Debian 11

Installation Tutorial

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Author : Yogiman

Foreword

It is true to say that once upon a time, installing Debian as well as many other Linux distributions was an exercise left to experience and patience. However over the years that statement has become less and less true and today I would argue it is actually simpler to install than the current version of Windows. Having said that I do my best to avoid installing or using Windows so I perhaps am not the best judge of this exercise.

I have been involved in the I.T. industry for many decades. In the beginning I received a lot of help from other I.T. enthusiasts who were more than willing to pass on their knowledge. As a result I like to pay it forward! In doing so I spends a huge amount of time researching and testing these instructions as well as creating the document you are now reading. This takes many hours of work on my behalf so I ask that if you pass on this document to others you leave it in tact and do not make modifications to the document or claim ownership of it.

Conventions

Fonts

I use fonts to show when I am speaking and when I want you to execute a command. This text is written in the speaking font!

When I want you to type a command I use fixed space mono which is displayed in a code box so that you can clearly see spaces where they exist. Any code entered should be followed by you pressing the **ENTER** key. BOLD characters are used only to draw your attention to specific items of note. Look out for anything in RED this is a caution and you should take extra note of what I am pointing out to you.

Symbols

Any line prefixed with **>** is executed in the terminal using your normal account.

Any line prefixed with **#** is executed in the terminal or console as root user.

Some documents may require screen shots to make explanations clear, if screen shots are required they will be referred to as figure(s) example "See figure:1" you should then look for the corresponding screen shot labelled "figure:1"

This symbol ✍ means I want you to press a series of keys.
This symbol 💬 signifies a quick tip.
This symbol 🌐 signifies something you need to download.

Downloading

I will not direct link files for you to download from 3rd party sources, this is not safe. I will point you to a web site and do my best to point you to the required download. If I link to a file for you to download, this file will have been prepared by me and uploaded to my Google Drive. These files are safe and I will notify you of any scripts and what they do.

LMC = Left Mouse Click "I want you to point at an item and click it with your left mouse button"

RMC = Right Mouse Click "I want you to point at an item and click it with your right mouse button"

L/CTRL = Hold down the left CTRL key.

L/SHIFT = Hold down the left SHIFT key.

L/ALT = Hold down the left ALT key.

Example: L/CTRL+L/ALT+DEL would mean you need to hold down left CTRL and left ALT at the same time as you press the DEL key.

[F1] = Function Key 1 found at the very top of your keyboard on modern computers.

{} - If you see anything enclosed in these brackets, you need to change it to your required value, DO NOT include the brackets they are there only for formatting!

These are generic instructions for a basic installation of Debian GNU/Linux to a single hard disk using the entire hard drive and a single data partition and a separate swap partition.

<p style="text-align:center">**!!WARNING!!**</p>

If you want to use multiple hard disks, SSD's or a dual boot installation where Debian is on a single drive shared with windows, **DO NOT** follow these instructions.

I have created these instructions for users of Windows or Linux if you are a Mac user please **DO NOT** follow these instructions.

To download the current version of the Network Installer, browse to the Debian home page and look on the right hand side for the Download button, click that and the network installer .ISO will download to your computer. I am no longer including links to the installer because the name changes for every update and frankly I don't have the time to keep messing. Why they can't just call it NETINSTALLER.ISO I have no idea, but there you go, they must be more clevers than I is!

Before you can install Debian you will require some form of installation media. Follow the links below to install the required media creation software. Then follow the linked tutorials on how to accomplish your media creation task. Note I have selected easy to use tools to create the media required however there are other means of doing so using different graphical tools or in the case of Linux using the command line to create the required media, however these methods are more complicated and a Noob approach has been taken with this document.

Creating a CD/DVD Installer on Microsoft Windows

Required Tool: CDBurnerXP
Tutorial: How To Burn .ISO Images To Disc

Creating a USB Installer on Microsoft Windows

Required Tool: Balena Etcher

Creating a CD/DVD Installer on Linux

Required Tool: Brasero (Normally installed by default, if not install using your distro's package manager)
Tutorial: Burn image to CD/DVD tutorial

Creating a USB Installer on Linux

Required Tool: Balena Etcher

<p style="text-align:center">**You can not continue until you have created the required installation media.**</p>

BIOS Settings

If your computer doesn't automatically boot from CD/DVD or USB you will need to do one of two things, either locate the BOOT menu when your computer starts and select the correct device to boot from or enter the (BIOS) of the computer and change the boot order for the drives so that the media you want to use is selected, for example setting the priority to CD/DVD will ensure that the CD/DVD drive boots before the hard disk unless media is not found, setting the priority to the USB ports will ensure that the USB drive boots before the hard disk unless media is not found.

Depending on the manufacturer and more specifically the BIOS type this action is achieved with different key strokes. Rather than duplicate work, I have linked to the most popular manufacturers instructions for performing this task. If you can not find the manufacturer listed below, a Google search for " {Computer/Make/Model} Boot Menu or How to enter BIOS " should yield the required answer.

Intel   Hewlett Packard   Dell   Award/Pheonix   Toshiba

Once you have managed to get your computer to boot from the CD/DVD or USB drive you have created you can move onto the next section.

Start Installing Debian GNU/Linux

The first screen you are presented with is the Debian installer selection screen, under normal circumstances you would select Graphical Install, however should your computer have an inability to use VESA graphics or if your computer has another anomaly which prevents it from running the installer, you may have to investigate further before continuing. With computers that can not use the graphical installer, you can use the non graphical installer, however this will achieve installation but you may not be presented with a graphical user interface on completion of the installation. This may result in you requiring additional drivers and you should investigate this before proceeding.
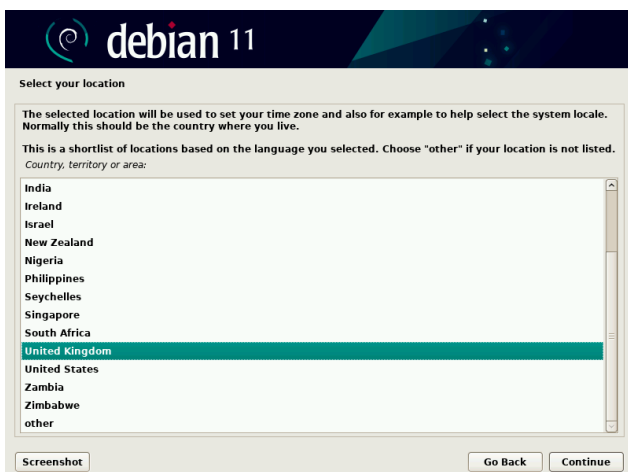
Assuming you can start the graphical installer and all is well. Continue....
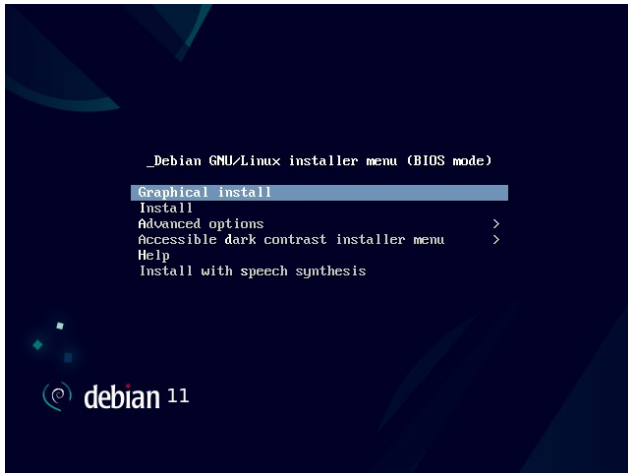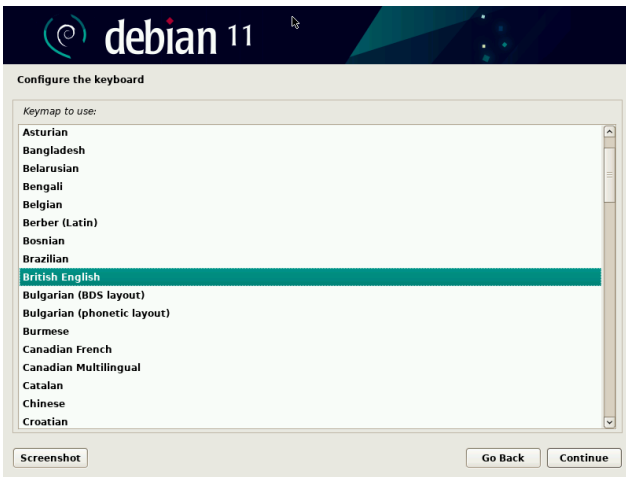

1. This is the first screen you will see, the Debian GNU/Linux Installer Menu. Press **ENTER** with the Graphical Install option highlighted, unless you have a requirement to use a different installation method.
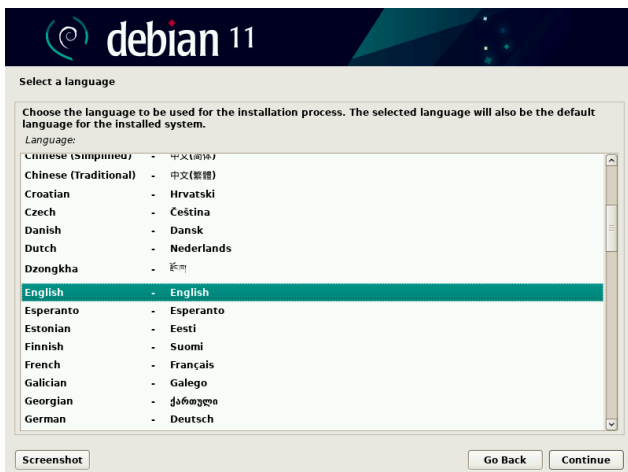
2. Language Selection, select your required language, in my case this is English.
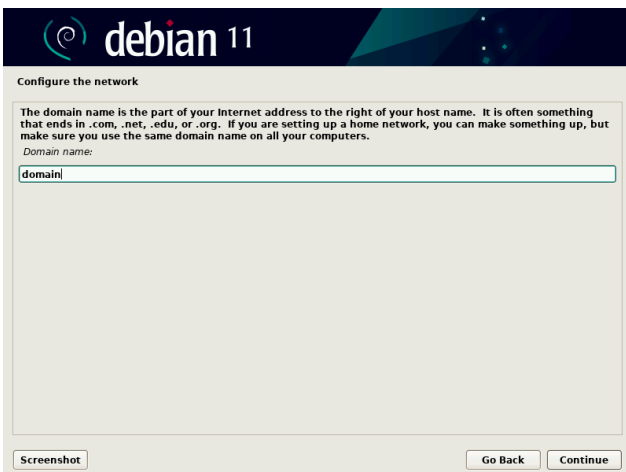

3. Location Selection, select your location (country).

4. Select the correct keyboard layout for your keyboard/country.

5. Enter the host name for your computer, this is the friendly name you would want your computer to have on your network example: dads-pc

6. Enter your domain name, if you are a company enter your company domain name here, however if you are a home user you can use anything you want, just ensure that all computers have the same domain name or they won't be able to see each other. Common domain names are: home or workgroup when connecting to networks using the default Microsoft Windows settings.

7. Next we need to create a password for the ROOT user, the ROOT user is the computers boss or administration account, I recommend using a password that is at least thirteen characters long and a mixture of letters (upper and lower case), numbers and symbols to make the account as safe as possible. Make sure you write it down and copy it exactly as written before continuing because a failure to do so will mean you are effectively locked out of your computer for any administration tasks.

Example Password: &1_W3nT-t0+Sp41n!

DO NOT use words that can be found in a dictionary or simple password unless you want your computer to be hacked or be infected with a possible trojan or virus (yes Linux can be infected, however it is less likely than on a Windows platform).

8. Now we need to create a new user account that you will use on a daily basis for non administrative tasks. You can use any name you like so first enter the full name of the account you want to create, for example: "John Smith" then click "Continue".

9. Now enter the the username for the account, this is a shorted rule applied username, so using our example of "John Smith" a good name for the account would be "jsmith". Enter the required username and click "Continue".
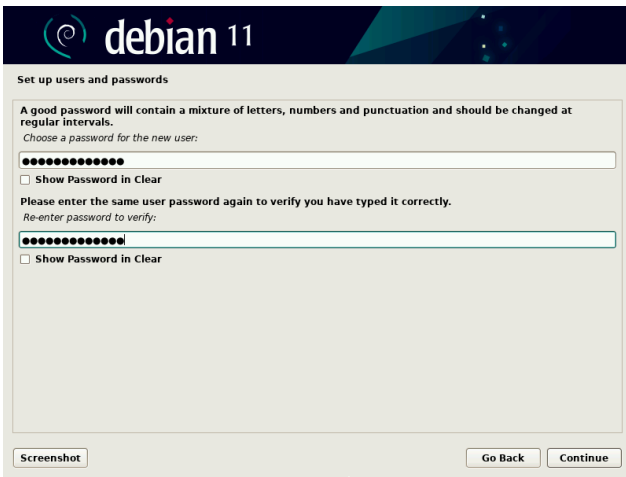
10. Now you are required to create a password for the new account. Note the same password rules should apply to this account as used for the Root account. Once entered, click "Continue".
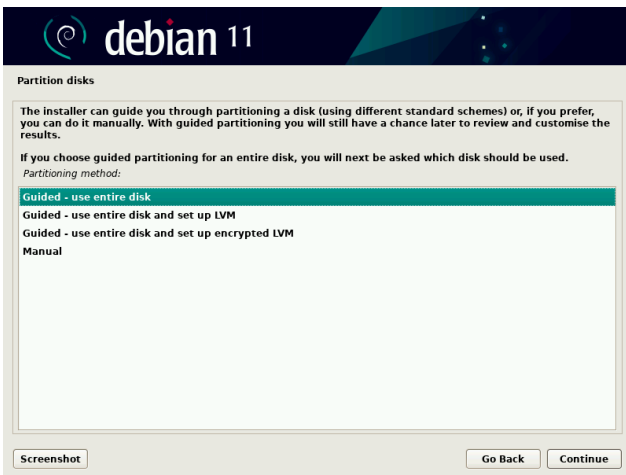
11. Here we can select how we want to set up the disk we are going to use for Debian, however because this is a noob installation. You just need to select "Guided - use entire disk" and click "Continue". If you are intending to use multiple disks or less than basic setup you will find this tutorial is not aimed at you.

12. On this screen you should see the drive you want to put your installation on. Select that drive and click Continue, however if you have multiple drives be careful not to accidentally select the wrong drive.
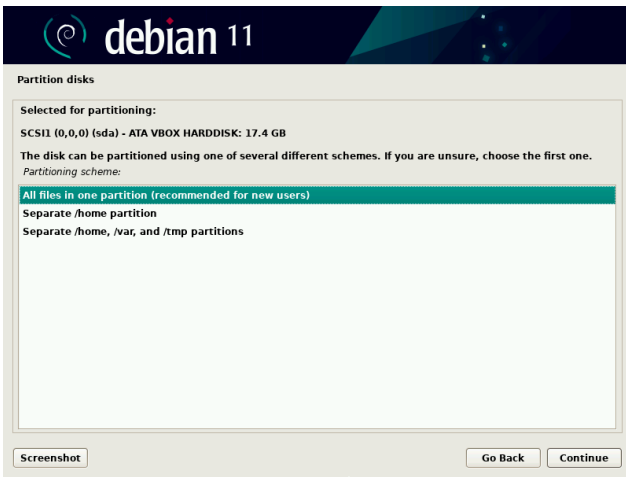
13. You will now be required to select what type of partition scheme you would like, if you are unsure the default option is fine, click Continue. If you would like alternative partitions select the option you would like and then Continue.
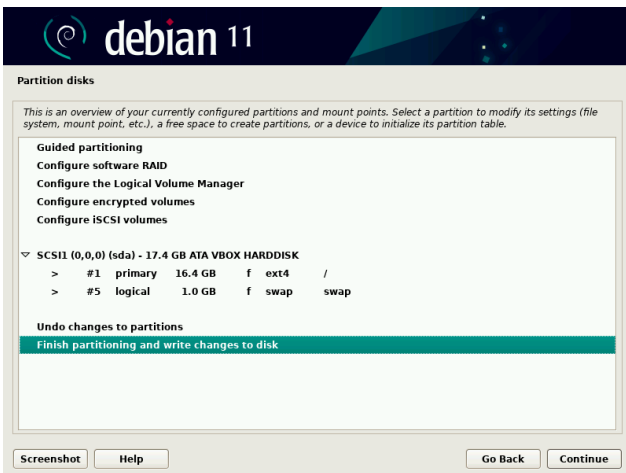
14. The next screen requires you to confirm your partition scheme, just click Continue.
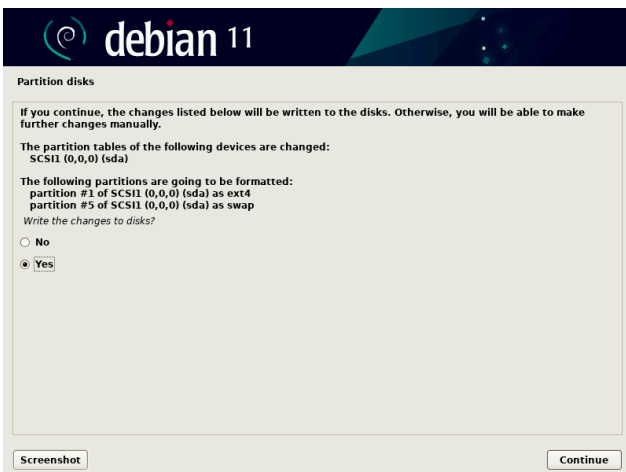
15. Once again.... Overkill you are asked to confirm you really want to make changes to the disk partitions, note after you click continue you can not go back and all of your old partitions will be gone. So make your mind up and if you are happy, click Continue.

16. On this screen you have the option to scan additional media, so for example if you have a 3 DVD set you may want to do that now. If not select no and continue.
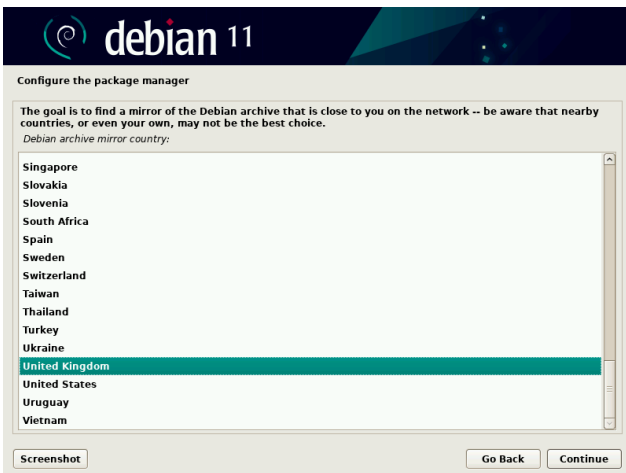
17. You now need to decide where you are going to connect to a mirror service for your updates and software installation, I would recommend for now selecting your local country.

18. You now need to select the server for your package manager to use. My normal selection would be mirrorservice.org or ftp.uk.debian.org for my location in the UK however if you don't know just select the default. You can test for the fastest location later using **Software & Updates**.
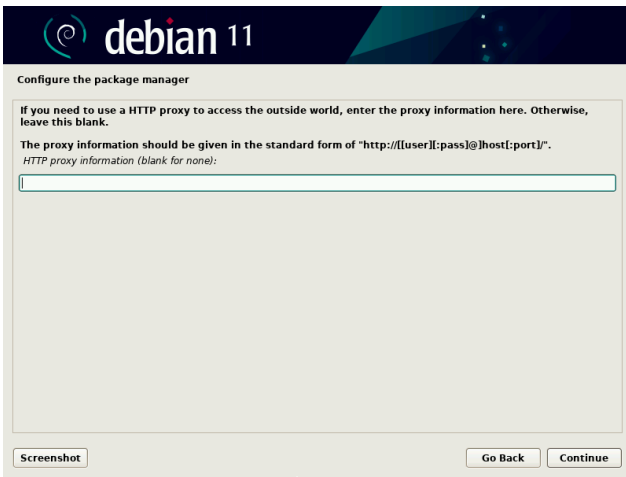
19. Here you can enter the details of your proxy server, should you need to do so to get access to the outside world. However for most people you just need to click Continue.

20. Debian collects a small amount of data about package usage, this is an anonymous process, however you are given the choice of participation or not. Choose and click Continue.
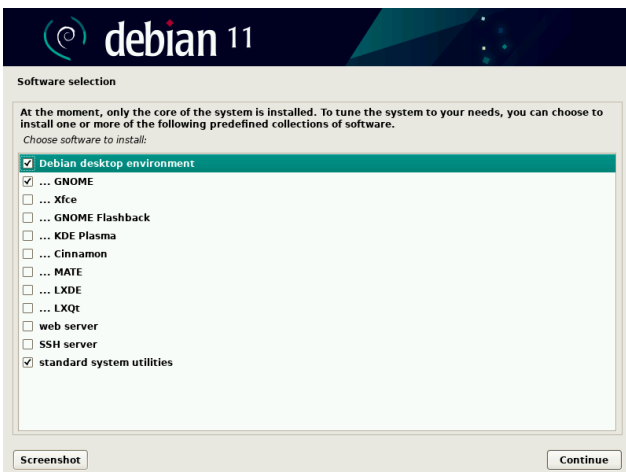
21. Software selection, at this point if you select nothing more than print server and standard system utilities, you will boot to a console prompt. So if you want a shiny GUI select your flavour and click continue. I would recommend the additional items shown in the screen shot, this will give you a better desktop experience. Then click Continue.

22. Now you will choose if you want to put the GRUB boot record, in most cases the answer is yes, however in some cases when using multiple OS's on the same hard drive you may need to select No. Make your choice and click Continue.
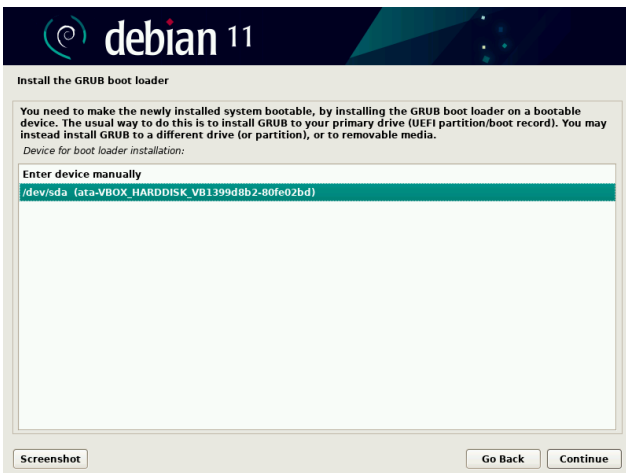
23. On this screen you need to select the hard disk that you want the GRUB boot loader installed upon. Then click Continue.
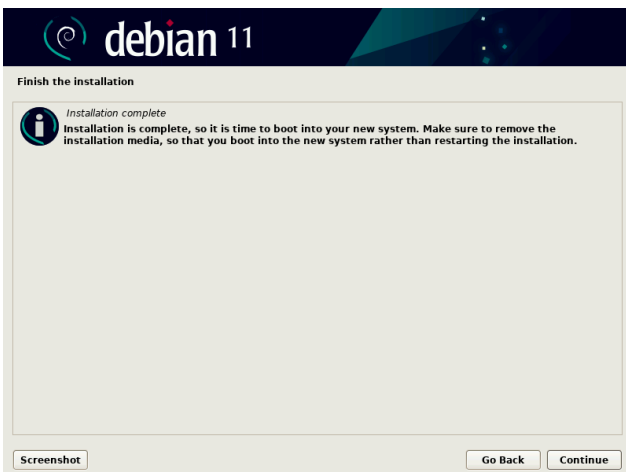
24. You made it, remove your installation CD/DVD or USB stick and click Continue. Your computer will now reboot.

Initial Tasks Executed As Root User

Once the installation has finished, it will reboot into your new Debian operating system.

NOTE: This is a basic install and although fine will require some tuning to make it fully usable from the perspective of someone who is more than a basic user.

At the Gnome login screen you will see your newly created user account, in my case "administrator" yours may be different, you will be tempted to login at this point **DON'T!** at least not as this user! We are going to login to a console session as root user at this point before we do anything else.

☞ L/CTRL+L/ALT+[F3]

The above key presses will switch to a text console. You will be asked to login.

Login as your root user.

username: root
password: **{ROOT_USER_PASSWORD}**

Modifying Sources

Once logged in, type: >

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

Nano text editor will open and load the file sources.list from "/etc/apt/".

The file will look similar to the one below, this shows the repositories your system will use to download software and updates. **NOTE:** The entries in this list may differ from yours if you have not used my installation tutorial, note: I use **mirrorservice.org** to determine the fastest servers based on my location, if you have for example selected UK or USA etc. as your sources then they will look different from mine. Having said that, the important bit is the same regardless. Note at the end of each line that starts with "**deb**" it currently ends with "**main**" you want to modify each of these lines and append "**contrib non-free**" to the end of each line.

See *Figure:1* this is the content of the default sources.list file found in "/etc/apt/".

```
#deb cdrom:[Debian GNU/Linux 11.0 _bullseye_ - Official amd64 NETINST xxxxxxxx-xx:xx]/ bullseye main

deb http://mirrorservice.org/sites/ftp.debian.org/debian/ bullseye main
deb-src http://mirrorservice.org/sites/ftp.debian.org/debian/ bullseye main
deb http://security.debian.org/debian-security bullseye/updates main
deb-src http://security.debian.org/debian-security bullseye/updates main

# bullseye-updates, previously known as 'volatile'

deb http://mirrorservice.org/sites/ftp.debian.org/debian/ bullseye-updates main contrib
deb-src http://mirrorservice.org/sites/ftp.debian.org/debian/ bullseye-updates main contrib
```
Figure:1

See *Figure:2* this is how the list should look after modifying the lines I have stated above.

Once you have finished your sources lists should look similar to this, but may have changes for the fastest server based on your location.

```
#deb cdrom:[Debian GNU/Linux 11.0 _bullseye_ - Official amd64 NETINST xxxxxxxx-xx:xx]/ bullseye main

deb http://mirrorservice.org/sites/ftp.debian.org/debian/ bullseye main contrib non-free
deb-src http://mirrorservice.org/sites/ftp.debian.org/debian/ bullseye main contrib non-free
deb http://security.debian.org/debian-security bullseye/updates main contrib non-free
deb-src http://security.debian.org/debian-security bullseye/updates main contrib non-free

# bullseye-updates, previously known as 'volatile'
deb http://mirrorservice.org/sites/ftp.debian.org/debian/ bullseye-updates main contrib non-free
deb-src http://mirrorservice.org/sites/ftp.debian.org/debian/ bullseye-updates main contrib non-free
```
Figure:2

Now you have modified this file ensure that you have no typo's and everything looks correct, then save the file and exit nano.

☞ *L/CTRL+X*

Type: >

```
apt update && apt upgrade
```

This will check the repositories for updates and install them if required. **NOTE:** *Because you have installed using the NET Installer, you won't get any updates, why? Because they were done during the installation.*

Add Some Utilities and Modify User Account

ype: >

```
apt install sudo ntp apt-xapian-index aptitude inxi ttf-mscorefonts-installer ttf-
                       bitstream-vera ttf-dejavu ttf-ubuntu-font-family
```

You will see a list of files to be installed and you will be asked if you want to continue, press Y and then Enter.

Xfce Note

If you are installing Xfce you should also install gvfs-backends to enable network support in Thunar.

Type: >

```
apt install gvfs-backends
```

Modifying Standard User Account Permissions

nce those packages have finished installing. Type: >

```
usermod -a -G sudo {YOURUSERNAME}
usermod -a -G adm {YOURUSERNAME}
usermod -a -G lpadmin {YOURUSERNAME}
```

Install Additional Firmware

Now it's time to add some extra firmware, don't worry if you don't have some of these, they are small files and won't affect your system if they are not required. Type: >

```
apt install firmware-amd-graphics firmware-realtek firmware-linux-nonfree firmware-
                                                                              linux
```

You will see a list of packages to be installed and you will be asked if you want to continue. Press **Y** and **Enter**.

Once these packages have finished installing. Type: >

```
sudo shutdown -r now
```

The system will now reboot, take a note to see if you have any errors, unless you have an odd bit of hardware I don't have then you should no longer see errors for missing firmware.

Once your reboot completes you should be back at the Gnome login screen.

Login as your normal user account and password. You now have super user privileges so except for rare occasions you should never need to login as root! **NOTE:** This is important, regardless of how familiar you are with Linux, logging in as root and issuing commands can cock-up your system, so don't do it by default!

Everything we have done so far is designed to give you a basic functioning system. From this point forward we are going to give you a more tailored system. Some of these things may not appear useful or needed at first glance but you will find these additions and changes useful at some point during the lifetime of your install.

Standard folders for Fonts, Icons and Themes

There are a couple of items which I do because I am fickle, review what I suggest and omit items you do use if you see fit to do so.

Open a terminal and Type: >

```
cd ~
```

This will ensure we are in your home folder.

Now Type: >

```
mkdir .fonts && mkdir .icons && mkdir .themes
```

Now if you want to use a new font download the .TTF file and place it into the .fonts folder the same applies to icons and themes. Note that these are hidden folders so you need to "Show Hidden" if you want to actually see the folders in your home folder.

Any fonts added to the font folder will become available in applications after restarting those applications if they are already running. You can download some from me by clicking this LINK copy the files to your .fonts folder **RMC** the file and select Extract Here. You will need to move all the files up one folder level because the extraction process creates an unwanted folder.

Themes added into the .themes folder can be accessed using Tweak tool and making sure the User Themes extension is enabled.

Icons can be placed in the .icon folder, these will not be included when you do an icon browse unless you direct the software to that location. It's just a nice place to keep everything and keeps the system in keeping to avoid confusion.

There are many places on the internet to find additional free fonts. Just search for free TTF fonts in your favourite search engine.

But in keeping with this

I would at this point recommend opening Nautilus, browsing to each of the newly created folders and bookmarking them for easy access, don't forget once bookmarked you can **RMC** any of the labels and rename them for preference.

Templates

I have no doubt that you have noticed a folder in your home folder called **Templates**, did you know that placing any template you create in the templates folder will give you the ability to **RMC** and select **New Document** and select a new blank document?

I have included a few basic templates that you can use to create blank documents with ease, Just click this LINK to download them. Then locate the **templates.tar.xz** file in your Downloads folder and copy it to the **Templates** folder in your home folder. Once you have copied it there, **RMC** the **templates.tar.xz** file and select **Extract Here**. Once extracted delete the **templates.tar.xz** file.

Now when you **RMC** in a folder in Nautilus you will be able to create new blank documents with ease.

Nautilus Keyboard Short Cuts

Nautilus is the file manager that comes stock with Debian Gnome edition. Nautilus is a very powerful file manager, but it is not evident when you look at the GUI which in recent years has become more and more cut down. However Nautilus has some very useful controls in the form of keyboard short cuts, below are two templates listing all of these short cuts. You may want to cut them out and stick them to your desk!

Shortcuts

General

Ctrl + N		New window
Ctrl + W		Close window or tab
Ctrl + F		Search
Ctrl + D		Bookmark current location
F1		Show help
Ctrl + ? / Ctrl + F1		Shortcuts

Opening

↵ / Ctrl + O	Open
Ctrl + ↵	Open in new tab
Shift + ↵	Open in new window
Ctrl + Alt + O	Open item location (search and recent only)
Shift + Ctrl + ↓	Open file and close window
Ctrl + O / Alt + ↓	Open with default application

1 2 3

Shortcuts

Tabs

Ctrl + T	New tab
Ctrl + Page Up	Go to previous tab
Ctrl + Page Down	Go to next tab
Alt + 0 ⋯ 8	Open tab
Shift + Ctrl + Page Up	Move tab left
Shift + Ctrl + Page Down	Move tab right
Shift + Ctrl + T	Restore tab

Navigation

Alt + ←	Go back
Alt + →	Go forward
Alt + ↑	Go up
Alt + ↓	Go down
Alt + Home	Go to home folder
Ctrl + L	Enter location
/	Location bar with root location
~	Location bar with home location

1 2 3

Shortcuts

View

Ctrl + +	Zoom in
Ctrl + -	Zoom out
Ctrl + 0	Reset zoom
F5 / Ctrl + R	Refresh view
Ctrl + H	Show/hide hidden files
F9	Show/hide sidebar
F10	Show/hide action menu
Ctrl + 1	List view
Ctrl + 2	Grid view

Editing

Shift + Ctrl + N	Create folder
F2	Rename
Delete	Move to the Wastebasket
Shift + Delete	Delete permanently
Ctrl + X	Cut
Ctrl + C	Copy
Ctrl + V	Paste
Ctrl + A	Select all
Shift + Ctrl + I	Invert selection
Ctrl + S	Select items matching
Ctrl + Z	Undo
Shift + Ctrl + Z	Redo
Ctrl + I / Alt + ↵	Show item properties

1 2 3

Opera Browser

I am a fan of Opera, apart from the fact it loads faster, renders pages faster and has a build in free VPN for browsing it doesn't have the bloat of the other more popular browsers and it doesn't have any of the spying either (mention no names ! GOOGLE!).

You need to download Opera from the main Opera web site. Click this LINK to open the Opera home page in your browser and click the blue Download now button to download the .deb file to your Downloads folder.

Open Nautilus and browse to your downloads folder, locate the Opera .deb file, at the time of writing this the file is: **opera-stable_75.0.3969.171_amd64.deb** however as Opera updates frequently I would suggest that the version number of this file will have changed by the time you actually download it. So use your common sense and locate the file in your Downloads. **DO NOT** just double click the file.

RMC on the file and select Properties from the menu. This will open the Properties dialogue box. Now click **Open With** and select **Software Install** and click the **Set As Default** button. Now close the dialogue window. This will make **Software Install** the default .deb installation manager.

Now double click the Opera .deb file and wait for the installation dialogue to appear. Once it does select Install. You will be asked to enter your Super User password. Do this and continue. During the installation another dialogue will appear asking if you want Opera to update with the rest of the system software, leave this defaulted and click **Next** continue with the installation. Once installation has completed you can delete the Opera .deb file from your Downloads folder.

Locate Opera in your Applications menu and select it to launch Opera. At this point I would also suggest **RMC** the Opera launcher and selecting **Add To Favourites**. This will add Opera to your launcher bar.

Codec Pack

OK now I would like to explain the reasons for the next steps. We are going to install codecs for Flash Player and for ffmpeg. The reason we have to install these manually is because Opera do not license these products. Therefore they can not be bundled with Opera by default.

The two sets of codecs we are going to install will allow Opera to display Flash video, H264 video and WebM in web sites such as YouTube among others. It is not a good idea to miss out this part of the installation because the web is changing and older formats are being used less and less, these two codecs will take care of pretty much most things you will encounter in terms of multimedia on the web. An additional note here. When Opera updates, which is frequently, it overwrites one of the codecs we need, so I have devised a method of manually updating this file each time Opera is updated. This is not complicated but you will be required to manually run a script if you notice Opera has been updated or you notice that some videos are no longer playing back on sites like YouTube. It's not a great solution but at present it's the best I can come up with.

Now through the wonder of scripting I have saved you a load of work at this point. I have created an archive for you to download. It contains the codecs and the scripts to install and update the required codecs.

You can download the file by clicking this [LINK](#).

Once downloaded you should go to your Downloads folder **RMC** the file called **yogicodecpak.tar.xz** and select **Extract Here**.

This will create a new folder called opera_codec_installer inside of this folder you will find a sub folder called .codecs (This is a hidden folder) and two script files. You will need to have Hidden Files switched on so if you can't see the .codec folder:

L/CTRL+h

You should now be able to see that folder.

Once you can see all of these files and folders:

.codecs

install.sh

update-ffmpeg.sh

Select all and copy them to the root of your home folder.

Once the files have finished copying open a terminal. Type: >

```
                                                            cd ~ [ENTER]
                                                           ls -a [ENTER]
```

Now we need to execute the scripts, you need to do this in the correct order so don't go rushing ahead. Each script will run without elevated privileges, however those that do require sudo will ask for your password at the correct times.

Type: >

```
                                                ./install.sh      [ENTER]
```

Follow on screen prompts. Once the installer has finished you will need to **RESTART** your computer. "You must do this for changes to take effect".

Updating ffmpeg

You DO NOT at this point need to execute the **update-ffmpeg.sh** file, this is for updating that codec as and when Opera is updated. If at some point Opera updates you can update the codec by opening a terminal and typing:
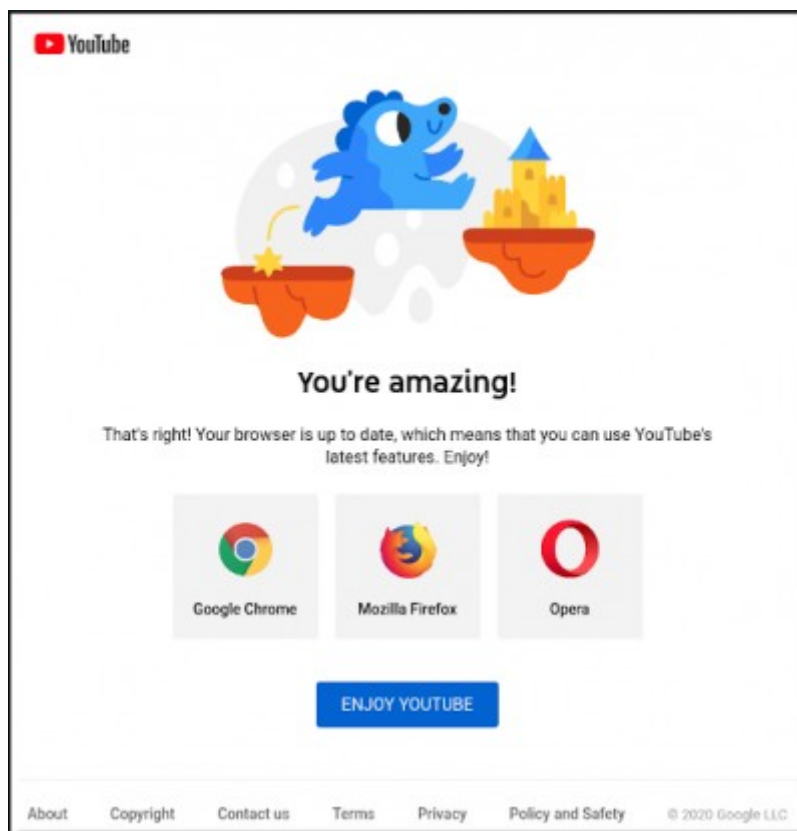
```
                                                          cd ~ [ENTER]
                                              ./update-ffmpeg [ENTER]
```

Testing the Codecs

After Restarting Your Computer

We should now check that Opera is using the codecs correctly. Make sure you close and re-open Opera if you already have it running.

Now click this LINK and make sure you see the below screen from YouTube.

Now we need to test an HTML 5 video so click this LINK and make sure the video plays. Sorry about the subject matter! If the video plays correctly then we can move onto the next test.

OK so although there is still a codec for Adobe Flash player, it is very out of date and no longer supported as of December 2020. So I will no longer be suggesting installing it or testing it. If you have a requirement for FLASH content in your browser, the above codec will work or at least should, however I no longer recommend using it. If you do, then you do so at your own risk. Any web sites still using FLASH content should have already updated to HTML5.

Now that we are happy that ffmpeg and Flash Player codecs are working we need to go back to our home folder and delete the **install.sh** script.

Open terminal if it is not already open and run these commands:

Type:

```
cd ~                [ENTER]
rm install.sh       [ENTER]
```

Follow on screen prompts.

That's it Opera and your codecs are now installed. Obviously you need to enter the Opera settings and make things the way you like them. I would suggest turning on the Opera Adblocker and installing Adblock Plus. I would also recommend installing all of the Adblock Plus subscription filters from THIS PAGE, I recommend everything from Anti-circumvention onward. But this is optional.

Adding Extra Repositories

Debian comes by default with the stable repositories enabled. If you want a newer package or a package unavailable in the default repositories you need to add them. Here you can find a list of additional repositories that in my experience are safe to use with Debian and I have had no problem with software from these repositories making the system unstable.

Debian Backports

Add Backports to sources.list

Open a terminal and Type: >

```
sudo nano /etc/apt/sources.list [ENTER]
```

At the end of the file add this line: Type: >

```
deb http://ftp.debian.org/debian stretch-backports main
```

Save your changes and exit. Type:

☞ L/CTRL+X

Now update your repository cache. Type:

```
sudo apt update
```

Backports are deactivated by default so you have to specifically select the backports package to install it, otherwise the installer will select the version from the standard repository (If available).

To install a package from backports Type: >

```
sudo apt -t bullseye-backports install {package-name}
```

Gksu

ince Debian 10 gksu is a depreciated package. Current recommendations suggest that to run an application with elevated privileges you should Open terminal

Type: >

```
xhost +
```

Type the command to execute required application then again in terminal.

```
xhost -
```