MANJARO LINUX

User Guide

Graphical and Command-Line Installation Methods

Manjaro 0.8.8

The Manjaro Development Team

Core Team

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A Note About Manjaro and Arch

Manjaro is based on another distribution called *Arch Linux*. As such, it is also able to draw software packages from the community-maintained *Arch User Repository* (AUR). However, please note that Manjaro is not Arch, and any enquires about the Manjaro operating system should be directed towards the Manjaro forums and Internet Relay Chat (IRC) channels alone.

For example, although Ubuntu is derived from Debian - and therefore shares some simularities with its parent - there are still substantial differences between these operating systems and how they work. Such is the case with Manjaro, which is far from just being an "easy to install" or "pre-configured" Arch operating system.

Here are some of the key differences between the Manjaro and Arch operating systems:

- **Manjaro** is developed independently from Arch, and by a completely different team.
- **Manjaro** is designed to be accessible to newcomers, while Arch is aimed at experienced users.
- **Manjaro** draws software from its own independent repositories. These repositories also contain software packages not provided by Arch.
- **Manjaro** provides its own distribution-specific tools such as the Manjaro Hardware Detection (MHWD) utility, and the Manjaro Settings Manager (MSM).
- **Manjaro** has numerous subtle differences in how it works when compared to Arch.

To reiterate, although Manjaro is indeed a an Arch-derivative, it is not Arch!

Contents

Introduction

About Manjaro

Manjaro is a user-friendly Linux distribution based on the independently developed *Arch* operating system. Within the Linux community, Arch itself is renowned for being an exceptionally fast, powerful, and lightweight distribution that provides access to the very latest cutting edge - and bleeding edge - software. However, Arch is also aimed at more experienced or technically-minded users. As such, it is generally considered to be beyond the reach of those who lack the technical expertise (or persistence) required to use it.

Developed in Austria, France, and Germany, Manjaro provides all the benefits of the Arch operating system combined with a focus on *user-friendliness* and *accessibility*. Available in both 32 and 64 bit versions, Manjaro is suitable for newcomers as well as experienced Linux users. **For newcomers**, a user-friendly installer is provided, and the system itself is designed to work fully 'straight out of the box' with features including:

- Pre-installed desktop environments
- Pre-installed graphical applications to easily install software and update your system, and
- Pre-installed codecs to play multimedia files

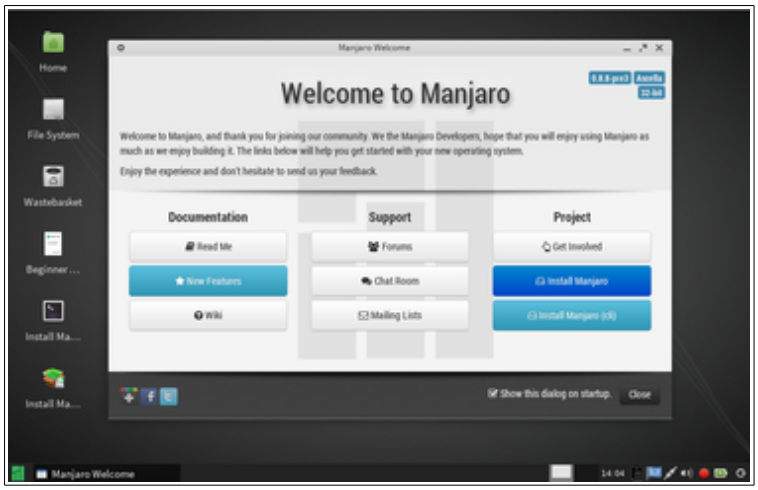
Features

Manjaro shares many of the same features as Arch, including:

- Speed, power, and efficiency
- Access to the very latest cutting and bleeding edge software
- A 'rolling release' development model that provides the most up-to-date system possible without the need to install new versions
- Access to the *Arch User Repositories,* and
- The versatility to be shaped and moulded in every respect to suit personal taste and preference.

However, Manjaro boasts a few extra features of its own, including:

- A simplified, user-friendly installation process
- Automatic detection of your computer's hardware (e.g. graphics cards)
- Automatic installation of the necessary software (e.g. graphics drivers) for your system
- Dedicated software repositories that deliver fully tested and stable software packages, and
- Support for the easy installation and use of multiple kernels



1. Downloading Manjaro

32 and 64 bit versions of Manjaro are available for download as ISO files. An ISO file is itself a literal copy of a disc image, although not in the same sense as a copy and paste duplicatation. Rather it is a copy of the raw machine code that makes up the files and folders of that disc. This is why just copying an ISO file to a disc (or USB flashdrive) to begin installing it won't work; you'll need to use a *disc burning application* to translate that raw data into the files and folders. Instructions to do so for both Linux and Windows operating systems are provided below.

Note: There is an exception to this rule. If you intend on installing Manjaro in a virtual machine environment using Oracle's Virtualbox , then there will be no need to burn the image as Virtualbox will be able to read from the ISO file directly as a *virtual disc*.

ISO images available for 32 bit systems will end in **i686.iso**, while images for 64 bit systems will end in **x86_64.iso**. Please try to ensure that you download the appropriate ISO image for your system as:

• a 64 bit ISO won't run on a 32 bit system, and
• a 32 bit ISO will not be able use the full power or resources of a 64 bit system.

1.1 Manjaro Editions

There are two editions of Manjaro available for download:

1. The full edition: This edition of Manjaro comes complete with a pre-installed desktop environment. In the caseof XFCE, it will also come with popular software applications, and codecs. This would of course be the most appropriate choice for those who wish to try out Manjaro on a *Live-CD* without having to install it first. An ISO image for a full edition of Manjaro will list the pre-installed desktop environment in its name. For example, an ISO image beginning with **manjaro-xfce** will have the XFCE desktop environment pre-installed.

2. The NET edition: This edition of Manjaro provides only a base installation, stripped of any and all pre-installed software. Starting from the command line, this is suitable for more experienced users who may wish to build their own Manjaro systems from the ground up. An ISO image for a NET edition will always begin with **manjaro-net**.

1.2 Downloading an ISO Image

Each stable release and test-build of Manjaro has its own particular folder, which will contain all the 32 and 64 bit versions of both the full and NET editions available. Each folder will also contain the relevant *checksum* files which can be used to check the integrity of your downloaded ISO file (i.e. to ensure that it has not been corrupted during download). A link to the guide on doing this has been provided below.

Stable Releases of Manjaro are intended to be used by the general public. As such, will be the appropriate choice for the majority of users. Each of the stable releases - starting from 0.8.0 - can be downloaded from the Stable Release section of the *Sourceforge* website.

Test Builds of Manjaro are intended to be used only by developers and testers, in order to identify any bugs or issues to be addressed as their development continues towards the next stable release. **These are not suitable - or intended - for use as a main operating system by the general public**. However, should you wish to try out a test build (preferrably in a virtual machine), each current release can be downloaded from the from the Test Build section of the *Sourceforge* website.

2. Checking a Downloaded ISO File for Errors

Prior to burning your downloaded ISO image (or using it as a virtual disc in Virtualbox), it is **strongly** recommended that you first check that it hasn't been corrupted. The consequences of not doing so - especially if you intend on installing Manjaro as your main operating system - should be obvious (i.e. a corrupted image will result in a corrupted installation).

To do so, you must first download the appropriate *checksum file* from the same *Sourceforge* website folder as your chosen ISO image. A checksum file will have the same name as the ISO image that it is to be used with; the only difference is that it will end in either **-sha1.sum** or **-sha256.sum**. For example, the appropriate checksum files for the*manjaro-xfce-0.8.1-x86_64.iso* file (64 bit Manjaro release 0.8.1 with the XFCE desktop) would be:

- manjaro-xfce-0.8.1-x86_64**-sha1.sum**, and/or
- manjaro-xfce-0.8.1-x86_64**-sha256.sum**

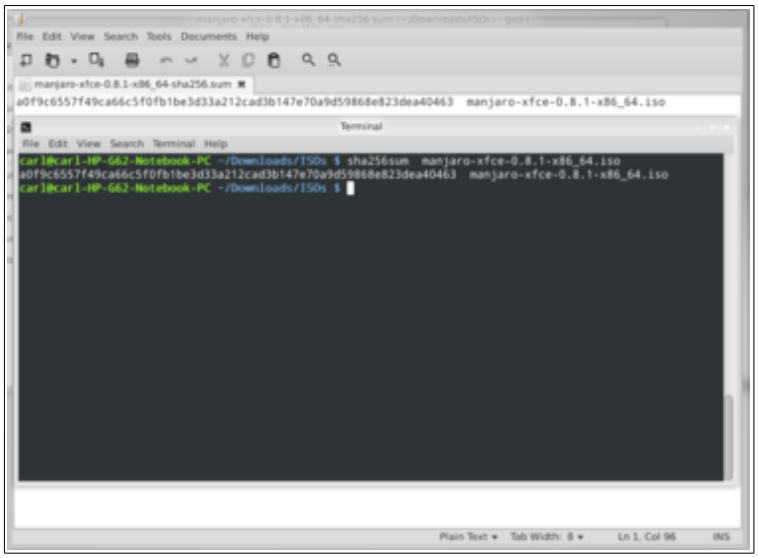
2.1 SHA1 and SHA256

The 'sha' part of the checksum file name stands for Secure Hash Algorithm. This algorithm is used to generate a particular code unique to the downloaded ISO image. **Sha1** and **sha256** are different versions of the algorithm that you can use to do this. Whilst sha1 is the most commonly used version, sha256 is a later and more secure version. Which you decide to use is entirely your choice. **However, if you are unsure, then it is recommended to use sha256**.

The checksum file itself is just a text document that contains a code that should match the code generated by the sha1 or sha256 algorithm. As such, if the code generated from the ISO file matches that contained in the checkum file, then the ISO is fine. Otherwise - if the two codes don't match - then it means that the ISO file has changed in some way, most likely due to being corrupted. You can think of it like someone using a secret password to identify who they are: if they provide the wrong password, then something is obviously amiss!

Don't worry if this all sounds a bit much - it's actually very straightforward and easy to use!

2.2 Checking In Linux



To check the integrity of your downloaded file, it will be necessary to first open the downloaded checksum file using a text editor such as *Gedit*.

Depending on whether you intend to use sha1 or sha256, ensure that you have downloaded and opened the appropriate checksum file (i.e. ending in -sha1.sum or -sha256.sum, respectively) as they will contain different codes.

Once the checksum file has been opened - and the code is visible - open up your terminal and change to the directory where your downloaded ISO is stored.

For example, if your ISO file is located in the default *Downloads* folder, you would enter the following command:

cd Downloads

The command to then perform a checksum uses the following syntax:

[sha1sum or sha256sum] [ISO Image]

For example, the following command will use sha256 to generate a code from the 64 bit Manjaro XFCE 0.8.1 ISO. The code generated can then be compared to the code provided by the appropriate sha256 checksum file:

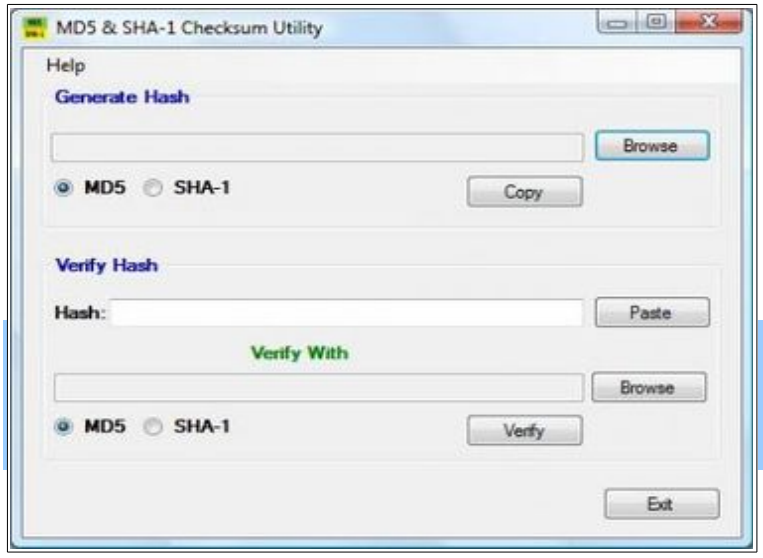
sha256sum manjaro-xfce-0.8.1-x86_64.iso

As illustrated above, in this instance both codes match, thus confirming that the downloaded ISO file is completely fine. The following command would use sha1 to undertake exactly the same task:

sha1sum manjaro-xfce-0.8.1-x86_64.iso

Where satisifed that both codes match, then it is safe to proceed to either burning the ISO to your chosen installation, or using it immediately in Virtualbox. Otherwise, it will be necessary to delete the ISO image and download it again.

2.3 Checking In Windows



It will be necessary to download and install a checksum utility application. Several free versions may be found on the Download.com website .

A very positively reviewed free checksum utility you may wish to consider is the

MD5 & SHA-1 Checksum Utility .

Note: If you do decide to use the *MD5 & SHA-1 Checksum Utility*, then you will only be able to use the code provided by the-**sha1** checksum file for your ISO. This utility does not support using sha256.

3. Burning an ISO File

An ISO is not simply a 'drag and drop' or 'copy and paste' duplication of Manjaro's installation files.

It is in fact a copy of the raw computer code that makes up the files themselves. This is why it is necessary to use a **software burning application** to 'burn' an ISO file (i.e. convert its raw code into the files) to a physical medium such as a DVD or USB flashdrive / datastick in order to use it.

Once burned / converted, the files on that medium can then be used to run Manjaro directly without having to install it to your system (referred to as *Live-CD* mode), and/or install Manjaro on your system. Again however, it will not be necessary to to burn an ISO if you intend on running Manjaro in a virtual machine environment using Oracle's Virtualbox. This is because Virtualbox is able to read ISO files directly as *virtual disks*.

Note: Manjaro will not have full functionality when run in Live-CD mode. For example, you will not be able to save any changes to the system, or install updates or new applications.

3.1 Burning to a CD/DVD in Linux

Tip: It is strongly recommended to select the slowest speed available when burning to disc in order minimise the possibility of corruption during the burning process.

Several different software burning applications - if not already installed - should be available for installation from your distribution's Software Center / Software Manager / Package Manager / repositories. Popular burners include *XFBurn*, *K3b*, and *Brasero*. Which one you may choose is entirely down to personal choice. However, a guide to burning your downloaded Manjaro ISO using Brasero has been provided below:

1. Insert a Blank CD/DVD (use a DVD if burning an ISO for anything other than the NET Edition)

2. Start the Brasero software burner

3. Click the **Burn Image - Burn an existing CD/DVD image to disc** button to open the *Image Burning Setup* window.

4. Click the button beneath the title **Select a disc image to write** to open up your file manager. Locate and double-click the downloaded ISO file to load it. Upon automatically returning to the*Image Burning Setup* window, note that the ISO file is now listed as the disc image to write.

5. Underneath the title **Select a disc to write to** the blank CD/DVD inserted should already have been automatically listed. Otherwise, click the button to select it manually.

6. Click the **properties** button to open the *properties window*, and then click the button beneath the title **Burning Speed**. Again, it is strongly recommended to select the slowest speed available. Once selected, click the **Close** button.

7. Click the **Burn** button to start the burning process. If necessary, follow any on-screen instructions provided.

3.2 Burning to a CD/DVD in Windows

Several free software burner applications are available for Windows. The most popular examples of these include:

- Imgburn (Youtube video tutorial)
- Burn Aware free (Youtube video tutorial), and
- CDBurnerXP (Youtube video tutorial)

An overview of each of these applications is available on the CD/DVD Burning Article on the TechSupportAlert website . Additional burners may also be found on the Download.com website , although you will have to filter the search results to view only the free applications provided. It will also be worthwhile to take the time to read any reviews provided for your choice(s).

3.3 Writing to a USB Stick in Linux

ImageWriter should be available for installation from your distribution's Software Center / Software Manager / Package Manager / repositories. Once Imagewriter has been downloaded and installed, ensure that your USB stick is plugged in before starting it.

A brief guide to writing the Manjaro .ISO image has been provided:

1. Click on the centre icon

2. Navigate to where the ISO image has been saved and select it

3. Ensure that your USB device has been selected from the drop-down menu

4. Click on the **Write** button

5. Reboot your system

3.4 Writing to a USB Stick in Windows

Note: Windows Imagewriter does not automatically detect .ISO files, which is why it is necessary to type ***.*** in the filename box, in order to find them.

It is recommended to use ImageWriter For Windows , which is a free application designed to write disc images to USB sticks as well as *Compact Flash* (CF) and *Secure Digital* (SD) cards. Once Imagewriter has been downloaded and installed, ensure that your USB stick is plugged in before starting it.

If you find that *ImageWriter* is unable to start, then it may be necessary to download Microsoft's .NET 2.0 Runtime Framework , which is used by some software programs to run. In addition, if an error message is displayed upon starting the process, then you may wish to open ImageWriter by first right-clicking on the icon, and then selecting the **Run as Administrator** option.

A brief guide to writing the Manjaro .ISO image has been provided:

Tip: Ensure that *Windows Explorer* is closed prior to attempting to write the ISO image, otherwise it may block access to the USB stick, resulting in the following error being displayed:**system.componentModel.Win32Exception:Access is denied**.

1. Click the **seclect** button

2. Type ***.*** in the filename box and then select the Manjaro .ISO image

3. Select your USB Stick

4. Click the **Write** button.

Should your attempt to write to a USB stick still be unsuccessful, then use a partition tool to format it as a **RAW** partition type, and use *ImageWriter* again.

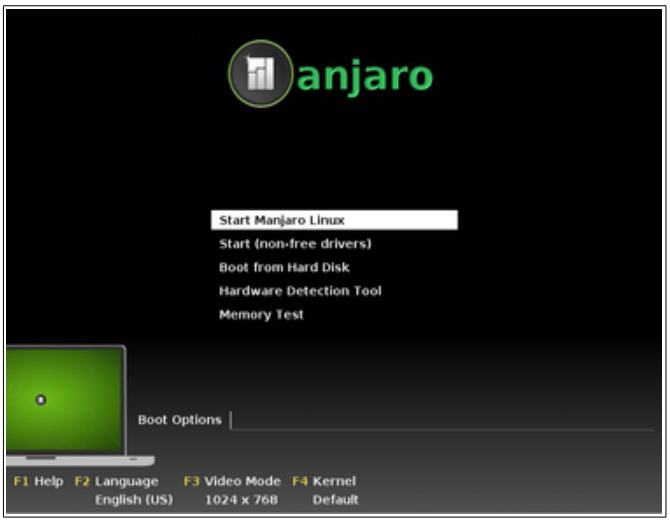
Warning: Re-partitioning your USB stick as a **RAW** data type will result in all data present being destroyed, and will render it unusable for other purposes until reformatted back to its original partition type.

4. Pre-Installation

Tip: Manjaro uses a Rolling Release Development Model. As such, by virtue of keeping an existing installation updated, it is already the latest release. More information can be found in our Blog article: Manjaro installation up to date? Then you already have the latest release!

Where possible, ensure that you are connected to the internet prior to booting from your installation media (e.g. disc, USB flash drive, or even an ISO file directly if booting in Oracle's Virtualbox). If you have a hard-wired connection via an Ethernet cable, then Manjaro will automatically connect to the internet without you having to do anything. Otherwise, once you have booted into Manjaro's desktop, you will need to select and then connect to your wireless network.

4.1 Setting Your Language and Keyboard Layout



Once Manjaro has booted, you should be presented with the Manjaro boot screen. However, particularly if you are not a native English speaker, don't actually boot into anything just yet!

It is possible at this stage to easily set your preferred language and keyboard layout prior to actually using Manjaro. This will mean that you will be able to use and install Manjaro in your native language straight away.

Tip: Setting the language and keyboard layout - as shown below - are undertaken through pressing the F2 key. As many computers have multiple functions assigned to each function key, it may be necessary to hold down another key first to use them. For example, on a HP G62 laptop, to use the function keys, the 'fn' key must first be pressed and held.

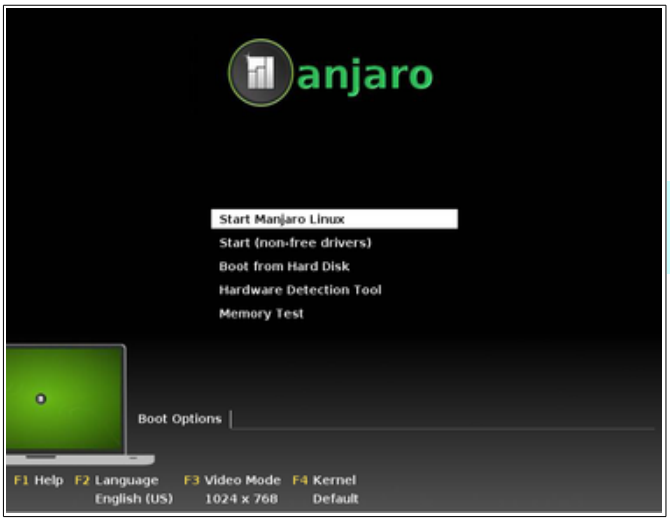
First, set your preferred language by pressing the F2 key. The options available can be highlighted for selection by using the arrow keys on your keyboard. In this instance, *English (UK)* has been highlighted for the user.

Once selected, press <enter> to confirm and to be taken back to the boot menu.

Second, set your preferred keyboard layout (keymap) by pressing the F2 key, selecting **keyboard**, and then pressing <enter> to bring up the options.

Where selecting your preferred language, the appropriate keyboard layout should already be selected. In this instance, *English (UK)* has been highlighted for the user.

Once selected, press <enter> to confirm and be taken back to the boot menu.

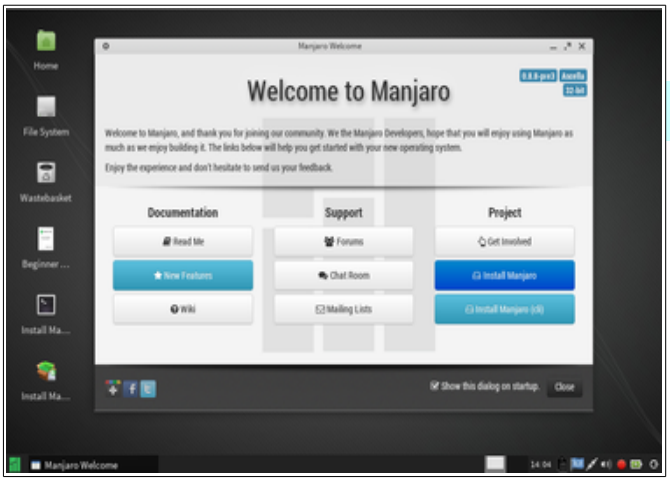


Manjaro can now be booted to begin the installation process. Two options are available:

1. Start Manjaro Linux
2. Start (non-free drivers)

Tip: For the best results, select the 'Start (non-free drivers)'. This should match the right manufacturer's driver(s) your particular graphics card(s).

Again, use the arrow keys to highlight your choice, and then press <enter> to continue.



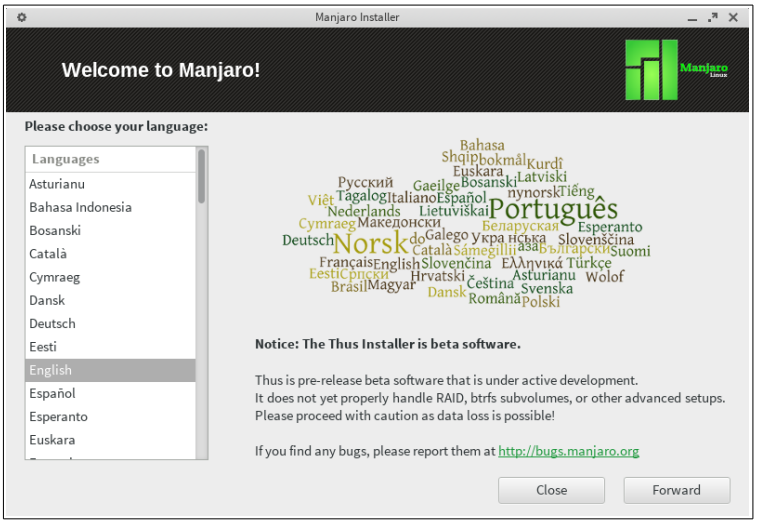
As seen here, Manjaro 0.8.8 with the XFCE desktop environment is to be installed.

Tip: If you wish to connect to the internet using a wireless connection, now is the time to do it!

To begin the installation process in XFCE, click the “Install Manjaro” button in the welcome window.

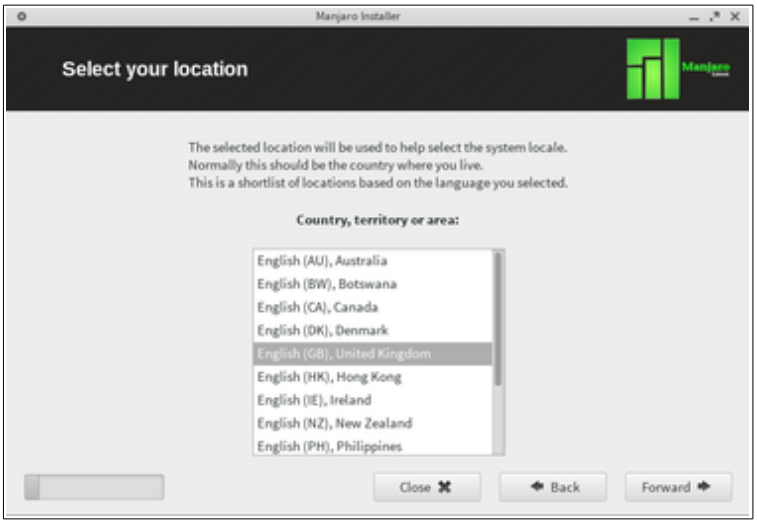
For the Openbox flavour, the installation process can be started by right-clicking on the desktop, and then selecting one “Install – Graphical” at the top of the menu.

5. Using the Graphical Installer – For Beginners



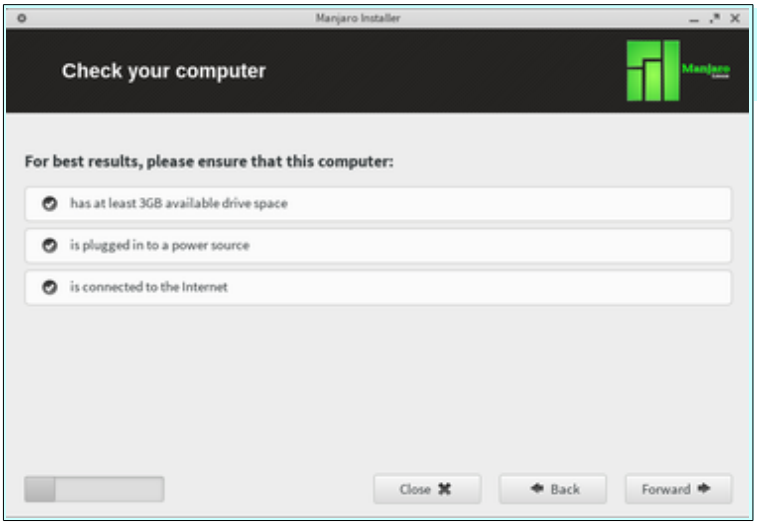
If you were able to select your preferred language before booting, then it should already be selected for you.

Once selected, click **Forward** to proceed to the next step.



The locations available to choose will depend upon the language you selected in the previous step.

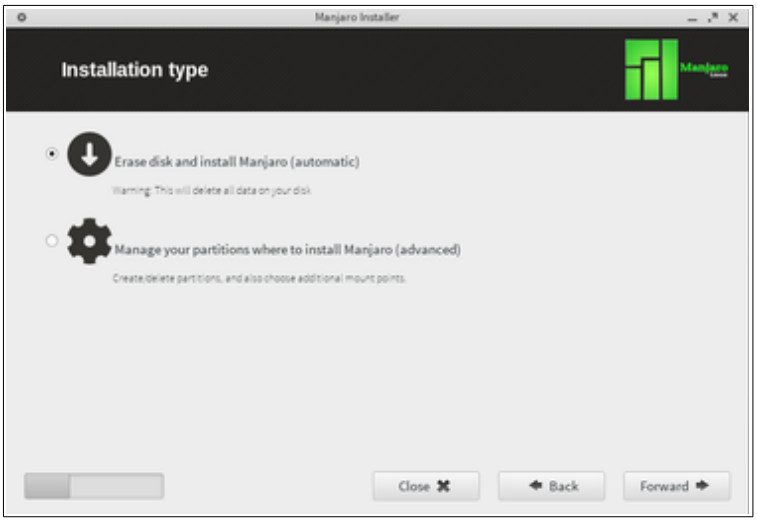
Once selected, click **Forward** to proceed to the next step.



Tip: It is not necessary to have an active internet connection in order to install Manjaro. This is recommended however for best results.

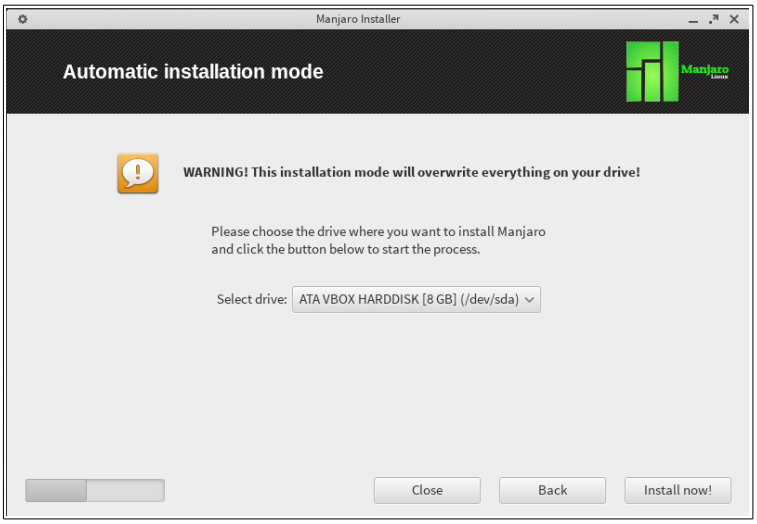
Your computer will automatically be checked to ensure that Manjaro can be safely installed upon it. This will include ensuring that sufficient hard-drive space is available (although the *absolute minimum* allowed is 3 Gigabytes, at least 15 Gigabytes of free space is recommended).

Once satisfied that your system meets the minimum requirements necessary, click **Forward** to proceed to the next step.



To proceed with the 'automatic' (and very easy) installation method, ensure that the **Erase disk and install Manjaro (automatic)** option has been selected.

Once complete, click **Forward** to proceed to the next step.



Select the hard disk that you wish to install Manjaro on.

Where only one hard disk is present, this will be automatically selected for you. Otherwise, the first drive will be listed as listed as (*/dev/sd**a**),* the second (*/dev/sd**b**)*, and so on.

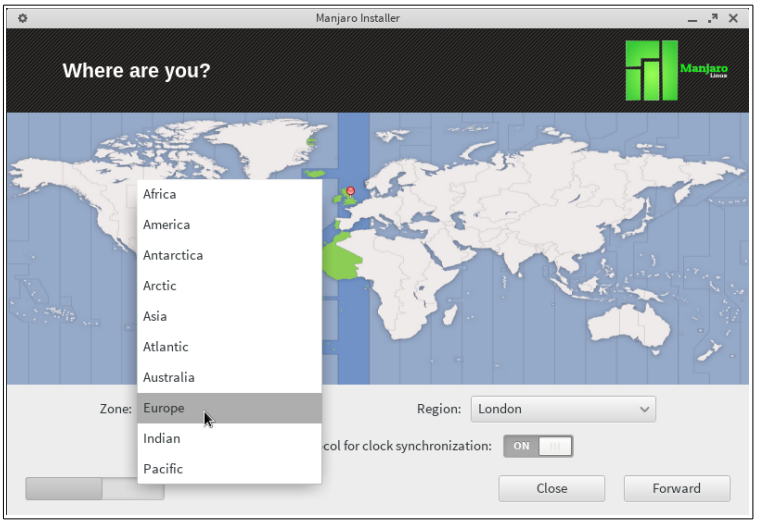
Once selected, click **Install Now!** to... well, install now!

Note: You will also have the option to **Use the Network Time Protocol for clock synchronisation**. In plain English, this means setting your system time by connecting to the internet. **If you are unsure what to do, then leave it on**.

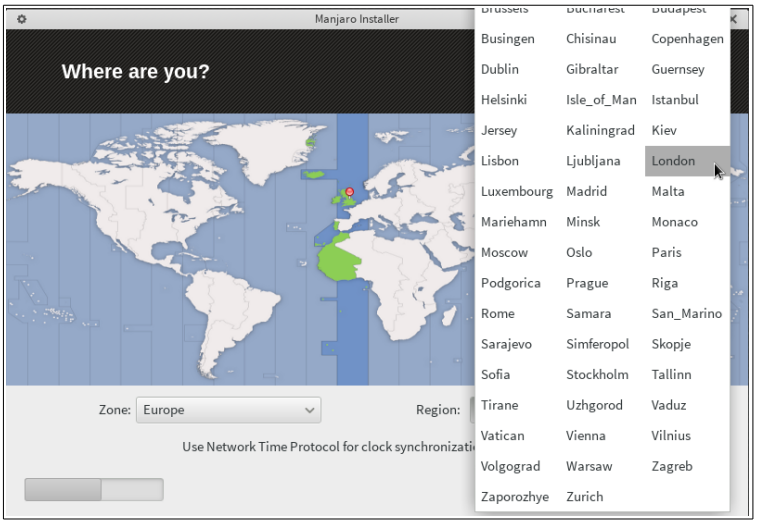
It will now be necessary to confirm your location once again.

The **Zone** is the continent you live in. The **Region** is the city or closest city to that you live in **within that Zone**.

As such, if not already set for you, you must first select the correct Zone in order to then select the correct Region within it.

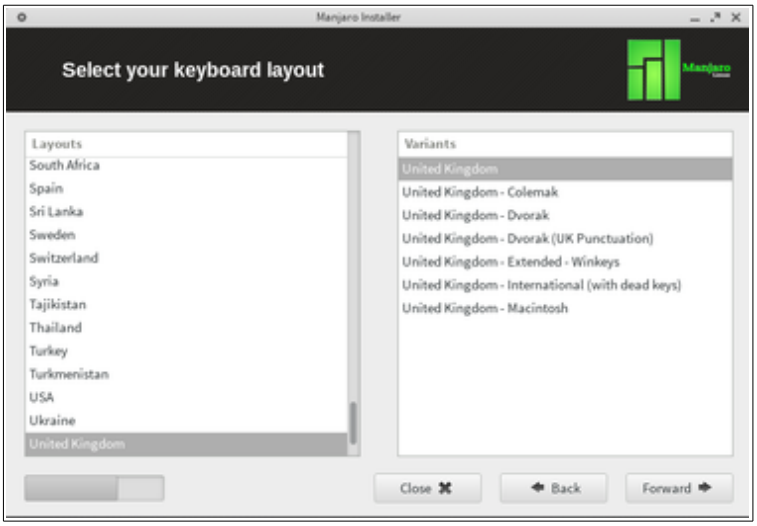


To select your Zone simply click its menu. In this instance, 'Europe' has been selected for the Author.



Once the correct Zone has been set, to then select your Region again simply click its menu. In this instance, 'London' has been selected for the Author.

Once satisfied that these details are correct, click **Forward** to proceed to the next step.

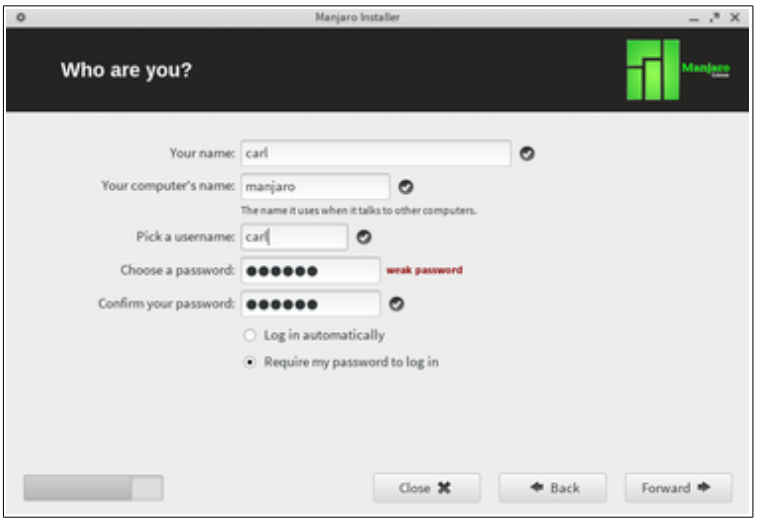


Just because you live in a certain location, that does not necessarily mean that you wish to use the keyboard layout native to it.

As such, you will now have the opportunity to either confirm or choose your preferred keyboard layout.

To choose your desired layout, simply click on your choice(s) to highlight them. Variants will be automatically generated depending on the country chosen.

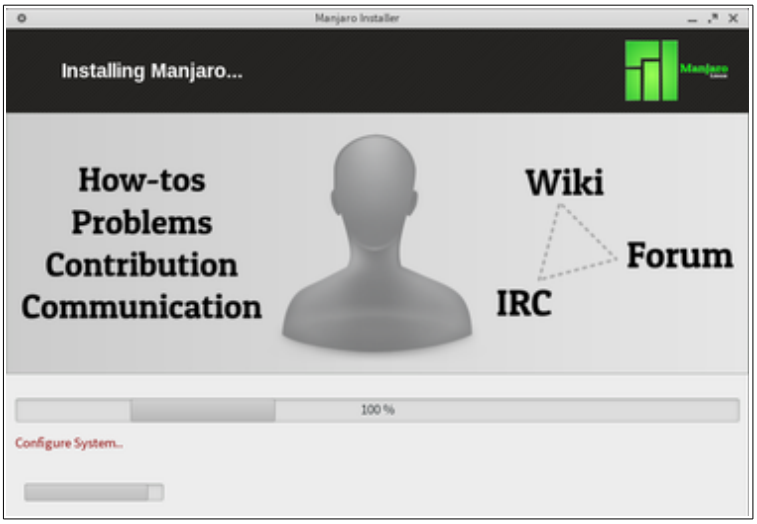
Once satisfied that these details are correct, click **Forward** to proceed to the next step.



Enter your real name, your computer's name (just enter 'manjaro' - minus the quotation marks - if you are unsure what this means), and your user-name (use lower case letters). Your user-name will be the name of your personal account in Manjaro.

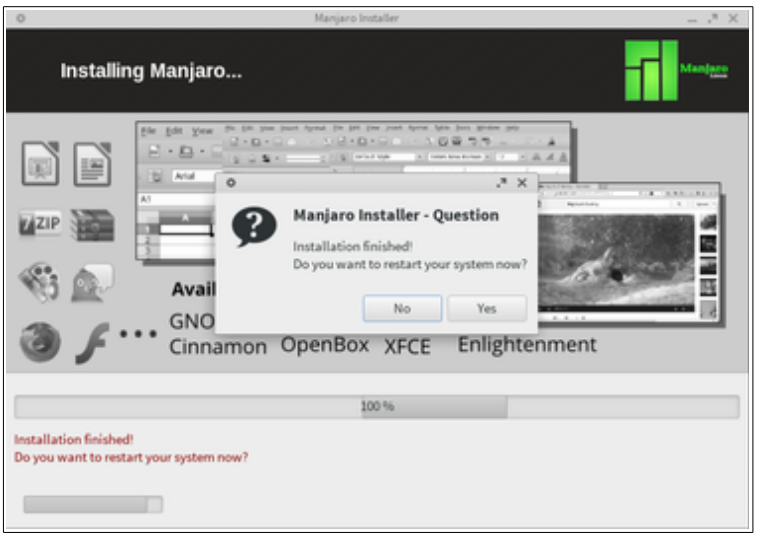
You will also need to enter your intended password twice. Again, please remember that the use of upper and lower case letters in it must be remembered in order to successfully log in after installation (e.g. 'abc123' is not the same as 'ABC123').

All done! Once satisfied that these details are correct, click **Forward** to install Manjaro.



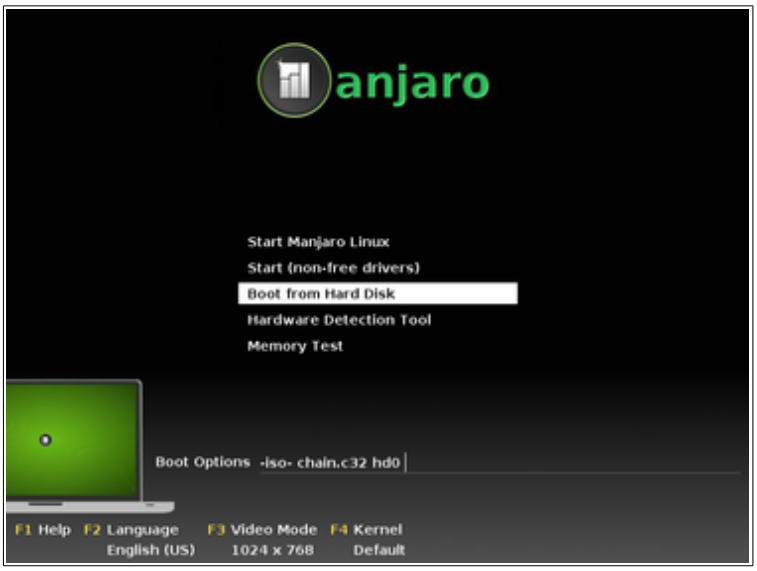
The automatic installation process will now begin – that was easy!

During this process, useful information about Manjaro and its community will be displayed.



Once complete, you will be asked if you want to restart your system.

Select *Yes* to reboot immediately, or *No* to close the installer and continue using the Manjaro installation media.



Upon rebooting, it is possible to eject the installation media as the computer turns back on. However, it is also possible to boot from the installation media itself by selecting the **Boot From Hard Disk** option and then pressing <enter>.

Where using the *Boot From Hard Disk* option, you may then safely remove or eject the installation media at your leisure as your freshly installed Manjaro system boots up.

Congratulations - and welcome to your freshly installed Manjaro system!

Now, why not consider becoming part of our community? You will find yourself more than welcome at our multi-language **forums!**

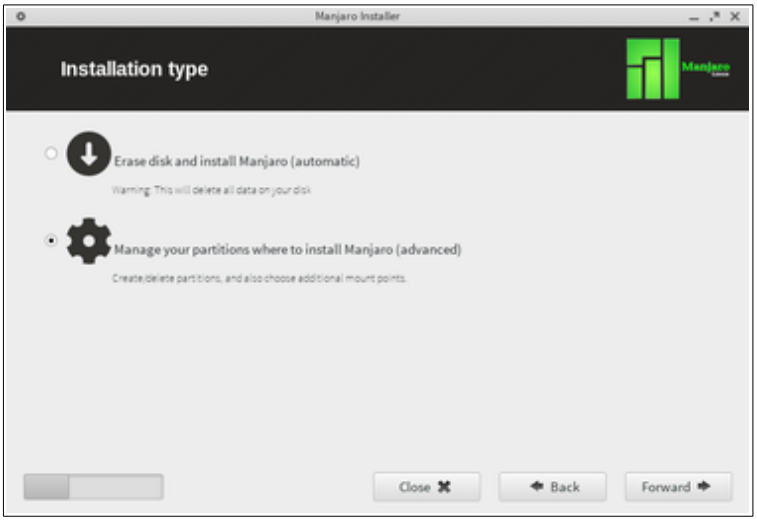
6. Using the Graphical Installer – For Experienced Users

This **Experienced Users' Guide** is suitable for those with sufficient technical knowledge to manually create their own partitions. As such, this guide focuses on providing an example of how to use the 'Advanced' installation method in general, rather than outlining the entire installation process, or listing all the popular partition schemes that may be used.

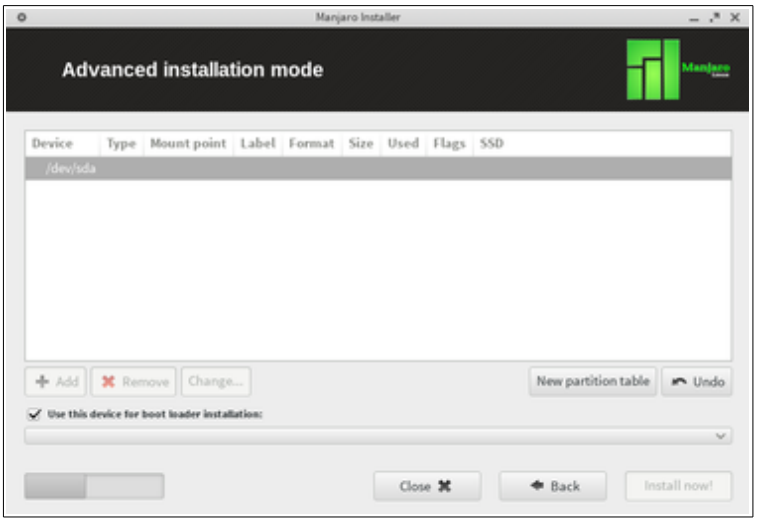
If you feel it would be helpful to refresh yourself on various partitioning schemes, then the wiki pages about **Partitioning** and **Partitioning Scenarios** should prove to be useful.

Where possible, **ensure that you are connected to the internet** prior to booting from your installation media (e.g. disc, USB flash drive, or even an ISO file directly if booting in Oracle's Virtualbox). If you have a hard-wired connection via an Ethernet cable, then Manjaro will automatically connect to the internet without you having to do anything. Otherwise, once you have booted into Manjaro's desktop, you will need to select and then connect to your wireless network.

6.1 Starting the Process of Partitioning

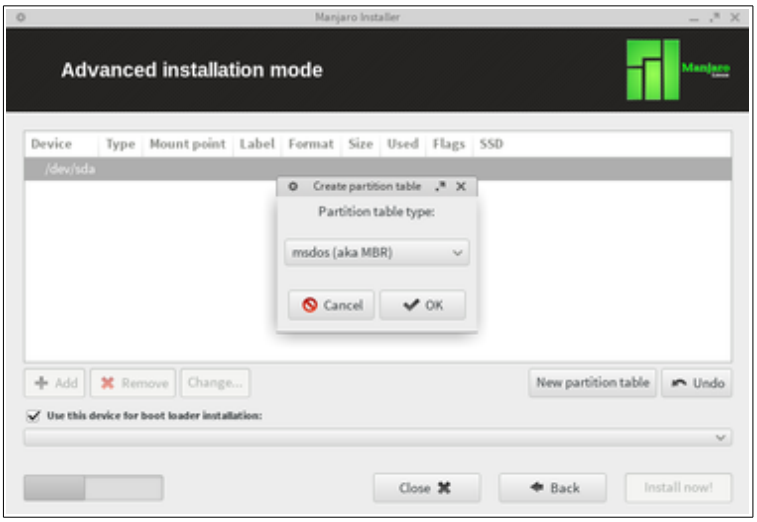


During the installation process, select **Manage your partitions and where to install Manjaro (advanced)** and then click **Forward** to proceed to the next step.



If you have more than one hard drive on your computer, then you may select the desired one to install Manjaro here.

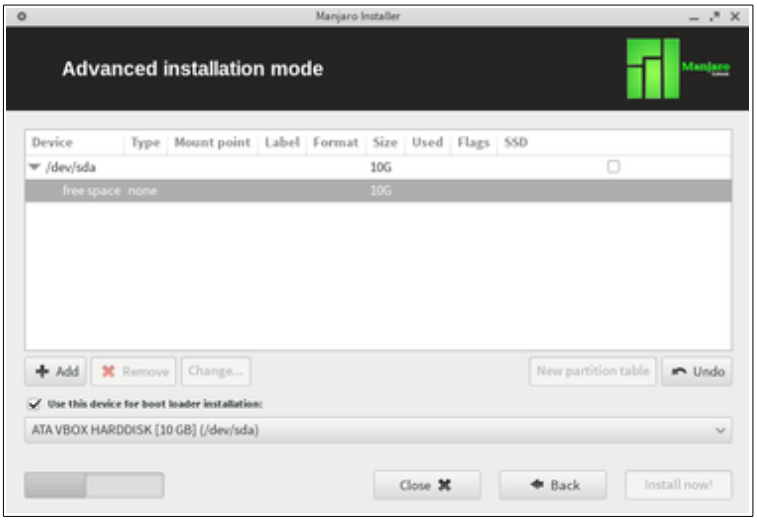
Once the desired hard drive has been selected and highlighted as shown, click **New Partition Table** to proceed to the next step.



In this instance, the **msdos (aka MBR)** partition table type has been selected, as this the appropriate choice for non-UEFI systems.

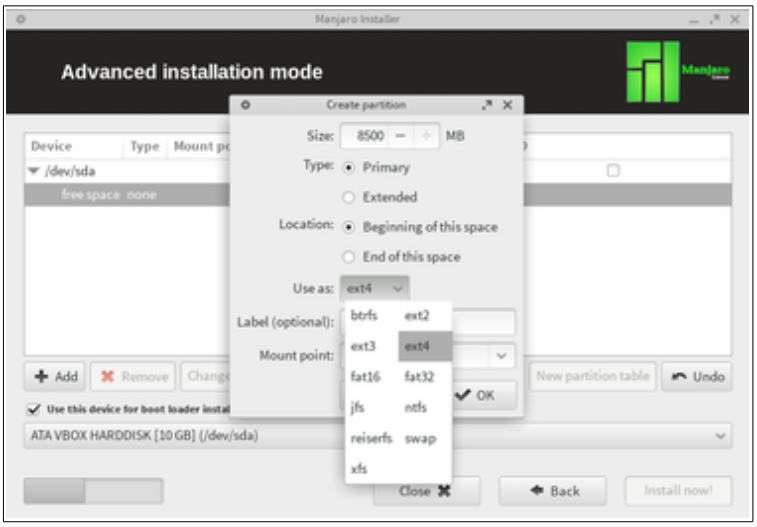
Once selected, click **OK** to start creating the partitions.

6.2 A Two Partition Scenario



In this scenario, Boot, Root, and Home will be combined into a single bootable partition (SDA1). A separate swap partition will also be created in the remaining space (SDA2). Both will be **Primary Partitions**.

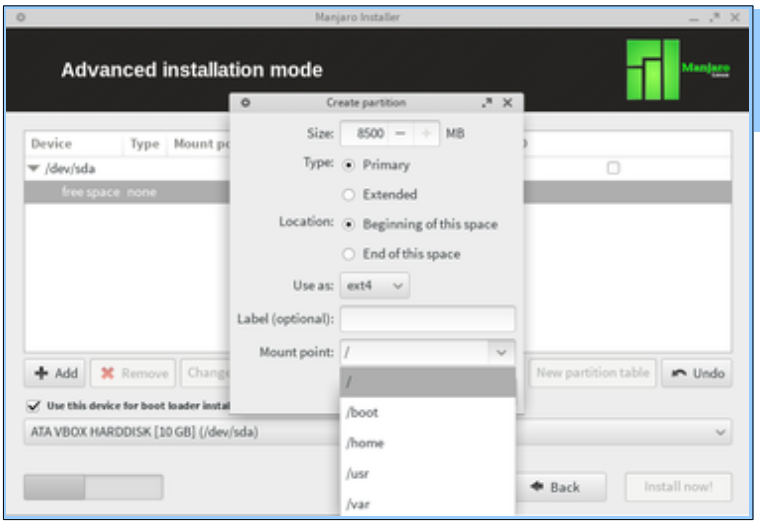
Ensuring that the appropriate free space has been selected and highlighted, click **+ Add** to create the first partition.



The first partition is intended to contain Boot, Root, and Home. As such:

- 8,500MB (8.5GB) out of a total of 10,000MB (10GB), has been allocated, leaving approximately 2000MB (2GB) for the swap partition.
- The Primary Partition type has been selected
- The Partition itself is to be located (i.e. to start) at the beginning of the available drive space.

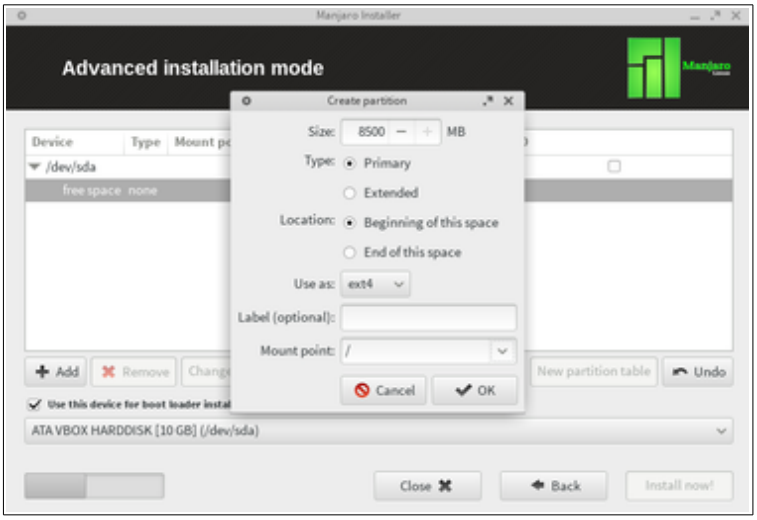
As illustrated, the popular **EXT4** file system has also been selected.



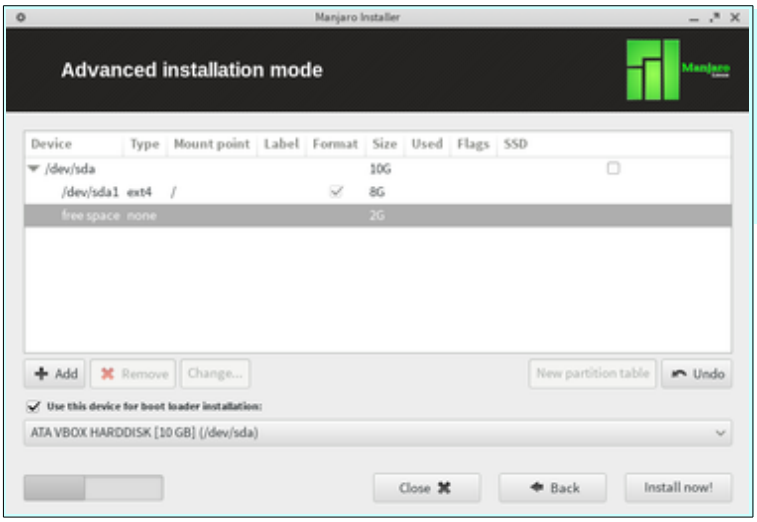
Note: Again, this is just an example of a possible partitioning scenario. You may prefer to create separate partitions for Boot and Home, for example.

The **Mount Point** must now be selected. As illustrated, in this instance, the mount point chosen has been Root (*/*).

In the absence of separate Boot and Home partitions, these elements will automatically be integrated into this Root partition.

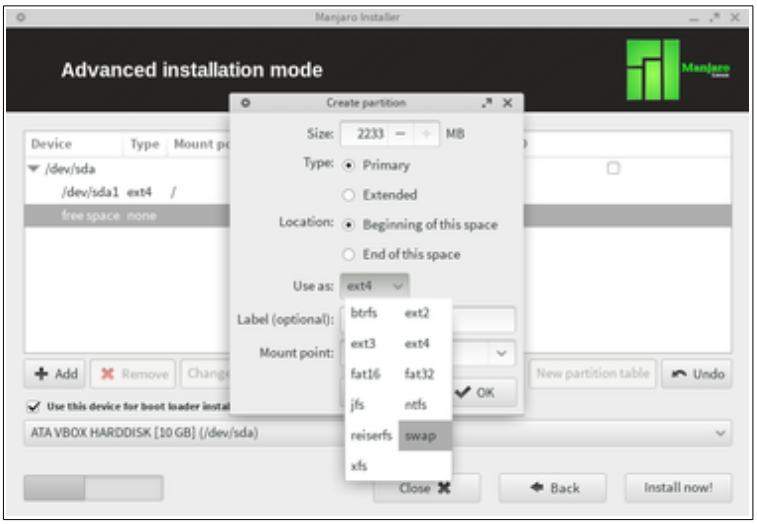


Once the partition has been fully defined, review this information before clicking **OK** to set and create it.



Tip: The Swap partition is optional, although is still highly recommended, especially for laptops and/or lower-specification computers with low memory. As well as serving as extra (albeit slow) additional memory should your system run out of RAM, it is also used for the suspend and hibernate functions.

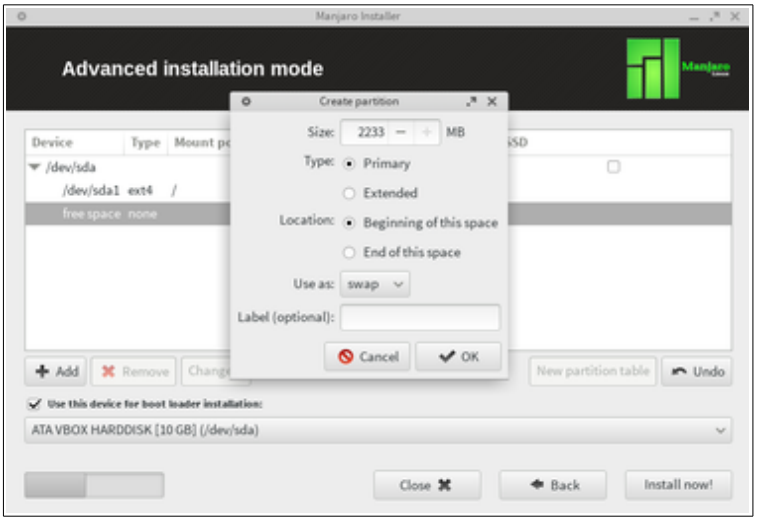
Now select the remaining free space in order to create the **Swap partition**, and click **+ Add** once more to create it.



For the Swap partition:

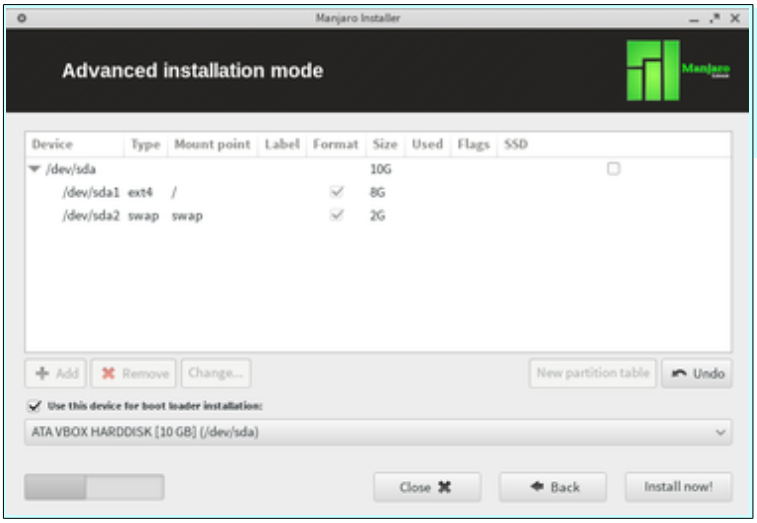
- The remaining 2000MB (2GB) of space has been allocated.
- The Primary Partition type has been selected
- The Partition itself is to be located (i.e. to start) at the beginning of the available drive space.
- The Swap file system has been selected.

Upon selecting the Swap file system type, note that there will no longer be any need to set the mount point.



Once the partition has been fully defined, review this information before clicking **OK** to set it and complete the two-partition scenario.

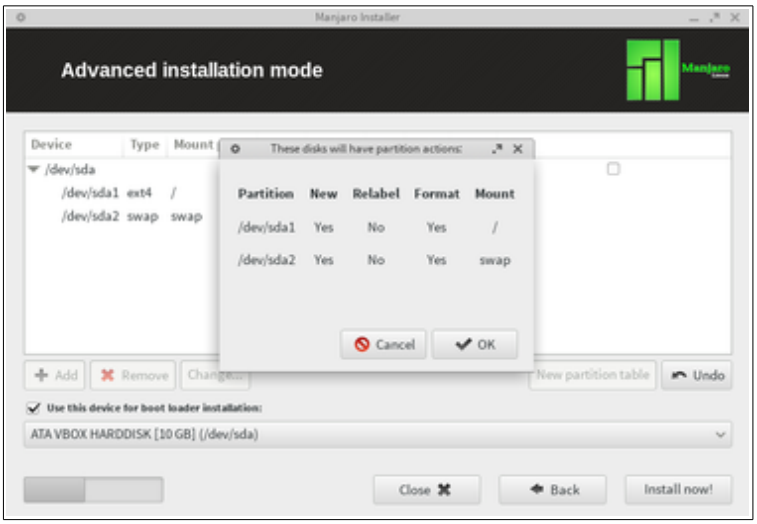
6.3 Finalising the Process of Partitioning



Tip: There is no need to manually assign a boot flag to any partitions. The installer will automatically assign this flag to your Boot or Root partition. You also have the option not to use the drive at all for booting, where appropriate.

Again take the time to review your scenario. **Neither your partitions nor your definitions of them are set in stone**, and so may still be removed or changed at this stage.

Where satisfied with the partitioning scenario, click **Install Now!** to proceed to the next step.



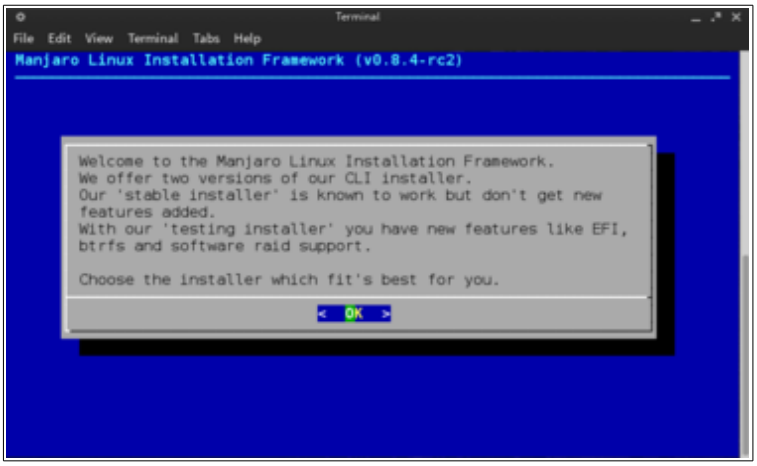
A transaction screen will appear, outlining all the necessary actions that are to take place. In some instances, this may include the removal of previous partitions that were deleted in the partitioning process.

Again, the option to **Cancel** and return to the partitioning process will still be available. Otherwise, to complete the partitioning process and begin installing Manjaro, click **OK**.

7. Command-Line Installation

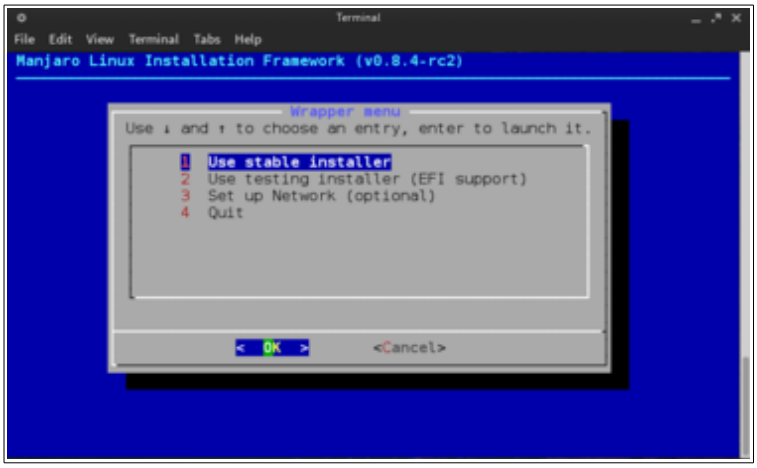
The original command-line installation method is also available. This may be selected via:

- The welcome message in XFCE,
- The desktop icon in XFCE,
- The desktop menu in Openbox, or
- By entering the command **sudo setup** in the terminal.



The installer will begin by stating that there are two installation versions available: The **Stable Installer** and the **Testing Installer**. This guide will use the Stable Installer.

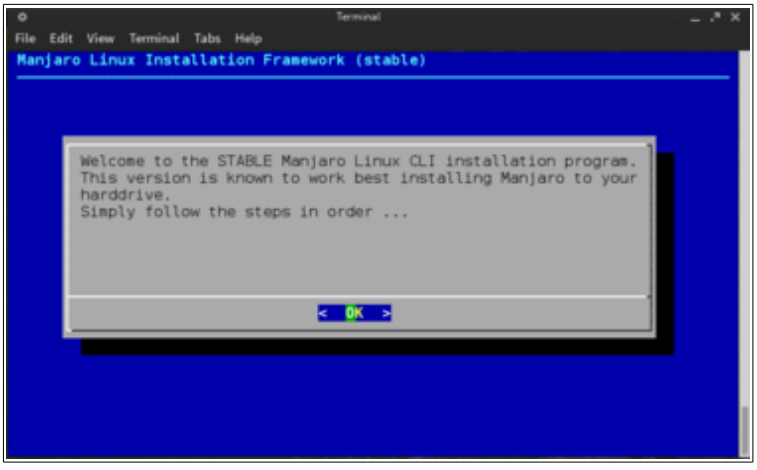
Press <enter> to continue.



Select the stable installer.

This option should already be highlighted. If not, use the arrow keys to highlight it.

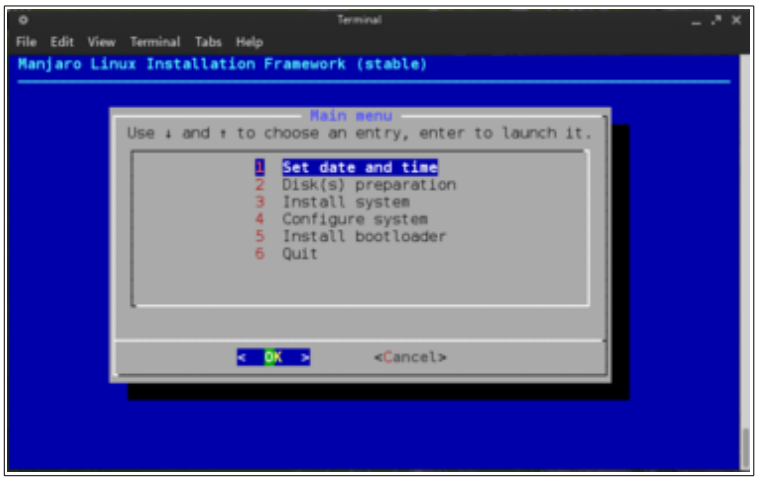
Press <enter> to continue.



A confirmation message will appear, stating that the Stable installer has begun. It also provides some good advice: **Follow the steps IN ORDER.**

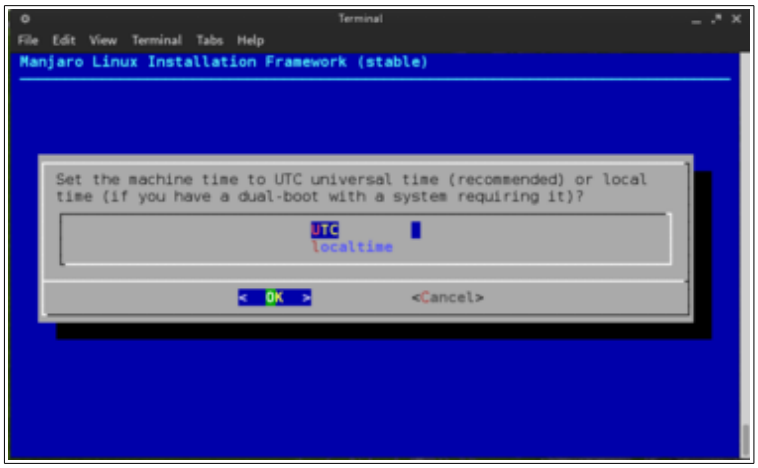
Press <enter> to continue.

7.1 Setting the Date and Time



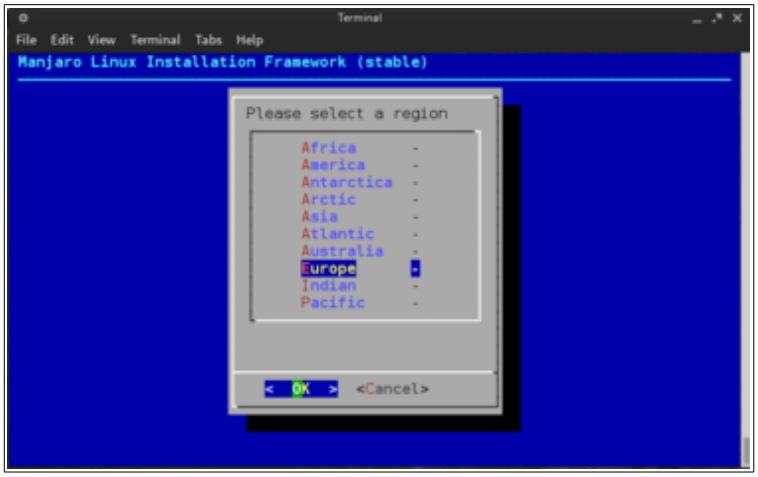
Set Date and Time should already be highlighted. If not use your arrow keys to do so.

Press <enter> to continue.



Ensure that **UTC** (Co-ordinated Universal Time - the primary time standard by which the world regulates its clocks and times) is highlighted.

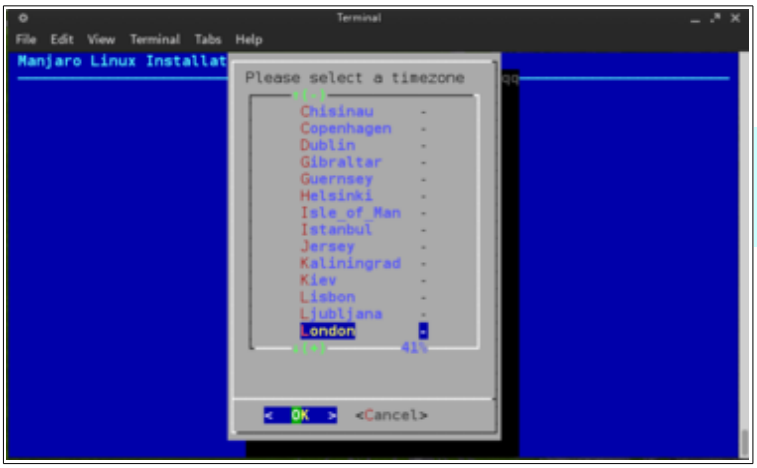
Press <enter> to continue.



Highlight the region you live in.

In this instance, Europe has been chosen, as this is the region applicable to Great Britain.

Press <enter> to continue.

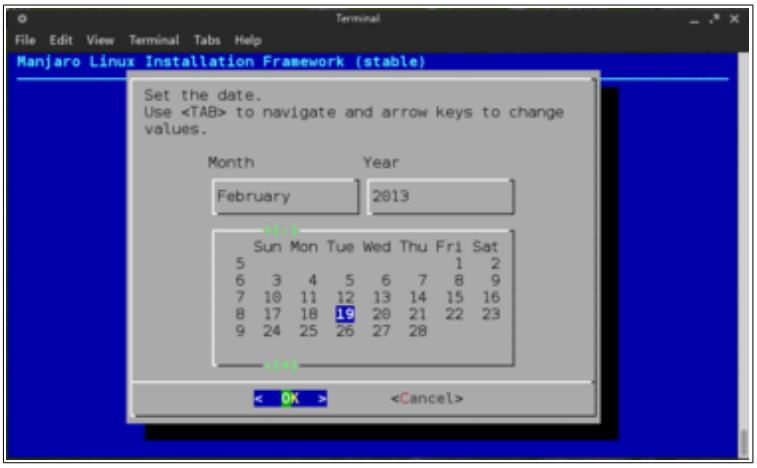


Select your time zone.

This is understaken by highlighting the appropriate capital city.

Tip: As there are a lot of cities to chose from, you can skip forwards in the menu by entering the first letter of the appropriate city to be taken to that section.

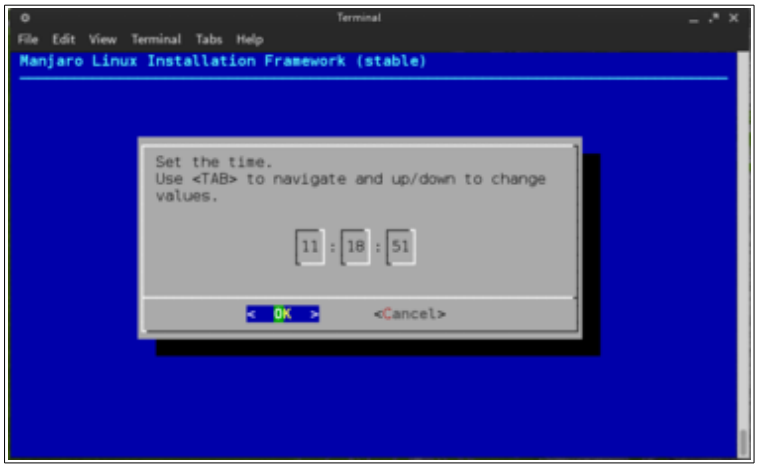
Press <enter> to continue.



Set the date.

If you are already connected to the internet, then this should already be set for you. Otherwise, use the <tab> key to switch between the day, month, and year elements, and use the up or down arrow keys to change them.

Ensure that **OK** is highlighted, and press <enter> to continue.

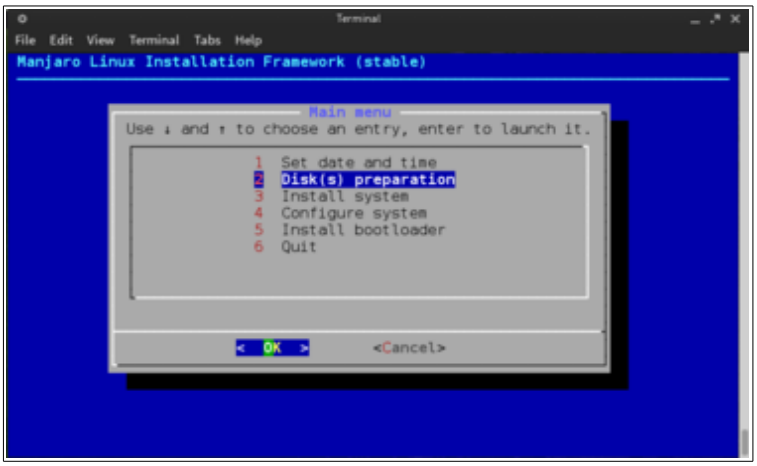


Finally, set the time.

Again, if you are already connected to the internet, then this should already be set for you. Otherwise, use the <tab> key to switch between the hours, minutes, and seconds elements, and use the up or down arrow keys to change them.

Ensure that **OK** is highlighted, and press <enter> to be taken back to the main installation menu.

7.2 Preparing the Hard Disk

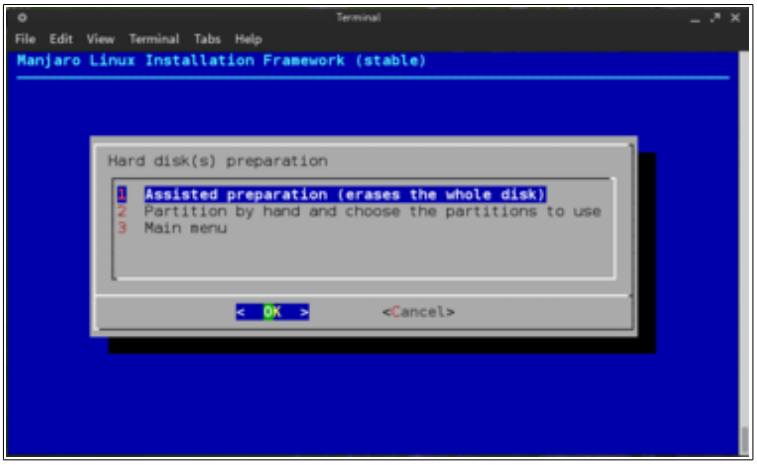


Prepare your computer's hard disk for installation.

Again, in this tutorial the assisted preparation method will be chosen, which is most suitable for beginners.

Ensure that **Disk(s) Preparation** is highlighted.

Press <enter> to continue.

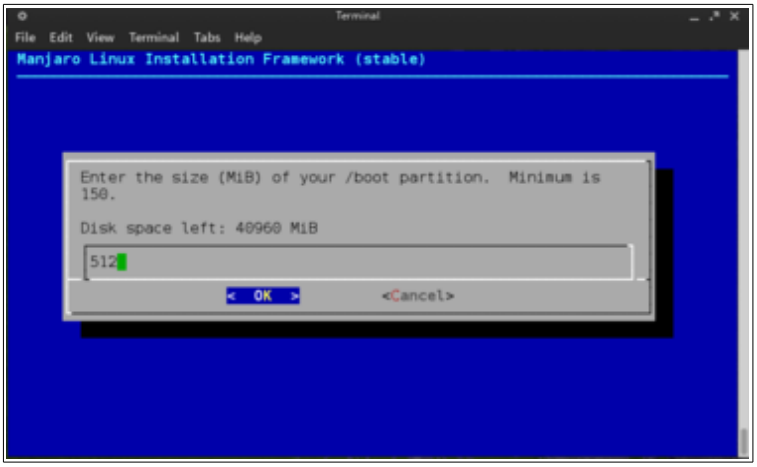


Ensure that **Assisted Preparation (erases the whole disk)** is highlighted.

As the option would suggest, this **will** erase your entire hard disk. Make sure you have backed your files up somewhere (e.g. disc, USB flash drive, internet, etc.).

Press <enter> to continue.

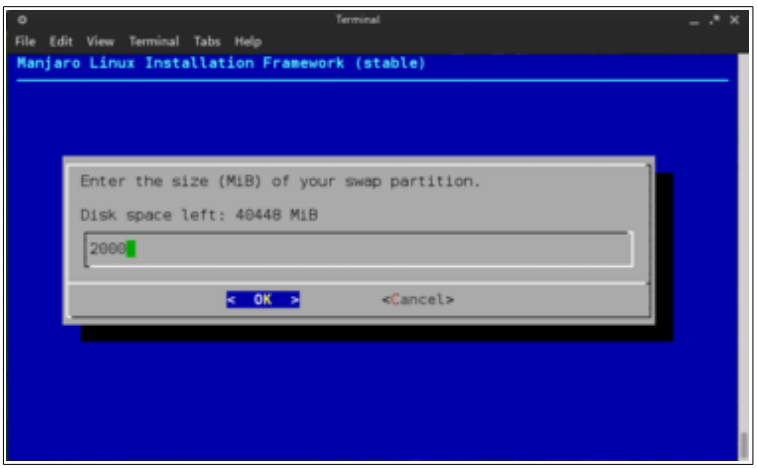
Note: The space to be set aside on your hard disk for each step of this stage is measured in megabytes (MB). It is also important to keep in mind how much hard disk space you have remaining for each step. In this tutorial, the total hard disk space being used is 40,960MB (40 gigabytes / GB).



Set the amount of hard disk space for the GRUB (**GR**and **U**nified **B**ootloader).

This is responsible for booting up Manjaro after your computer is turned on. The default value of 512MB is actually quite generous - far more than sufficient - and is intended to ensure that users can comfortably install and use multiple kernels, if desired.

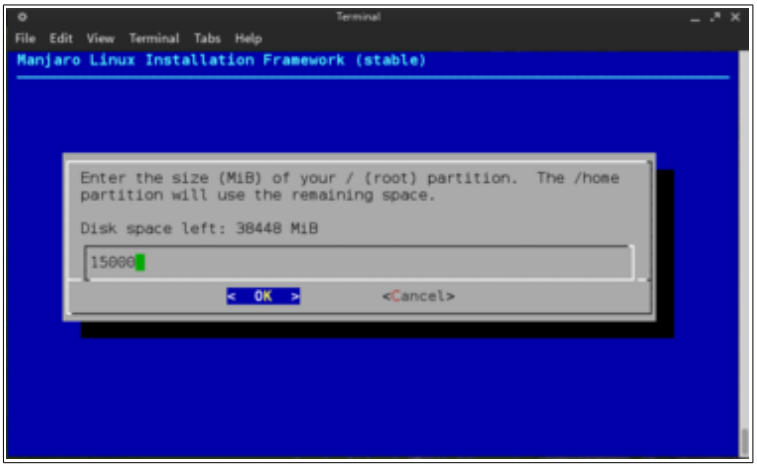
Press <enter> to continue.



Set the amount of hard disk space for the Swap Partition. This is used as virtual memory if you run out of RAM, and for the hibernate / suspend functions

The size of the Swap Partition should be equal to the amount of memory (RAM) used by your computer . For example, 2000MB (2GB) of Swap should be set for a computer using 2GB of RAM.

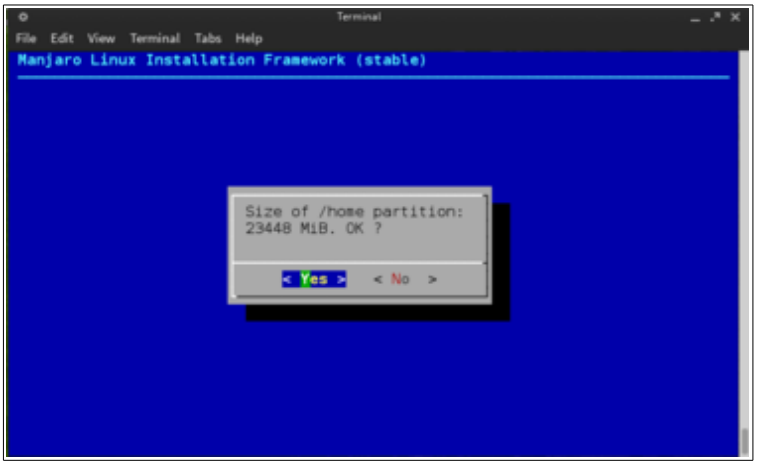
Once set, press <enter> to continue.



Set the amount of hard disk space for the Root Partition. This is where Manjaro and its installed applications will be stored.

Where possible, it is recommended to set the value of the Root Partition to at least 15,000MB (15GB). Just ensure that this leaves plenty of space for your **Home Partition**, which which where all your personal files will be stored.

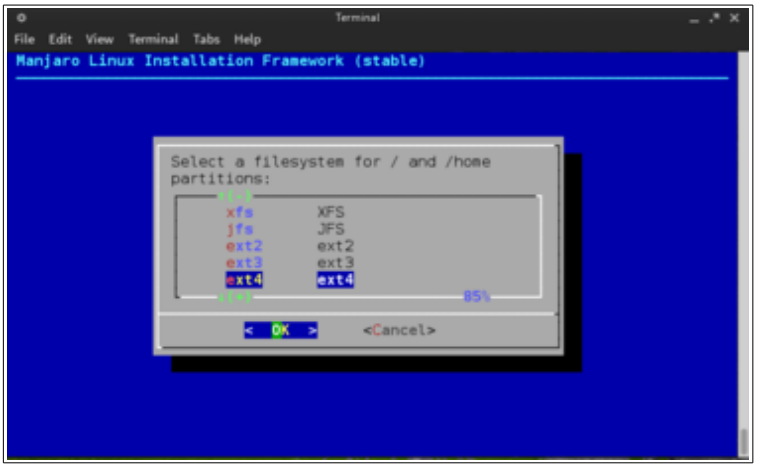
Once you have set the size of your Root Partition, press <enter> to continue.



Confirm the amount of hard disk space for the Home Partition. 15GB of 38GB hard-disk space has already been allocated to the Root partition, so the remaining 23,448MB (23GB) has been automatically allocated to the *Home partition*.

If you are not happy with the amount of space allocated, highlight **No** and press <enter> to go back. Otherwise, ensure that **Yes** is highlighted.

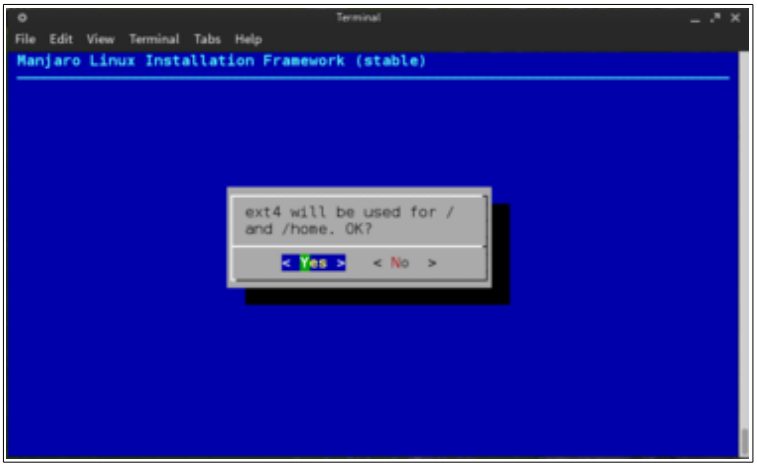
Press <enter> to continue.



Set the file system to manage your files.

Different file systems can handle different file sizes, numbers of files, and so on. If you are unsure which file system to choose, as illustrated, **it is recommend that you highlight ext4 as this is one of the latest and perhaps most widely used Linux file systems.**

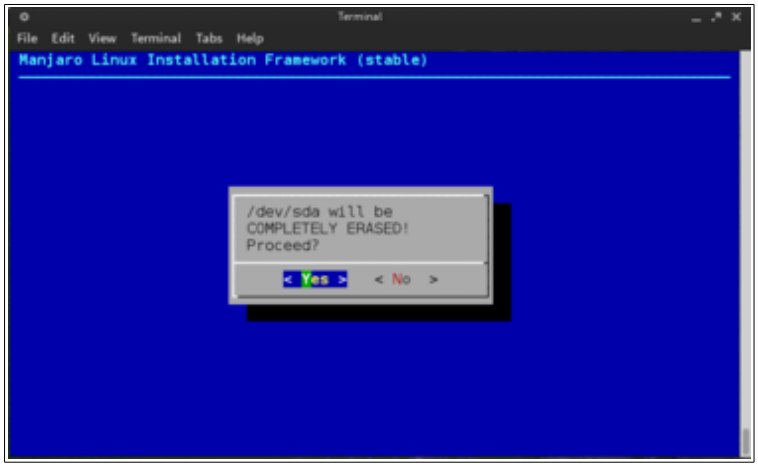
Press <enter> to continue



Confirm your selected file system.

If you wish to review or perhaps change your selection, highlight **No** and press <enter> to be taken back to the list of available file systems. Otherwise, ensure that **Yes** is highlighted.

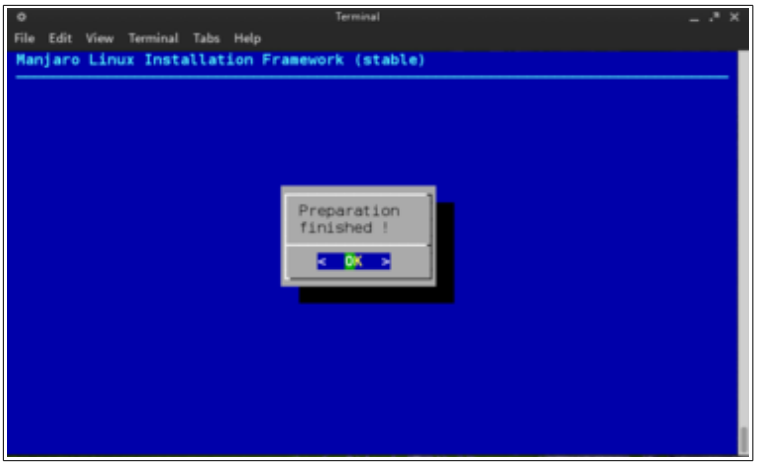
Press <enter> to continue.



Confirm that you wish to proceed with the assisted preparation.

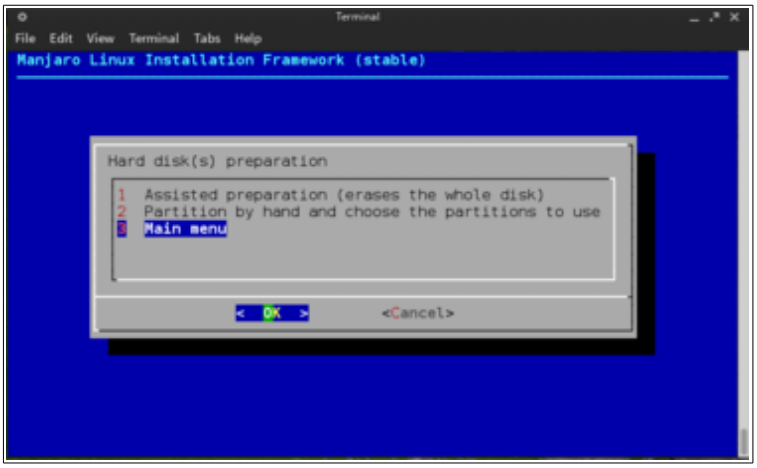
A warning will now appear that proceeding will result in your hard disk (referred to as /dev/sda) being completely erased. If you do not wish to continue, highlight **No** and press <enter> to be taken back to the hard disk preparation menu. Otherwise, ensure that **Yes** is highlighted.

Press <enter> to continue.



The installer will take a few moments to set up your hard disk (and in the process, completely erase any data that was previously stored on it). Once complete, the illustrated confirmation message will appear.

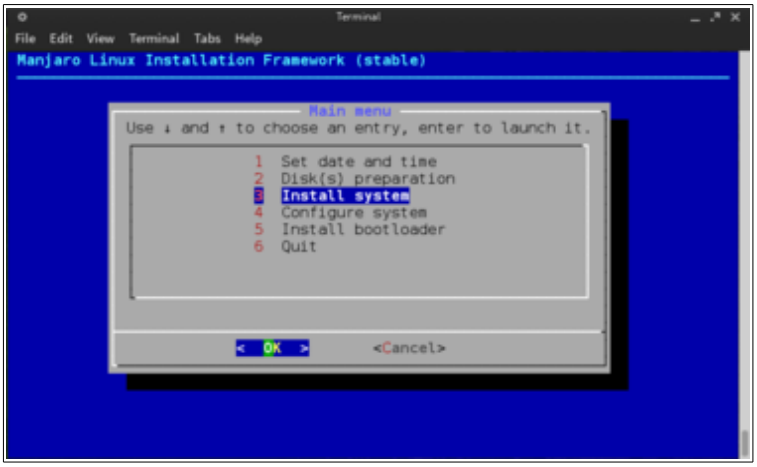
Press <enter> to confirm and to be taken back to the hard disk preparation menu.



Go back to the Main Menu.

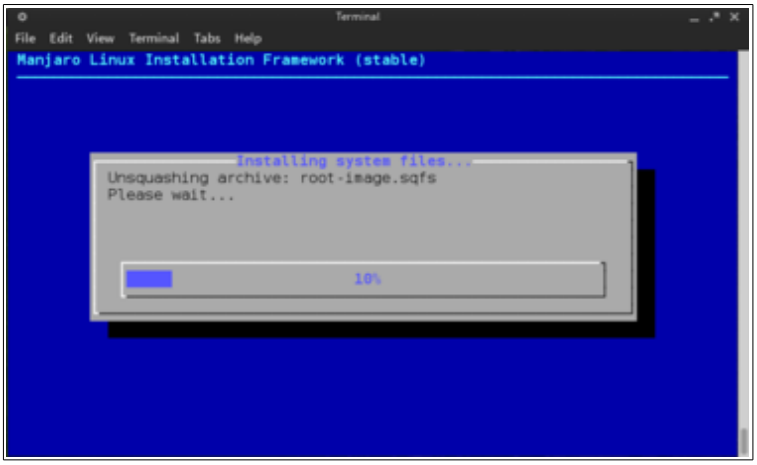
As this step has been completed, highlight **Main menu** and press <enter> to be taken back to the installer's main menu.

7.3 Installing Manjaro



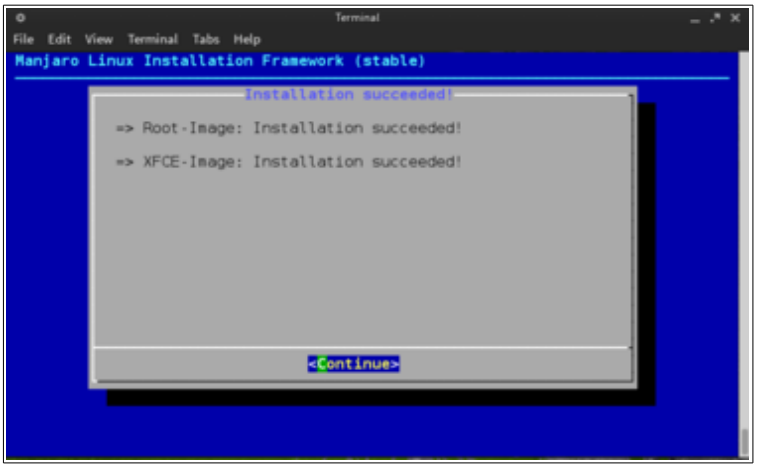
Ensure that **Install System** is highlighted.

Press <enter> to continue.



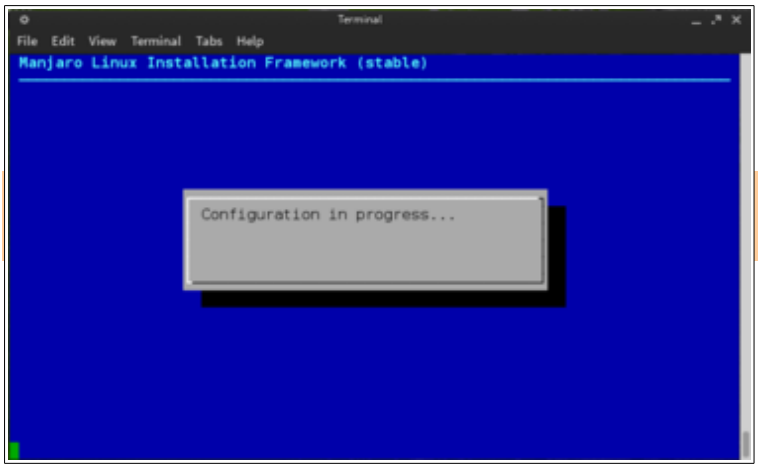
The installation process will start automatically.

A progress bar will be displayed to chart the progress of the installation itself.



After a few moments, a message will appear confirming Manjaro has been successfully installed.

Press <enter> to continue.

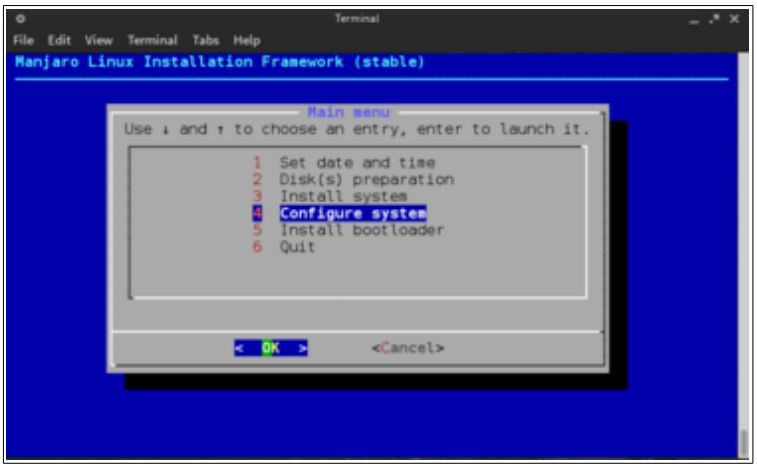


The installer will now automatically configure your system, detect your hardware, and install the appropriate drivers. It will also find the Manjaro servers from which you can download updates, software packages, and applications.

Warning: Manjaro will not be able to find the available servers unless you are connected to the internet.

Once complete, you will automatically be returned back to the installer's Main menu.

7.4 Configuring Manjaro

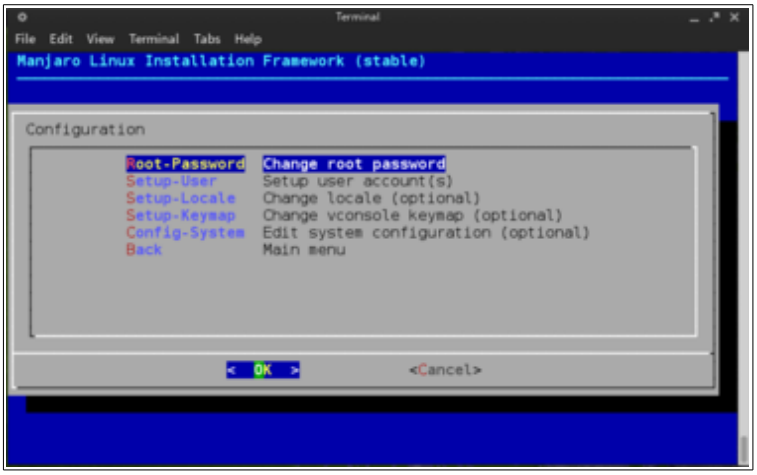


It will now be necessary to personalise Manjaro by configuring a few key things. Don't worry about this as there will be no need for any technical expertise or to manually edit any configuration files. The process will be quick and painless!

Ensure that **Configure System** is highlighted.

Press <enter> to continue.

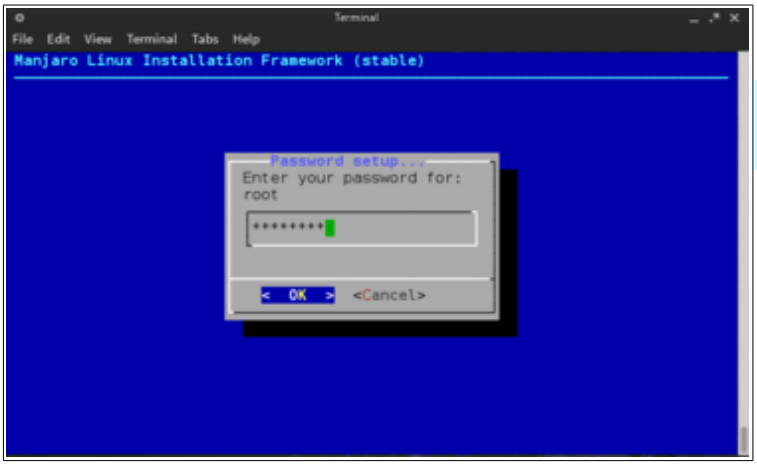
7.4.1 Root Password



Set the Root password. In a nutshell, Root is a standard user account included in Linux distributions by default that has full and unrestricted access to the system. A Root account is necessary to have in order to install, change, and remove system files.

Ensure that **Change Root Password** is highlighted.

Press <enter> to continue.



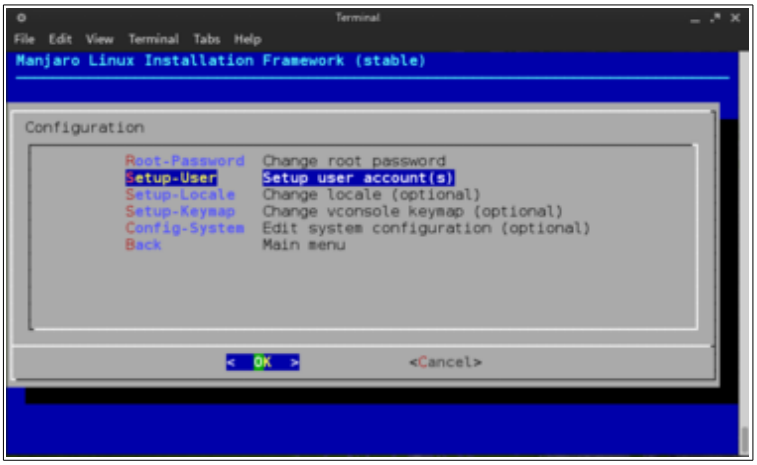
Type in your chosen Root password. You can enter just about anything you like.

Tip: Passwords will be case sensitive. To use the password later on, the upper and lower case letters will have to match exactly.

Once complete, ensuring that **OK** is highlighted, press <enter> to continue. You will then have to re-enter the Root password again to confirm it.

Press <enter> to continue.

7.4.2 User Account

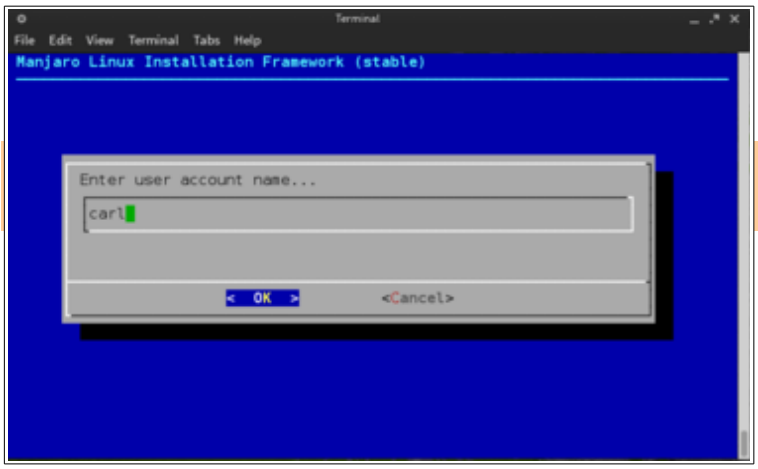


Set up your own personal user account.

To protect the system, you will not be expected to use the system as a Root user at all times. As such, you should also create your own personal account.

Ensure that **Setup user account(s)** is highlighted.

Press <enter> to continue.

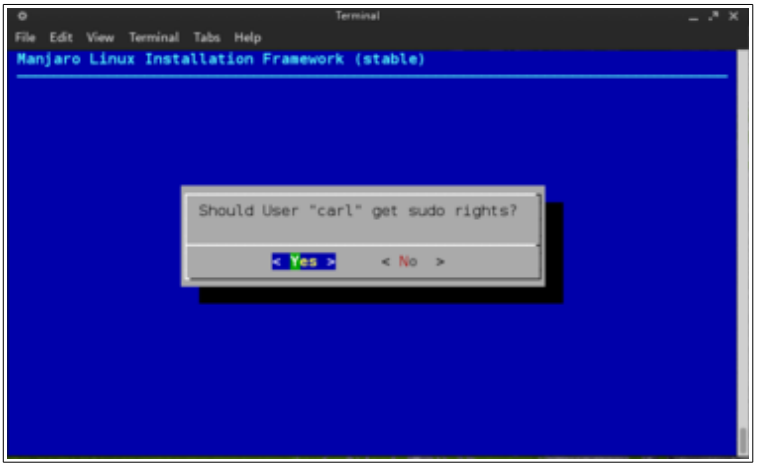


Type in your chosen account / login name. The default name is *manjaro*, which can be changed by deleting it and replacing it with your own. In this instance, the username *carl* has been entered.

Warning: Although you can enter almost anything you like, **ensure that any and all letters in the name are in lower case**.

When finished, ensure that **OK** is highlighted.

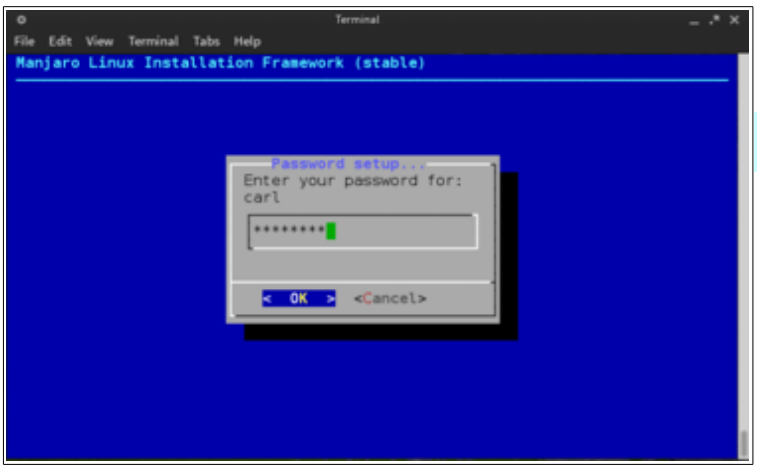
Press <enter> to continue.



Confirm that you wish to get sudo rights.

Sudo is short for '**S**uper **U**ser **Do**', and means that your own account will be granted the same system privileges as the Root account.

However, undertaking such tasks using your personal account will require you to enter your password to continue (to be set up next). Ensure that **Yes** is highlighted, and Press <enter> to continue.

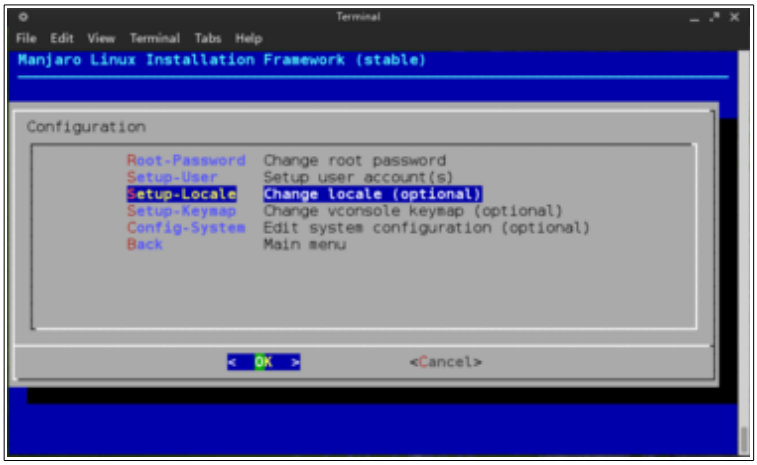


Type in your chosen password for your own personal account. Again, you can enter just about anything you like.

Tip: To keep things simple, you can just type the same password used for the Root account.

Once complete, ensuring that **OK** is highlighted, press <enter> to continue. You will then have to re-enter your password again to confirm it.

7.4.3 Set Locale (optional)

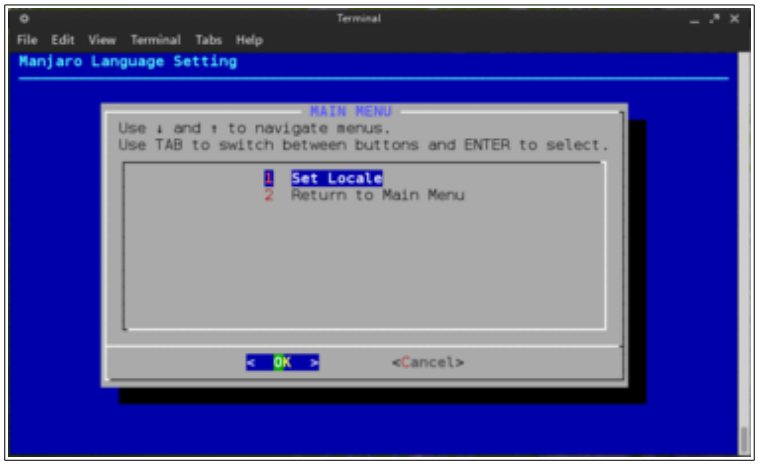


Set your preferred language.

If you were able to set your preferred language at the beginning, then you can skip this step.

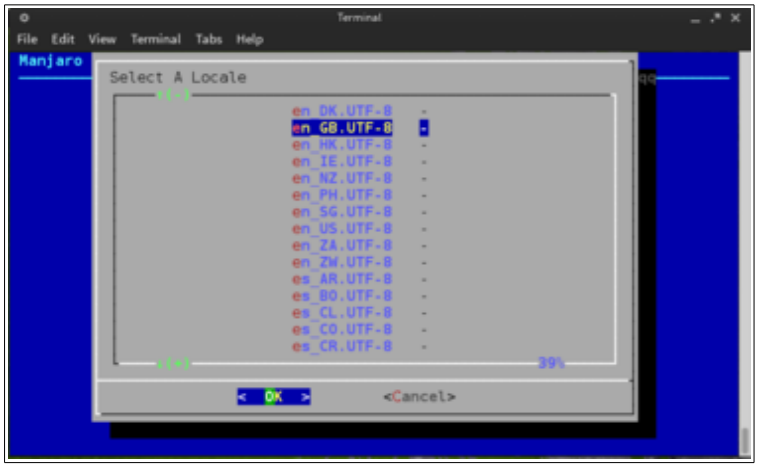
Otherwise, ensure that **Change locale (optional)** is highlighted.

Press <enter> to continue.



Confirm that you wish to set your preferred language by ensuring that **Set Locale** is highlighted.

Press <enter> to continue.

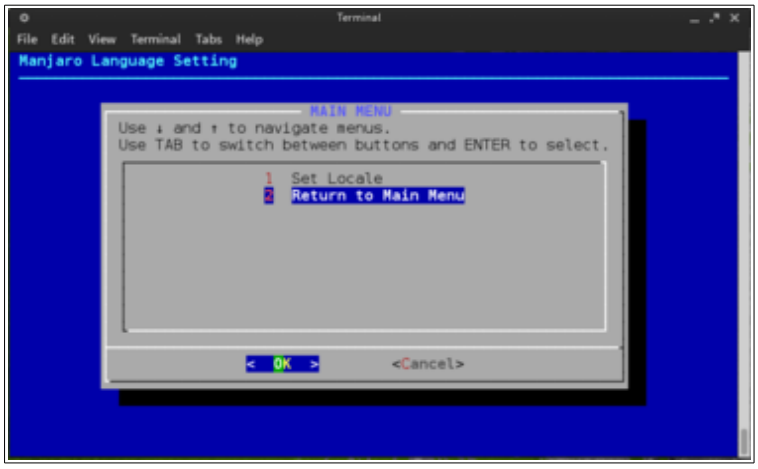


A list of codes will be presented. The lower case letters stand for the language, and the upper case letters stand for the country: language_COUNTRY.

For example, *en_GB* stands for **English, Great Britain.** The UTF-8 and ISO parts of each line are used by the system. **Try to pick a code that ends in UTF-8 if possible**.

Once you have highlighted your desired code, press <enter> to set it.

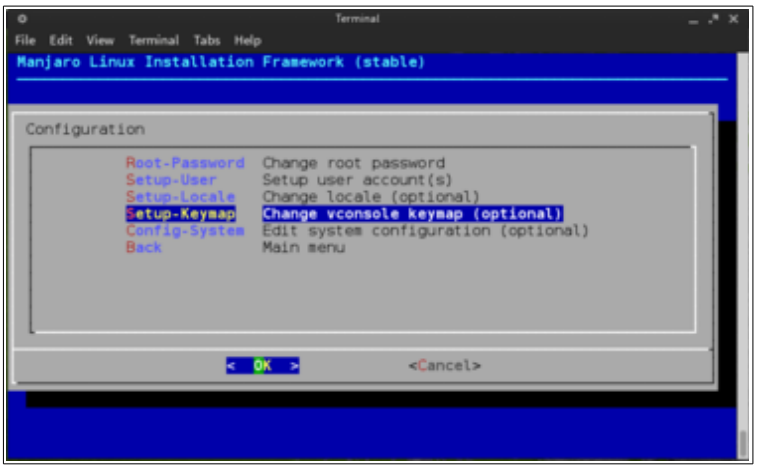
Tip: If you are not sure what code represents your language and country, a small selection of examples are available here: http://www.fincher.org/Utilities/CountryLanguageList.shtml (ignore the use of dashes '**-**'instead of underscores '_').



Return to the configuration menu my highlighting **Return to Main Menu**.

Press <enter> to continue.

7.4.4 Set Keymap (optional)

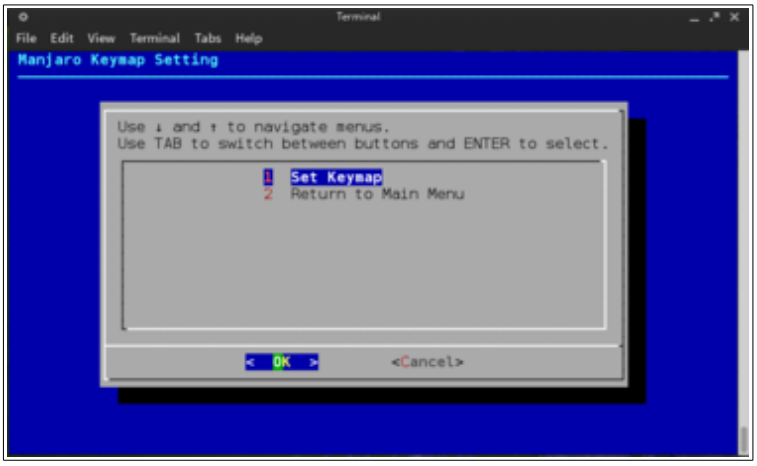


Set your preferred keyboard layout.

If you were able to set your preferred keyboard layout at the beginning, then you can skip this step.

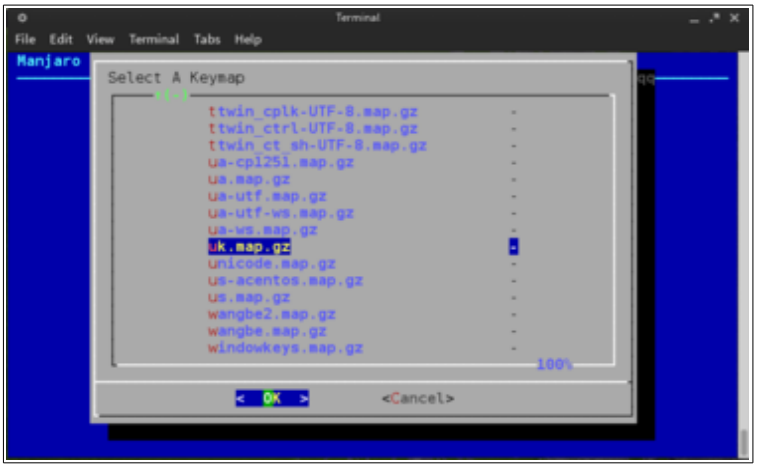
Otherwise, ensure that **Change vconsole keymap (optional)** is highlighted.

Press <enter> to continue.



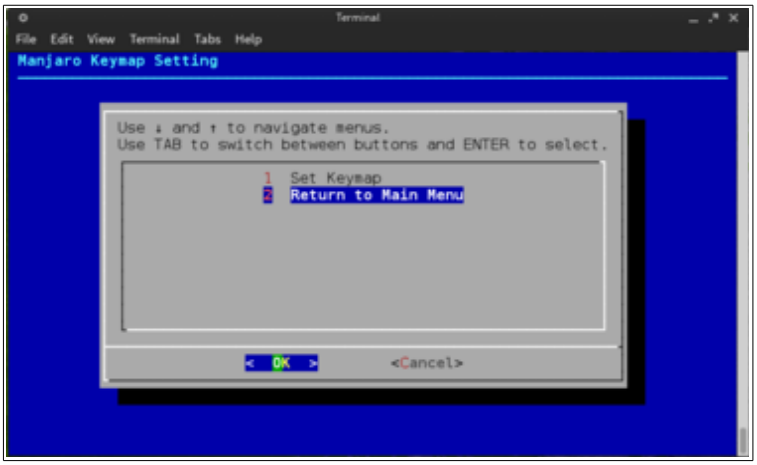
Confirm that you wish to set your preferred language by ensuring that **Set Keymap** is highlighted.

Press <enter> to continue.



If you do not know the necessary code for your keyboard layout, then it may be necessary to undertake an internet search to determine this. In this instance, for illustrative purposes, the code **uk.map.gz** has been selected, as this is the appropriate code for the keyboard layout used in the United Kingdom / Great Britain.

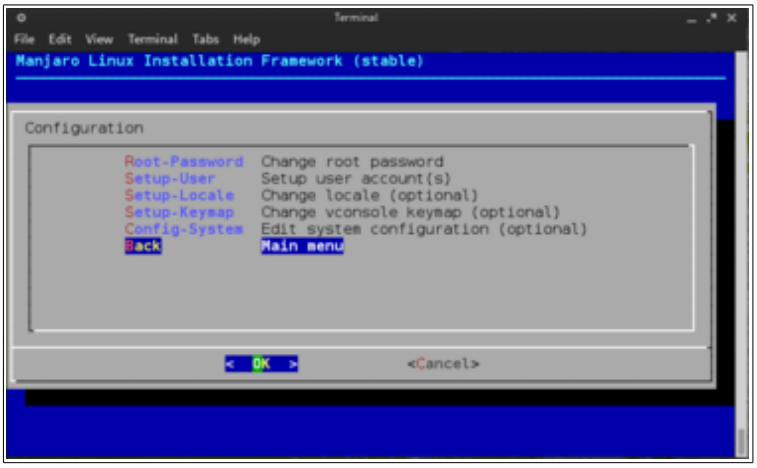
Once you have highlighted your desired code, press <enter> to set it and be taken back to the keymap menu.



Return to the configuration menu by highlighting **Return to Main Menu**.

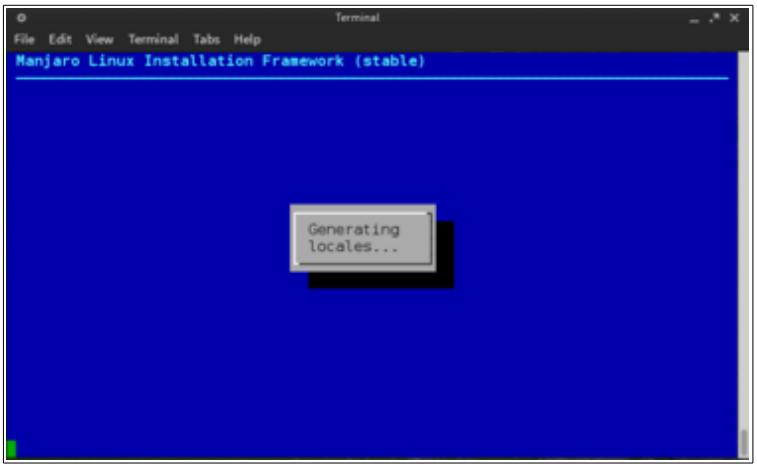
Press <enter> to continue.

7.4.5 Exit the Configuration Menu



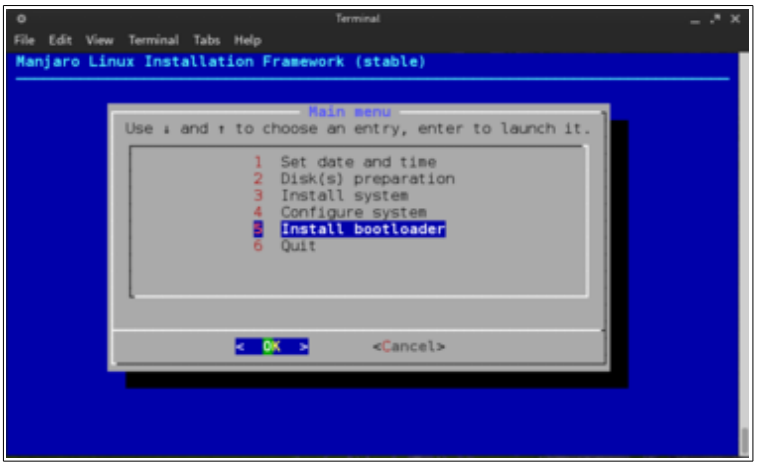
With the configuration complete, exit from the configuration menu by highlighting **Main Menu**.

Press <enter> to continue.



It will then be necessary to wait a few moments while the Manjaro installation is automatically configured according to your preferences. Once complete, you will automatically be taken back to the Main Menu.

7.5 Installing the Bootloader

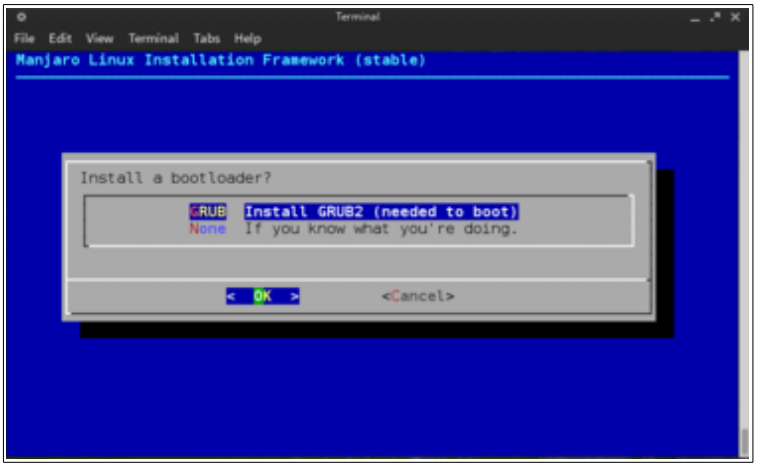


Finally, install the GRUB.

Again, the GRUB (**GR**and **U**nified **B**ootloader) is responsible for booting up (i.e. starting) Manjaro when you turn your computer on.

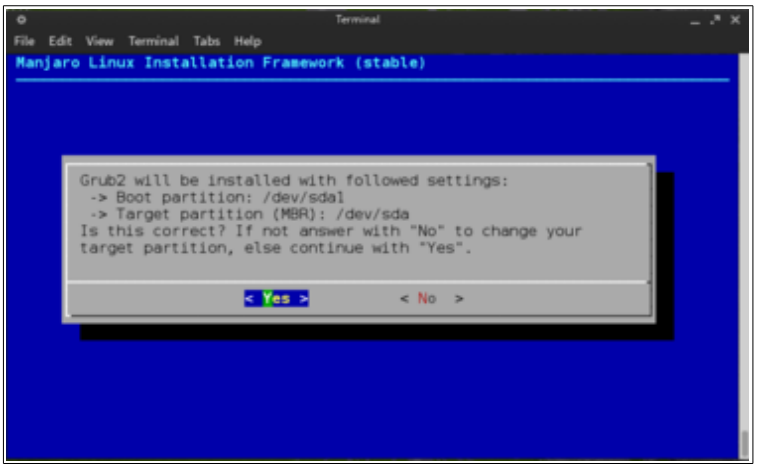
Ensure that **Install Bootloader** is highlighted.

Press <enter> to continue.



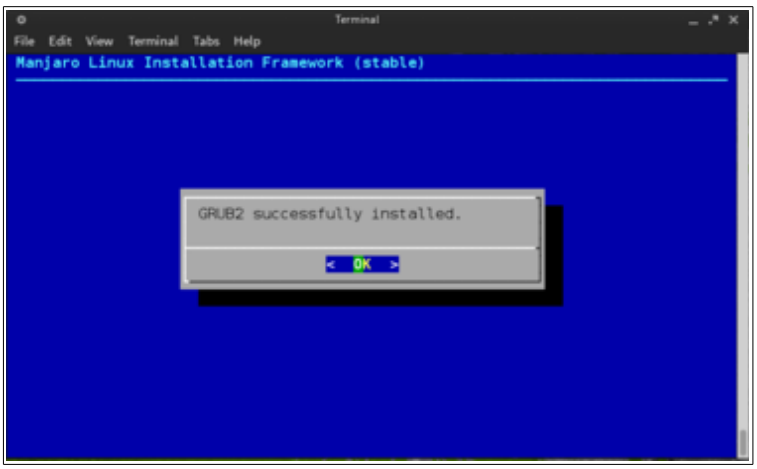
Ensure that **Install GRUB2 (needed to boot)** is highlighted.

Press <enter> to continue.



A confirmation message will appear, stating the target partition (place on your hard disk) where GRUB2 is to be installed. The default setting is fine.

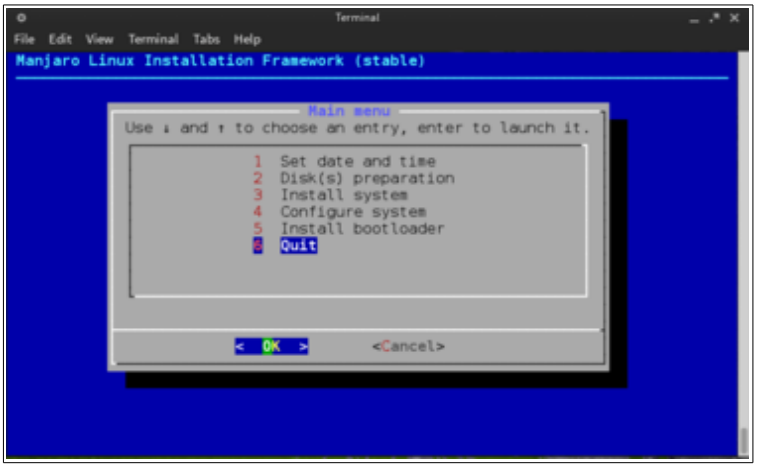
Press <enter> to start the installation.



A confirmation message will appear after a few seconds, stating that GRUB2 has been successfully installed.

Press <enter> to be taken back to the main installer menu.

7.5 Completing the Installation



All done - now highlight **Quit** to finish the installation!

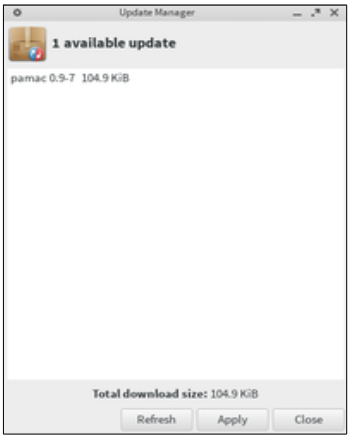
Press <enter> to continue.

The installer will then take a few moments to finalise the installation. A confirmation message will then appear, stating that the installation process has finished. The installer will then automatically close, and you will be returned to the desktop environment.

8. Welcome to Manjaro!

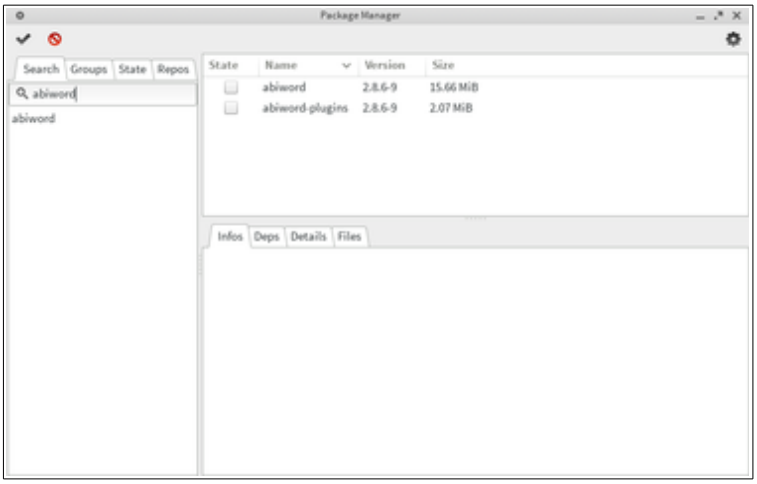
Here's a brief overview of the key points it is necessary to know in order to get the most out of using the Manjaro Linux operating system.

XFCE: Updates and Software Management



Developed exclusively by the Manjaro Team, the **Pamac Updater** will automatically check and notify you of any available system updates when launched.

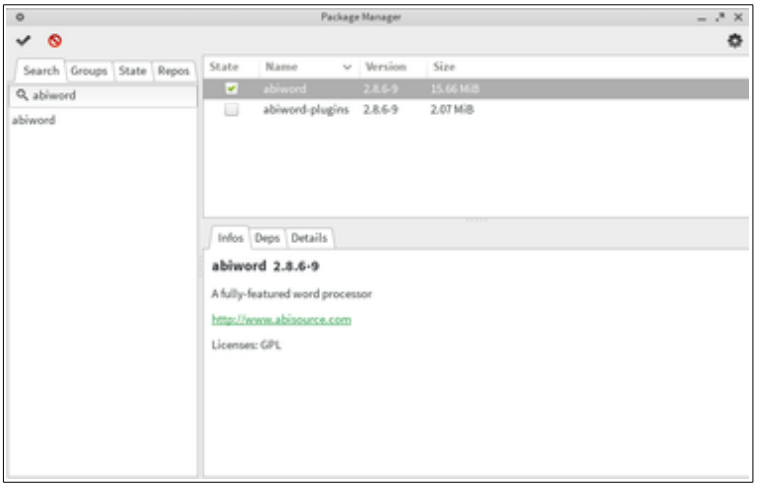
To install updates when listed, simply click the **Apply** button.



The Pamac Manager is a very simple yet powerful tool to add and remove software packages (e.g. applications) from your system.

Upon launching, it will automatically check the official Manjaro Repositories for new and updated software. Once complete, simply enter the name or short description of what you want to install or remove, and click the **Tick** button.

All installed and available software matching your search will then be displayed on the right. Click the name of any result to see more information about it immediately below.



A checkbox next to the package name will indicate whether it is installed or not.

To install a package, click the adjacent box to mark it.

To remove an installed package, click the adjacent box to clear it.

Once package boxes have been marked and/or cleared, you may undertake more searches before clicking the **Tick** button to conform your choice(s).

It's that simple!

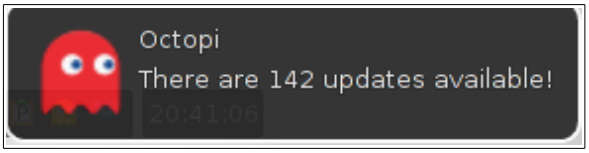
Particularly when installing new software applications, on occasion several other software packages will also be automatically installed as well. These are known as **dependencies**, as they are necessary for whatever is being installed to work properly. In other words, the software package being downloaded is *dependent* upon them.

Pamac will list the dependencies required for software packages in the information pane.

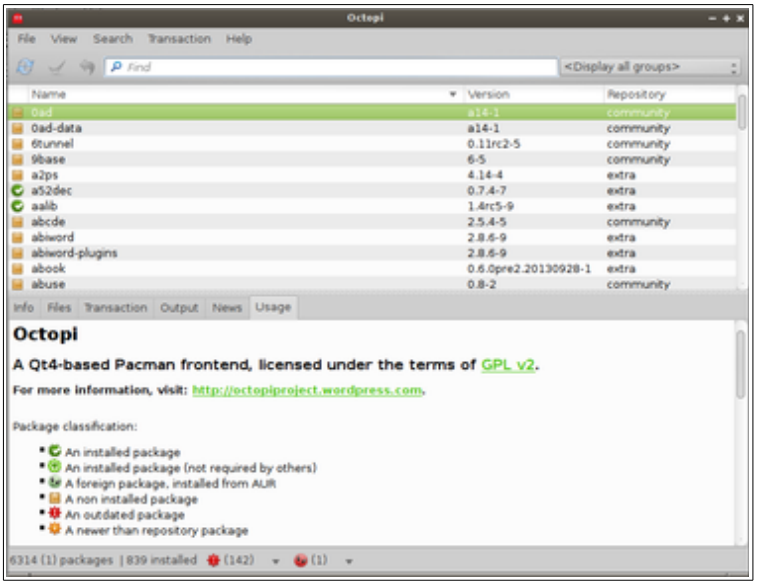
For example, if the *VLC Media Player* were to be installed, then several other software packages - such as to allow it to play different media formats - would also be automatically be downloaded if not already installed on the system. Without them, the Media Player would not be able to play certain media formats, or perhaps not be able to play anything at all!

Tip: You won't need to worry about dependencies yourself, as they will be automatically identified and downloaded for you when necessary.

Openbox: Updates and Software Management

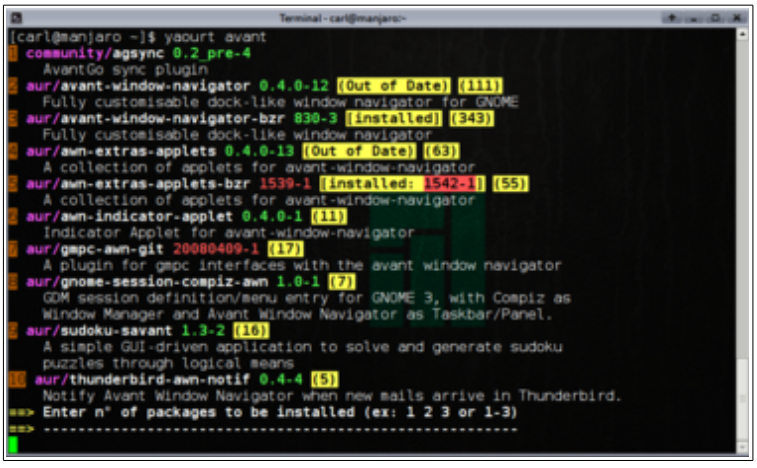


Openbox uses an application called **Octopi** for software updates and management. This may be installed via the “Drivers and Support --> Install Software manager” option in the desktop menu.



- **To install available updates** click the menu icon at the bottom of the application window (in this illustration, next to the red star), and then select **Install**.
- **To install a package** after searching, right-click the listed package (ins, and then select **Install**. Once done, then click the green tick icon at the top to confirm.
- **To remove a package** after searching right-click the listed package (installed packages will have a green icon with a tick next to them), and then select **Remove**. Once done, then click the green tick icon at the top to confirm.

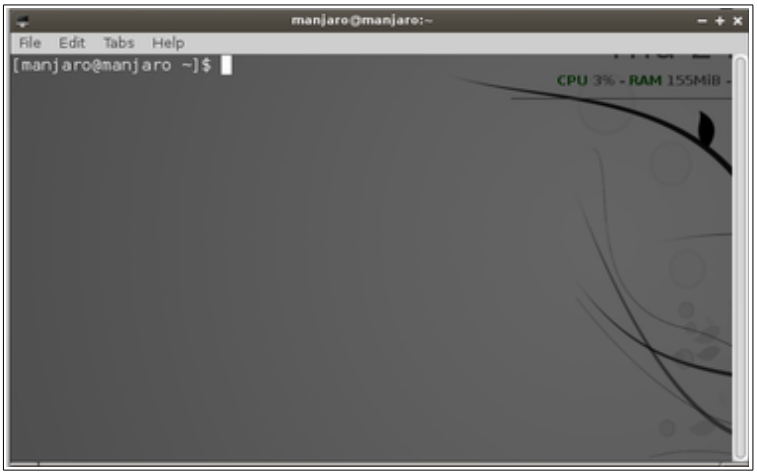
Arch User Repository (AUR)



Although Manjaro is 100% Arch compatible - being based on Arch itself - it is not possible access the official repositories of the Arch System to download software.

However, it is still possible to access additional software packages from the Arch User Repository (AUR), which is managed by the Arch community (i.e. users) themselves. Although this repository is unofficial, software packages first placed here are known to make their way into Arch's official repositories if they become popular enough.

Using The Terminal



In simple terms, a terminal (or console) is an interface that allows for text commands to be entered and displayed. As it is an exceptionally powerful and versatile tool to use, Arch and other Arch-based systems are notable for relying far more heavily on their use than other (user-friendly) distributions such as Ubuntu or Mint, which have placed a greater focus on the use of Graphical User Interfaces.

For users who wish to learn more about how Manjaro works, and for those who wish to take full advantage of its versatility, it is highly recommended to learn how to use the terminal.

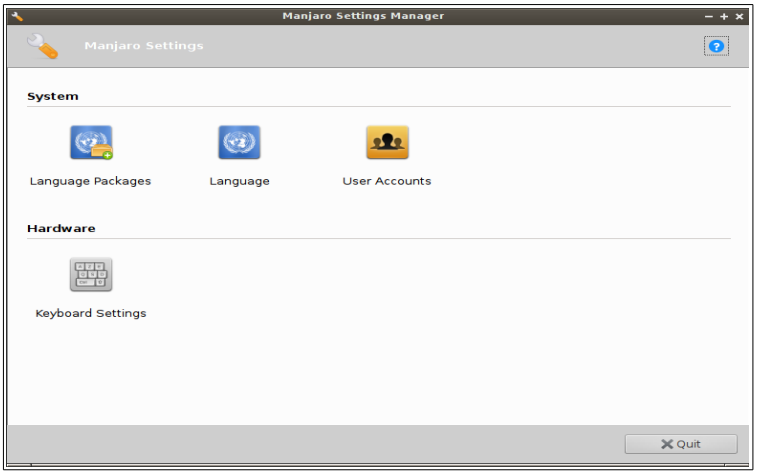
Using Multiple Kernels

A Linux kernel is the core of a Linux operating system, which acts as an interface between your computer's hardware and the applications that run on it.

Manjaro not only supports the use of multiple kernels (selectable from the boot screen), but allows easy access to the very latest bleeding edge kernels as well.

All available kernels installed on your system will be presented upon booting up, including backup copies of each kernel version installed.

Manjaro Settings Manager



The Manjaro Settings Manager provides a set of user-friendly tools to easily and quickly configure aspects of your system.

Presently, this includes adding/changing language support and keyboard layouts, as well as user accounts.

Still a work in progress, new features will also be added in the near future.

9. Accessing the Arch User Repository

Warning: Use the AUR at your own risk! Support will not be provided by the Manjaro team for any issues that may arise relating to software installations from the AUR.

Although Manjaro is 100% Arch compatible - being based on Arch itself - it is not possible access the official repositories of the Arch System to download software. Manjaro instead uses its own official repositories in order to ensure that any software packages provided (e.g. system updates and applications) have been fully tested and are completely stable before release.

However, it is still possible to access additional software packages from the *Arch User Repository* (AUR), which is managed by the Arch community (i.e. users) themselves. Although this repository is unofficial, software packages first placed here are known to make their way into Arch's official repositories if they become popular enough.
Unfortunately, as a community maintained repository, using the AUR does still present potential risks and problems. These include the AUR providing:

- Multiple versions of the same packages
- Out of date packages
- Broken or only partially working packages
- Improperly configured packages (e.g. unnecessary dependencies, and/or not downloading necessary dependencies)
- Malicious packages (although extremely rare)

As such, although much of the software packages provided by the AUR should work, do not expect the installation process to always be quite as straightforward as when using the official repositories. On occasion, it may be necessary to manually identify and install dependencies yourself after an aborted installation attempt, for example. In addition, there is no guarantee that any installed software will work properly, if at all.

9.1 The Necessary Software

64-bit versions of XFCE should already have the necessary software pre-installed. Otherwise, it will be necessary to consequently install special software in order to download from the AUR. T**o install this software in XFCE**, enter the following into a terminal (or search for them using your software manager):

sudo pacman -S autoconf automake binutils bison fakeroot flex gcc libtool m4 make patch yaourt

Openbox users may install AUR support through the “Drivers and Support” option in the desktop menu.

9.2 Searching For and Installing Software From the AUR

Tip: It is **strongly** recommended to first visit the AUR website and examine the relevant page(s) for any and all software intended to be installed. These pages contain comments from both existing users and package developers, which may provide valuable information (e.g. warnings and/or solutions to problems). The AUR website can be found here**.**

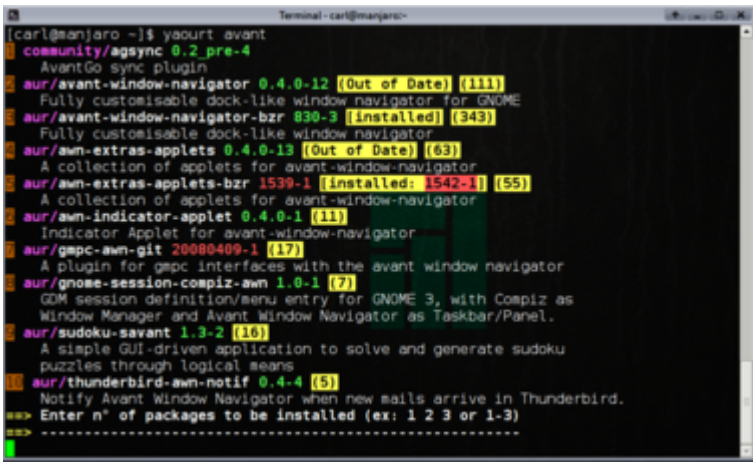
Yaourt must be used in the terminal, and is itself very similar to pacman to use. Furthermore, as with pacman, it is not necessary to specify precise or complete package names in order to search for or download software. For example, if wishing the download the *Avant Window Navigator* (a popular dock/toolbar), simply entering 'avant' will yield a list of potential matches to browse and select from. While the use of the *sudo* command is a convention when using pacman to install files (e.g. sudo pacman -S [software package name]), it is not necessary to use this with yaourt.

To search for and install software packages from the AUR, the syntax is:

yaourt [software package name]

For example, to search for the *Avant Window Navigator*, the following command would be entered:

yaourt avant



As illustrated, a search for the *Avant Window Navigator* undertaken has resulted in ten possible matches being listed. Any combination of listed packages can be downloaded by simply entering their numbers.

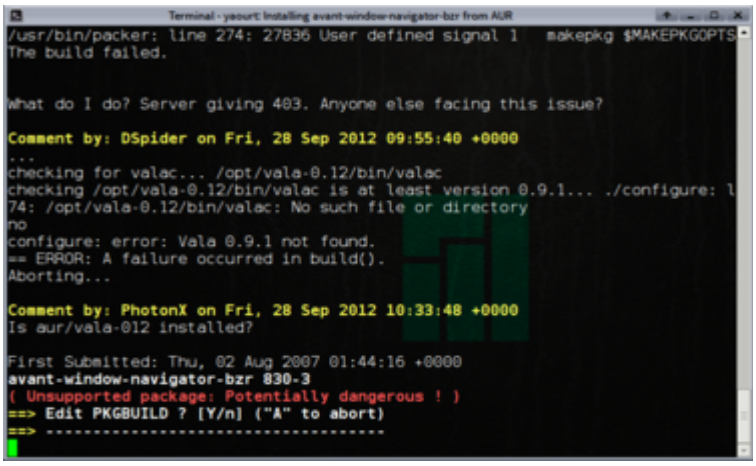
For example, entering **3** would install the package *avant-window-navigaor-bzr*. Adding **5** after this would also install extra applets for for this package:

==> Enter No of packages to be installed (ex: 1 2 3 or 1-3)

==> ----------

3 5

Tip: The numbers at the end of each line are user votes for each package. The higher the number, the more popular the package. Note that option '3' has the highest number of votes by far!



Once the number(s) of your chosen software package(s) have been entered, and the installation process has begun, user comments from the AUR website will also be displayed.

You may also be presented with a standard warning that the download package is unsupported and potentially dangerous.

You may also be asked if you wish to **Edit PKGBUILD**. Unless you know what you are doing, always type **n** for 'no' when asked.

The purpose of this option is to allow experienced users to inspect the instructions that will be used to build the package(s) to be installed. As dependencies may also have to be installed first in the process, it is possible to be prompted to edit these as well.

Although you should just keep entering 'no' to these prompts, be aware that you will also be prompted on occasion to continue the installation as well. **So make sure you read each prompt properly before entering anything,** else you could end up aborting the installation by accident!

10. Configuring Graphics Cards

Note: It will be necessary to manually enable catalyst drivers where using AMD cards. **In addition, it will also be necessary to run the appropriate command to install your graphics card in the Openbox flavour after installaition. This can be done AUTOMATICALLY via the “Drivers and Support” desktop menu option.**

Where installing the full version of Manjaro (i.e. complete with a pre-installed desktop environment, codecs, and software applications), the mhwd command will be automatically run by the CLI installer to automatically detect your graphics card and install the most appropriate driver for it. **Whether free or proprietary drivers are installed will depend on your initial choice of using free or nonfree graphics drivers to boot up**.

However, it is also possible to use the mhwd command to install drivers for graphics cards yourself, if desired.

10.1 Automated Installation Method

This is the recommended method for the detection and installation of graphics drivers. The syntax for the automated installation method is:

sudo mhwd -a [pci or usb connection] [free or nonfree drivers] 0300

A breakdown of the command used for the automated method is as follows:

• **-a**: Automatically detect and install the appropriate driver
• **[pci or usb]**: Install the appropriate driver for devices connected internally via pci, or externally via usb (again, mhwd currently only supports pci connections at this stage in its development)
• **[free or nonfree]**: Install either free drivers (e.g. provided by the Linux community), or nonfree drivers (e.g. provided by hardware manufacturers)
• **0300**: Identify that a driver is to be installed for a graphics card (0300 is the ID for graphics cards. As the mhwd command develops, new ids will be used for other hardware devices).

For example, the following command would result in the automatic detection and installation of the best available **proprietary driver** for a pci-connected graphics card:

sudo mhwd -a pci nonfree 0300

Otherwise, the following command would result in the automatic detection and installation of the best available **free driver** for a pci-connected graphics card:

sudo mhwd -a pci free 0300

10.2 Manual Installation Method

Taking a do-it-yourself approach is itself relatively easy and straightforward using the mhwd command. This should be undertaken in two stages:

1. Identify the appropriate driver to be installed, and then

2. Install the driver

Tip: Just ensure that you have identified and are indeed about to install the correct driver for your particular graphics card!

10.2.1 Identifying Available Drivers

Prior to manually installing a graphics driver, it will be necessary to identify what drivers are available for your system. To list the appropriate drivers available, the basic syntax is:

mhwd -l [optional: detailed view] [optional: --pci or --usb connection]

Using this command without the additional options will list basic information for all the available drivers for devices connected to your system. **All drivers graphics card drivers will have the prefix (video-) in their name**. The basic information provided for all listed drivers will be:

• Name
• Version
• Free or proprietary, and
• PCI or USB connection

A more detailed list of installed drivers can be obtained by entering:

mhwd -l -d

A detailed list will provide the following information:

• Name
• Version
• PCI or USB connection
• Description
• Priority
• Free or proprietary
• Dependencies
• Conflicts
• Class ID (e.g. '0300' for graphics card drivers), and
• Vendor ID

In addition, using the *–pci* filter in the following example will list detailed information for only the drivers available for devices (e.g. graphics cards) using an internal PCI connection:

mhwd -l -d --pci

10.2.2 Installing a Driver

To install a driver for a graphics card, the syntax is:

sudo mhwd -i pci [name of driver]

A breakdown of the command used to manually install a driver is as follows:

• **-i**: Install a driver
• **[pci]**: Install a driver for a device connected internally via pci (e.g. graphics cards)
• **[name of driver]**: The name of the driver to be installed

For example, to install the proprietary nvidia graphics card driver, the following command would be used:

sudo mhwd -i pci video-nvidia

10.2.3 Forcing the (re)Installation a Driver

Warning: use this command with care!

To force the (re)installation of a driver without removing what has already been installed first, the syntax is:

sudo mhwd -f -i pci [name of driver]

For example, to force the re-installation of a previously installed nvidia graphics card driver, the following command would be used:

sudo mhwd -f -i pci video-nvidia

10.3 Removing an Installed Driver

On occasion it may be necessary to remove an installed graphics card driver. Similarly to manually installing a graphics card driver, two steps should be undertaken for removal:

1. Identify the installed driver

2. Remove the identified driver

After all, it would be somewhat difficult to remove an installed driver if you don't know what it's called!

10.3.1 Identifying Installed Drivers

To identify and list Manjaro's installed drivers - including the graphics driver to be removed, the syntax is:

mhwd -li [optional: detailed view] [optional: pci or usb devices only]

Using this command without the additional options will list the basic information of all the drivers currently installed on your system. **Once again, all drivers for graphics cards will have the prefix (video-) in their name**. As with listing drivers available for your system, the *-d* option used in the following command will list detailed information:

mhwd -li -d

This information may prove useful to determine any otherwise unforeseen consequences or problems upon removing a driver. And again, it is also possible to filter your list of installed drivers by whether they are used on hardware connected via pci or usb. In this instance, a detailed list will be generated only for installed drivers used on hardware with a PCI connection:

mhwd -li -d --pci

10.3.2 Removing Installed Drivers

Warning: use this command with care!

To remove an installed driver, the syntax is:

sudo mhwd -r [pci or usb] [name of driver]

For example, to remove the installed driver for a nvidia graphics card (connected internally via pci), the following command would be used:

sudo mhwd -r pci video-nvidia

11. Manjaro Kernels

As the name would imply, as with the kernel of a seed, the Linux kernel is the core of a Linux operating system. Every other element of a Linux-based operating system is built around the kernel, which acts as an interface between your computer's hardware and the applications that run on it.

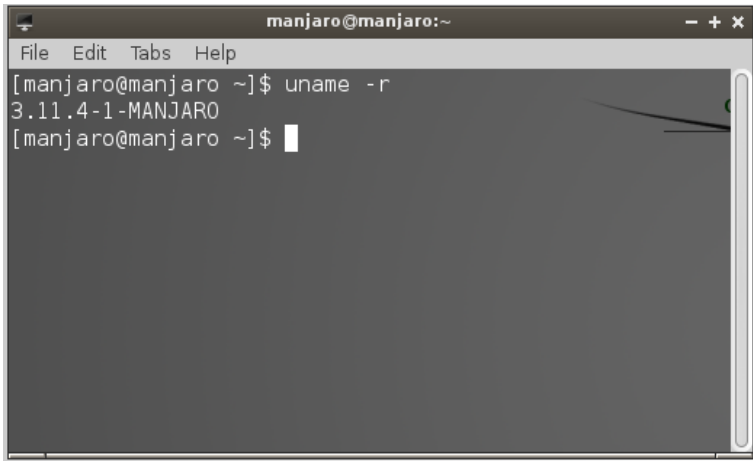
As hardware and software applications become more complex and sophisticated, so do the kernels to fully utilise them. As such, Linux kernels are continually under development, with new revisions and versions being regularly released. Further information on the very latest developments in kernel technology can be found at **The Linux Kernel Archives**

The first Linux kernel was originally developed by **Linus Torvalds**, the creator of Linux. As an open source project, although modern kernels now contain millions of lines of code generated by thousands of programmers, Linus Torvalds still has the final authority on their development and release.

11.1 Identifying the Kernel Being Used

If the existing Kernel being run in Manjaro is not immediately apparent, then it can be shown by opening the terminal and then entering the following command:

uname -r



As seen in this example, Manjaro is running kernel 3.11.4-1-MANJARO. The information given here is not arbitary; each part means something about the kernel:

- The 3 indicates the version
- The 11 indicates the major revision
- The 4 indicates the minor revision
- The 1 indicates bug fixing
- MANJARO indicates the specific distribution it is used for

11.2 Adding New Kernels

Tip: mhwd-kernel will automatically update a newly installed kernel with any modules currently used in your existing kernel. For example, if you were to update from kernel 3.5 to 3.6, mhwd-kernel would automatically update 3.6 with any and all modules present in 3.5. How about that!

Manjaro not only supports the use of *multiple* kernels (selectable from the boot screen), but allows easy access to the **very latest *bleeding edge*** kernels as well. This is undertaken through use of Manjaro's own *MHWD-kernel* (Manjaro Hard-Ware Detection) command. The syntax of the command is as follows:

sudo mhwd-kernel -i [new kernel: linux(version)] [optional- remove current kernel: rmc]

When listing a new kernel to be installed in the command, it is not necessary to write the entire version number. For example, any version of Kernel 3.10 can be listed simply as 'linux310', and any version of Kernel 3.11 can be listed as 'linux311', and so on.

The optional **rmc** (**r**e**m**ove **c**urrent) component is of vital importance. Using this will result in your existing kernel being deleted upon the installation of the new kernel. Otherwise, if it is not used, then the existing kernel will be kept, and will be selectable alongside the new kernel at the boot screen.

It is recommended - especially if updating to the latest bleeding edge kernel - to keep your old one, even if only for a short time afterwards. This the safer option, and the old kernel can be easily removed when satisfied with the stability and functionality of the new one.

As an example, once the terminal is opened, the following command will install a new kernel (3.10) **without deleting the existing kernel currently being used**:

sudo mhwd-kernel -i linux310

Otherwise, the following command will install a new kernel (3.4) to replace the existing kernel, **which will be deleted**:

sudo mhwd-kernel -i linux10 rmc

Either way, Manjaro will automatically configure the new kernel for you, ready for immediate use. Once completed, close the terminal and re-boot the system for the change to take effect.

11.3 Removing Kernels

Warning: DO NOT attempt to delete an existing kernel while it is actually being used by Manjaro at the time. You can first identify what kernel is running on your system by using the command **uname -r** in the terminal (see above).

Where multiple kernels are present on your system, *pacman* can be used to remove them in the terminal. It may be necessary to delete a total of three elements of the kernel in total to completely remove it:

1. The kernel itself
2. The kernel's headers
3. The kernel's extra modules

Whether or not the headers and extra modules must be deleted depends on whether or not they have been installed. The syntax of the pacman command to remove a kernel is as follows:

1. **To delete a kernel**, the syntax is:

sudo pacman -R linux[version]

For example, to delete kernel version 3.10 from the system, the following command would be entered:

sudo pacman -R linux310

2. **To delete a kernel's headers**, the syntax is:

sudo pacman -R linux[version]-headers

For example, to delete the headers of kernel version 3.10 from the system, the following command would be entered:

sudo pacman -R linux310-headers

3. **To delete a kernel's extra modules**, the syntax is:

sudo pacman -R linux[version]-extramodules

For example, to completely remove all elements of kernel version 3.10, the following command would be entered:

sudo pacman -R linux310-extramodules

4. **To delete all elements of a kernel at the same time** - where they are all present on your system - the syntax is:

sudo pacman -R linux[version] linux[version]-headers linux[version]-extramodules

For example, to completely remove all elements of kernel version 3.10, the following command would be entered:

sudo pacman -R linux310 linux310-headers linux310-extramodules

Please note however, that attempting to delete multiple elements at once if they are not present on your system will result in an error message before the operation itself is aborted. It is also worthwhile noting if Manjaro is being run in a virtual machine (e.g. Oracle Virtualbox), you may not be able to delete certain kernels if they contain elements important to the virtualisation process itself.

11.4 Selecting Kernels

All available kernels installed on your system will be presented upon booting up. As illustrated, this includes backup copies of each kernel version installed (which will also be automatically removed if or when a kernel version is deleted).

To select a kernel, simply use the arrow keys to highlight the desired version, and then press <enter>.

Where a selection is not made, Manjaro will usually automatically select a kernel version after waiting five seconds for a key entry. The version automatically selected will usually be the one used previously.

12. Enabling Printing Capabilities

Note: This should already be enabled in XFCE. Openbox users can easuly enable printing support through the “Drivers and Support” desktop menu option.

Printing is undertaken through the use of CUPS (previously an acronym for **C**ommon **U**nix **P**rinting **S**ystem). This is a popular open source printing system used in most Linux distributions due to its ease of use. As stated by Wikipedia:

> *'CUPS consists of a print spooler and scheduler, a filter system that converts the print data to a format that the printer will understand, and a backend system that sends this data to the print device. CUPS uses the Internet Printing Protocol (IPP) as the basis for managing print jobs and queues.*'

Several software packages must be installed in order to enable *full and comprehensive* printing capabilities on your system. Particularly to assist new users, it is possible in Manjaro to install everything that is required with just a single command. However, once the necessary software packages have been installed, it will then also be necessary to actually enable printing capabilities as well.

12.1 Installing the Printer Software

To just install the necessary software packages, enter the following command:

sudo pacman -Sy manjaro-printer

12.2 Enabling Printing

Once the necessary software has been installed, to enable printing capabilities, enter the following command:

sudo systemctl enable cups.service

Once printing has been enabled, in order to start doing so immediately without rebooting, input the command:

sudo systemctl start cups.service

12.3 Disabiling Printing

If for any reason you wish to disable CUPS (e.g. in order to use an alternative printing system), open your terminal and enter the following command:

sudo systemctl disable cups.service

13. Pacman

Pacman is a **pac**kage **man**ager developed specifically for use in Arch Linux. It is used to install, upgrade, configure and remove software (i.e. to manage software packages). Pacman is used through typing commands terminal; all the commands listed below to undertake various tasks assume that you have your terminal open.

13.1 Updating the System

Tip: This should be the first thing you do after installing Manjaro!

To update your system, enter the following command in the terminal:

sudo pacman -Syu

13.2 Synchronising With the Manjaro Repositories

Your Manjaro system has a database of all the software packages (e.g. system updates and applications) that are available from the official repositories. This is used to help pacman locate and download these packages for installation.

When updating your system, its database will automatically be refreshed as well. However, using this command is more thorough, as rather than just refreshing or updating the database, it will actually rebuild it completely. To synchronise your database with the Manjaro repositories, enter the following command in the terminal:

sudo pacman -Syy

To simultaneously synchronise with the repositories **and** update your system, enter the command:

sudo pacman -Syyu

13.3 Searching for Software

It is also possible to use pacman to search Manjaro's software repositories for any desired software, provided you know the name of what you want. To search for a software package, the basic syntax is:

sudo pacman -Ss [Software Package Name]

For example, to search the repositories to see if a text editor called Leafpad is available, the following command would be entered:

sudo pacman -Ss leafpad

13.4 Installing Software

To install a software package, the basic syntax is:

sudo pacman -S [Software Package Name]

For example, to download and install leafpad, the following command would be entered:

sudo pacman -S leafpad

Tip: many software packages (especially complex applications) will require other software packages - known as *dependencies* - to also be downloaded and installed in order to work. Fortunately, pacman will automatically detect and install these for you.

13.5 Removing Software

To remove a software package, the basic syntax is:

sudo pacman -R [Software Package Name]

For example, to remove the software application Leafpad, the following command would be entered:

sudo pacman -R leafpad

It is also possible to remove package and its dependencies, provided those dependencies are not being used by any other packages. Deleting dependencies exclusive to a certain package is wise, as once the main package is removed, they will become *orphans*, serving no other purpose than to clutter up your system. To do so, enter the following command:

sudo pacman -Rs [Software Package Name]

However, Pacman usually also creates backup configuration files when deleting packages. As such, for a more thorough (and cleaner) removal (ie. the package, its dependencies, and any configuration files usually generated by pacman) enter the following command:

sudo pacman -Rns [Software Package Name]

13.6 Learning Pacman's Options

It is a very good idea to become familiar with the varied and powerful uses of pacman. A comprehensive list of options that can be used with pacman can be found by entering the following command:

man pacman

To exit out of the list, simply press **q**.

14. Changing Servers

The official Manjaro repositories (also known as *mirrors*) are hosted on *Software Servers*. Physically located throughout the world, these servers are responsible for receiving requests for software packages via the terminal and/or the software managers, and consequently delivering them to your system. There are therefore three primary factors that will determine how fast your downloads are:

•Your internet connection
•The speed of the server itself, and
•The proximity of the server to you (i.e. how close or how far away it is)

Barring upgrading your internet package or switching providers, it is therefore potentially possible to improve the speed of downloads from the Manjaro repositories by selecting a different server to use. The easiest way to do this is to enter the following command into the terminal:

sudo pacman-mirrors -g

This will automatically find and set the available servers for you in order of speed.

However, it is also possible to manually switch between available servers if you wish.

14.1 Step 1: Changing Servers

Tip: More than one server can be enabled. However, they will be selected in the order they are listed, and *pacman* will only select another server if there is a problem with the one before it.

This is undertaken by amending the **mirrorlist** file, which is used by Manjaro's package manager – pacman - to tell it the internet addresses of the Manjaro servers in order to download updates and software applications from them.

14.1.1 Open the Mirrorlist

You will need to first open your terminal in order to edit the mirrorlist file. The syntax of the command to edit the mirrorlist is:

sudo [text editor] /etc/pacman.d/mirrorlist

For example, if you wish to edit the file within the terminal using *nano* (a standard terminal-based text editor) then enter:

sudo nano /etc/pacman.d/mirrorlist

Otherwise - if you have installed the full version of Manjaro (i.e. not the NET-Edition) - you may find it easier to use the pre-installed *gedit* text editor instead. This will open the mirrorlist file up as a document, making it easier to read and edit. To use gedit instead, the command is:

sudo gedit /etc/pacman.d/mirrorlist

14.1.2 Edit the Mirrorlist

Lines beginning with a hash '#' will be ignored by pacman. In the example below, only the UK server has had the hash removed, and as such, this is the only server that has been enabled for use:

```
##
## Manjaro Linux repository mirrorlist
## Generated on 09 October 2013 20:09
##
## Use pacman-mirrors to modify
##

## Location  : Netherlands
## Time      : 0.090
## Last Sync : 3:14
## Server = http://ftp.nluug.nl/pub/os/Linux/distr/manjaro/stable/$repo/$arch

## Location  : United_Kingdom
## Time      : 0.104
## Last Sync : 0:14
Server = http://manjaro.mirrors.uk2.net/stable/$repo/$arch
```

The UK Server can therefore be disabled by simply placing a hash at the beginning of the **Server=** line. Another Server can be enabled in turn by removing its hash at the beginning of the appropriate line. In the instance below, the Netherlands server has been enabled:

```
##
## Manjaro Linux repository mirrorlist
## Generated on 09 October 2013 20:09
##
## Use pacman-mirrors to modify
##

## Location  : Netherlands
## Time      : 0.090
## Last Sync : 3:14
Server = http://ftp.nluug.nl/pub/os/Linux/distr/manjaro/stable/$repo/$arch

## Location  : United_Kingdom
## Time      : 0.104
## Last Sync : 0:14
## Server = http://manjaro.mirrors.uk2.net/stable/$repo/$arch
```

Warning: Do not remove hashes from any lines that list the names of the server countries.

Once you have disabled and/or enabled the desired server(s), save the changes and close the mirrorlist by:

- **nano**: Press CTRL and 'x' to exit, 'y' to save, and <enter> to finish, or
- **gedit**: Select the 'save' option and then close the window.

All that is required now is to Synchronise with the newly enabled server(s).

14.2 Step 2: Synchronising with the Newly Enabled Server(s)

Your Manjaro system has a database of all the software packages that are available from the official repositories. These are used by pacman to locate and download them for installation. Synchronising your database after changing servers will therefore ensure that it is up to date, and avoid any potential problems when subsequently downloading software packages.

To synchronise your database with the Manjaro repositories, enter the following command in the terminal:

sudo pacman -Syy

Once the Mirrorlist has been amended and the database synchronised, the change will be immediate. There will be no need to reboot your system for the change to take effect.

Appendix A: If Your Screen is Too Dim

Some people - particularly those using laptops - are encountering a problem where the screen brightness is too dim upon replacing Microsoft Windows with a Linux distribution as their main operating system. Although it affects all Linux distributions, the problem is actually due to the computer's BIOS settings. Certain hardware manufacturers have set it up so that if Windows is not detected running on their systems, the backlight is automatically disabled.

This problem can be easily fixed by ensuring that the GRUB bootloader re-activates the backlight. To do this, first open up your terminal, and enter the following command (all one line):

sudo sed "s/\(GRUB_CMDLINE_LINUX=\)\"\"/\1\"acpi_osi=Linux acpi_backlight=vendor\"/" /etc/default/grub -i

You will also have to enter your password to continue. Now enter the second and final command:

sudo update-grub

Once complete, close the terminal and re-boot your system for the changes to take permanent effect. **A Youtube video tutorial is available here.**

Appendix B: Manjaro FAQ

General Linux

What is Linux?

Linux is an open-source operating system, meaning that it is completely free to use and free to distribute. Originally developed in 1991 by Finnish Programmer Linus Torvalds , Linux is an exceptionally robust and reliable system most commonly used for internet servers, mobile phones, and tablets (e.g. Android). However, the use of Linux as an alternative operating system for personal computers has also been growing over the years, with several million users having already discovered the benefits of it.

What are the benefits of using Linux?

There are quite a few. Linux is free, highly efficient, and very fast; The 64 bit version of Manjaro with the XFCE desktop boots up in only a few seconds, and uses only 200MB of memory to run. Linux systems are also very secure, and are not affected by the huge amount of Windows viruses, trojans, worms, or malware out there. Anti-virus software is not required. And as for the tens of thousands of software applications available - including fully compatible equivalents of popular Windows software such as MS Office - these are also completely free. It is also possible to easily run many popular Windows applications on Linux using compatibility software such as *Wine/PlayonLinux*. The examples given here are *far* from comprehensive!

Why is Linux free? What's the catch?

There isn't one. Linux operates on a completely different philosophy than those of for-profit corporations such as Microsoft and Apple. Linux systems and software applications are funded through sponsorship, donations, and of course, the hard work of many, many enthusiasts. Linux has a dedicated and highly enthusiastic fan-base for a very good reason.

Why are there so many different Linux distributions?

Different Linux distributions (i.e. operating systems) have been developed for different types of users, for different purposes, and for different hardware capacities. For example, distributions such as *Mint* or *Zorin* are specifically designed to apply to newcomers or those without technical expertise. At the other end of the scale, distributions such as *Arch* are designed for computer enthusiasts. Manjaro is designed to bridge that gap. Different **flavours** of a distribution means it comes with different desktop environments - you're rarely if ever stuck with whatever desktop comes pre-installed.

What is the difference between cutting edge and bleeding edge technology?

Generally speaking, *cutting edge* refers to the latest technology that has finished development and has been fully tested. *Bleeding edge* technology is that which has not finished development and/or is still undergoing testing. The use of bleeding edge technology therefore carries the risk of being unreliable or unstable.

Manjaro Specific

Is Manjaro just an easy-to-install version of Arch?

No. Manjaro is not like other Arch-based distributions such as *Archbang* or *Bridge Linux*, which are. While there are numerous subtle differences between Manjaro and Arch, the most obvious examples - including the use of our own dedicated software repositories.

Can Manjaro use the Arch Software Repositories?

No. Manjaro is configured to use its own dedicated software repositories, although you can still access the community-maintained Arch User Repository (AUR) for additional software, if you wish. In addition, if you want to access the very latest *bleeding-edge* software, Manjaro's own testing and unstable repositories are also available.

Can Manjaro be converted into a full Arch system?

No. Manjaro can no more be converted into Arch than Ubuntu can be converted into Debian.

What is the Manjaro Forum like?

Very friendly! Both newcomers and experienced users are more than welcome to participate, ask questions, and just talk to other members of the Manjaro community, as well as the developers themselves. You don't even have to register to post on the forum. Even though Manjaro is a new distribution, there are already many dedicated Manjaro Community members who will be more than happy to answer your questions and help you out.

How is 'Manjaro' Pronounced?

It's pronounced 'Manjaro'! As in *Mount Kilimanjaro*, which was the inspiration for the name. Man-ja-ro.

Appendix C: Useful Links

Manjaro Homepage

For the latest news, developments, download links, contact details, and more!

http://blog.manjaro.org/

Manjaro Forum

Read and participate in our active form – everybody's welcome!

http://forum.manjaro.org/index.php

Manjaro Wiki

Beginner-friendly guides are available to help you use the system and to solve problems.

http://wiki.manjaro.org/index.php/Main_Page

For Philip Müller – a wonderful friend and mentor

Carl Duff