AGHA TALHA 22P-0500 BCS-4A

GENTOO INSTALLATION GUIDE

INTRODUCTION

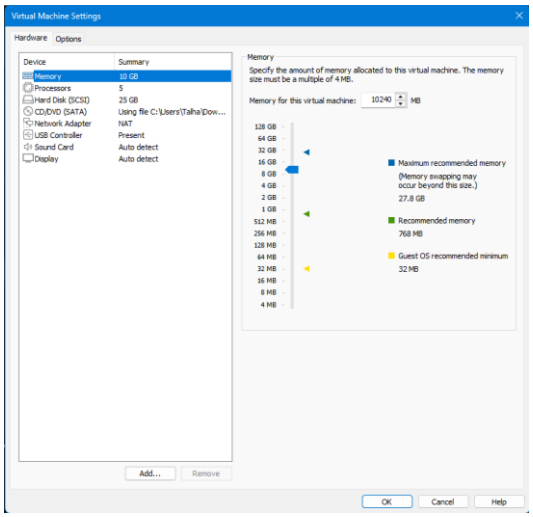
This is an installation guide to install gentoo on VMWare system in UEFI Mode and in OpenRC file system. The Gentoo Handbook is the main source for installing it. And it can change after this is released, so do take that as a primary source of installing gentoo linux for the future

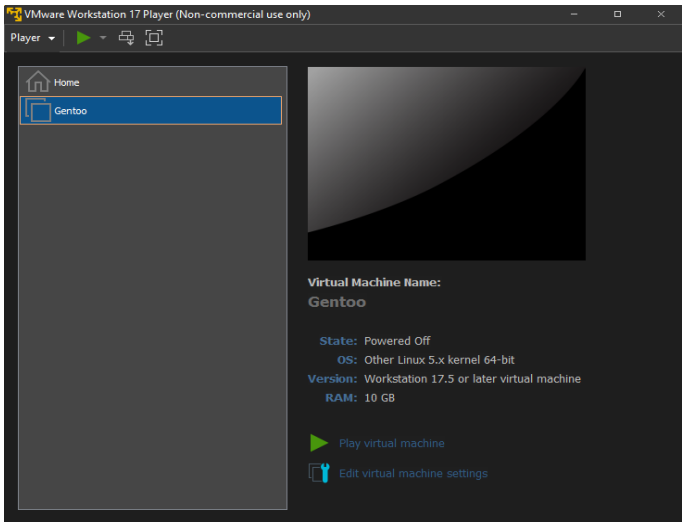
You will need the following

- At least a 4 core CPU. It can work on less but might die before its completed.
- At least 4 GB of RAM, But I will recommend 8 GB for smoother installation.
- Minimum 8GB of Storage. I used 25GB for safe keeping
- Lastly, you'll need a pinch of consistency, a handful of patience, a whole lot of time and some cups of Tea.

1- Now you have all this, first we will configure our VMWare for Gentoo Installation so go grab the Gentoo Installation from the Official Website under the amd64 minimal installation ISO.

2- After downloading that, setup your VMWare environment. Mine is setup like this

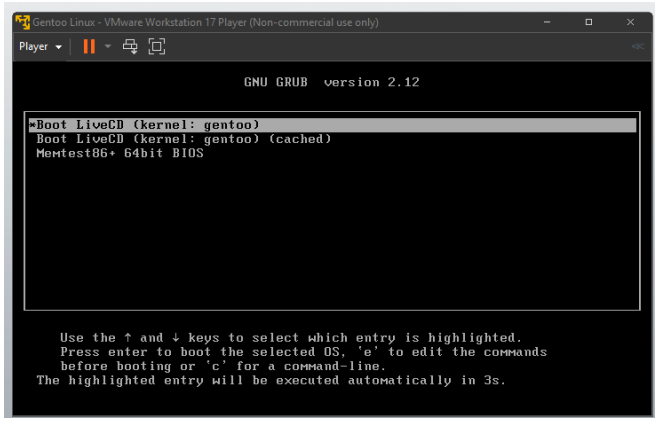




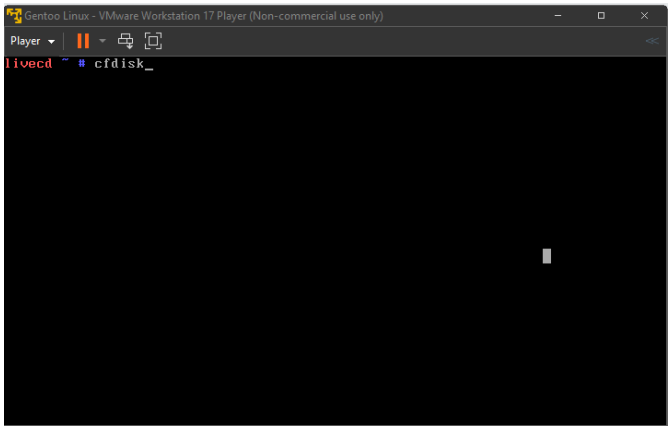
2.1. One thing I did to fix my Gentoo and make sure it runs on the UEFI System with Safe boot disabled is I added these two lines in my Gentoo.vmx (in your case Gentoo will be the name you gave to the Linux on setup). Add these two lines anywhere in that file.

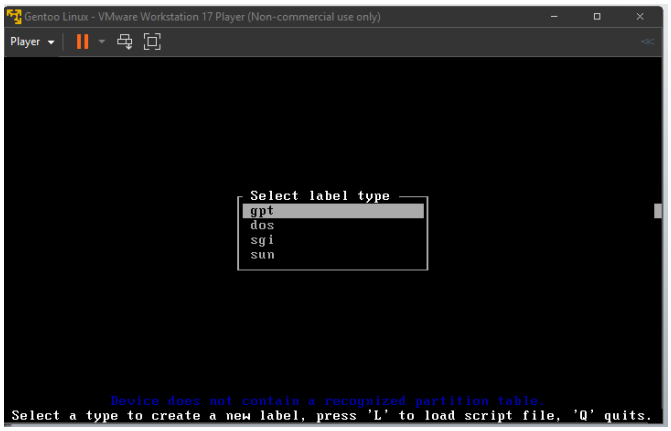
- firmware = "efi"
- efi.secureBoot.enabled = "FALSE"

3- After this go on and select the first option in the Gentoo ISO options. It can say LiveCD or Simple Gentoo Installation. Doesn't matter.

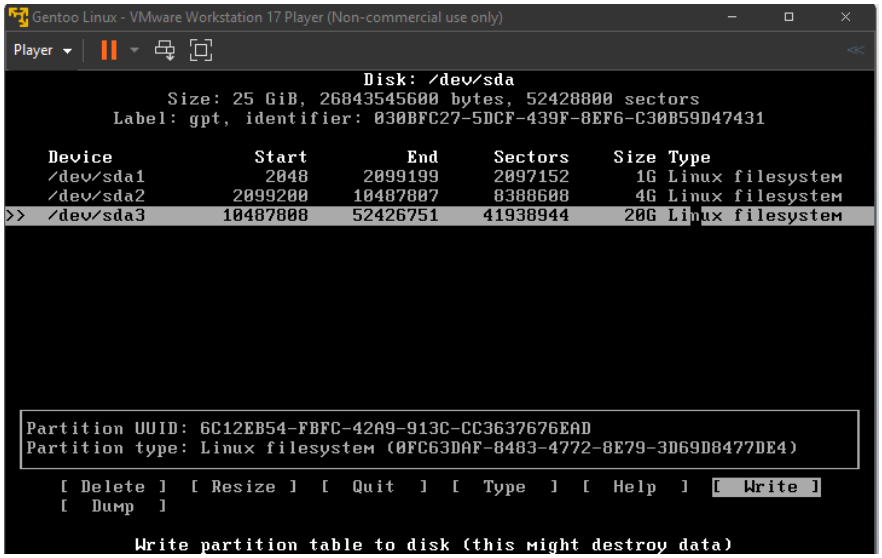


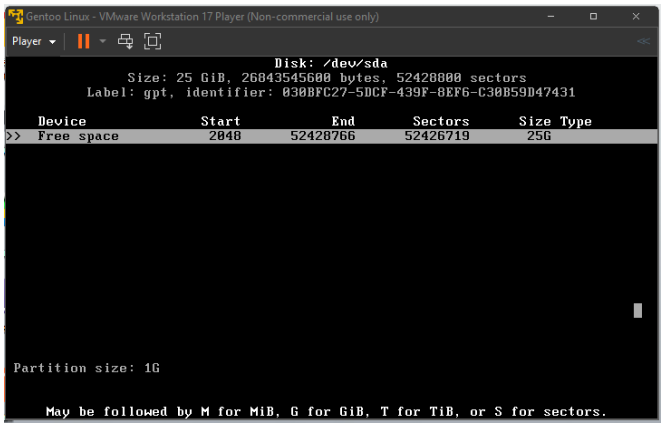
4- Now we start the process of making our partitions. Start by running cfdisk to start the disk partition process and select the GPT option.



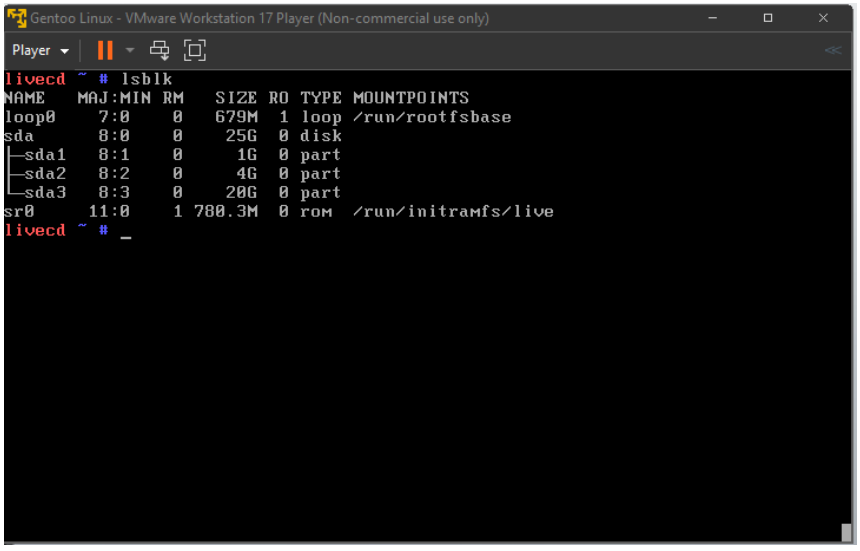


5- After that start the disk creation by creating a 1G root partition, 4G swap partition in case the RAM falls short, and the rest will be your storage for Gentoo Linux.

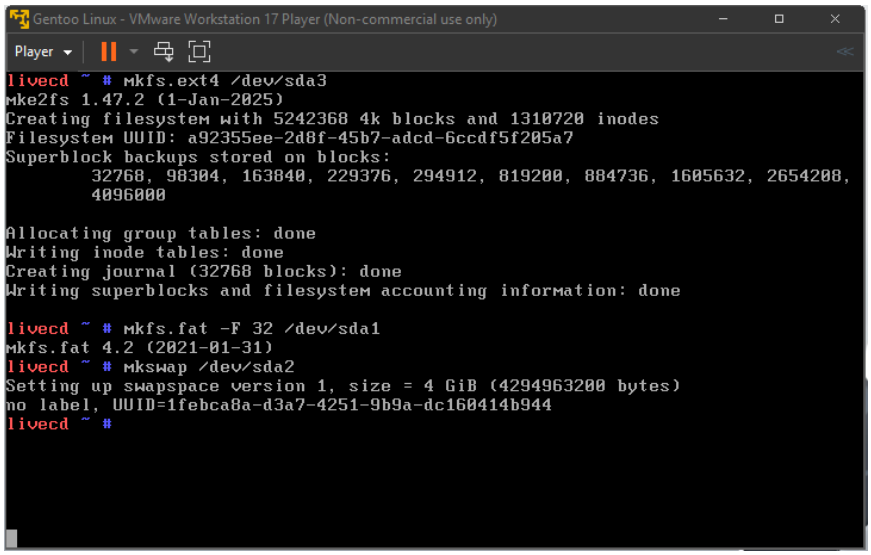




6- To confirm your filesystem is created, type lsblk and it should show a tree under sda

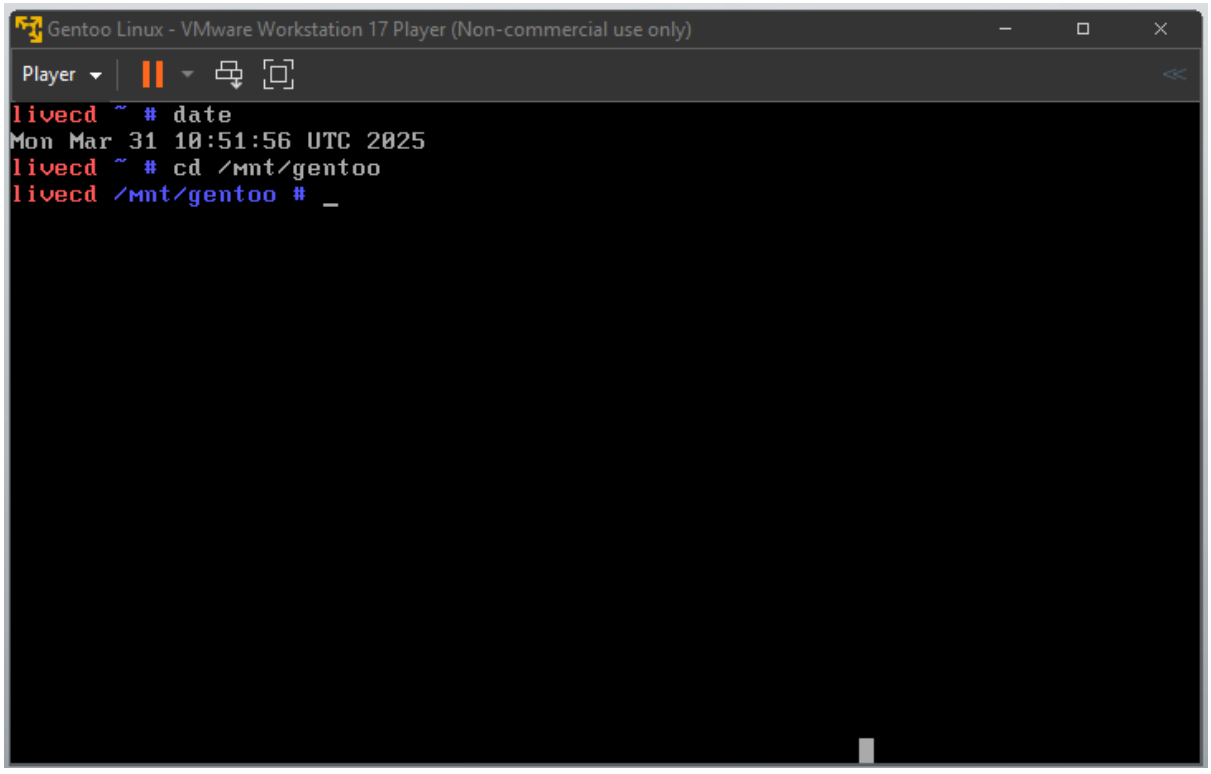


7- The provide the extension for each partition you just created according to the image below, do remember to follow the Gentoo Handbook here



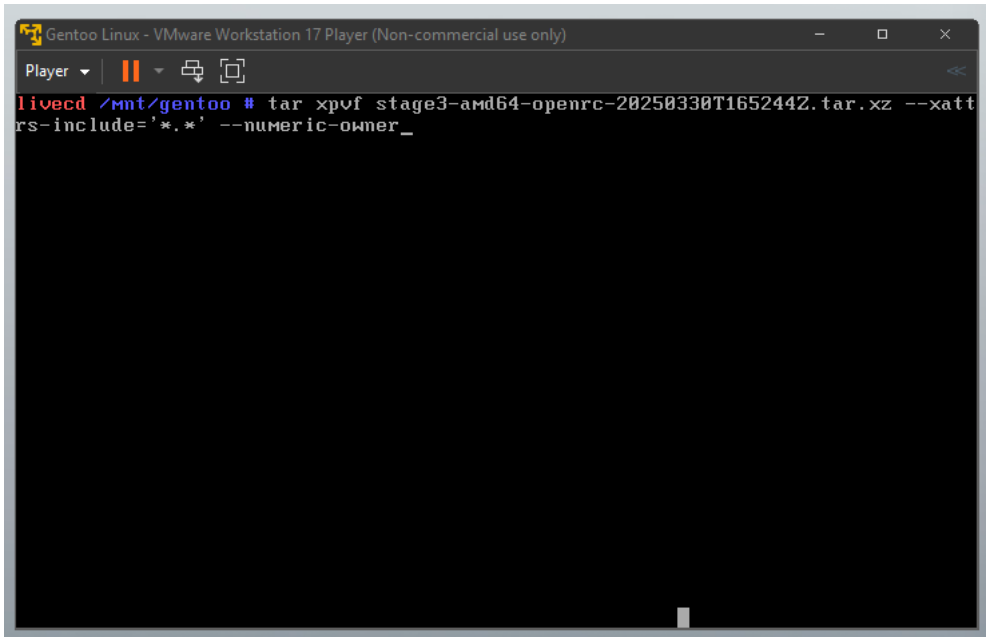
8- Following that add the following command “mkdir -p /mnt/gentoo” and mount your /dev/sda3 on /mnt/gentoo folder.

9- Make sure your date is correct by writing “date” in the terminal and the cd into the /mnt/gentoo folder

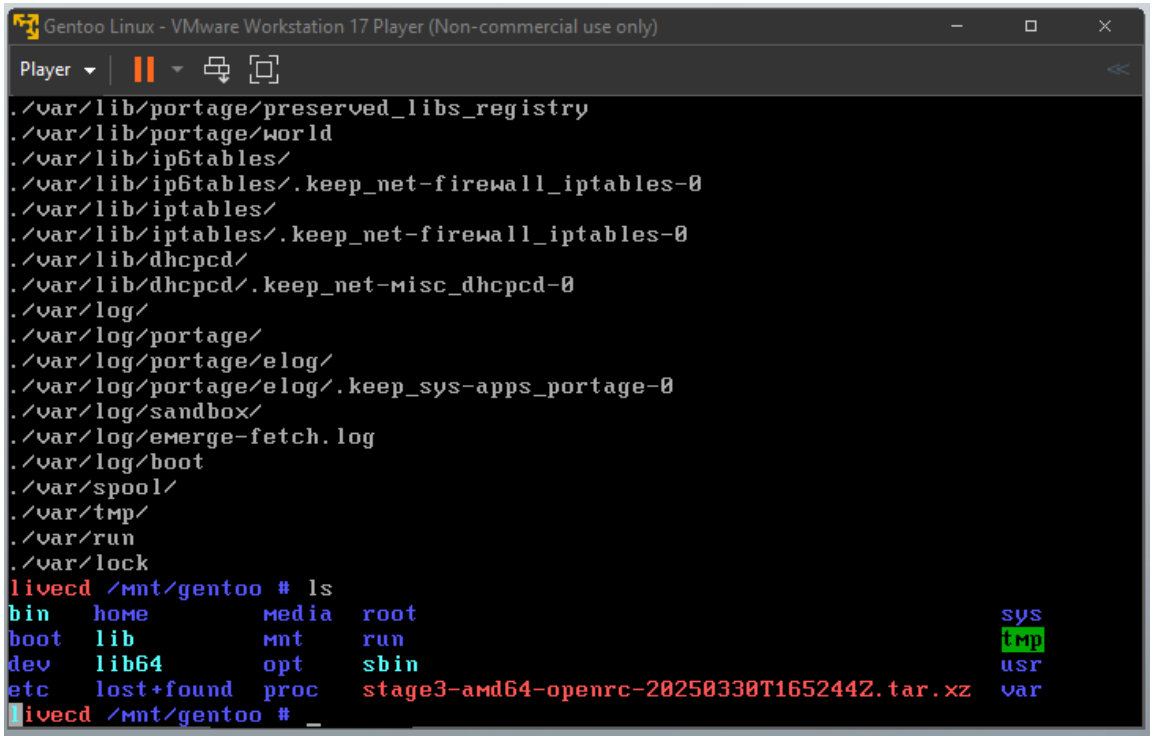


10- After that we will install the gentoo OpenRC stage file by using the Links command. Go to the download section there and then to the Stage3-OpenRC file and save that file. Commands for the links command is in the Gentoo Handbook

11- After installing write the command and wait for some time.



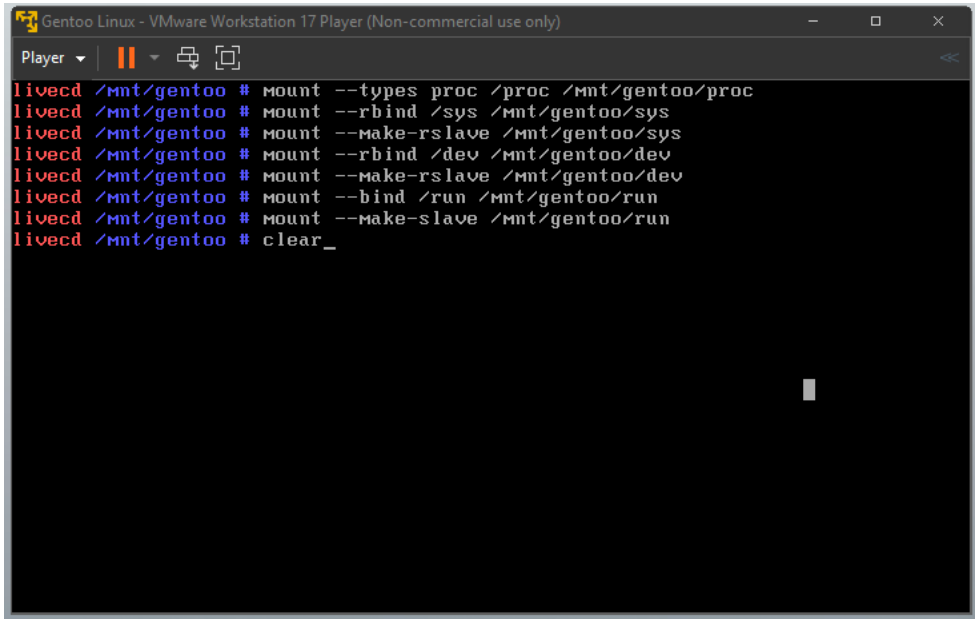
After installing the Stage 3 file your filesystem should look like this



12- Now change your Use and MAKEOPTS flags in the make.conf file. Follow the Gentoo Handbook on how to choose the optimal number of MAKEOPTS. Usually its min(Ram Amount || CPU Cores Allocated). And in the use flags write USE = “-systemd -kde -gnome -bluetooth”.

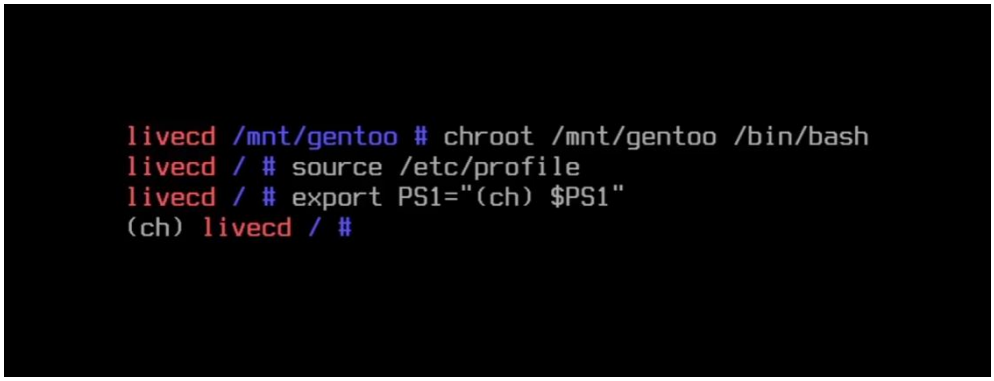
13- Now copy your DNS info from etc/resolv.conf to /mnt/gentoo/etc. Check the Gentoo Handbook for changes here if any error occurs.

14- Now mount your filesystems so that they are available later on using these commands.

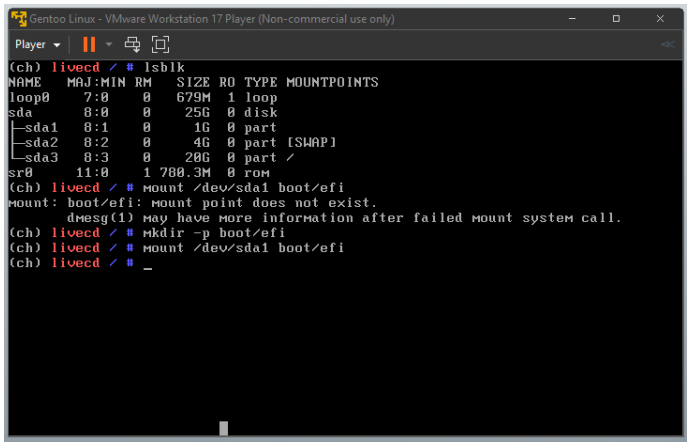


15- Now CHROOT into your gentoo file and then write

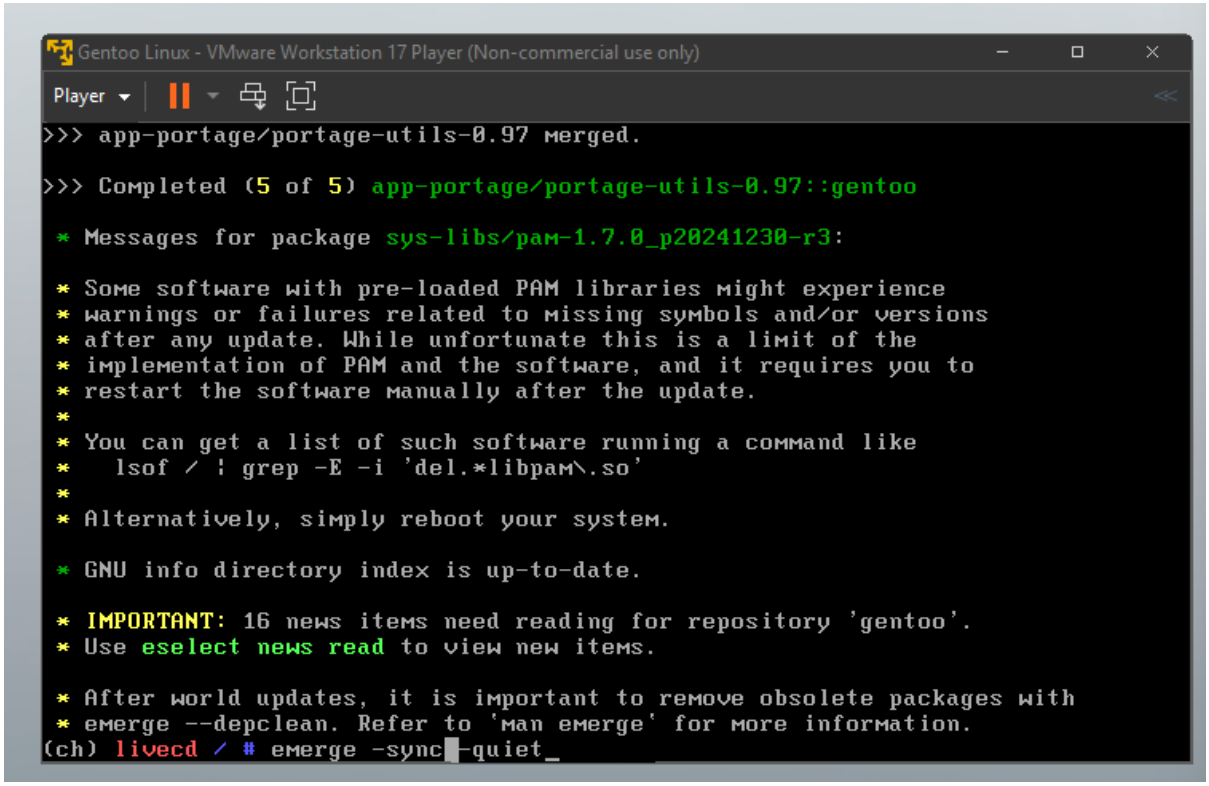
- source /etc/profile
- export PS1 = “(ch1) $PS1”



16- Then after installing the base kernel, we add our EFI partition in the sda1

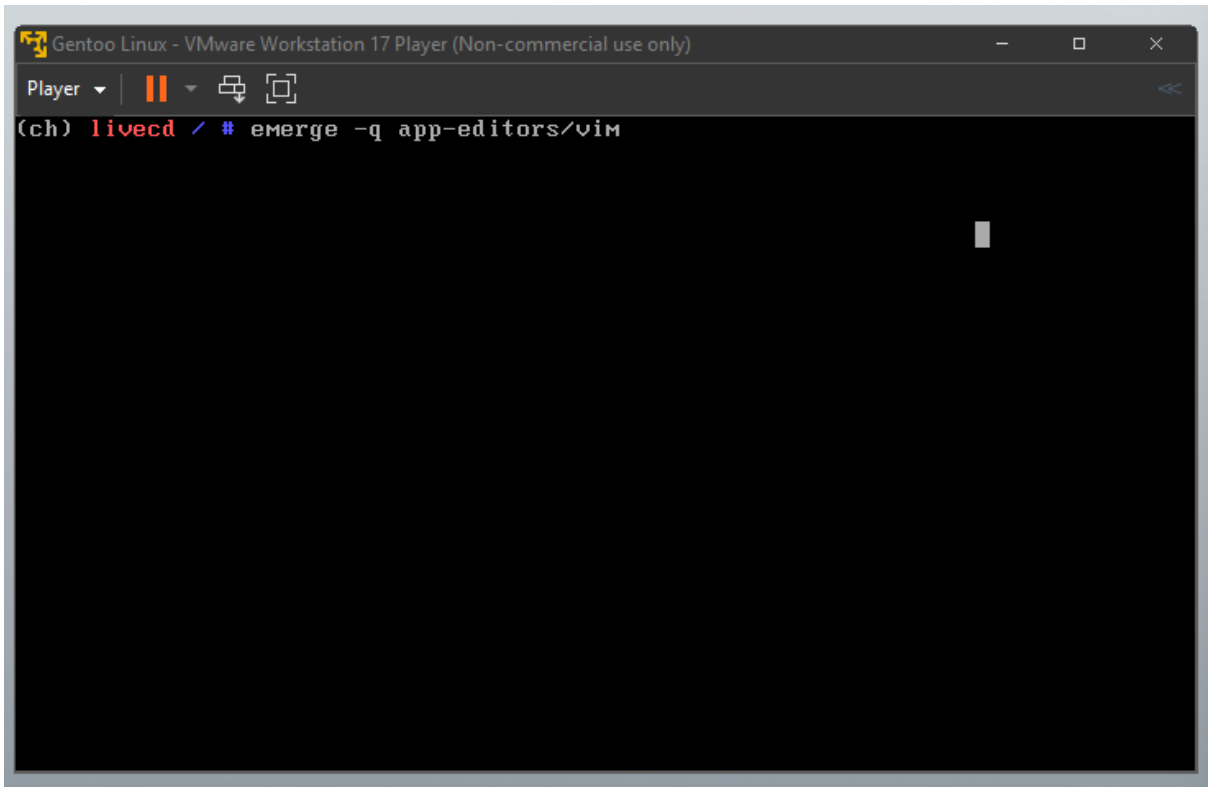


17- Then sync your emerge services by writing emerge-webrsync, then sync your emerge.



18- Then update your emerge base by writing emerge –ask –verbose –update –deep –changed-use @world.

19- Now install VIM for editing in the files later on.



20- Then set your time and local by following the Gentoo Handbook, Use America as Country and Los_Angeles as state. Follow the handbook because this part change with time.

```
(ch) livecd / # ln -sf ../usr/share/zoneinfo/America/Los_Angeles /etc/localtime
```

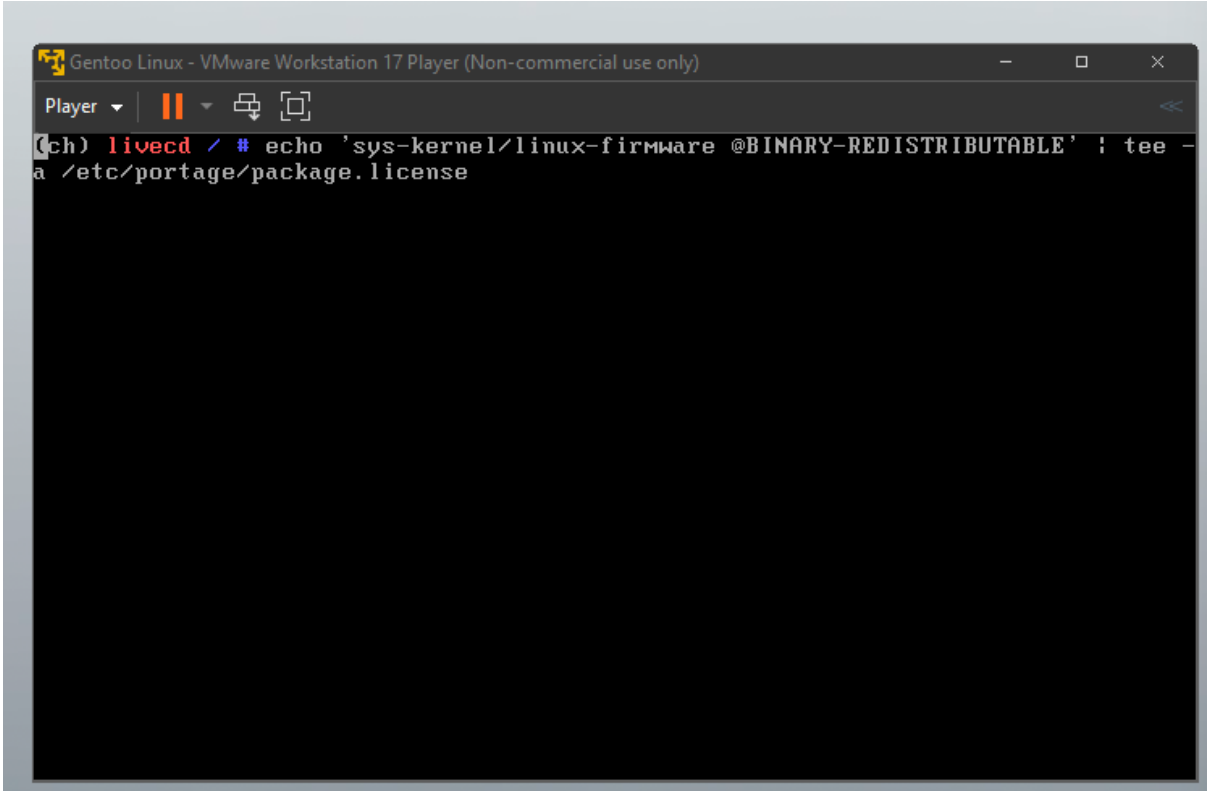
21- Then enter the locale.gen file and uncomment the UTF8 line on the second number at the options in the end.

```
(ch) livecd / # vim /etc/locale.gen
```

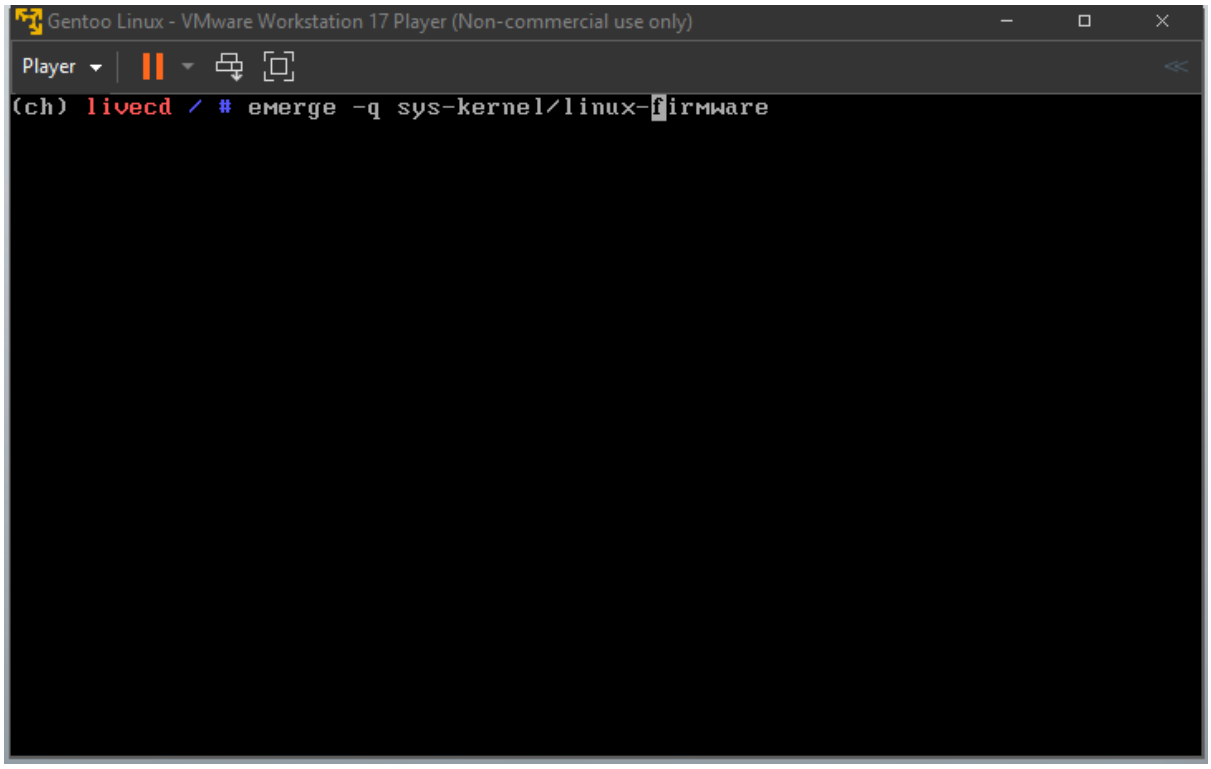
22- Then select the system-wide locale and update the environment

```
(ch) livecd / # eselect locale list
Available targets for the LANG variable:
  [1]   C
  [2]   C.utf8
  [3]   POSIX
  [4]   en_US.utf8
  [5]   C.UTF8 *
  [ ]   (free form)
(ch) livecd / # eselect locale set 4
Setting LANG to en_US.utf8 ...
Run ". /etc/profile" to update the variable in your shell.
(ch) livecd / # env-update && source /etc/profile && export PS1="(ch) $PS1"
>>> Regenerating /etc/ld.so.cache...
(ch) livecd / #
```

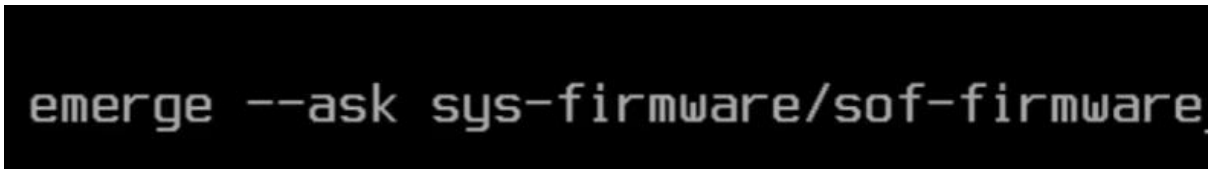
23- Now we are ready to install the Kernel. Write the following command first.



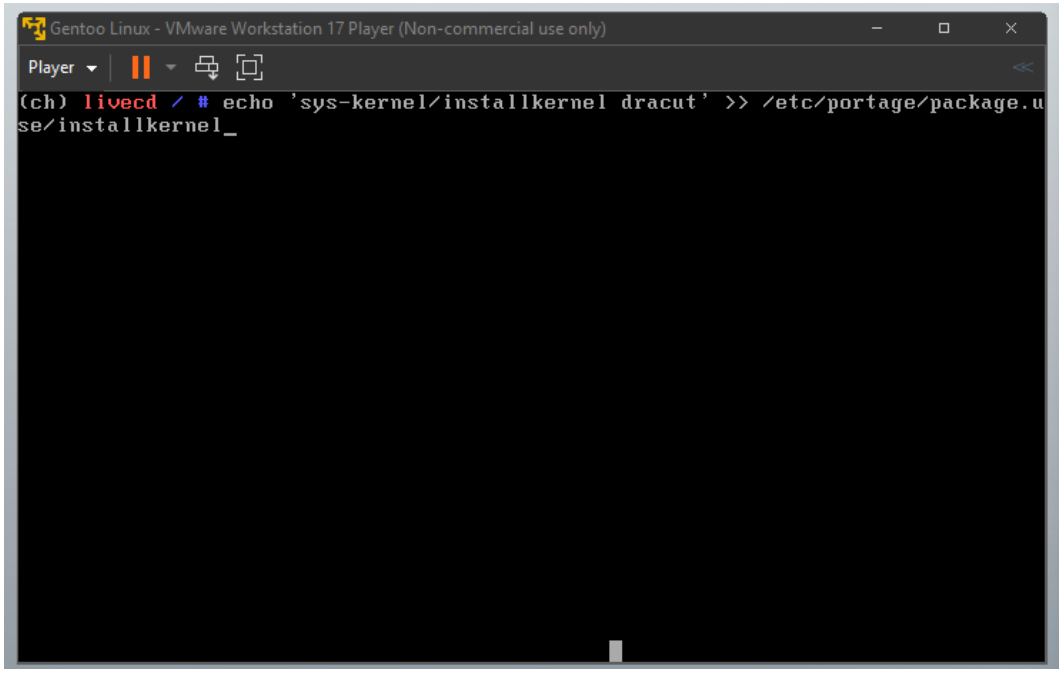
24- Now install the linux firmware and the system kernel



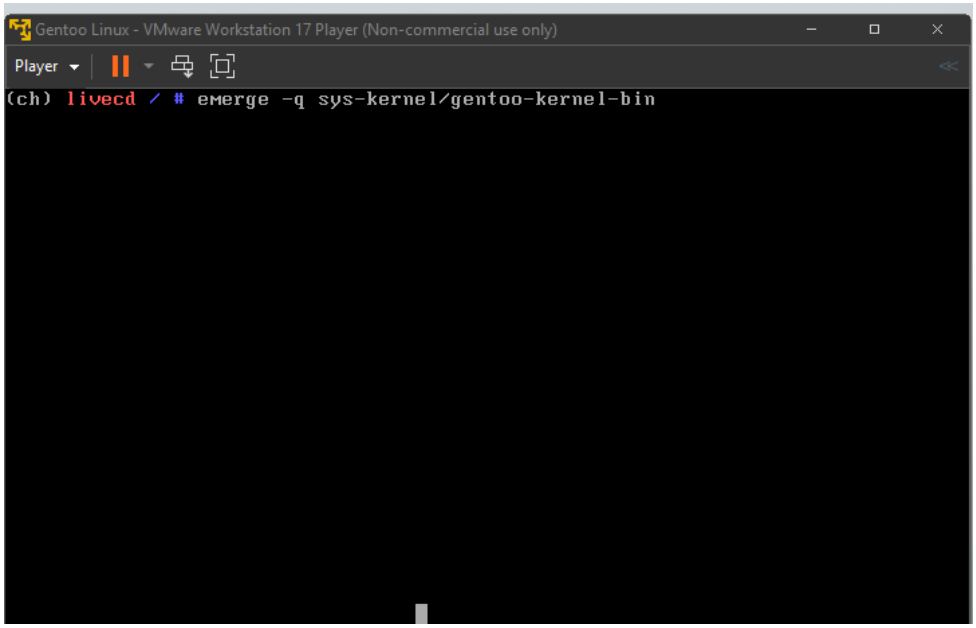
25- Install SOF for sound drivers by this command.



26- Then we install Dracut by putting Dracut in the package.use file



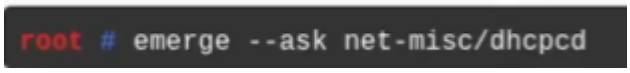
27- After that install the kernel by writing “emerge sys-kernel/installkernel” following with emerge -q sys-kernel/gentoo-kernel-bin

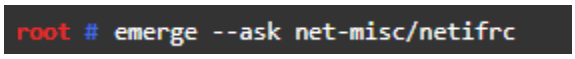


28- Now you need to set your fstab file. I’ve done it using vim by calling vim /etc/fstab and writing the following at the end of the file

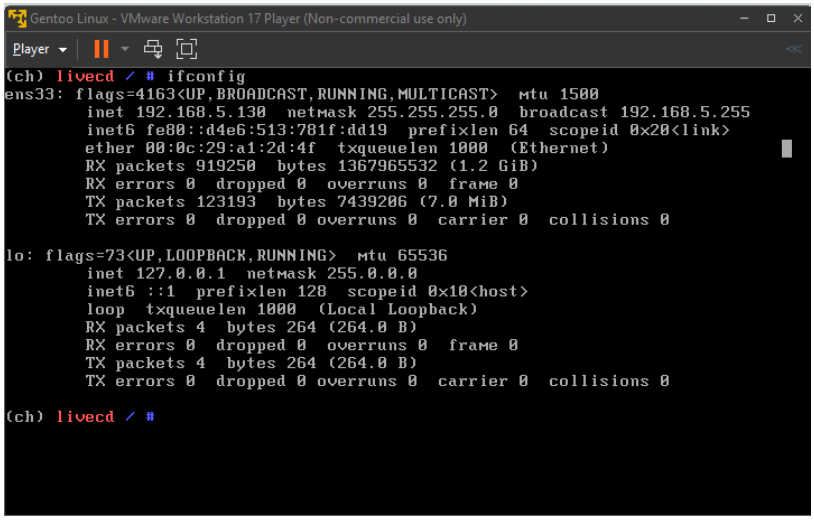
29- Now set your hostname and change /etc/hosts according to the Gentoo Handbook. If you don’t change it, by default it is set to “localhost”. But I would recommend that you change it.

30- Now install dhcp and netifrc via the command



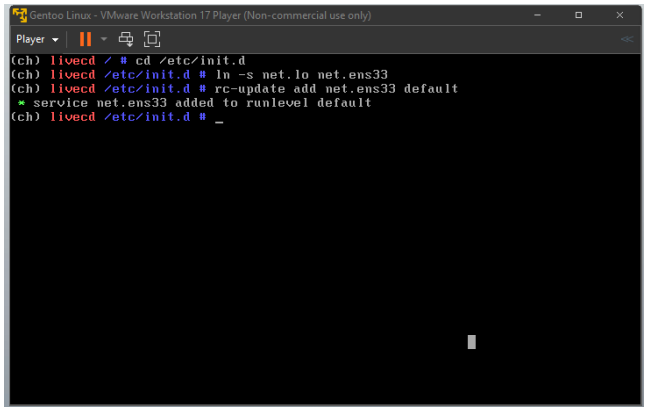


31- Now write ifconfig and remember your config name. For my case it was ens33 and it can be changed for your case.



32- Now change your /etc/conf.d/net file and write config_ens33=”dhcp”

33- Then add the networking at boot. Cd into /etc/init.d



34- then write passwd and add a password for the root user.

35- Create a user for yourself using the command “useradd -m -G users,wheel,audio,video -s /bin/bash YOURPROFILENAME”

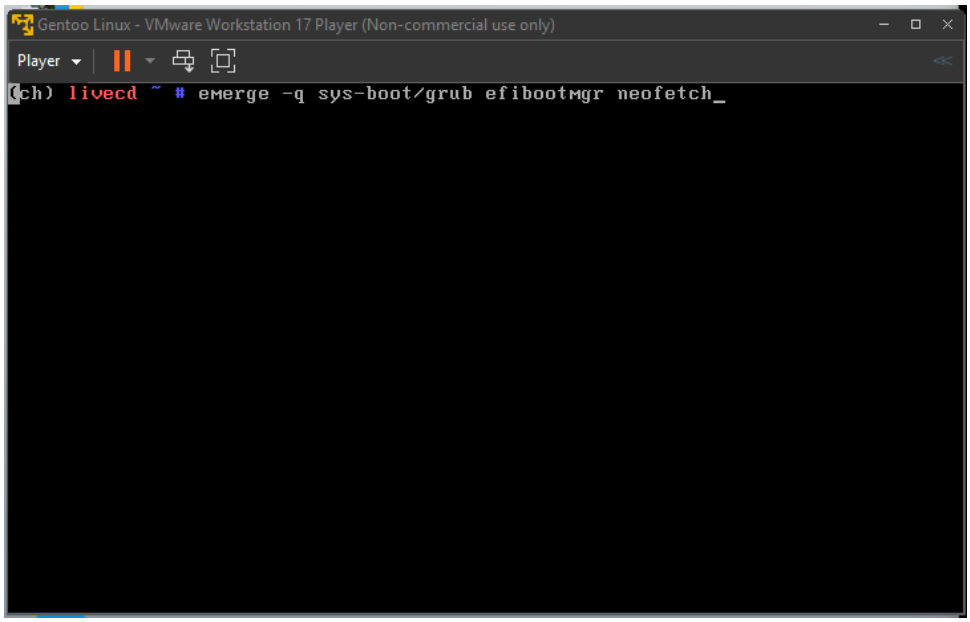
36- Then add passwd command again for your profile password which you will use.

37- Now install sudo by the command “emerge -q sudo”. Add the command EDITOR=vim visudo and comment the line where it says “%wheel ALL = (ALL:ALL) ALL”

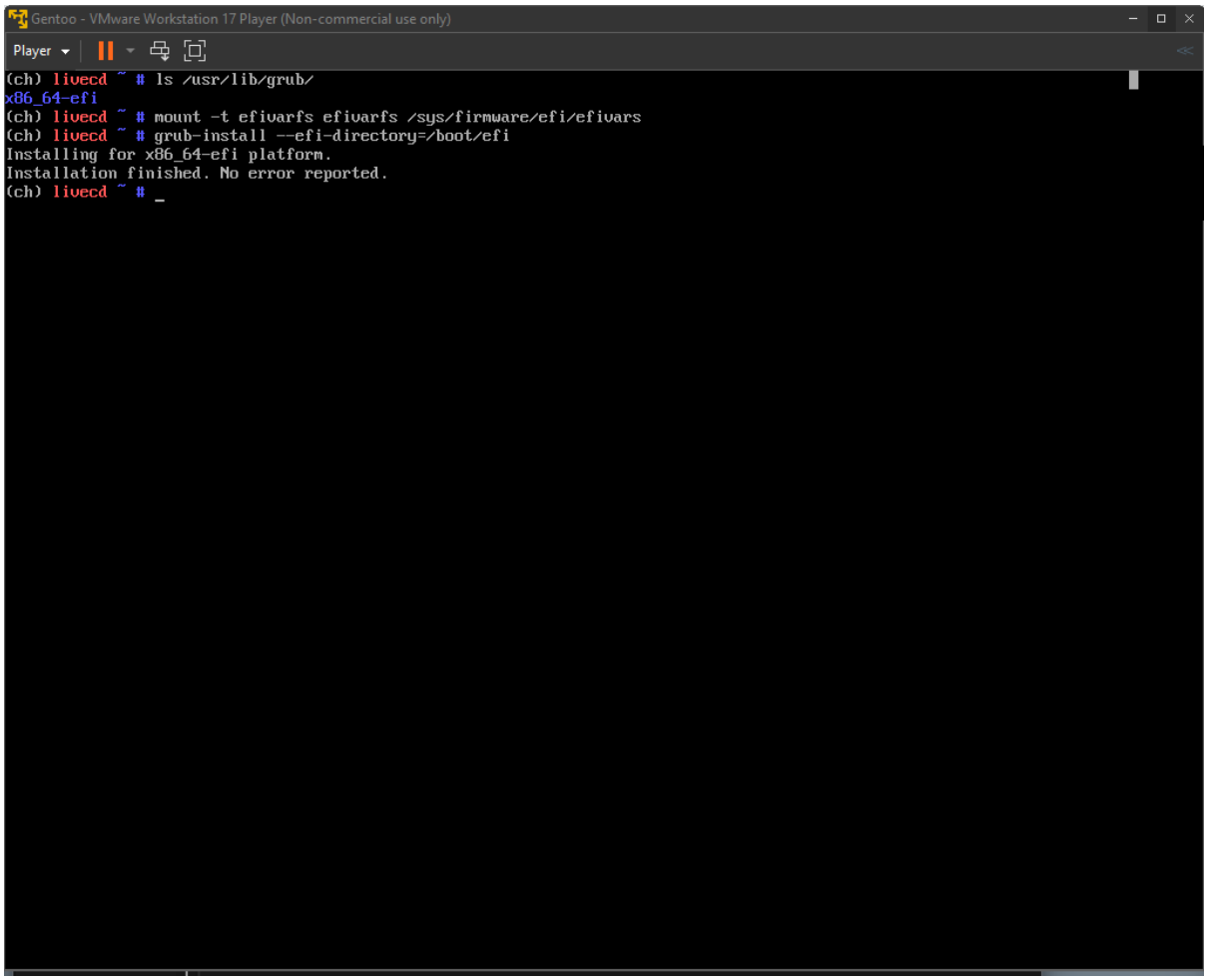
38- Then go to home directory by using cd and add the command below

```
echo 'GRUB_PLATFORMS="efi-64"' >> /etc/portage/make.conf
```

39- Finally set up GRUB for installation



40- Now install GRUB

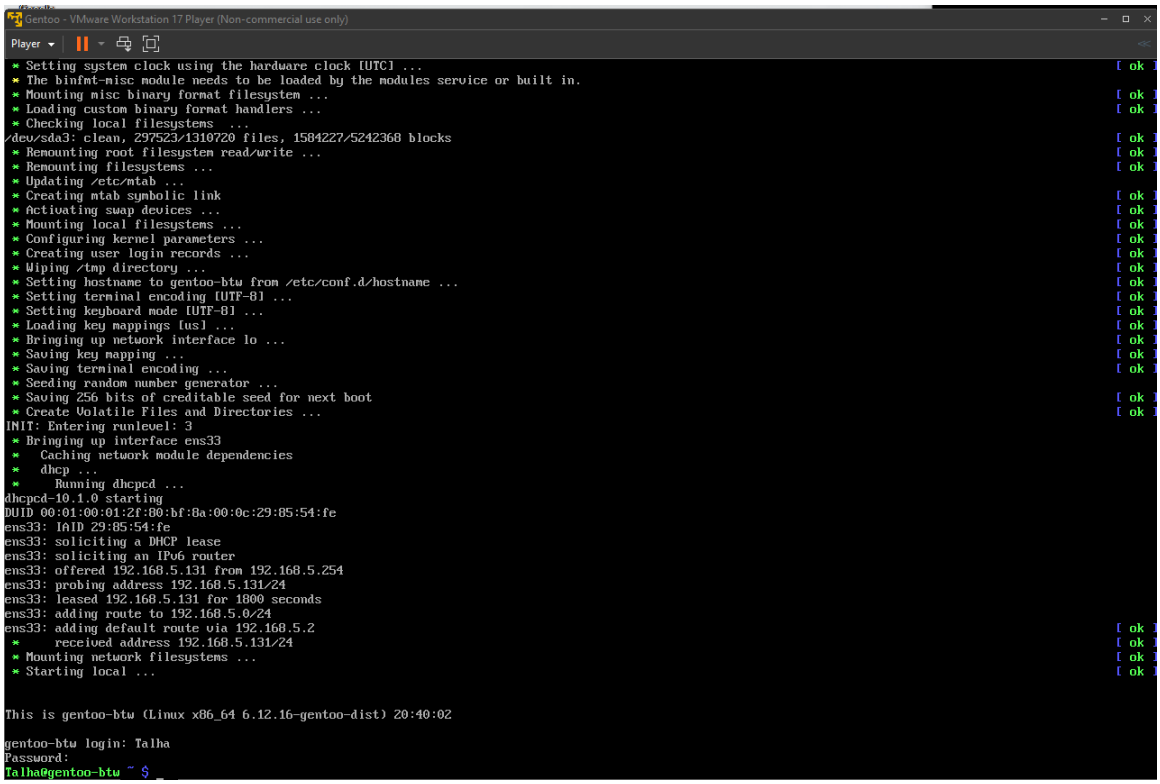


41- Then write the command grub-mkconfig -o /boot/grub/grub.cfg.

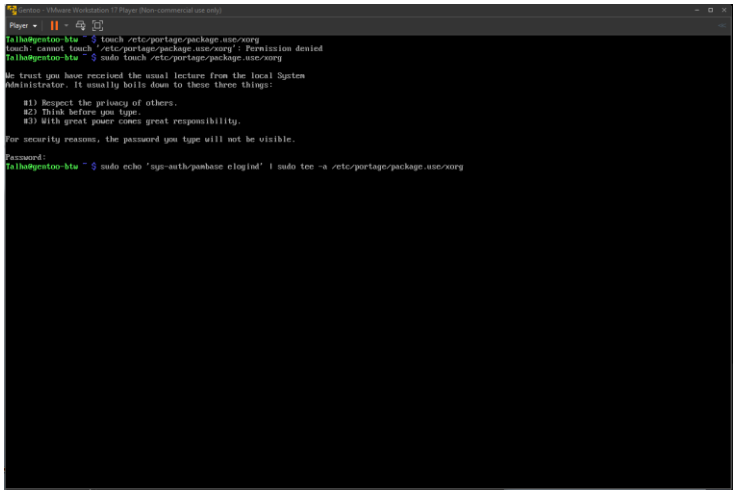
42- Now you are mostly there after we reboot the system all other options are optional.

43- Type “exit” to exit from chroot and cd to get to home directory and unmount your directories by writing umount -R /mnt/gentoo

44- Then type reboot and your Gentoo Linux is installed. Type in your username and password and you are logged in to Gentoo Linux.



45- All steps now are optional. Now you can add XORG



46- Add optional dependencies for future package installation like git, Firefox, llvm, Video-ves

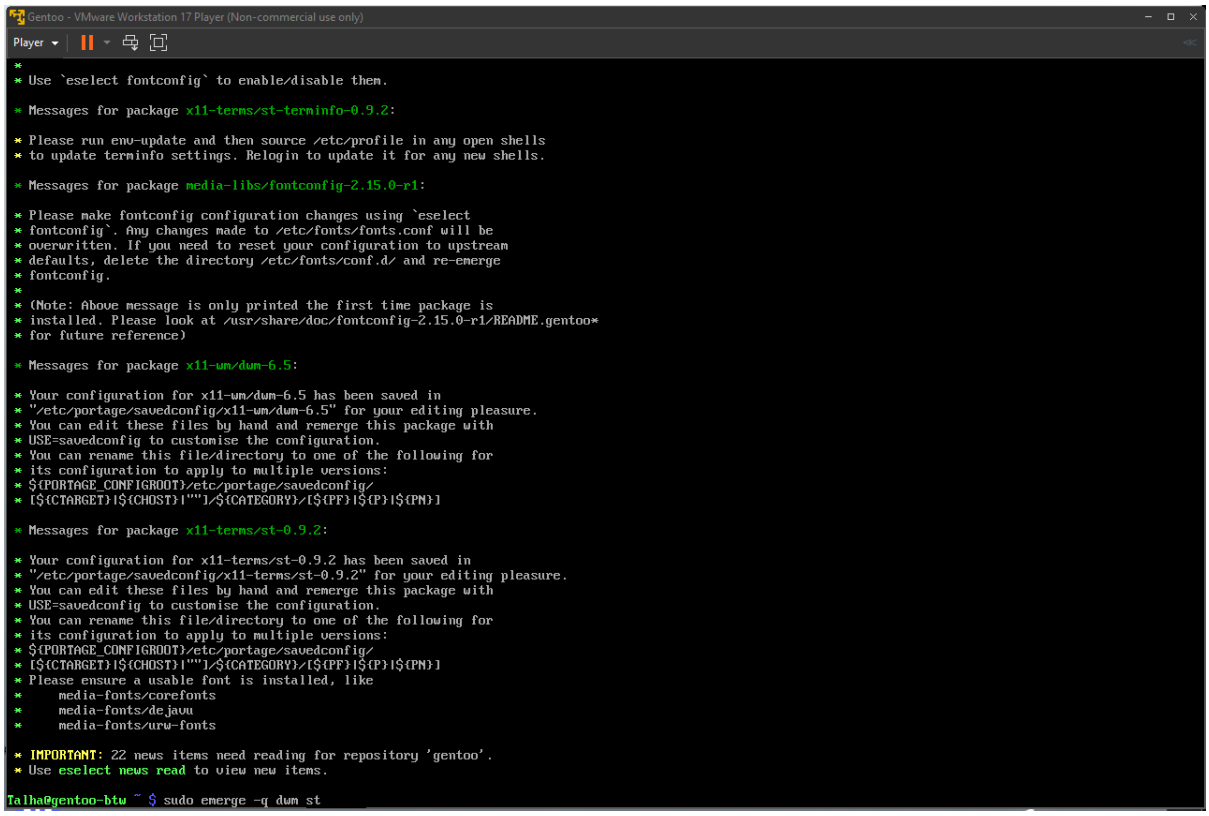
```
sudo echo 'media-libs/libglvnd X' | sudo tee -a /etc/portage/package.use/xorg
```

```
sudo echo 'net-wireless/wpa_supplicant dbus' | sudo tee -a /etc/portage/package.use/xorg
```

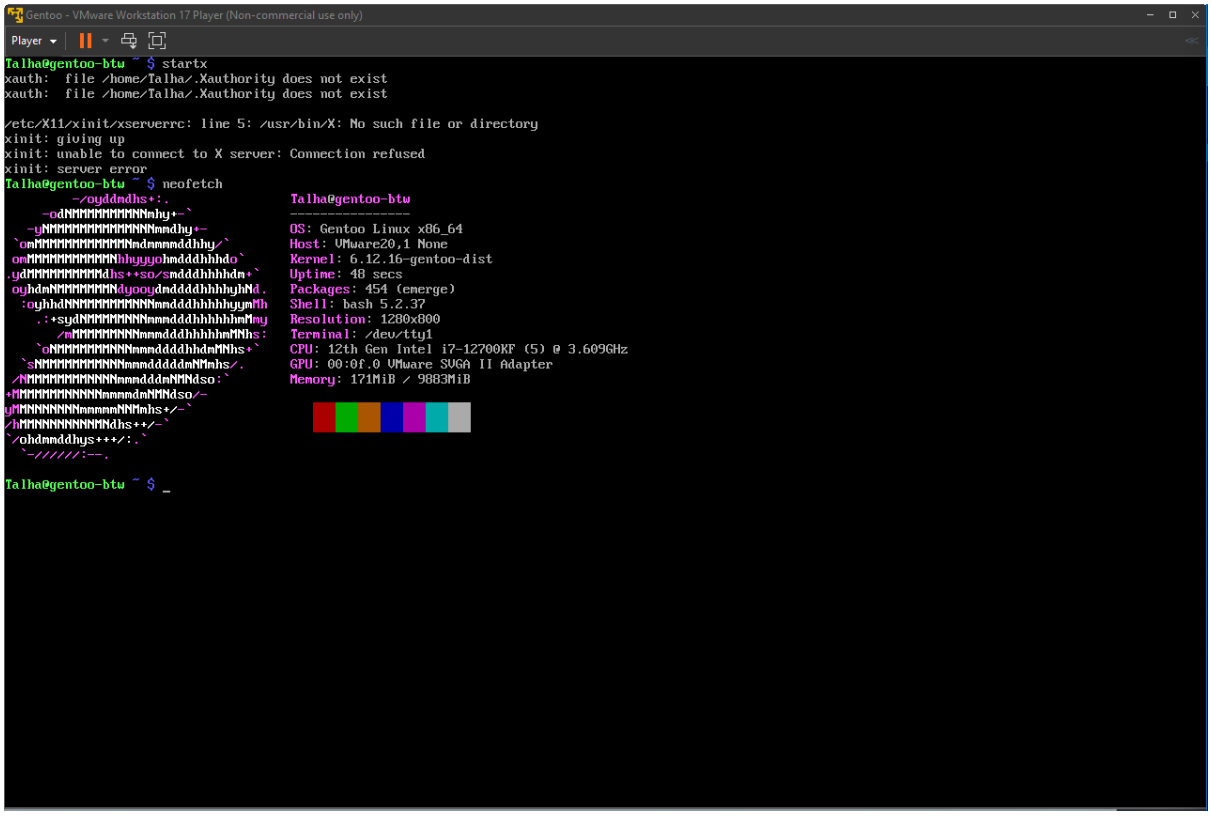
47- Add the optional packages from this command

```
sudo emerge --ask -q xorg-server x11-apps/xinit x11-apps/xrandr x11-drivers/xf86-video-vesa elogind dev-vcs/git
```

48- Now I've also added a Window Manager and Simple Terminal



49- Finally when all is done add the obligatory most needed and most awaited NEOFETCH



50- Here you go, your Gentoo Linux is now installed. Now you can tweak all your things and add new things if needed. Like I added a Network Manager for my Gentoo Linux.

CHALLENGES

1- Firstly, the main challenge is to check if Gentoo is installing in BIOS mode or UEFI mode. One trick to check that is to write ls /sys/firmware at start. If it returns a folder structure you are in UEFI mode. If not, then you are in BIOS mode.
2- The second challenge is all the File editing and making Gentoo customized for your environment. Gentoo has a guide for each set of hardware. I've skipped this part in my guide but its optional. Following the above guide will do most of your work. Make sure to check online for each File edits if you are unsure on what to do. Gentoo forums is a great place for that. Core file edits that are required should be done carefully.
3- Gentoo installation is a single go process, so you cannot break it in half. Do it properly and do it in a single go.
4- During the optional part of installing the packages LLVM takes very long to install, you can install the binary packages for that to reduce the time drastically just add -bin at the end of the package. LLVM is used in Media players and Firefox.
5- Make sure to change the localhost in the networking section and add a user and password, because without it root access and virtual machine issues can be very annoying.
6- Make sure secure boot is off in the VMWare. Description given above.
7- For file editing, its highly recommended to learn VIM a little.

ADVANTAGES

1- Gentoo Linux is highly customizable and can work on the weakest of the devices using different approaches.
2- You can add Package binaries and customize them to your own need. Like I didn't install LLVM at start because it was a large package, but it didn't stop me from using Firefox.
3- Look and feel of Gentoo can be changed via codes and GitHub Designs which is extremely fun to play with.\
4- You can install packages directly from source. You only understand it when you have worked on installing Gentoo Packages. Its a feature worthy of its own praise.