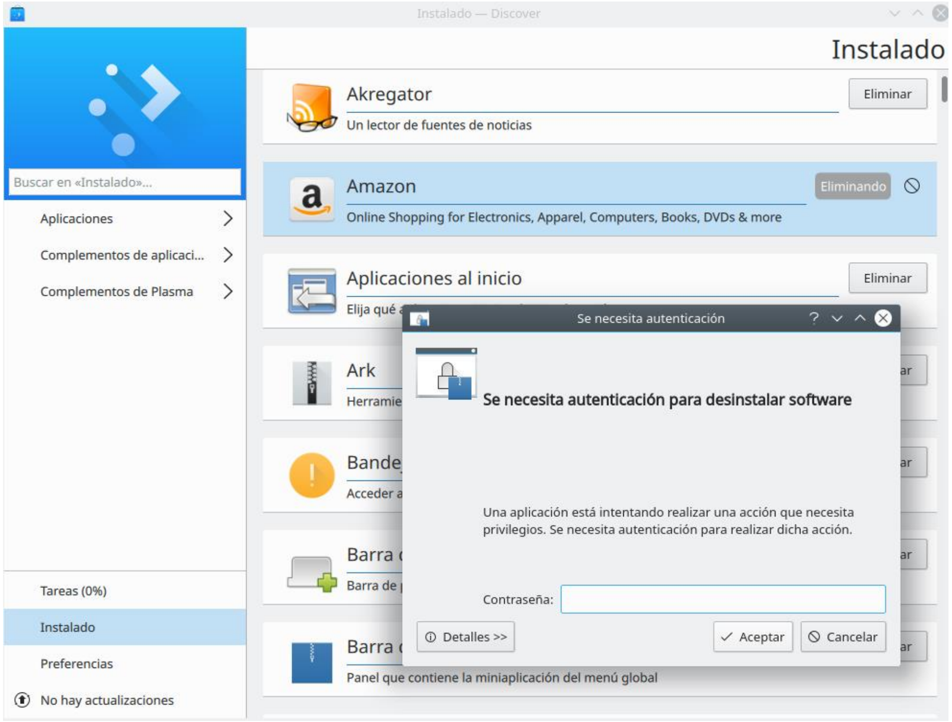
Aspects removed

Ubuntu 18.04 and kde-standard contain too many unnecessary applications that only take up memory space, so it is important to eliminate them and only keep those that are useful for the Rast Distribution theme. Those applications that were considered unnecessary were the following:

- Amazon.
- Calendar (Gnome).
- Cheese (camera).
- Dictionary.
- Thunderbird (email).
- Print Settings.

- Sieve editor.
- GNOME Power Statistics.
- GNOME Mahjongg.
- GNOME Mines.
- GNOME Sudoku.
- Image of the day.
- Simple Scan.
- Solitaire Aislerio.
- Comic Strip.

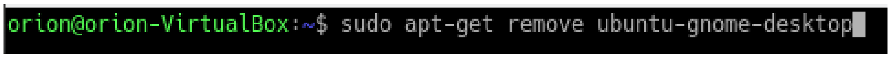
For its elimination it is enough to go to **"Software Center"**, which KDE provides us, and from there uninstall everything we want in a fast and simple way, in addition, along with its elimination, the dependencies or related packages will go away, something that makes things easier.



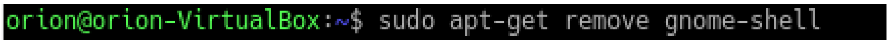
Se necesita autenticación para desinstalar software

Una aplicación está intentando realizar una acción que necesita privilegios. Se necesita autenticación para realizar dicha acción.

Apart from these applications, we no longer need GNOME, for this we will uninstall it with the following commands from the terminal.



```
orion@orion-VirtualBox:~$ sudo apt-get remove ubuntu-gnome-desktop
```

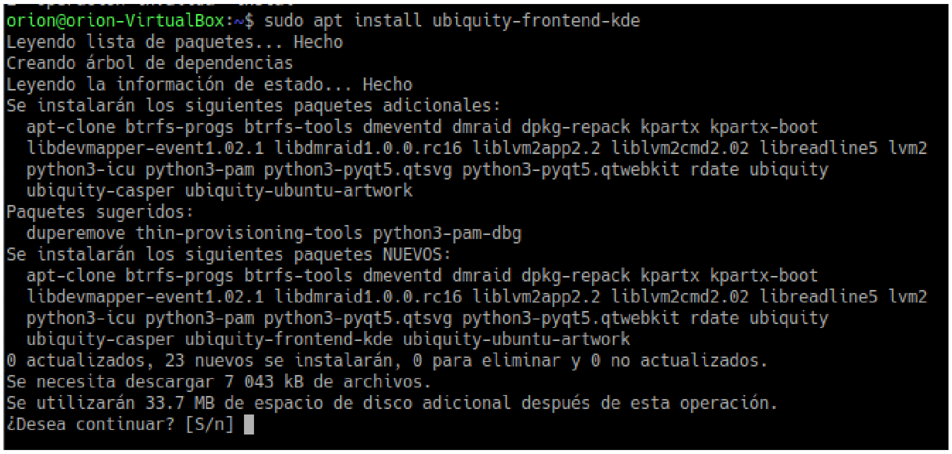


```
orion@orion-VirtualBox:~$ sudo apt-get remove gnome-shell
```

With this we will notice that when we log in, it will no longer ask us to choose between Plasma Desktop and the other default GNOME desktops, from now on, we will have Plasma Desktop as the default Desktop Enviroment.

Creation of the Rast Distribution from Pinguy Builder

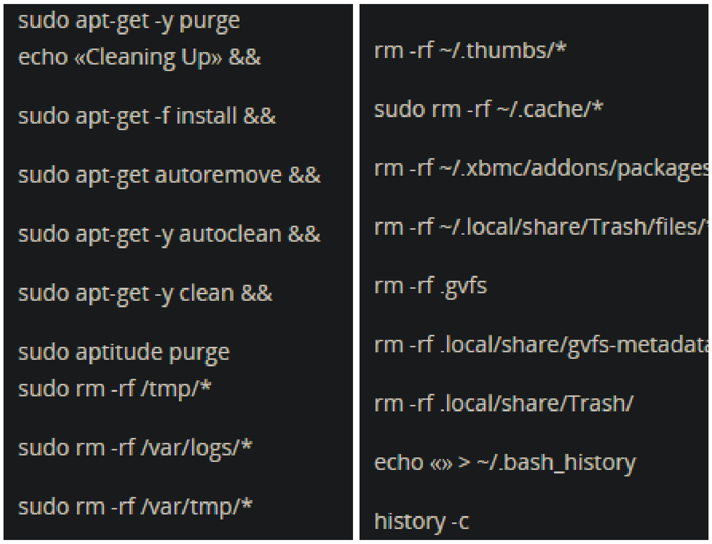
To create Rast Distribution, first, we must download a user interface frontend that is compatible with KDE, for this, KDE itself provides us with a KDE-based installer, which is **“ubiquity-frontend-kde”**. Simply download it and Pinguy Builder itself will take care of detecting it and putting it for the Live CD installer.



```
orion@orion-VirtualBox:~$ sudo apt install ubiquity-frontend-kde
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
Se instalarán los siguientes paquetes adicionales:
  apt-clone btrfs-progs btrfs-tools dmeventd dmraid dpkg-repack kpartx kpartx-boot
  libdevmapper-event1.02.1 libdmraid1.0.0.rc16 liblvm2app2.2 liblvm2cmd2.02 libreadline5 lvm2
  python3-icu python3-pam python3-pyqt5.qtsvg python3-pyqt5.qtwebkit rdate ubiquity
  ubiquity-casper ubiquity-ubuntu-artwork
Paquetes sugeridos:
  duperemove thin-provisioning-tools python3-pam-dbg
Se instalarán los siguientes paquetes NUEVOS:
  apt-clone btrfs-progs btrfs-tools dmeventd dmraid dpkg-repack kpartx kpartx-boot
  libdevmapper-event1.02.1 libdmraid1.0.0.rc16 liblvm2app2.2 liblvm2cmd2.02 libreadline5 lvm2
  python3-icu python3-pam python3-pyqt5.qtsvg python3-pyqt5.qtwebkit rdate ubiquity
  ubiquity-casper ubiquity-frontend-kde ubiquity-ubuntu-artwork
0 actualizados, 23 nuevos se instalarán, 0 para eliminar y 0 no actualizados.
Se necesita descargar 7 043 kB de archivos.
Se utilizarán 33.7 MB de espacio de disco adicional después de esta operación.
¿Desea continuar? [S/n]
```

You can also choose to download some "slides" that are presented during the installation, but in this case, they will not be put to avoid conflicts and leave it cleaner.

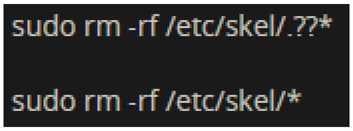
After this we must make sure to erase all the cache and any traces of our work so that the future user does not find files that should not be there. For this we apply the following list of commands to empty our cache.



```
sudo apt-get -y purge
echo «Cleaning Up» &&

sudo apt-get -f install &&

sudo apt-get autoremove &&

sudo apt-get -y autoclean &&

sudo apt-get -y clean &&

sudo aptitude purge
sudo rm -rf /tmp/*

sudo rm -rf /var/logs/*

sudo rm -rf /var/tmp/*
```

```
rm -rf ~/.thumbs/*

sudo rm -rf ~/.cache/*

rm -rf ~/.xbmc/addons/packages

rm -rf ~/.local/share/Trash/files/

rm -rf .gvfs

rm -rf .local/share/gvfs-metadata

rm -rf .local/share/Trash/

echo «» > ~/.bash_history

history -c
```

Once we have erased trace of our work, we must pass some folders and files that remain hidden in **/home** to the **/etc/skel** folder (a folder that, depending on what we put in it, will provide each user with a base to work with). But before that, we must delete all the elements that are in the **/etc/skel** folder.

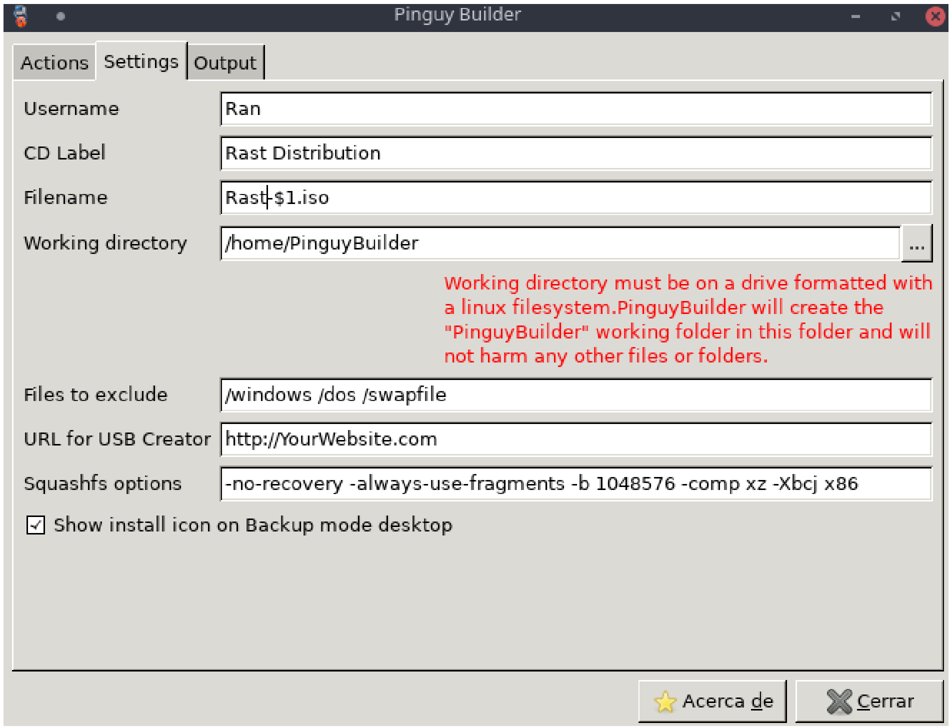


```
sudo rm -rf /etc/skel/.??*

sudo rm -rf /etc/skel/*
```

Now, we can move the relevant files and folders to **/etc/skel** with the following command: **"sudo cp -r /home/usu/NameOfFolderOrHiddenFile /etc/skel"**. The folders and files moved were as follows:

- **.config** (saves user configuration).
- **.local** (directories).
- **.kde** (contains all changes made to the graphical environment).
- **.profile** (contains commands that the system executes when logging in).
- **.bash** (it is a script file that is executed when the user logs in. It contains a series of settings for the terminal session).
- **.bash_logout** (it is the file read by the Bash when we exit the system).

After these movements we open Pinguy Builder and modify the “Settings” section with the information that one wants to provide. In this case the login user before installing Rast will be called "Ran" and the rest is related to "Rast Distribution".



Username: Ran

CD Label: Rast Distribution

Filename: Rast-$1.iso

Working directory: /home/PinguyBuilder

Working directory must be on a drive formatted with a linux filesystem.PinguyBuilder will create the "PinguyBuilder" working folder in this folder and will not harm any other files or folders.

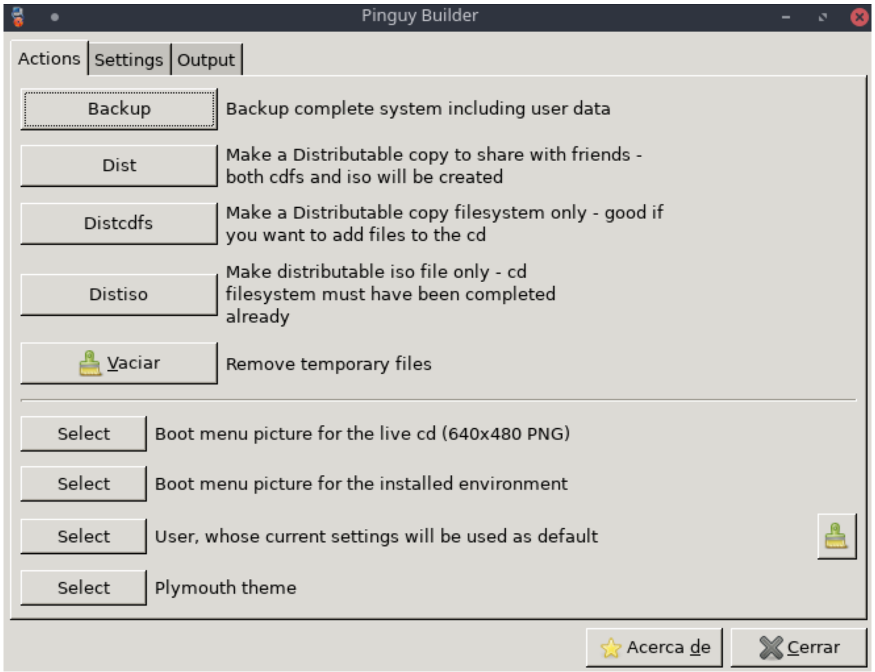
Files to exclude: /windows /dos /swapfile

URL for USB Creator: http://YourWebsite.com

Squashfs options: -no-recovery -always-use-fragments -b 1048576 -comp xz -Xbcj x86

☑ Show install icon on Backup mode desktop

Once this information has been modified, we return to the "Actions" panel and insert our default images in the first two sections that say "Select", the first is for the Live CD boot menu and the second is for the boot menu for the installed environment.



Backup complete system including user data

Make a Distributable copy to share with friends - both cdfs and iso will be created

Make a Distributable copy filesystem only - good if you want to add files to the cd

Make distributable iso file only - cd filesystem must have been completed already

Remove temporary files

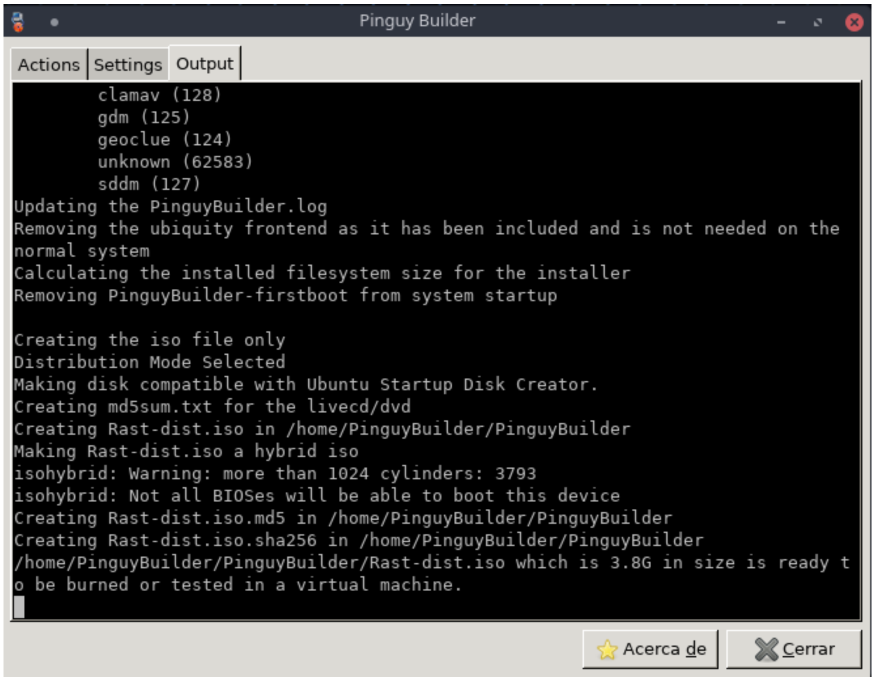
Boot menu picture for the live cd (640x480 PNG)

Boot menu picture for the installed environment

User, whose current settings will be used as default

Plymouth theme

Once all the pertinent modifications have been made, we must give the option **"Distcdfs"** (remembering that we must not open anything while this action is running); and after finishing we can continue with the option **"Distiso"** to create our final iso.



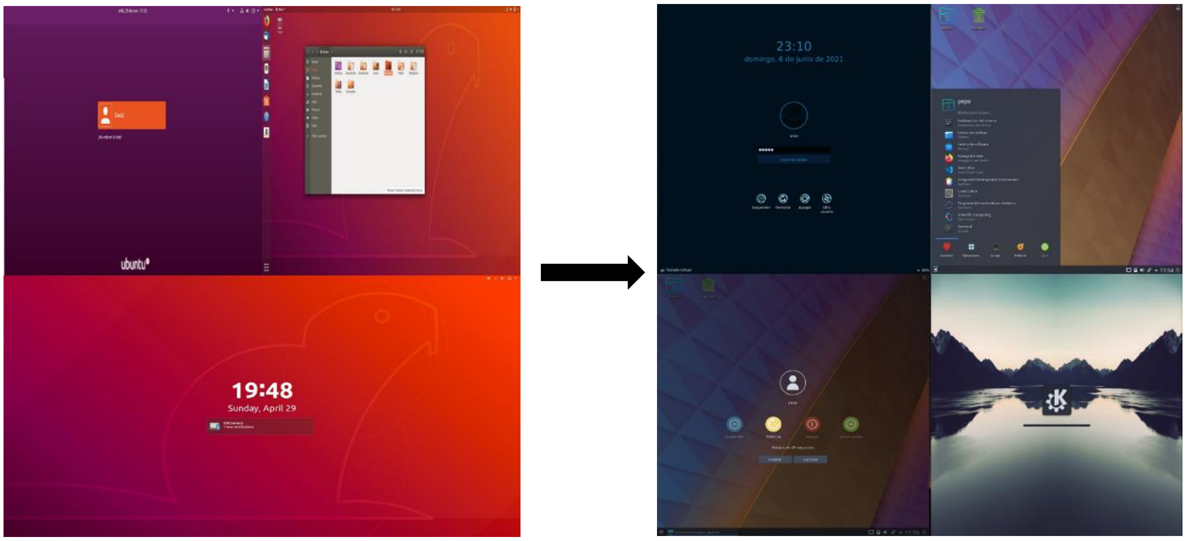
```
        clamav (128)
        gdm (125)
        geoclue (124)
        unknown (62583)
        sddm (127)
Updating the PinguyBuilder.log
Removing the ubiquity frontend as it has been included and is not needed on the
normal system
Calculating the installed filesystem size for the installer
Removing PinguyBuilder-firstboot from system startup

Creating the iso file only
Distribution Mode Selected
Making disk compatible with Ubuntu Startup Disk Creator.
Creating md5sum.txt for the livecd/dvd
Creating Rast-dist.iso in /home/PinguyBuilder/PinguyBuilder
Making Rast-dist.iso a hybrid iso
isohybrid: Warning: more than 1024 cylinders: 3793
isohybrid: Not all BIOSes will be able to boot this device
Creating Rast-dist.iso.md5 in /home/PinguyBuilder/PinguyBuilder
Creating Rast-dist.iso.sha256 in /home/PinguyBuilder/PinguyBuilder
/home/PinguyBuilder/PinguyBuilder/Rast-dist.iso which is 3.8G in size is ready t
o be burned or tested in a virtual machine.
```

And with this we get our Linux distribution, in this case called "Rast".

Differences between Rast Distribution and Ubuntu 18.04 predefined

This section will expose the differences between Rast Distribution and the predefined version of Ubuntu 18.04. Next, the main differences between the two distributions will be listed.

- Change the Display Manager (gdm3 → sddm).
- The Desktop Environment (GNOME Desktop → Plasma Desktop) has been changed.
- Various useless services were disabled and masked.
- A new package manager (Synaptic Package Manager) was installed.
- New applications dedicated to application development.
- New programming languages.
- Uninstalling useless programs that are not related to our distribution.
- Modifications of the visual environment through the inclusion of themes and other aspects.



General conclusion

The realization of this Rast distribution was too tedious, since it had to face an infinity of adversities to be able to find the final version of it. Without a doubt, making a distribution may seem simple at first, but in reality, it takes a lot of documentation and knowing the functionality of various files and folders that are essential in the development process of the Linux distribution.

In total, more than ten failed distribution attempts (prototypes) and more than ten snapshots taken from VirtualBox had to be created in order not to lose any progress. But in the end, after so much time spent between documentation and prototype distributions, it was possible to learn about the purpose of some Linux files and how they work. In addition to discovering that Linux offers you an infinite number of customization possibilities to make a distribution to suit you.