

Installing Gentoo

COMP 310 Operating Systems

January 10, 2020

Download VMWare There is a link on the COMP 310 homepage under the Tools card.

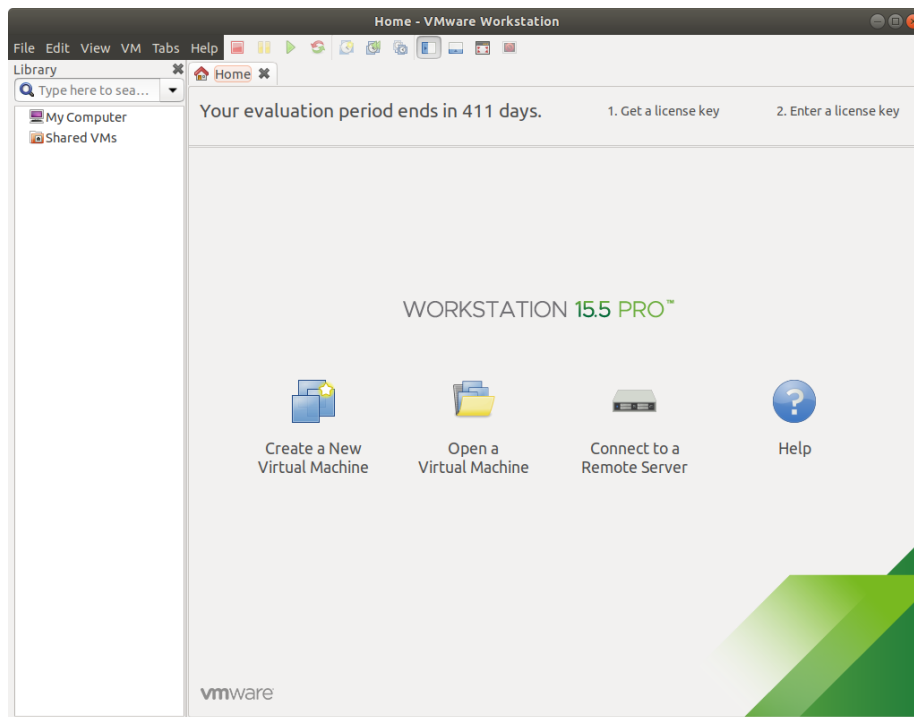
<https://neilklingsmith.com/teaching/loyola/cs310-s2020/>

You will need to create an account on the download site using your LUC email. It takes a few minutes for the account to activate. You'll get an email confirmation asking you to verify your email address, then you'll be able to download VMWare. Make sure you get the right version: you want VMWare Workstation if you use Windows and VMWare Fusion if you use Mac.

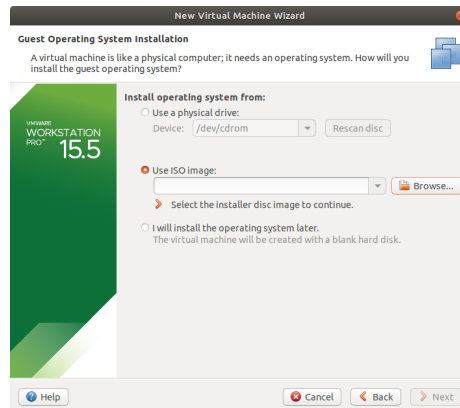
Download Gentoo Minimal Installation CD Go to the Gentoo Downloads web page and get the minimal intall CD for AMD64.

<https://gentoo.org/downloads/>

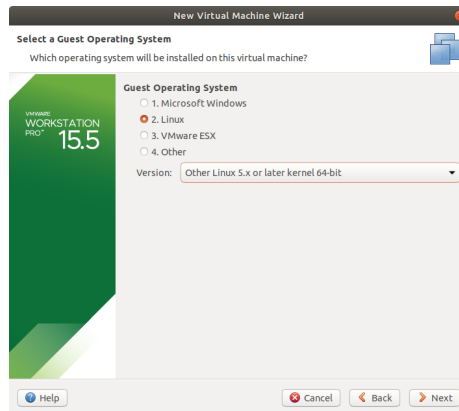
Start VMWare When you start up VMWare, you get the main screen (below). It might look different on Windows and Mac. You need to create a new virtual machine



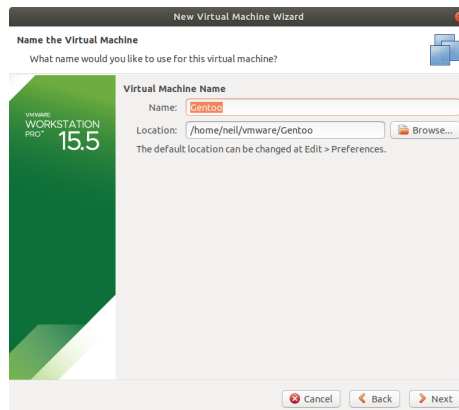
When you create the new VM, you need to set the boot ISO image to be the Gentoo minimal installation CD that you downloaded earlier.



Tell VMWare that you're using a 5.x or later kernel.



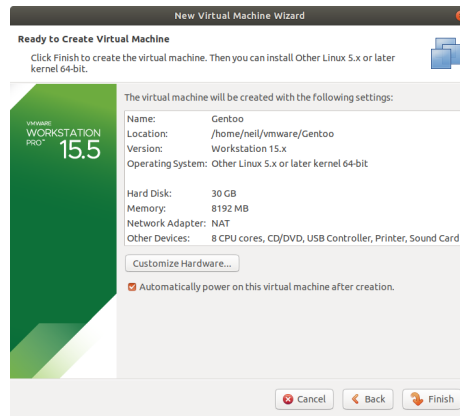
The guest's name doesn't really matter. I called mine Gentoo.



Set the guest disk size to 30 or 40 GB or more if you have space.



I suggest giving your VM as much RAM as you can spare. My machine has 32 GB of RAM, so I have my VM 8 GB. Also, give it a few processor cores.



Your VM should now be configured and ready to start the Gentoo installation process. Check out the Gentoo Handbook (<https://wiki.gentoo.org/wiki/Handbook:AMD64>) for instructions on how to install.

When you get to the part where you build the kernel, you should use the kernel config file that I've posted on the course webpage. It includes some special settings that the kernel needs to run in VMWare. After emerging gentoo-sources, download the file to your kernel directory:

Follow the Gentoo handbook to install the OS. When you're done installing the base system, you should be able to boot into a console (black screen) with no windowing environment. To test your system, be sure to remove your live CD before booting.

Gnome Once you're finished installing the base system, you will also want to install Gnome, the graphical user interface. Instructions here:

<https://wiki.gentoo.org/wiki/GNOME/Guide>

I've pasted the contents of my `/etc/portage/make.conf` below. This file contains a bunch of settings used by Gentoo's package manager (portage). The important ones are:

- The `USE` variable, which sets some options for Gnome
- The `VIDEO_CARDS` and `INPUT_DEVICES` variables tell the system that it's running as a guest in VMWare. This makes it use some special drivers for the mouse, keyboard, and video.
- The `QEMU_SOFTMMU_TARGETS` tells Qemu what processor we will be virtualizing. More on this later.

Make sure you paste these variables in to your `make.conf` file before installing Gnome.

```
root # cd /usr/src/linux
root # wget https://neilklingensmith.com/teaching/loyola/cs310-s2020/homework/.config
root # make oldconfig
```

```

# These settings were set by the catalyst build script that automatically
# built this stage.
# Please consult /usr/share/portage/config/make.conf.example for a more
# detailed example.
COMMON_FLAGS="-march=native -O2 -pipe"
CFLAGS="${COMMON_FLAGS}"
CXXFLAGS="${COMMON_FLAGS}"
FCFLAGS="${COMMON_FLAGS}"
FFLAGS="${COMMON_FLAGS}"

MAKEOPTS="-j5"

# NOTE: This stage was built with the bindist Use flag enabled
PORTDIR="/var/db/repos/gentoo"
DISTDIR="/var/cache/distfiles"
PKGDIR="/var/cache/binpkgs"

# This sets the language of build output to English.
# Please keep this setting intact when reporting bugs.
LC_MESSAGES=C

USE="alsa usb -qt5 -kde X gtk gnome gtkmm"

VIDEO_CARDS="fbdev vesa vmware"

INPUT_DEVICES="libinput keyboard mouse vmmouse"

QEMU_SOFTMMU_TARGETS="i386"

```

Figure 1: My `/etc/portage/make.conf` file.

Give the default answers to every question in the `make oldconfig` step (just press enter over and over). If you use my config file, you should be able to skip the `make menuconfig` step and jump straight to `make && make modules_install`

I have also included my version of `/etc/portage/make.conf` in this document (below). This has a bunch of special settings that Gentoo needs to be able to run in VMWare. This will (hopefully) save you a lot of pain when you install the graphical environment (Gnome). Make sure that the bottom four variables (`USE`, `VIDEO_CARDS`, `INPUT_DEVICES`, and `QEMU_SOFTMMU_TARGETS`) are the same as mine.

Notes on installing Gnome:

1. Some packages need a lot of RAM to build. Builds might fail if you

don't have enough RAM. You can create some swap space for your VM to simulate extra RAM:

```
dd if=/dev/zero of=/swapfile bs=1M count=4096
mkswap /swapfile
swapon /swapfile
```

This creates a 4G file on your VM called `/swapfile`.

If your terminal will not start in Gnome, try setting your language to English under the Gnome Settings Manager.

Install VMWare Tools

```
emerge open-vm-tools
```

Install Qemu

```
emerge -avD app-emulation/qemu nasm dev86 dev-vcs/git dosfstools
```