The Complete Architect Installation Guide

By

Chris Titus

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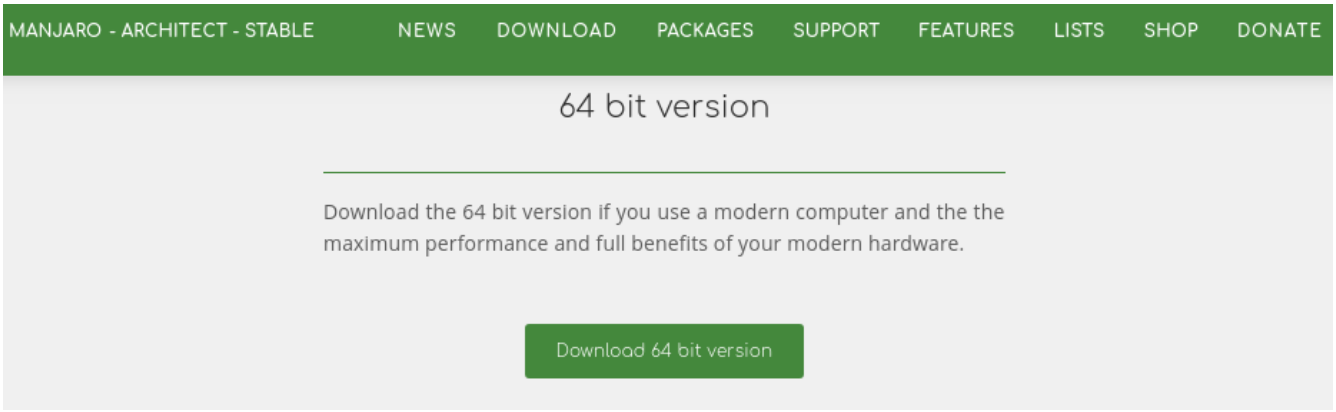
This guide was funded by the patrons of the Chris Titus Tech YouTube channel. I created this as a way for a beginner to not only install their own architect version of Manjaro, but be able to better understand the logical steps to create a Linux Distribution.

This is inteded for a beginner, but can be very useful to all as a resource to explore the Manjaro Architect Edition.

Links

- https://www.christitus.com - Official website
  - This has solutions I've documented since 2010 in business
- https://www.reddit.com/r/ChrisTitusTech/ - Official Reddit
  - This is a great resource if you need Linux help
- https://github.com/ChrisTitusTech – Official GitHub
  - Has scripts and other projects I have worked on
- https://www.youtube.com/c/ChrisTitusTech – Official YouTube
  - All my video guides, news, and tutorials
- https://www.patreon.com/christitustech – Patreon Website
  - Behind the scenes, reddit flair, direct chat, and roadmaps

Download

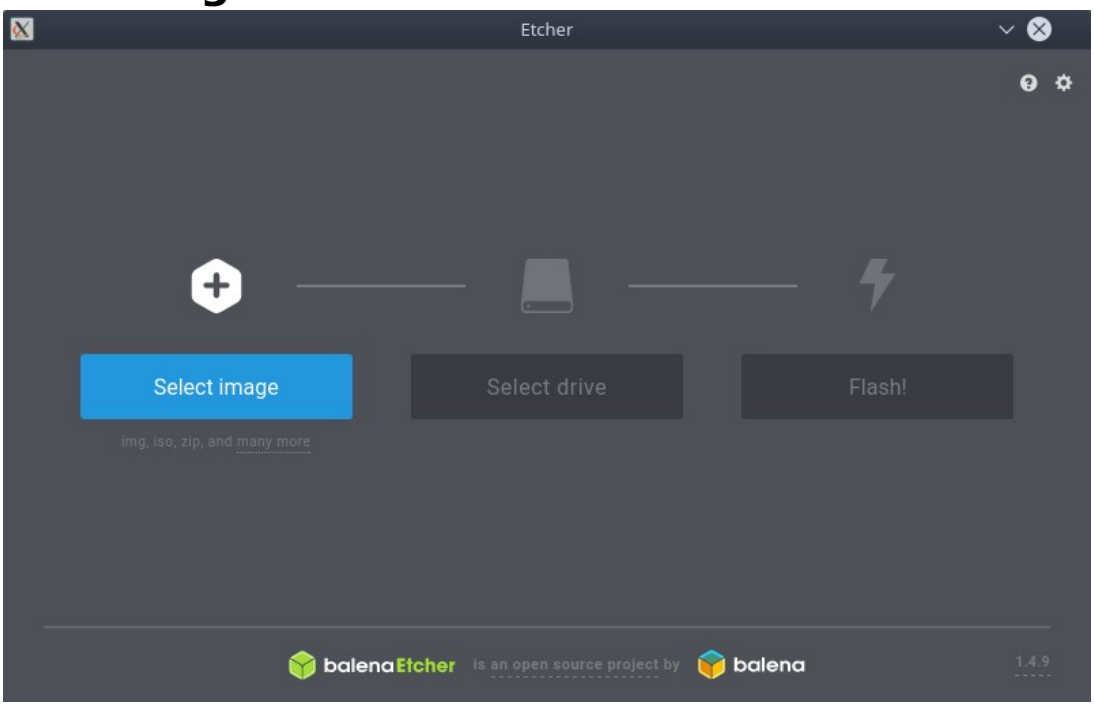


Official Download Site

https://manjaro.org/download/architect/

Download the ISO on any Computer (Mac OSX, Windows, or Linux)

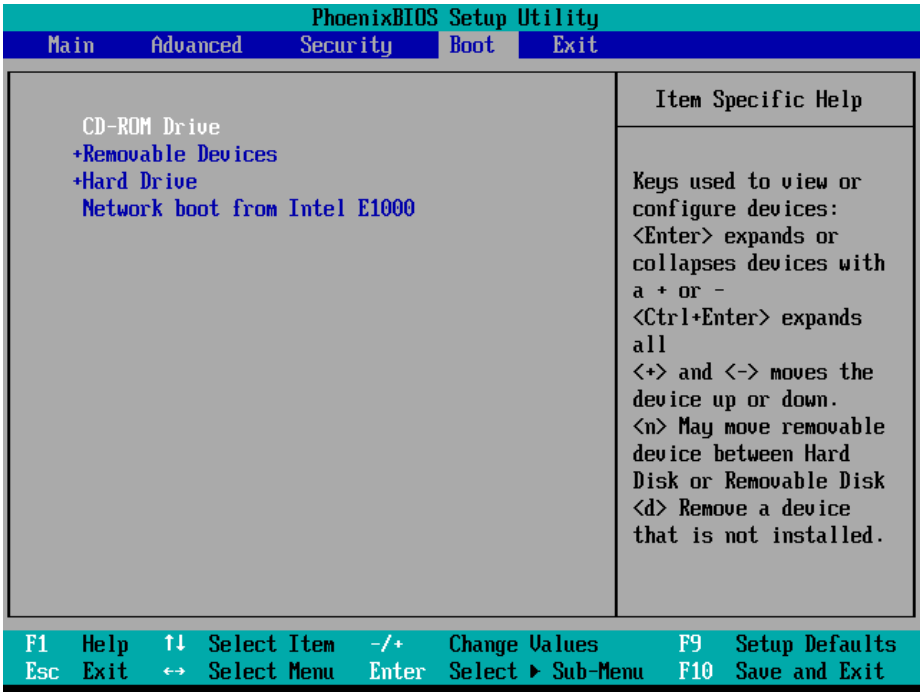
Burn ISO Image to USB Drive



- Download and install Etcher @ https://www.balena.io/etcher/
- Install Etcher by running the program
- Burn ISO to USB using Etcher

Launch Installer

Before preceeding make sure to insert USB drive into the computer you are installing Manjaro Architect on.



Change BIOS to boot from USB

Method 1

- Press F10 or F11 or F12 to directly launch Boot Menu
  - *Check manual to see if you have this option*
- Select USB Drive to boot to installer

Method 2

- Press F2 or DEL to launch into BIOS
- Change boot hard disk drive priority (BBS priorities)
  - *Note: Each BIOS is different but typically this is under advanced or boot sub-menu. You change the priority by either selecting the first item or using the + or – keys to change the order.*
- Save and Exit BIOS to boot to installer
  - *Typically this is the F10 key, but check footer of bios to verify*

Launch Manjaro USB Drive

Change any of the settings you need, but everything is set correctly by default if you are in the United States. Select **Boot: Manjaro.x86_64 architect** when you are ready to proceed.

Login to Manjaro Installer Setup Utility

This screen will prompt you to enter “manjaro” for username and password. You will follow this up by typing “setup” and launch into the setup utility.

Note: This setup requires an active internet connection. If no internet is detected you will need need to manually install your network drivers. Should this be too difficult, I’d recommend downloading a different version of Manjaro with all the options pre-downloaded.

Manjaro Architect Installer

Select your language after launching the setup command.

1 – Prepare Installation

1.1 Set Virtual Console (optional)

This is to reset the keyboard keymap to a different language. Unless you have special needs, you will not need to configure this from its defaults.

1.2 List Devices

This says optional, but I recommend you **ALWAYS** come in here and check what your devices are labeled as. Take a pen and paper and write down the device name. (Example: *sda*) Also take note of any existing partitions (Example: *sda → sda1)*

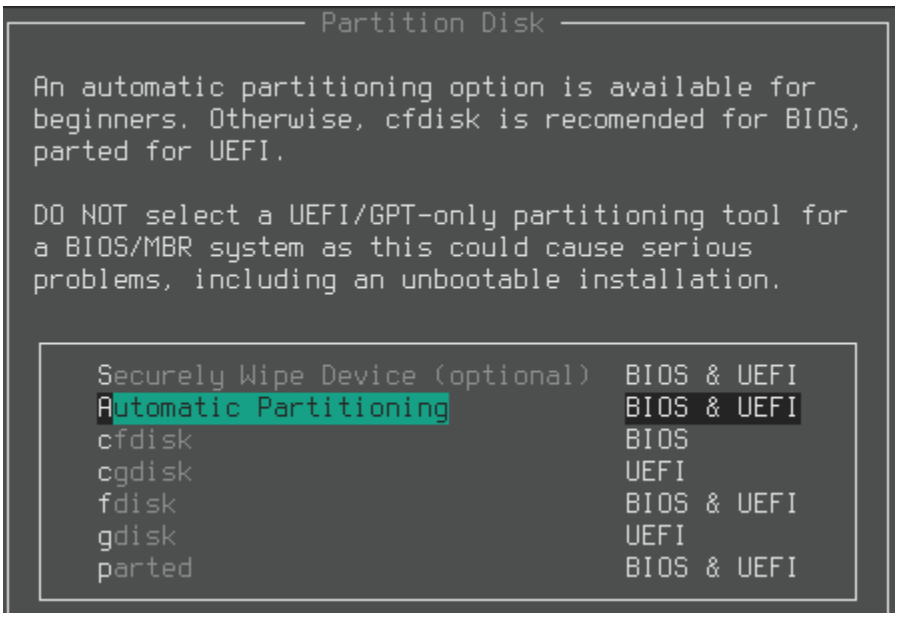
Note: NTFS partitions are generally Windows and overwriting these will wipe out your Windows Installation. You have been warned!

1.3 Partition Disk

Select your installation disk from List Devices.

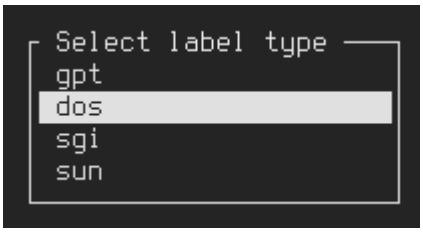
!!!BE VERY CAREFUL!!!

!!!IF YOU FORMAT A DISK ITS INFORMATION IS ERASED!!!

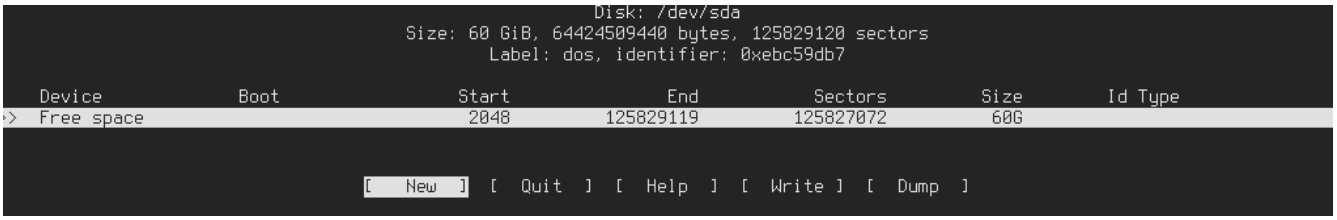


For this selection screen I recommend cfdisk for a MBR / BIOS based disk. This is the easiest for beginners. Select **cfdisk** and press [ENTER] key.

1.3.1 Partitioning in CFDISK Guide



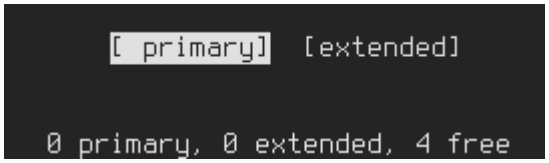
On the next screen, select **dos** since we are doing a traditional boot device

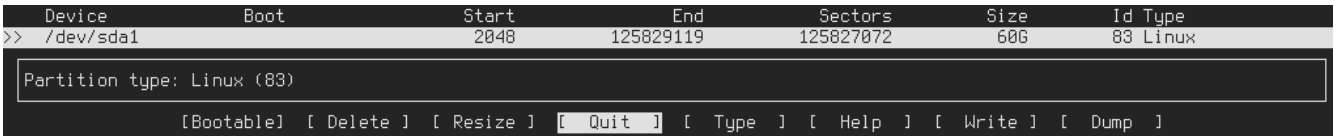


From this screen, we will select **[New]**

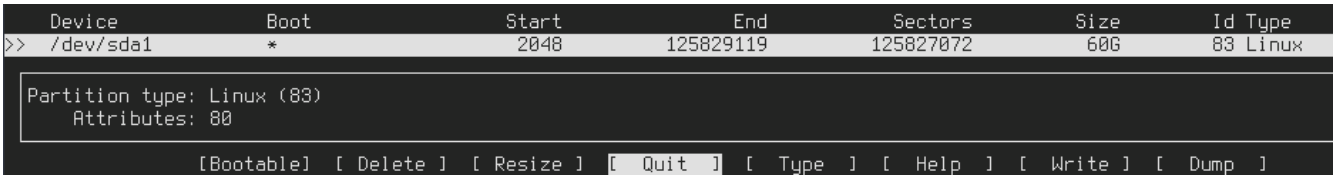
By default, this will auto-enter your entire disk size. To utilize the full disk press [ENTER] key to advance to next screen or change the size to your needs.

From this screen we will select **[primary]** and press [ENTER] key.

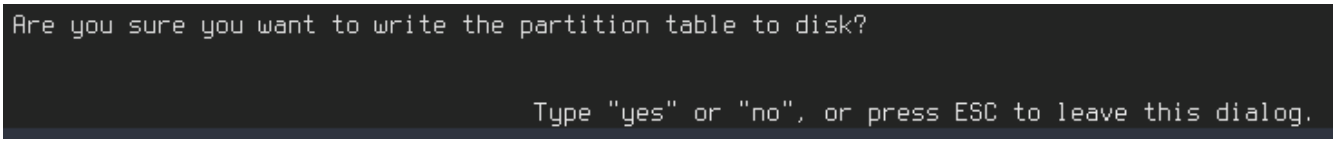




At this screen we need to make our new partition **[Bootable]** select it with arrow keys and press [ENTER]



Notice how the Boot column now has a * and we now see Attributes: 80 in this screenshot. This means we have set up our drive and now we need to **[Write]** the changes to it. Select **[Write]** and hit [ENTER] key.



Type **yes** and press enter to write your changes.

Note: It is imparitive you type out yes and not just type y because it REQUIRES you to type out the entire change and you will be notified of its success.

1.4 LUKS Encryption (optional)

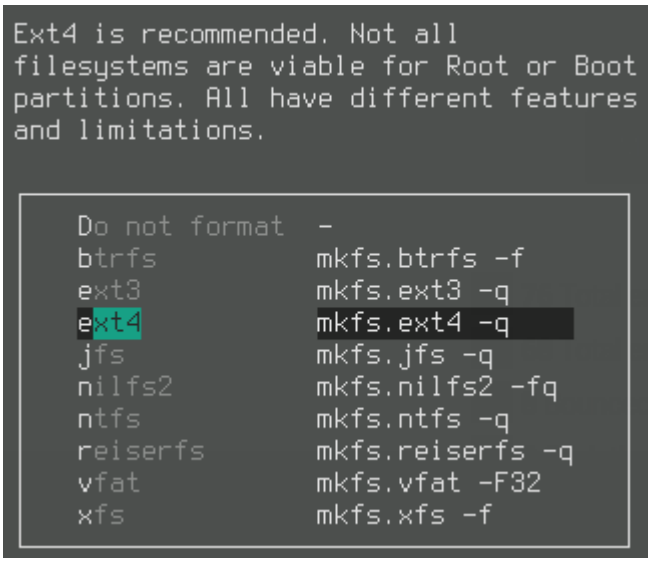
This encrypts the entire drive which makes it so noone can physically take your computer and copy the data off without a password. The downside of using encryption is it also makes recovery and moving the encrypted drive a bit more involved. **Not recommended for beginners.**

1.5 Logical Volume Management (optional)

Logicial Volume Management (LVM for short) is a way of dividing the partition of your drive up further OR combining drives into one logical volume. This can be very powerful but can confuse beginners. I highly encourage you to research and learn more about LVMs, but if you don't already know about it, it is best left alone. **Not recommended for beginners.**

1.6 Mount Partitions

Now we need to mount our new partition to be able to use it. We first select our ROOT partition / (this is where everything is installed to). From the above example it will be **sda1** and since we have never used this partition we need to format the drive. **Ext4** is highly recommended. This has the best compatibility with linux packages and is the de facto standard for file systems in Linux. Other notable file systems are btrfs for snapshots and ntfs for windows based installations. Vfat is mainly used for boot partitions when utilizing UEFI boots which we are NOT doing today. We are doing legacy boot on a single partition.



Continue through the prompts and you will get an options prompt for the partition. By default, **noatime** is selected and we won't change any of these settings. Go ahead and press **[OK]** and select **[NONE]** for swap file.

1.6.1 Special Notes about Mount Partitions

- You can mount several partitions and/or drives after selecting root /.
- I don’t recommend using a SWAP file for 16 GB of Memory and above unless in a business/server setting.
- In future installations I encourage you to seperate /home in its own drive or partition or logical volume. This gives you flexability when moving distributions.
- In UEFI based installations you would have a small partition 300-500MB that you would mount to /boot/efi
- In the above scenario with one partition EVERYTHING is put in the root partition. This includes the GRUB Bootloader and the Home directory. Other distributions by default like to seperate these out.

1.7 Configure Installer Mirrorlist

1.7.1 Edit Pacman Configuration

This is best left to Manjaro defaults. The default configuration has multilib and other options enabled by default for 32-bit programs.

1.7.2 Edit Pacman Mirror Configuration

```
##
## /etc/pacman-mirrors.conf
##

## Branch Pacman should use (stable, testing, unstable)
Branch = stable

## Generation method
## 1) rank   - rank mirrors depending on their access time
## 2) random - randomly generate the output mirrorlist
Method = rank

## Define protocols and priority
##   separated by comma 'https,http' or 'http,https'
## ATM available protocols are: http, https, ftp
## Not specifying a protocol will ban the protocol from being used
## If a mirror has more than one protocol defined only the first is written to the mirrorlist
## Empty means all in reversed alphabetic order
Protocols = https,http
```

Uncomment **Method = rank** and **Branch = stable**. Add **Protocols = https,http** this will make downloads much faster and speed up the next step by excluding ftp which is nortoriusly slow.

1.7.3 Rank Mirrors by Speed

Run this command after editing the mirror config above. This will query all the servers for your country and order them by the fastest response times.

1.8 Refresh Pacman Keys

This isn’t needed in most instances, but if you run into signing errors, run this command.

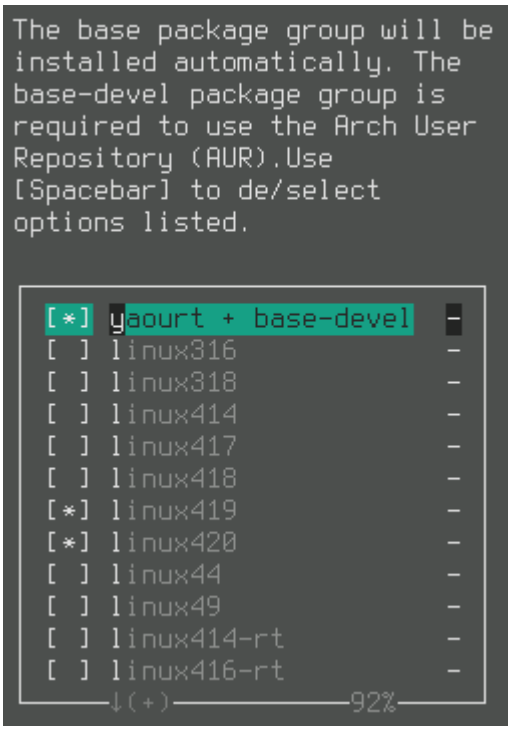
1.9 Choose Pacman Cache

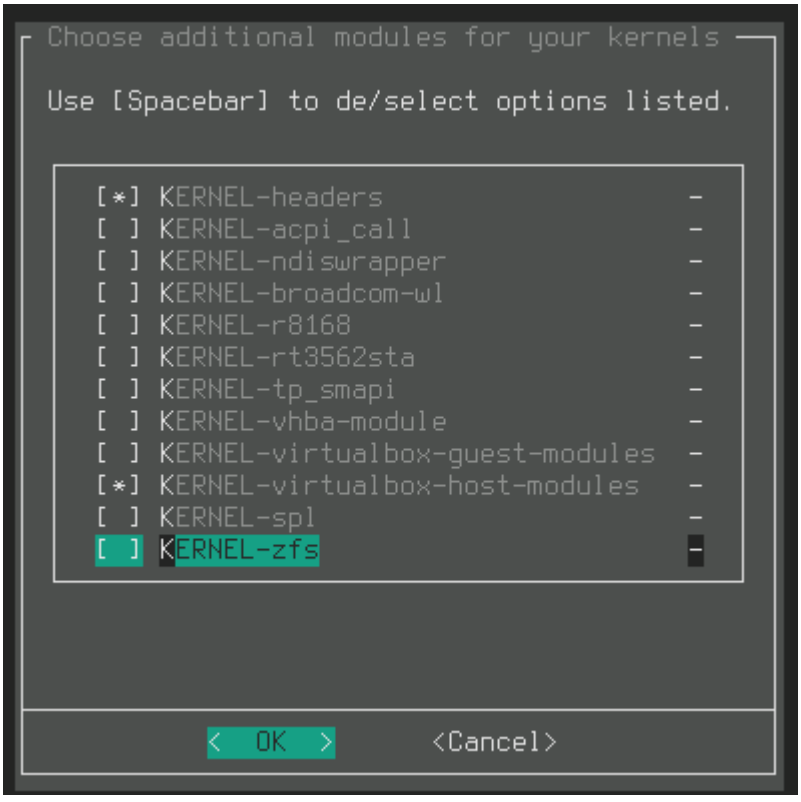
While the description reports that by selecting yes it can speed up your installation by skipping downloads, I recommend selecting **No** because of reports of failed installs. By default it doesn’t choose it and is on No.

2 - Install Desktop System

2.1 Install Manjaro Desktop

You need to select yaourt + base-devel and then a Linux Kernel. I highly recommend selecting 2 kernels just to give you options when booting. I generally select the two latest kernels when doing an installation like this. After selecting **[OK]** you will be presented with kernel options.





2.1.1 Kernel Options

To the left are my recommended defaults. **Headers** are used when compiling devices and other projects through GitHub. **Virtualbox-host-modules** are used when launching virtual machines in Virtualbox.

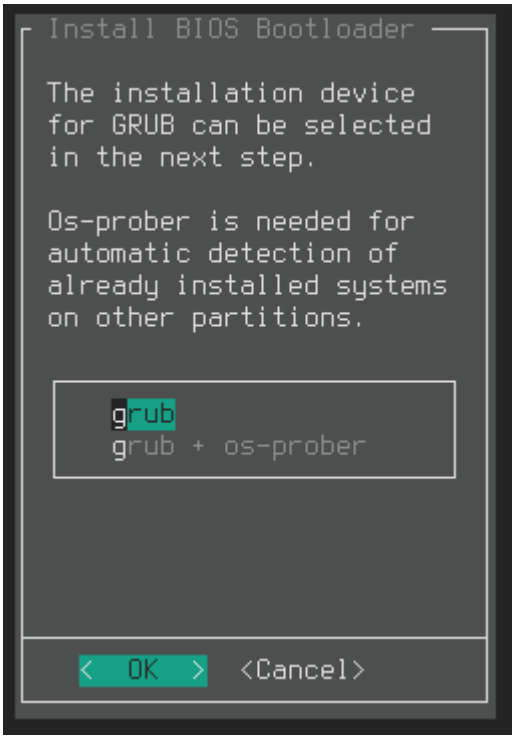
The rest of the modules I never use, but can be selected if you have a that specific hardware or special file system.

At the next prompt, select **[No]** for adding additional packages. I recommend doing this after installation. Then, proceed with a **[Full]** installation.

2.1.2 Install Display Driver

1. Auto-install free drivers – **(Recommended)** This should be chosen if you are using integrated graphics or AMD graphics cards.
2. Auto-install proprietary drivers – **(Recommended)** This should be chosen when you are using nVidia graphics cards. All nVidias official drivers are closed source and need proprietary drivers to get the most out of them.
3. Select Display Driver - **(Advanced)** If you want to choose the exact driver to install
4. Install all free display drivers – **(Not Recommended)** This installs every free display driver.

2.2 Install Bootloader



When installing the bootloader you are presented with the screen on the left.

grub – select this if you are only using this operating system. You will then select the drive from earlier.

grub + os-prober – select this option will have all your hard disked probed for other operating systems. If you are dual booting or have more than one operating system, I'd recommend selecting this option.

Note: after selecting [OK] and proceeding the next screen will hang on "This may fail on some machines running a custom kernel". This is normal and can take up to 15 minutes to complete on some systems. Be patient. You will need to select your drive after this finishes.

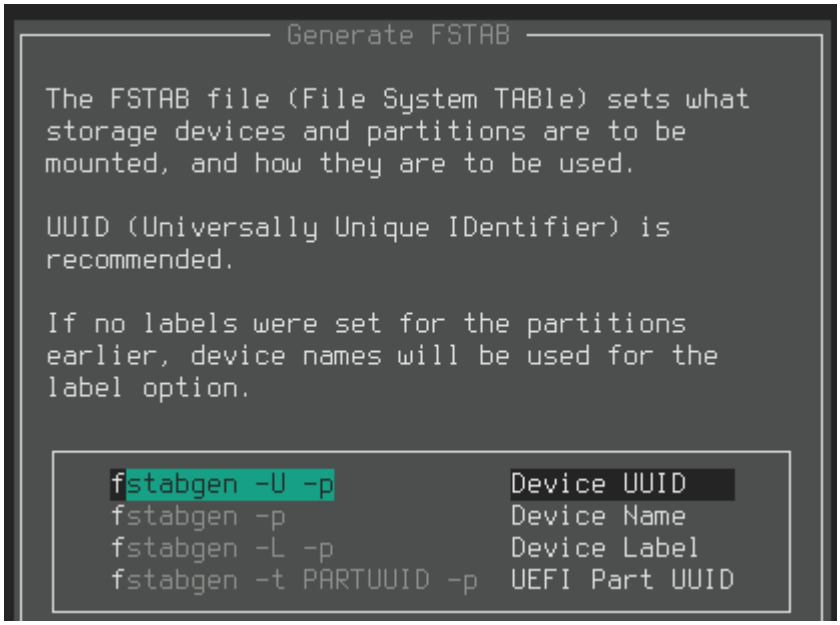
```
Generating grub configuration file ...
Found theme: /usr/share/grub/themes/manjaro/theme.txt
Found linux image: /boot/vmlinuz-4.20-x86_64
Found initrd image: /boot/intel-ucode.img /boot/initramfs-4.20-x86_64.img
Found initrd fallback image: /boot/initramfs-4.20-x86_64-fallback.img
Found linux image: /boot/vmlinuz-4.19-x86_64
Found initrd image: /boot/intel-ucode.img /boot/initramfs-4.19-x86_64.img
Found initrd fallback image: /boot/initramfs-4.19-x86_64-fallback.img
```

Above is what you should see as a sample output. If you see errors here you will need to fix these before preceeding. There is also usually a substaintial delay at this step as well. So be patient and wait for the next screen to appear.

2.3 Configure Base

2.3.1 Generate FSTAB

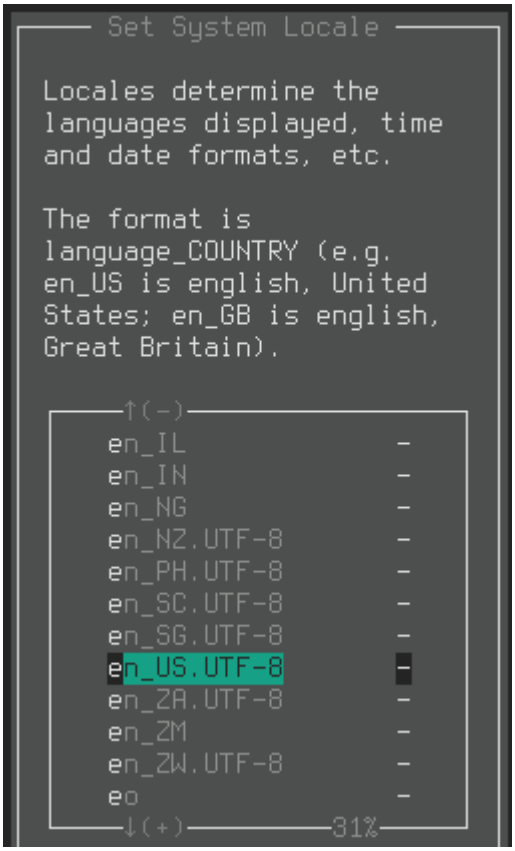
I always recommend using **Device UUID** as this ID never changes and is unique to that partition/drive. However, using the **Device Name** is acceptable if it is the only hard drive in the system. **Device Label** assigns the drive based on its label, but be careful that there are no identical labels before using this option. Finally, **UEFI Part UUID** is used in UEFI installations.



2.3.2 Set Hostname

By default, this is set to **manjaro** and if you would like to change your hostname go ahead and select this option and change it.

2.3.3 Set System Locale

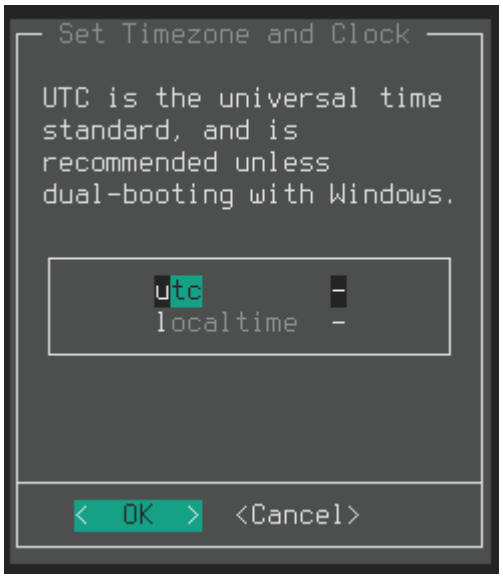


This determines what languages are displayed and the time and date formats. I always set this to en_US.UTF-8 since I am in the Unitied States.

2.3.4 Set Desktop Keyboard Layout

Set this to your country of origin. Since I'm in the United States, I set mine to **us**.

2.3.5 Set Timezone and Clock



First select your time zone from the following screens until you get to the screen on the right.

Disregard the discription. **Always use UTC**, because localtime can get thrown off and doesn't adjust for Daylight Savings Time.

However, if you have timezone issues, due to dual booting I recommend running the following commands:

In Manjaro:

```
ntpdate pool.ntp.org
hwclock --systohc --utc
```

Then in Windows, add the following to the registry:

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\TimeZoneInformation]
"RealTimeIsUniversal"=dword:00000001
```

2.3.6 Set Root Password

(Required) Set the root password to something memoriable as you will need this to elevate your user.

2.3.7 Add New User (s)

(Required) Setup your primary user and any additional users you may need.

Notes: username must be lowercase and the default option is to use zsh for terminal commands. Most distributions use bash as default and I recommend you change this to bash if unsure.

2.4 – System Tweaks

2.4.1 Enable Automatic Login

This enables automatic login, but if you are not in a secure physical location (Ex. Your House) then steer clear of using this feature.

2.4.2 Enable Hibernation

This requires a swap partition to function. If you want to use this feature you can enable it, but be aware it will create a swap partition equal to the amount of memory you have and rebuild your bootloader.

2.4.3 Performance

2.4.3.1 I/O Schedulers

(Advanced) I don't recommend changing anything in here from the default. It is already setup for optimal use in many scenarios. If you'd like to learn more about I/O schedulers check out https://wiki.archlinux.org/index.php/improving_performance#Input/output_schedulers

2.4.3.2 Swap Configuration

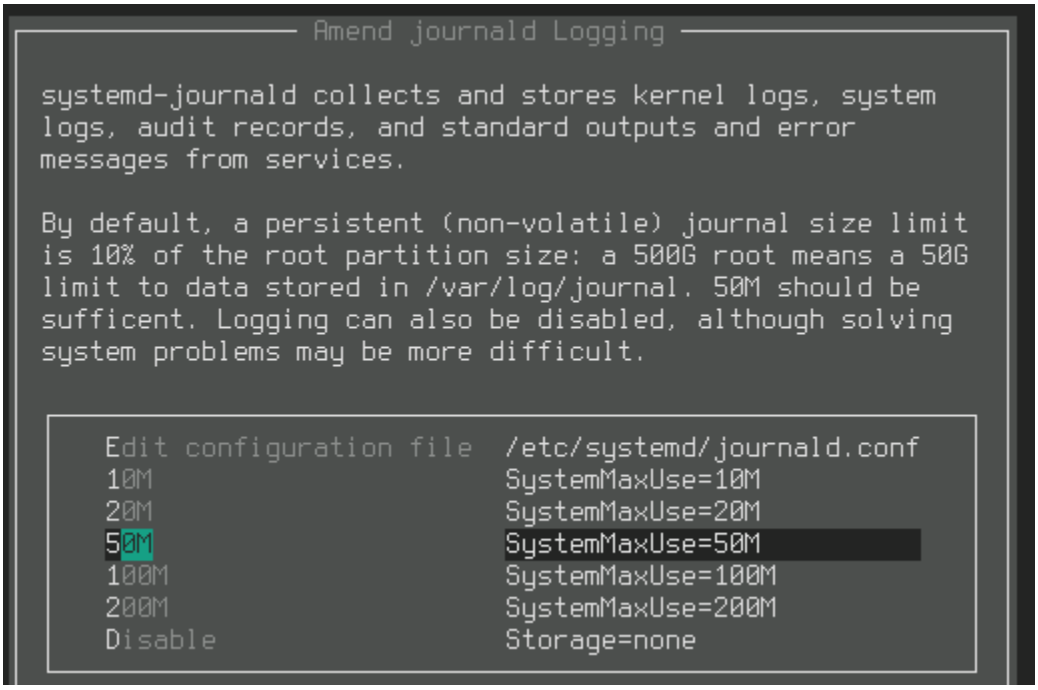
(Advanced) If you want to gain a bit of performance uncomment **vm.dirty_ratio = 3**. If you want to learn more about Swap configuration and adjusting sysctl check out https://wiki.archlinux.org/index.php/sysctl#Virtual_memory

2.4.3.3 Preload

(Recommended) Enabling this will automatically load your common programs into memory. The only time I don't recommend doing this is if you have limited amount of memory.

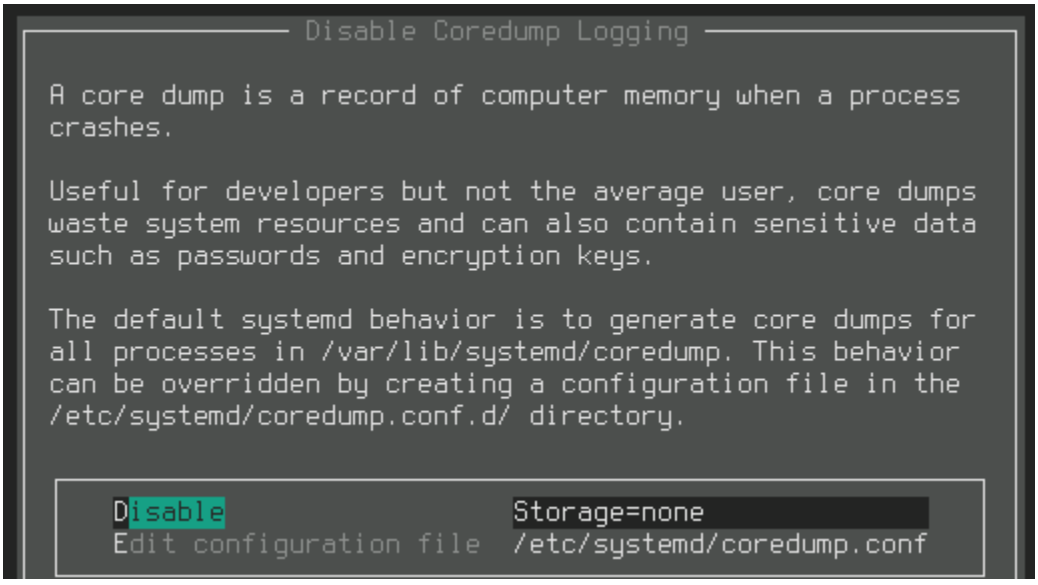
2.4.4 Security and systemd Tweaks

2.4.4.1 Amend journald logging



(**Recommended)** Setting this to **50M** this will keep your journald from hogging up too much space and adding bloat over time

2.4.4.2 Disable Coredump logging



(Recommended) Disabling this will give you better performance, more disk space, and increased security. If you'd like to learn more you can go here https://wiki.archlinux.org/index.php/Core_dump

2.4.4.3 Restrict Access to Kernel Logs

(Recommended) This restricts access to the Coredump files. If you disabled Coredump logging in the prior section you can skip this setting, as it has no effect since no logs would be generated.

2.5 Review Configuration Files

Use this section to manually edit any of the config files on the right hand side.

2.6 Chroot into Installation

While not needed, it is highly beneficial if you need to get into your install and manually change anything that hasn’t been covered. Most times this is for advanced users that prefer to edit config files and change system settings without drilling down into menus.

3.0 Install CLI System

This is for installing the command line system or “server” of manjaro with no desktop experience. All the sub menus are the same as 2.0.

4.0 Install Custom System

(Not Recommended) This is for installing an unconfigured desktop environment. All the sub menus are the same as 2.0 except it doesn’t configure any of the desktop environments with Manjaro’s defaults. This will require a deep understanding on how Linux operates and is only for advanced users. A user will be picking out the following under this installation:

- Display Server
- Desktop Environment
- Display Manager
- Networking Capabilities
  - Display Wireless Devices
  - Install Wireless Device Packages
  - Install Network Connection Manager
  - Install CUPS / Printer Packages
- Multimedia Support
  - Sound
  - Codecs
  - Accessibility Packages

5.0 System Rescue

This is Manjaro’s base system rescue packages. Most of these installation options have been covered in 2.0 Installing the Desktop System, however there are some great utilities in here. Also, be sure and mount your drives before attempting to install or modify anything because without them mounted they can’t be modified.

5.1 Install Hardware Drivers

5.1.1 Install Display Drivers

See 2.1.2 under Installing the Desktop System

5.1.2 Install Network Drivers

If you have issues with your network drivers try install the free ones first and if that fails try the proprietary ones in this section. Both options provide auto installation.

5.2 Install Bootloader

See 2.2 under Installing the Desktop System

5.3 Configure Base

See 2.3 under Installing the Desktop System

5.4 Install Custom Packages

You are presented with a listing of all packages that you can install ontop of your installation. If doing this on an existing installation, make sure you mount your drives first.

5.5 Remove Packages

You will be able to remove packages from an existing installation, as long as you have mounted your drives first.

5.6 Review Configuration Files

See 2.5 under Installing the Desktop System

5.7 Chroot into Installation

See 2.6 under Installing the Desktop System

5.8 Data Recovery

5.8.1 Clonezilla

This is a great tool for cloning disks. Should you have a hard drive that is starting to fail, you can use this tool to clone your existing drive on to a replacement drive.

5.8.2 Photorec

Don’t use this, you are better off recovering photos from a GUI like parted magic.

5.9 View System Logs

Unsure why your system won’t boot? View the system logs to find out!

5.9.1 Dmesg

First logs to check, this is for Display and Driver issues. Look for errors and search for fix once you know why your system won’t boot.

5.9.2 Pacman log

This will show you issue with packages and one of my first places I look when my system won’t boot after doing package installations.

5.9.3 Xorg log

Still having display issues but you don’t see any errors in Dmesg? Look through the xorg log to see if you have any fatal errors with your display manager.

5.9.4 Journalctl

This is the main log and is rather large in most instances. Use the bathroom and grab a drink before going through this log by hand. I normally don’t look through the entirety of this log, but do use the **grep** command from shell to check for certain keywords.

Conclusion

I hope this Guide has helped you out and if you run into any issues, please head over to the subreddit Chris Titus Tech and let us know what problem you are having. Almost any issue is answered in a timely manner. Also check out the Manjaro Videos on YouTube.

https://www.youtube.com/c/ChrisTitusTech

https://www.youtube.com/playlist?list=PLc7fktTRMBowys-iIwMsiq4mXhmZBn9pW

https://www.youtube.com/playlist?list=PLc7fktTRMBoxLwv2XtXfa7kTGB6ax5RSX