

Linux Setup Instructions

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You have several options to get started using Linux on your computer. The instructions will help you get everything setup.

Install a Virtual Machine

Ideally, you'll want to install a virtual machine, which allows you to safely simulate entire computers via software.

UTM (Mac Users only; recommended option)

1. Download UTM from <https://mac.getutm.app>.
2. Install it.

VMware Fusion (Mac M1/M2/M3 Users only; alternative option)

1. Go to <https://customerconnect.vmware.com/account-registration> and set up an account using your Wofford email address. Log in.
2. Register for a personal license (<https://www.vmware.com/go/get-fusionplayer-key>) (you can use VMware for free with this license if it's for educational use). Copy down the personal license key it gives you.
3. Install VMware Fusion by going to "License and Download" on that page and downloading the latest version of VMware Fusion. Use the personal license key that was given to you when it asks for it.

VirtualBox (Intel Users on Mac or Windows)

1. Download the latest version of VirtualBox [here](#).
2. Install VirtualBox.
 - If on macOS, you might have to approve a few security settings.
 - If on Windows, you *might* have to restart your computer, go into the BIOS, and enable "Virtualization". If you run into a Python dependency error, try running this command from your command prompt: `pip install pywin32`.

WSL (An Alternative Option for Windows Users)

Note: This is technically not a virtual machine.

1. Right-click on your Command Prompt program to run it as administrator
2. Type `wsl --install` , then hit ENTER. Let the install finish.
3. Restart your computer after it finishes.
4. Right-click on your Command Prompt program to run it as administrator again
5. You should now be able to simply type `wsl` to run Linux (the first run will ask you to create a an account with a username and password)
6. If you want to move files back and forth from Linux to Windows, you can type `explorer.exe .` from Linux. This will open up your Linux home directory on Windows, so you can move/drag files back and forth.

macOS Terminal App (An Alternative Option for Mac Users)

Note: This is not a virtual machine.

On macOS (since it is built on top of UNIX), we can just attempt to use the UNIX command line right in the Terminal app (it's not true Linux, but close enough).

However, we also need to have the **gcc** compiler and the **make** programs installed in order to compile code, and the easiest way to get these is by simply downloading **Xcode** from the Mac App Store. You might have to open Xcode after it downloads, and if it asks to install the command line tools, say yes. It's a pretty big app, so you may want to download it ahead of time.

Install Fedora/Ubuntu/Other Linux on the Virtual Machine

1. Download the latest release of Fedora Linux (or a different flavor like Ubuntu) as a Live ISO file
 - If you are using an Apple Silicon Mac (or any machine with an ARM-based processor), get the **aarch64** ARM architecture version.
 - Otherwise, get the **x86_64** Intel/AMD architecture version.
2. Launch your virtual machine.

If Installing on VMware Fusion

1. Create a new virtual machine, and do the option to “Install from disc or image”.
2. Under configuration, you can keep the default selection, or you can customize it if you wish. Click “Finish” when done.
3. It should fire up the virtual machine. Select “Start Fedora-Workstation-Live 39” and press ENTER.
4. After the live version of Fedora Linux launches, click “Install Fedora...”.
5. Choose options that make sense. For the System Destination, just use the automatic set up it recommends, and click “Done”.
6. Install Fedora Linux by clicking “Begin installation”. Let the installation finish, then click “Finish installation”.
7. Restart the virtual machine.
8. Click “Start setup” after it finishes restarting.
9. Select options that make sense, and don't forget your username and password!

10. You're done! You should now be able to boot into a copy of Fedora Linux! Feel free to delete the Linux *.iso file.

If Installing on VirtualBox

1. Click "New" to create a new virtual machine.

Virtual Machine Name and Operating System - Name: "Fedora Linux" - Folder: Wherever you want to save it, but the default is fine. - ISO Image: Select your downloaded Linux ISO file. - Select the "Skip Unattended Installation" checkbox.

Hardware - Base memory: 1024MB is *probably* OK. If you have a decent amount of RAM, maybe kick it up to 2048MB. - Processors: 1 should be fine. Feel free to try more. - Do *not* select the Enable EFI checkbox.

Virtual Hard Disk - Select "Create a Virtual Hard Disk Now", then "Create". - Size: 25GB should be fine. You *might* be able to get by with less. - Do *not* select the "Pre-allocate Full Size" checkbox.

Summary - Review your selections, then click "Finish" - You should now have a virtual machine ready to install an OS on (essentially a fake computer that is running on top of your actual computer)

2. Select your virtual machine, then click "Start". Because you previously already selected the ISO file, it should already be selected (essentially it's like you have inserted a CD-ROM into a disk drive). It should boot from the ISO "disk", and launch into the Fedora installer.
3. It should fire up the virtual machine. Select "Start Fedora-Workstation-Live 41" and press ENTER.
4. After the live version of Fedora Linux launches, click "Install Fedora...".
5. Choose options that make sense. For the System Destination, just use the automatic set up it recommends, and click "Done".
6. Install Fedora Linux by clicking "Begin installation". Let the installation finish, then click "Finish installation".
7. Restart the virtual machine (make sure to remove the ISO file from the fictional disc drive, so it doesn't simply restart the installer).
8. Click "Start setup" after it finishes restarting.
9. Select options that make sense, and don't forget your username and password!
10. You're done! You should now be able to boot into a copy of Fedora Linux! Feel free to delete the Linux *.iso file.

If Installing on UTM

1. Open UTM, and select “Create a New Virtual Machine”.
2. Select “Virtualize”, then “Linux”.
3. Leave the default settings, but browse to locate your Linux ISO file, then click “Continue”.
4. You can decide on how much of your computer to dedicate to Linux while it’s running, but I choose 2048MB for memory, and left the cores as the default. Click “Continue”.
5. Choose a size of the hard drive you want for Linux. I chose 30GB, but go with whatever you wish. The file will only take up the actual amount of space Linux needs, and automatically grows to the size you specified over time (if it needs it). Click “Continue”.
6. If you want to set up a shared folder between macOS and Linux, you can do that here. Otherwise, click “Continue”.
7. Name it “Linux” or something similar, then click “Save”.
8. You should now be able to fire up your virtual machine. After you install Linux, make sure to remove the disc from the fictional CD drive, so that when it restarts it doesn’t just try to install it again.

Installing other needed software

1. In Linux, search for “Terminal”. Launch it. We will use it a lot, so I would recommend on pinning it to the bottom bar so you can launch it quicker in the future.
2. There are a few pieces of software we will need. Fedora Linux uses the `dnf install` command to install software, while Ubuntu uses `apt-get install`. In the Terminal, run the following commands one after another (each line is a separate command, so press ENTER after each):
 1. If you installed Ubuntu or an Ubuntu-like version of Linux, `sudo apt-get install gcc` and `sudo apt-get install make`.
 2. If you installed Fedora or a Fedora-like version of Linux, `sudo dnf install gcc` and `sudo dnf install make`.
3. FOR VIRTUALBOX USERS ONLY: Install the VirtualBox Guest Additions by doing the following:
 - a) Click “Devices” on the top menu, then “Insert Guest Additions CD Image”.
 - b) In the Terminal, run the following command (the version number might be different):

```
cd /media/<yourUserName>/VBox_GAs_7.0.6/ sudo ./VBoxLinuxAdditions.run
```
 - c) Once that finishes, eject the CD (click the CD icon at the bottom, then “Remove disk”).

- d) Restart Fedora Linux (click the area in the top-right, then the power button, then “Restart”).
- e) After it restarts, the guest additions should have installed better graphics drivers. You should hopefully be able to resize your window now, and it will adjust the resolution.

Finished

You should now have a complete, working copy of Fedora Linux. Whenever you click the “X” to close out of the Virtual Machine, you have the option to “freeze” if you are on VirtualBox. This will save the exact state of the machine in order to resume it quickly later, and is a great option to speed things up. Alternatively, you can click in the top-right of Fedora, click the power button, then “Shutdown”. Whichever you choose is fine, but definitely do not click the “X”, then “Power off the machine”. This is the equivalent of pulling the power plug out of the wall of your fictional computer. Similarly in VMware Fusion and others, shut down the OS by clicking the power button in the top right corner.