

Computer Network Security | 2025  
Setting Up SEED VM for Apple Silicon

# Setting Up SEED VM for Apple Silicon Machines with VMware Fusion

Please refer the following github link for any doubts on how to install the VM

<https://github.com/seed-labs/seed-labs/blob/master/lab-setup/apple-arm/seedvm-fusion.md>

Follow the STEP 1 mentioned in the above link. You may ignore STEP 1.1 if the installation and setup of Homebrew and Xcode are already done and start with [STEP 1](#) mentioned in the Document.

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## Building the SEED VM on Fusion

Step 1: Install VMware Fusion (which is free for personal use). A detailed instruction is provided in [SeedVM-Fusion\\_Installation.md](#).

Step 2: Build an Ubuntu VM on VMWare Fusion. Since the desktop versions of all Ubuntu VM are removed, we can no longer use the pre-built desktop versions. We install the server version instead, but don't worry about the GUI, as we will install ubuntu-desktop in the VM later. A detailed instruction is provided in [SeedVM-Ubuntu\\_Installation.md](#).

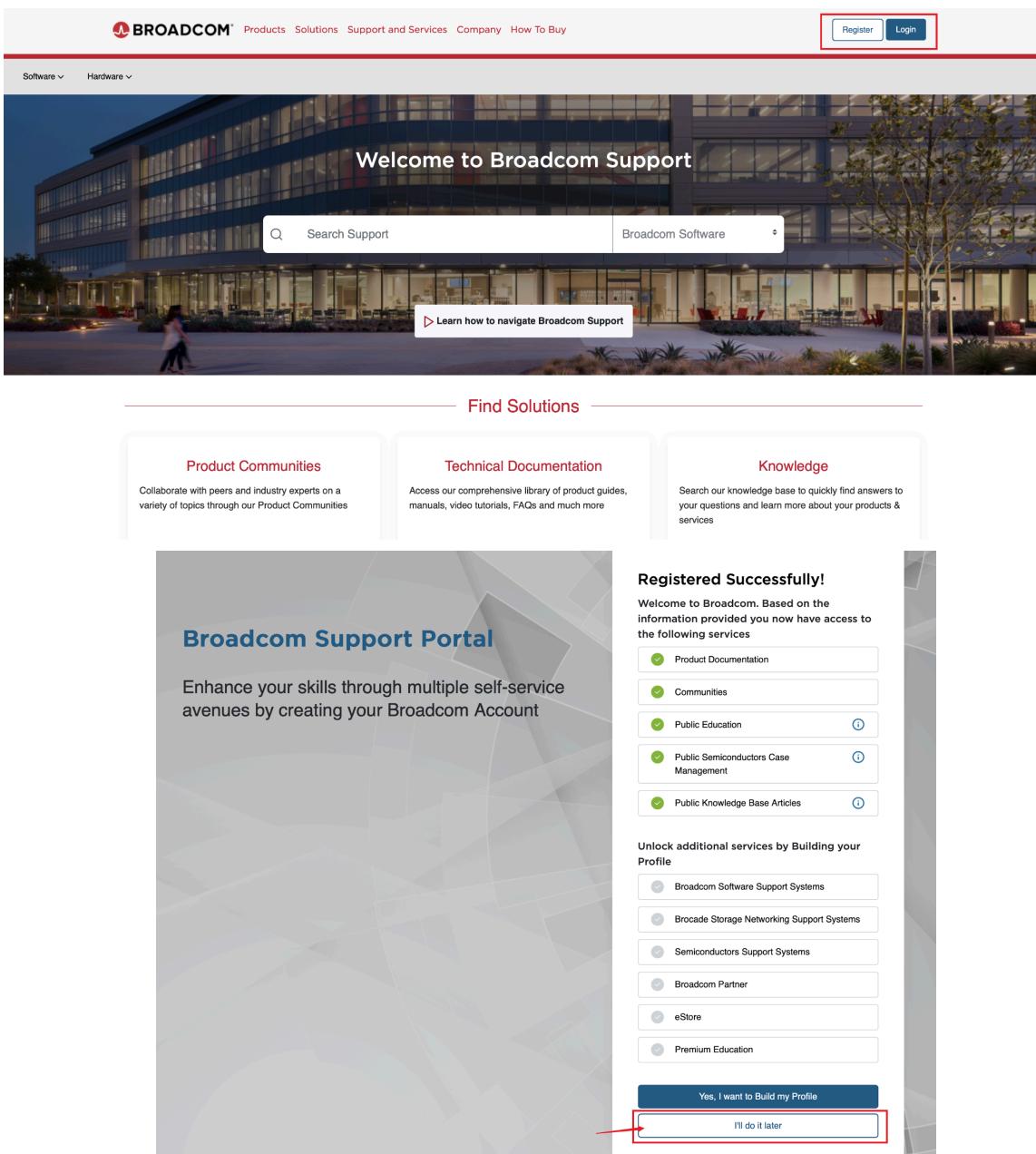
Step 3: Install software inside the VM to get the required environment of SEED labs. A detailed instruction is provided in [SeedVM-Lab\\_Setup.md](#).

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## Step 1: Install VMware Fusion Player

VMware Fusion Player is a free virtual machine software. It is similar to VirtualBox that we have been using for the SEED labs, but VirtualBox still cannot run reliably on Apple Silicon machines.

Go to [VMware Fusion](#) and either log in or register for a basic Broadcom account.

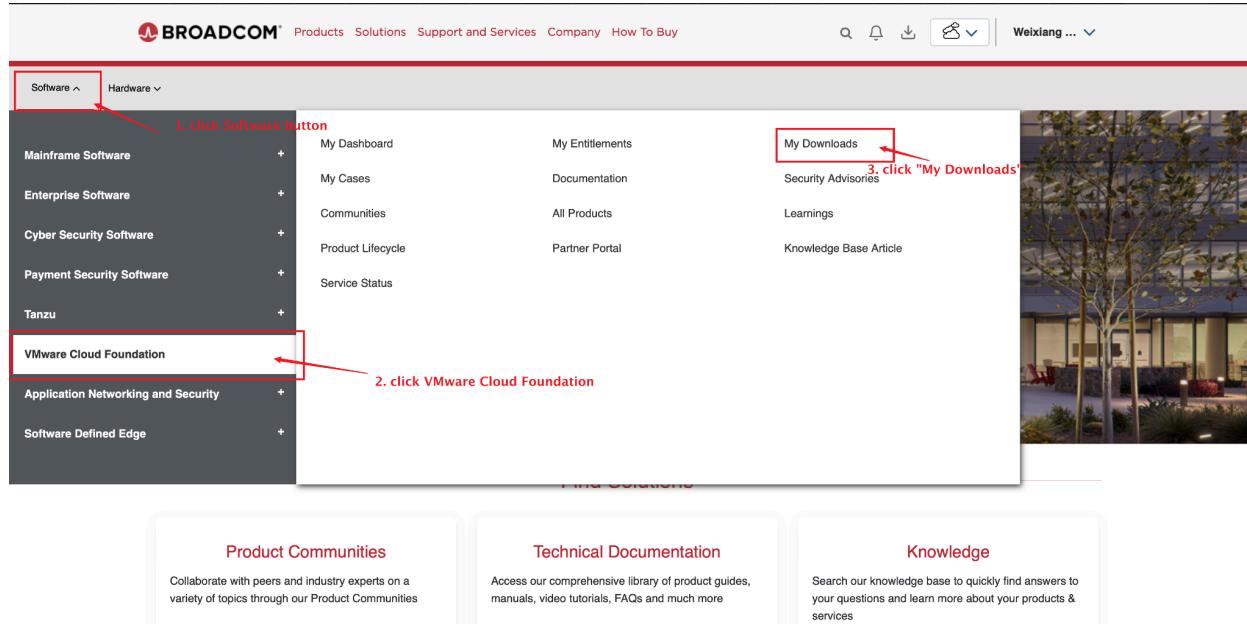


The screenshot shows the Broadcom Support Portal registration page. At the top, there's a navigation bar with the Broadcom logo and links for Products, Solutions, Support and Services, Company, and How To Buy. On the right, there are 'Register' and 'Login' buttons. Below the navigation is a large banner image of a modern office building at night. A search bar with 'Search Support' placeholder text and a dropdown menu for 'Broadcom Software' are visible. A red box highlights the 'Learn how to navigate Broadcom Support' button. Below the banner, there's a 'Find Solutions' section with three cards: 'Product Communities', 'Technical Documentation', and 'Knowledge'. The 'Product Communities' card describes it as a place to collaborate with peers and industry experts. The 'Technical Documentation' card says it's a library of product guides, manuals, video tutorials, FAQs, and more. The 'Knowledge' card says it's a knowledge base for answers to questions about products and services. The main content area features a large 'Broadcom Support Portal' banner with the text 'Enhance your skills through multiple self-service avenues by creating your Broadcom Account'. To the right, a 'Registered Successfully!' message is displayed, listing access to Product Documentation, Communities, Public Education, Public Semiconductors Case Management, and Public Knowledge Base Articles. Below this, a section titled 'Unlock additional services by Building your Profile' lists options like Broadcom Software Support Systems, Brocade Storage Networking Support Systems, Semiconductors Support Systems, Broadcom Partner, eStore, and Premium Education. At the bottom, there are two buttons: 'Yes, I want to Build my Profile' and 'I'll do it later', with the latter being highlighted by a red box.

Once logged in the Broadcom account, we come back to the [Broadcom Support Portal](#) if we're not redirected there. We click the Software dropdown to choose the VMware Cloud Foundation division to select My Downloads.

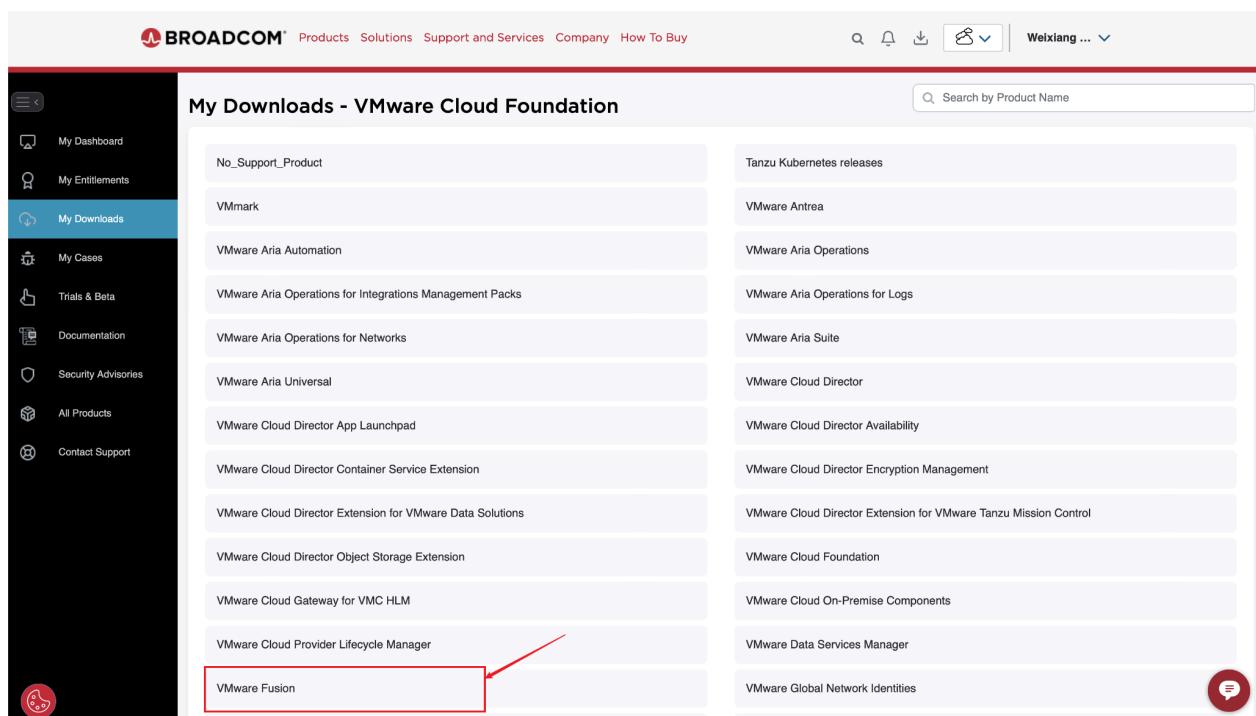
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The screenshot shows the Broadcom Product Support Portal. The navigation bar at the top includes links for Products, Solutions, Support and Services, Company, and How To Buy. Below the navigation bar, there are two dropdown menus: "Software" (selected) and "Hardware". The "Software" menu is expanded, showing categories like Mainframe Software, Enterprise Software, Cyber Security Software, Payment Security Software, Tanzu, VMware Cloud Foundation (highlighted with a red box), Application Networking and Security, and Software Defined Edge. A red arrow labeled "1. click Software button" points to the "Software" dropdown. Another red arrow labeled "2. click VMware Cloud Foundation" points to the "VMware Cloud Foundation" item in the list. In the top right corner, there is a "My Downloads" link, which is also highlighted with a red box and has a red arrow labeled "3. click 'My Downloads'" pointing to it.

Find VMware Fusion in My Downloads page.

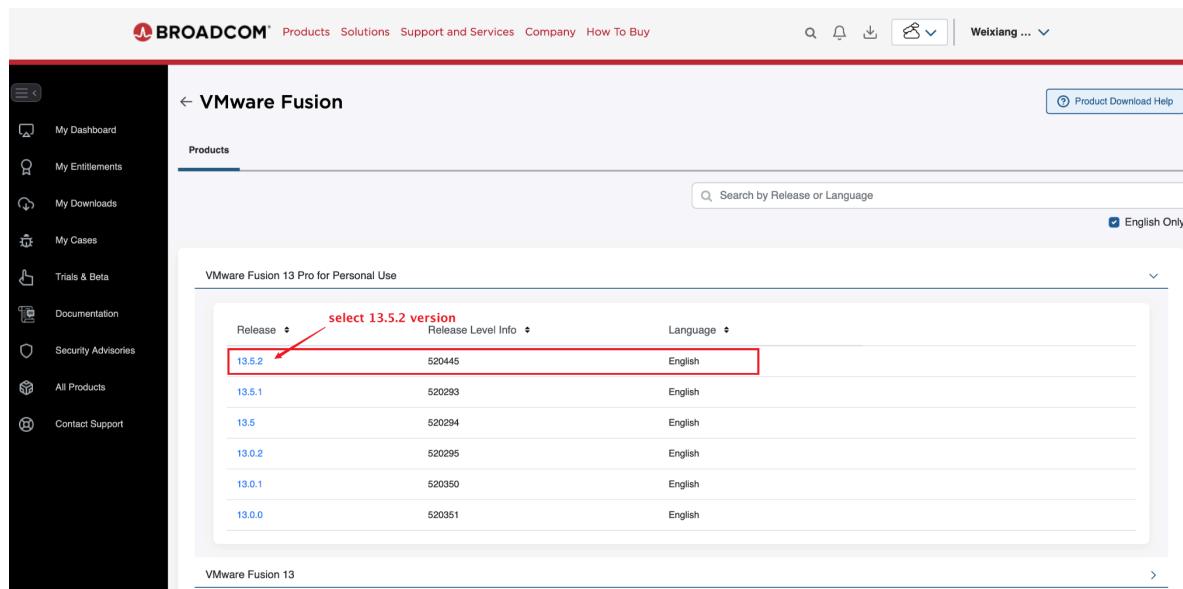


The screenshot shows the "My Downloads - VMware Cloud Foundation" page. On the left, there is a sidebar with links: My Dashboard, My Entitlements, **My Downloads** (selected and highlighted with a blue background), My Cases, Trials & Beta, Documentation, Security Advisories, All Products, and Contact Support. The main content area displays a grid of download items. The items listed are: No\_Support\_Product, VMmark, VMware Aria Automation, VMware Aria Operations for Integrations Management Packs, VMware Aria Operations for Networks, VMware Aria Universal, VMware Cloud Director App Launchpad, VMware Cloud Director Container Service Extension, VMware Cloud Director Extension for VMware Data Solutions, VMware Cloud Director Object Storage Extension, VMware Cloud Gateway for VMC HLM, VMware Cloud Provider Lifecycle Manager, **VMware Fusion** (highlighted with a red box), Tanzu Kubernetes releases, VMware Antrea, VMware Aria Operations, VMware Aria Operations for Logs, VMware Aria Suite, VMware Cloud Director, VMware Cloud Director Availability, VMware Cloud Director Encryption Management, VMware Cloud Director Extension for VMware Tanzu Mission Control, VMware Cloud Foundation, VMware Cloud On-Premise Components, VMware Data Services Manager, and VMware Global Network Identities. A search bar at the top right says "Search by Product Name".

click VMware Fusion 13 Pro for Personal Use dropdown to choose the 13.6.2 version(or later).

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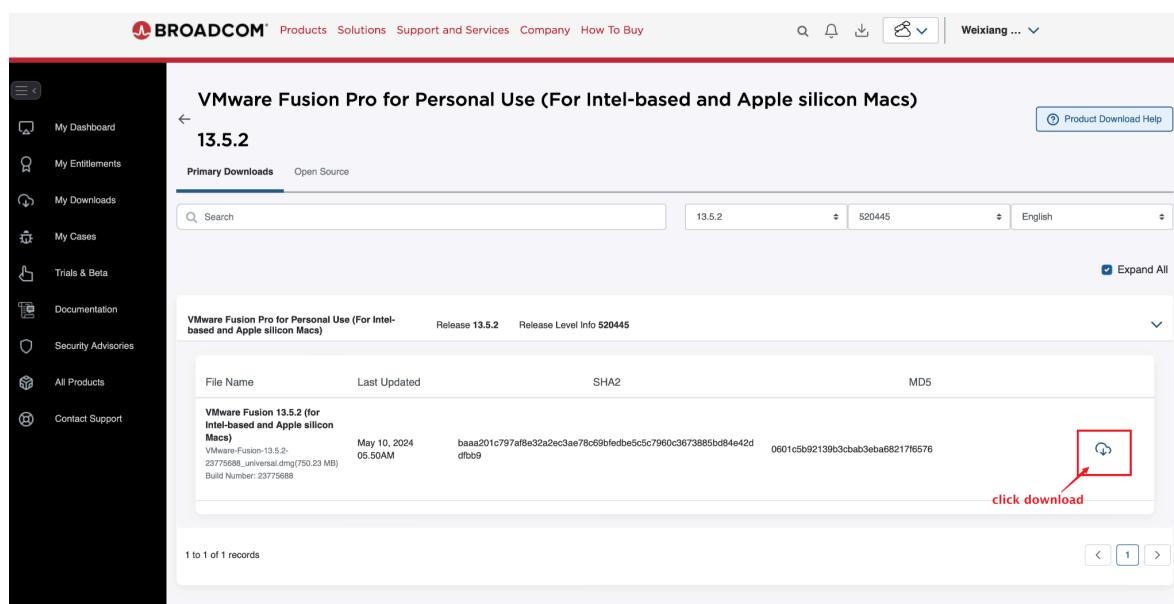
### Setting Up SEED VM for Apple Silicon



VMware Fusion 13 Pro for Personal Use

Release	Release Level Info	Language
13.5.2	520445	English
13.5.1	520293	English
13.5	520294	English
13.0.2	520295	English
13.0.1	520350	English
13.0.0	520351	English

In the Primary Downloads page, find the .dmg file and click download button to download the dmg file manually.



VMware Fusion Pro for Personal Use (For Intel-based and Apple silicon Macs)

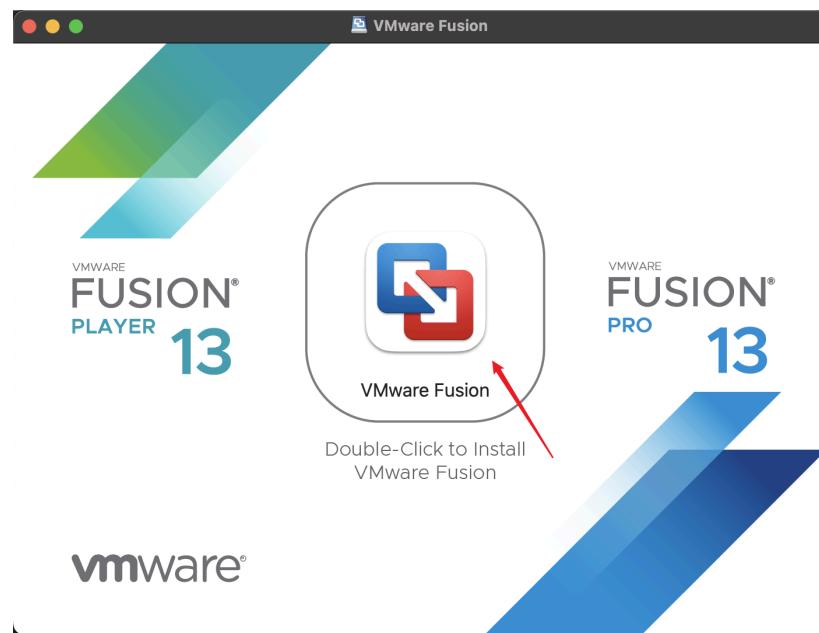
13.5.2

File Name	Last Updated	SHA2	MD5
VMware-Fusion-13.5.2-(for-Intel-based-and-Apple-silicon-Macs).dmg	May 10, 2024 05:50AM	baba201c797af8e32a2ec3ae78c69bfedbe5c5c7960c3673885bd84e42d dfb69	0601c5b92139b3cbab3eba68217f6576

Installation is straight forward. Double click on the downloaded dmg file and follow the instructions.

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After the installation is finished, you can start the VMware Fusion Player.

You will be asked to enter a license key. Select **VMware Fusion Pro for Personal Use**. You will be asked to allow the kernel extensions. Click on **Open Security Preferences**. In the **Security & Privacy** settings, click on **Allow** to allow the kernel extensions.

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## Step 2: Build an Ubuntu VM on VMWare Fusion.

- [Step 2.1: Download Ubuntu 22.04 server](#)
- [Step 2.2: Create VM on VMWare Fusion](#)
- [Step 2.3: Install Ubuntu server](#)
- [Step 2.4: Install Ubuntu Desktop](#)

### Step 2.1: Download Ubuntu 22.04 server

Since the desktop versions of the Ubuntu 22 version VM for ARM are removed; we will install the Server version instead. We recommend downloading the Ubuntu 22.04 version.

We will download the Ubuntu ISO image first. Go to [Ubuntu 22.04.5](#) and download the Ubuntu 22.04.5 LTS (Jammy Jellyfish) . Make sure you download the 64-bit ARM (ARMv8/AArch64) server install image.



### Select an image

Ubuntu is distributed on four types of images described below.

<b>Server install image</b>  The server install image allows you to install Ubuntu permanently on a computer for use as a server. It will not install a graphical user interface.	<b>64-bit ARM (ARMv8/AArch64) server install image</b> For 64-bit ARMv8 processors and above.  PowerPC64 Little-Endian server install image For POWER9 and POWER10 Little-Endian systems.  IBM System z server install image For IBM System z series mainframes, such as IBM LinuxONE.
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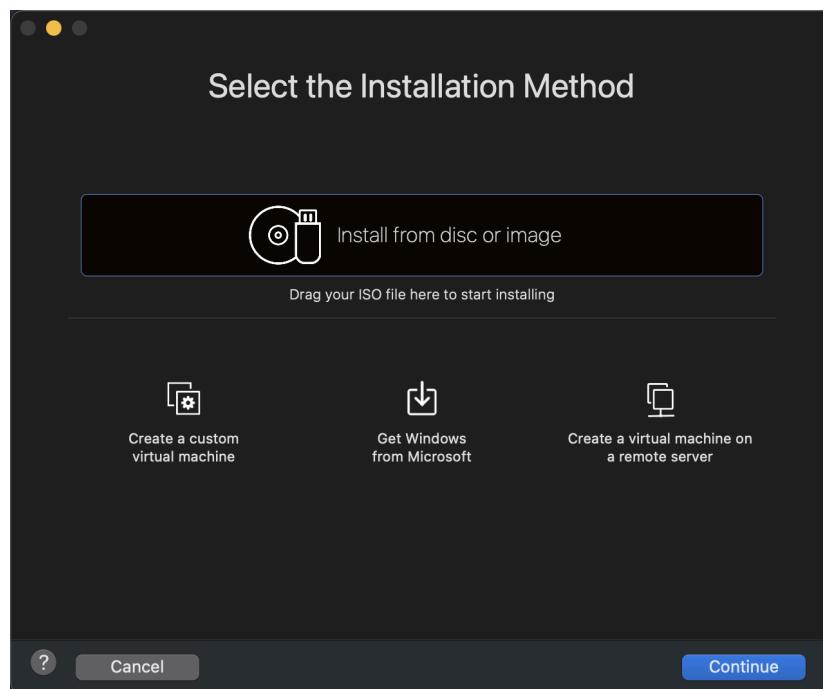
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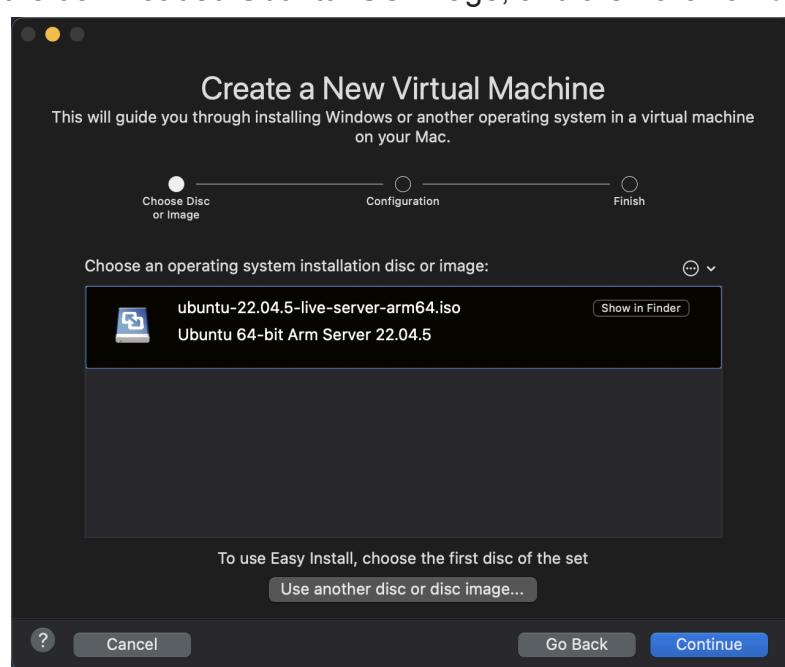
#### Step 2.2: Create VM on VMWare Fusion

After the download is finished, start the VMware Fusion Player. Click on **Create a New Virtual Machine**.

In Select the Installation Method, select **Install from disc or image** and click on **Continue**.



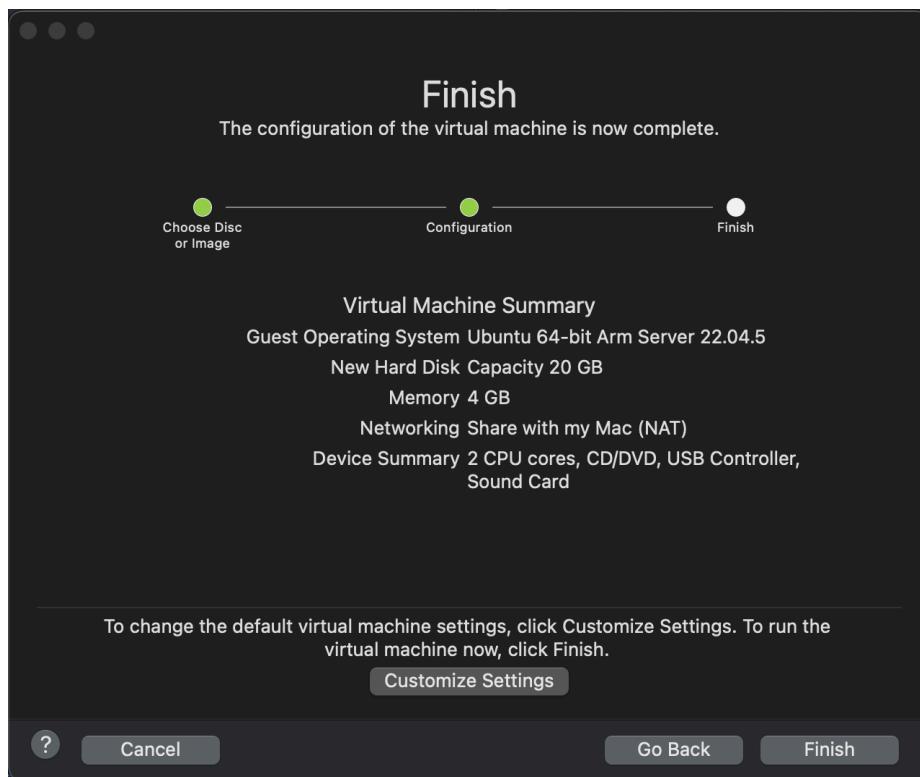
Select the downloaded Ubuntu ISO image, and then click on **Continue**.



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In the next screen, make sure that 2 CPUs and 4 GB of RAM are selected. Click on **Finish**. The VM will be created and started.

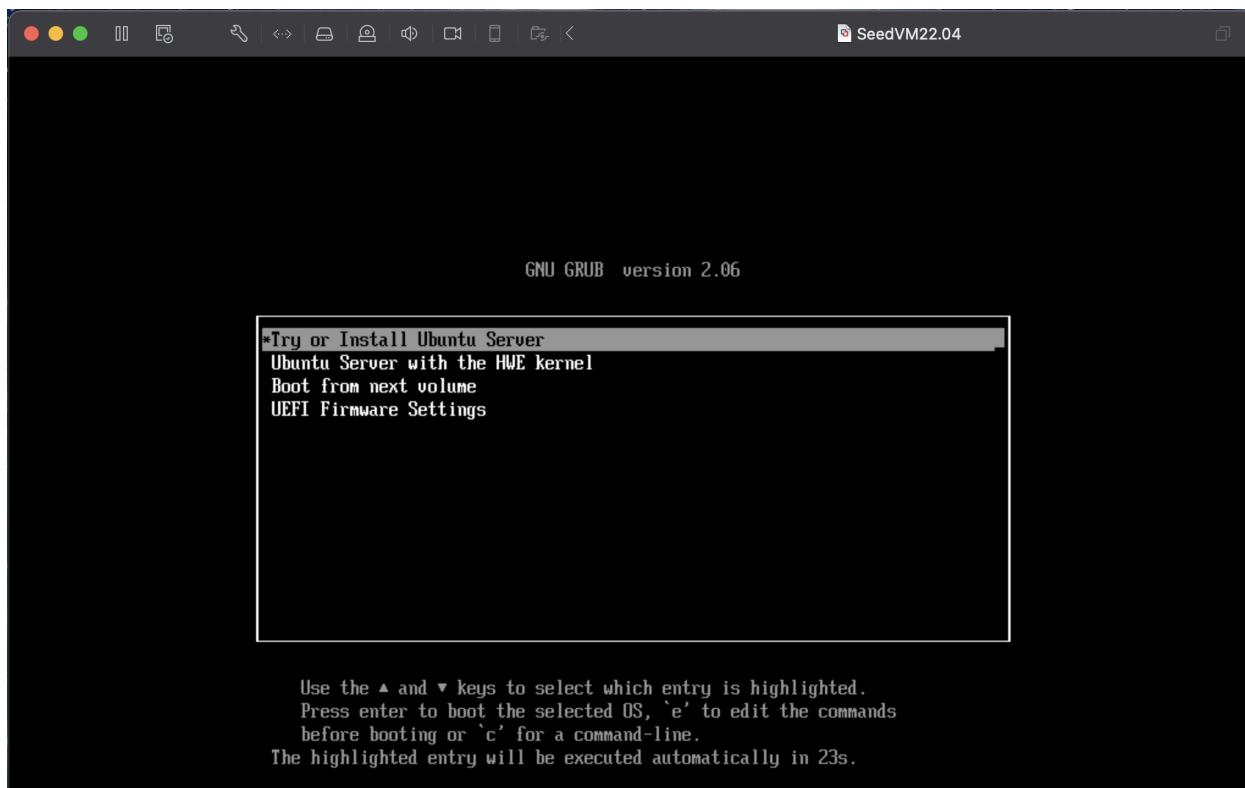


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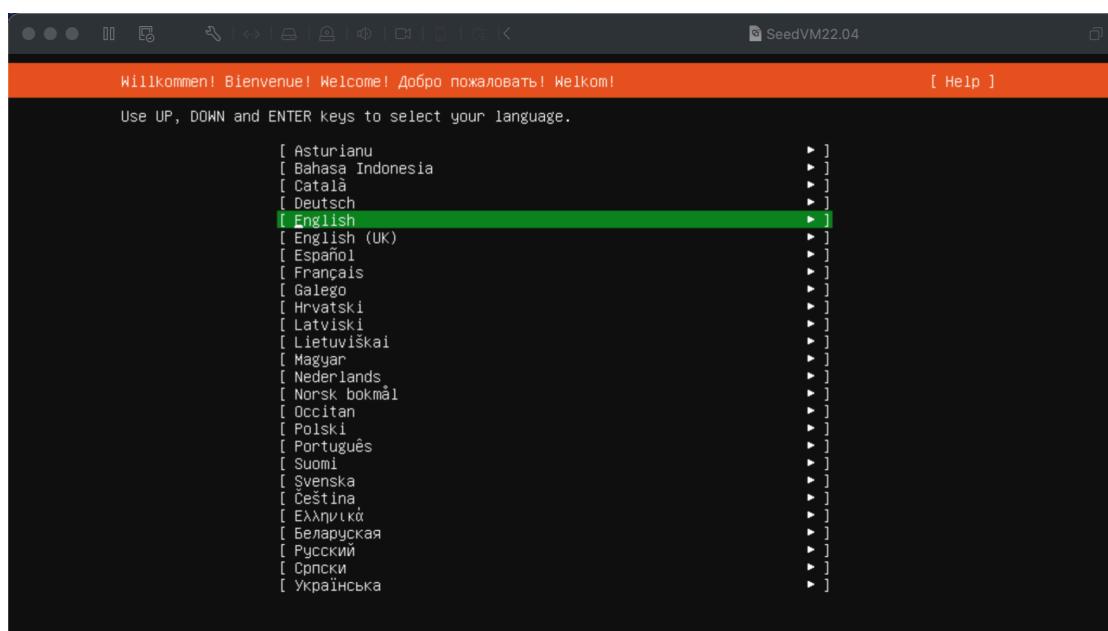
#### Step 2.3: Install Ubuntu server

After the VM is started, click on Try or install Ubuntu Server.



We will be greeted with the installation interface. Following the instructions below:

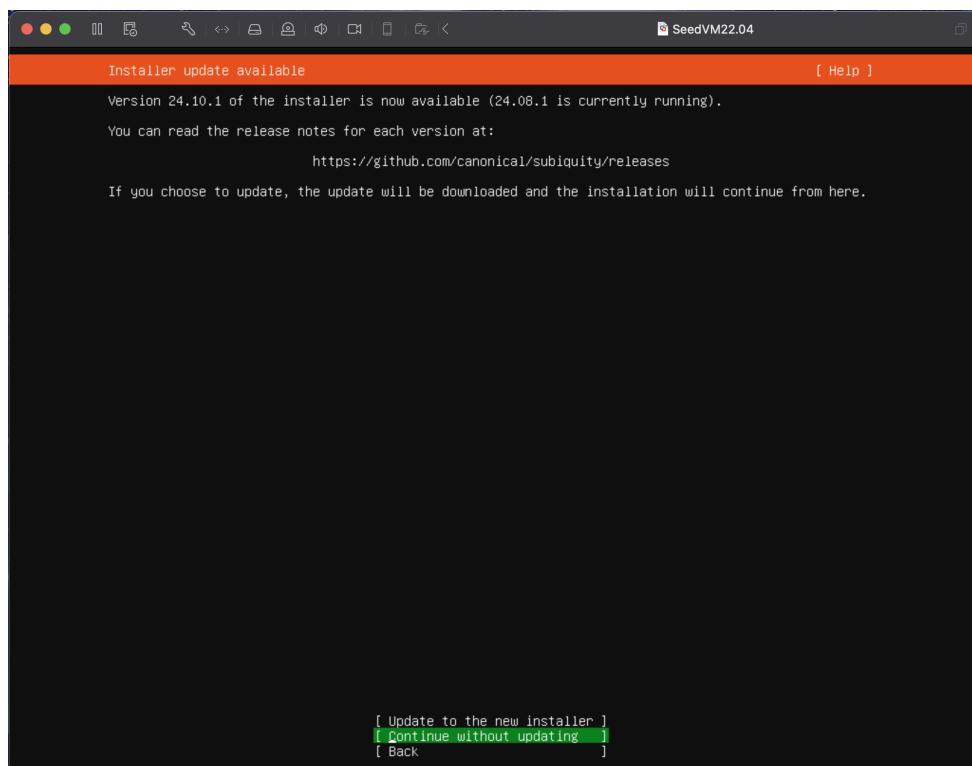
- Select the language as English.



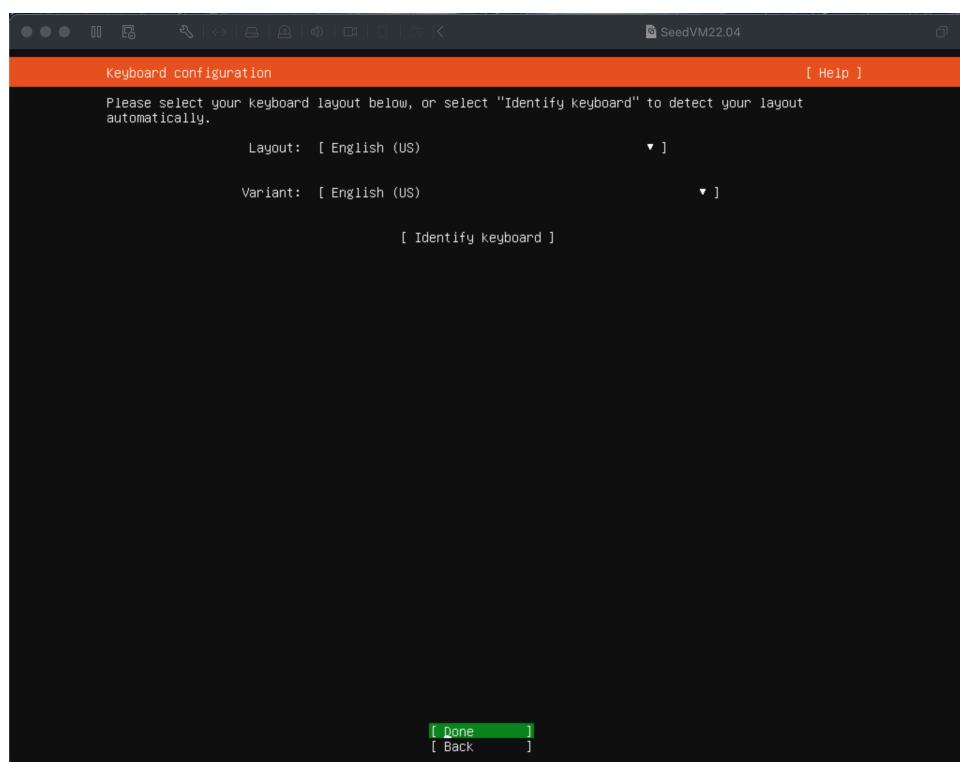
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For available installer updates, select Continue without updating.



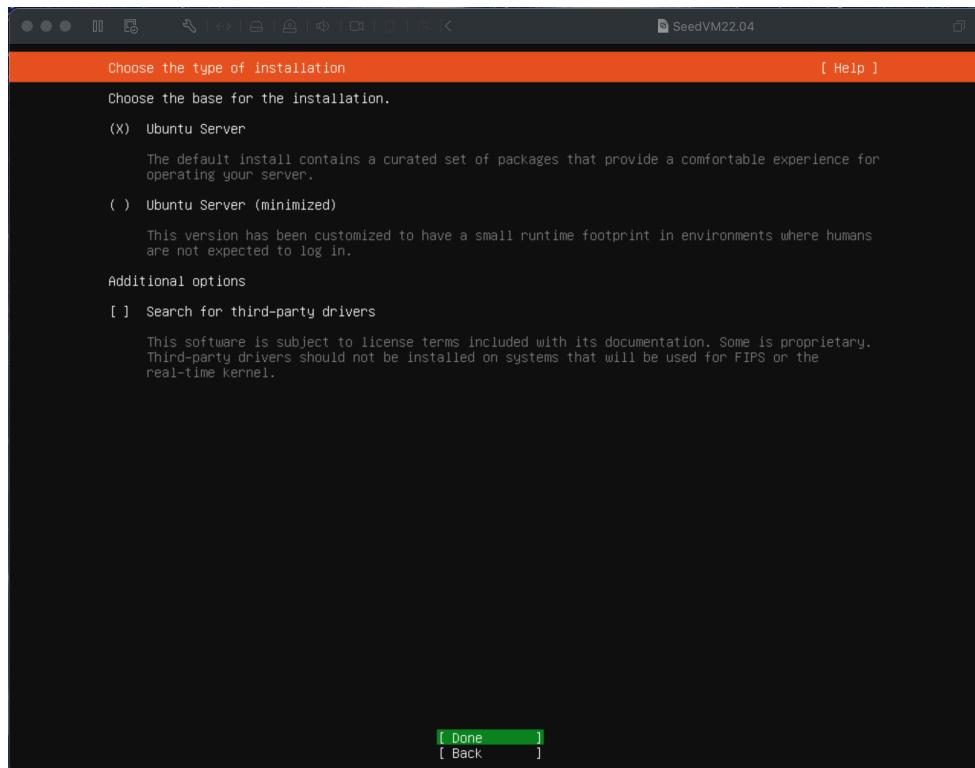
For Keyboard Configuration, select Done directly.



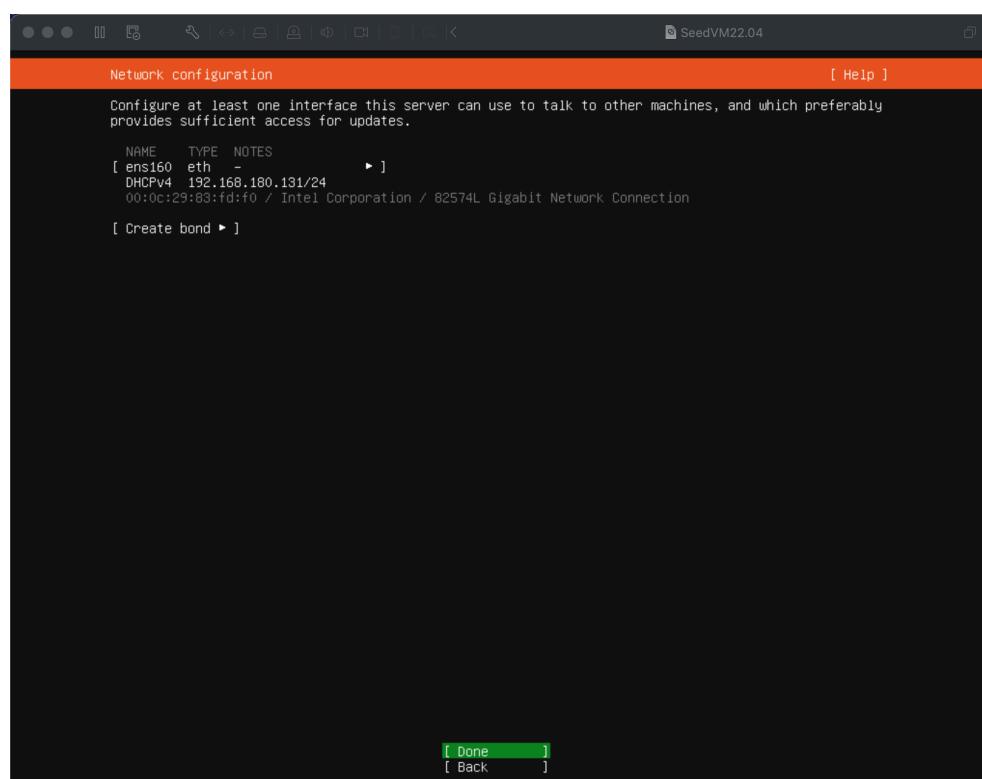
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For Type of Installation, select Ubuntu Server and Done



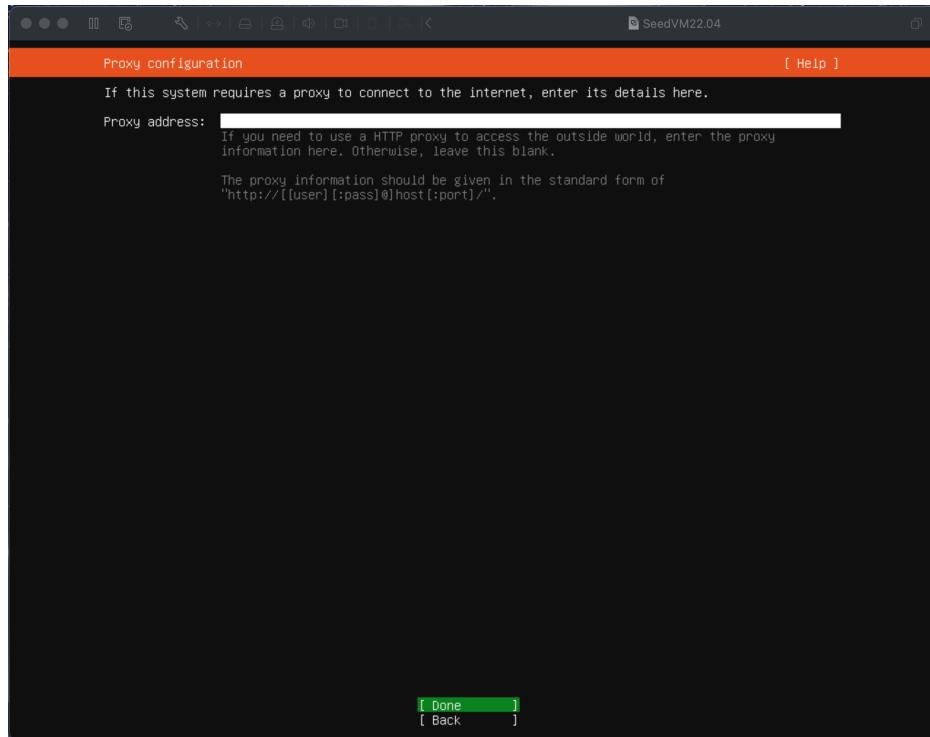
For Network Configuration, select Done directly.



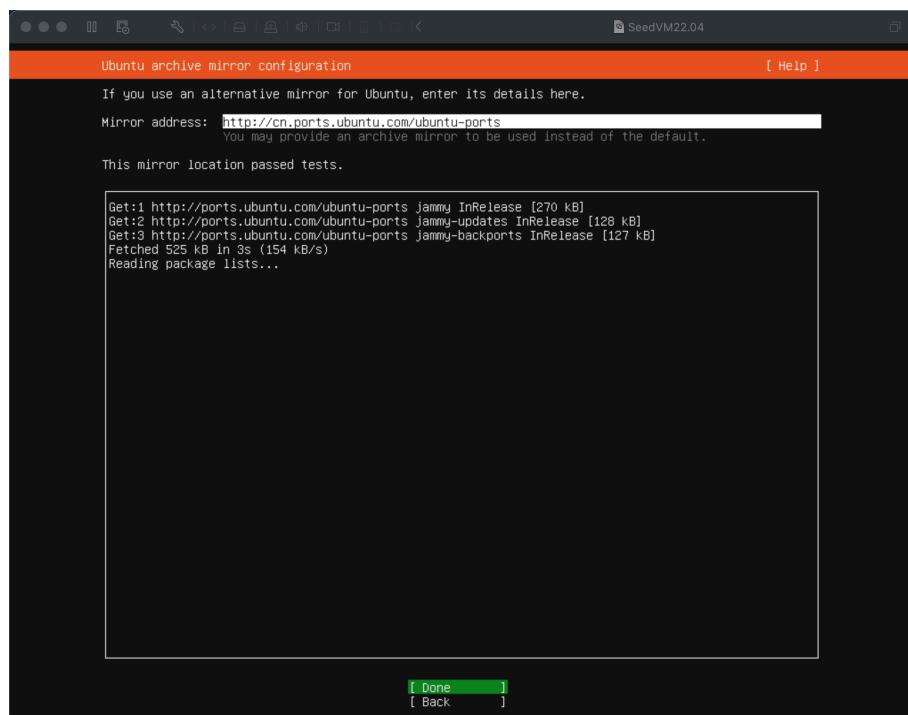
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For Proxy Configuration, select Done directly.



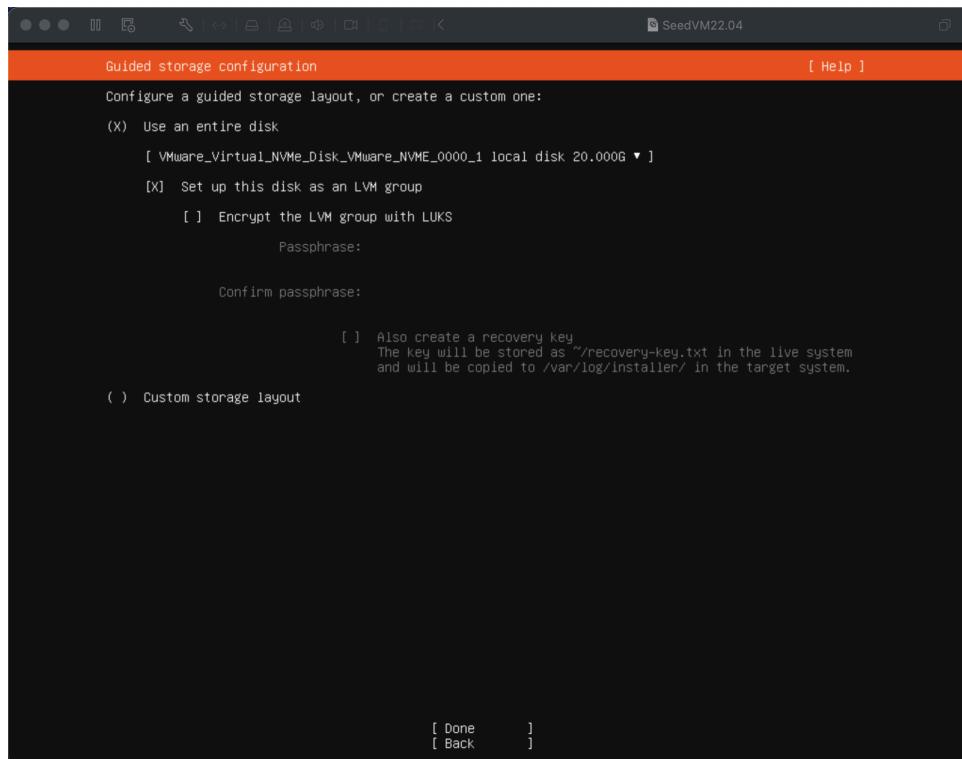
For Ubuntu Archive Mirror Configuration, wait until it completes the mirror location test and select Done directly.



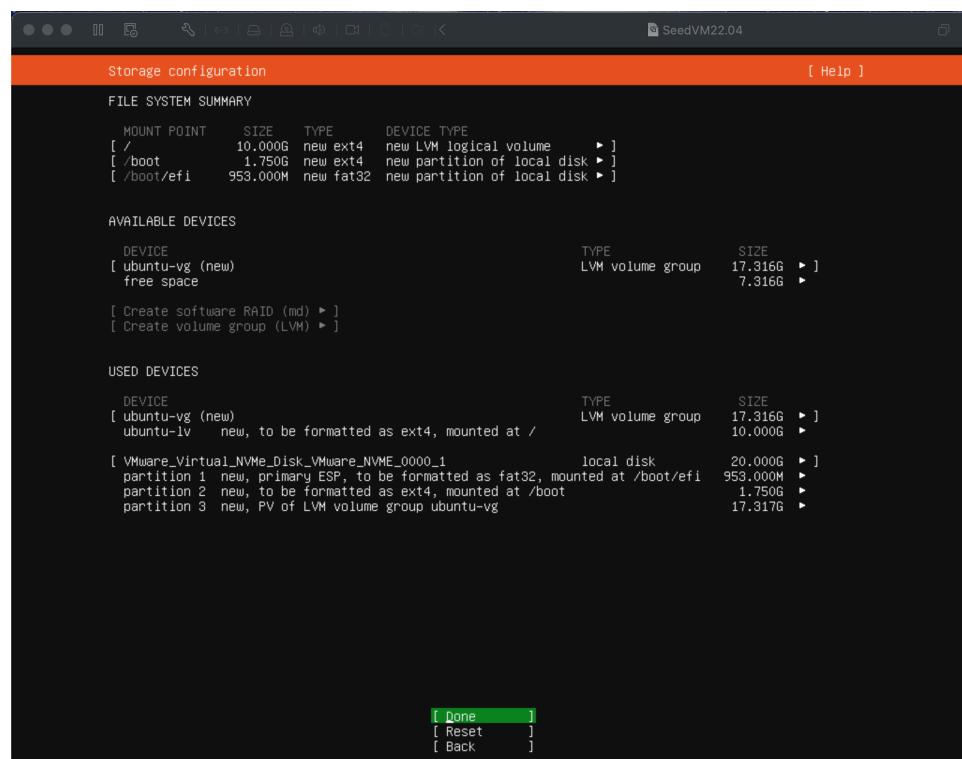
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For Guided Storage Configuration, select Done directly.



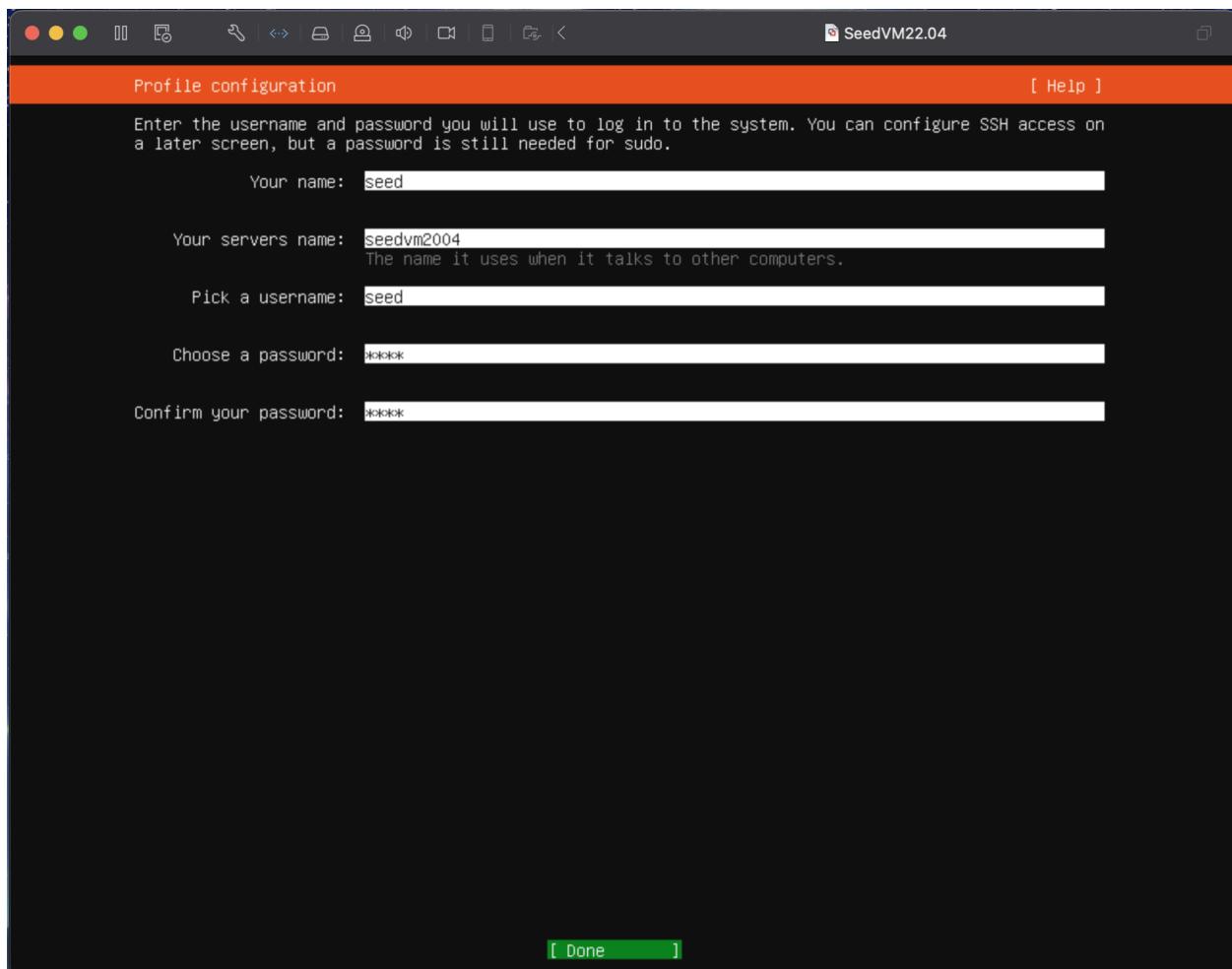
For Storage Configuration, select Done and Continue directly.



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### Setting Up SEED VM for Apple Silicon

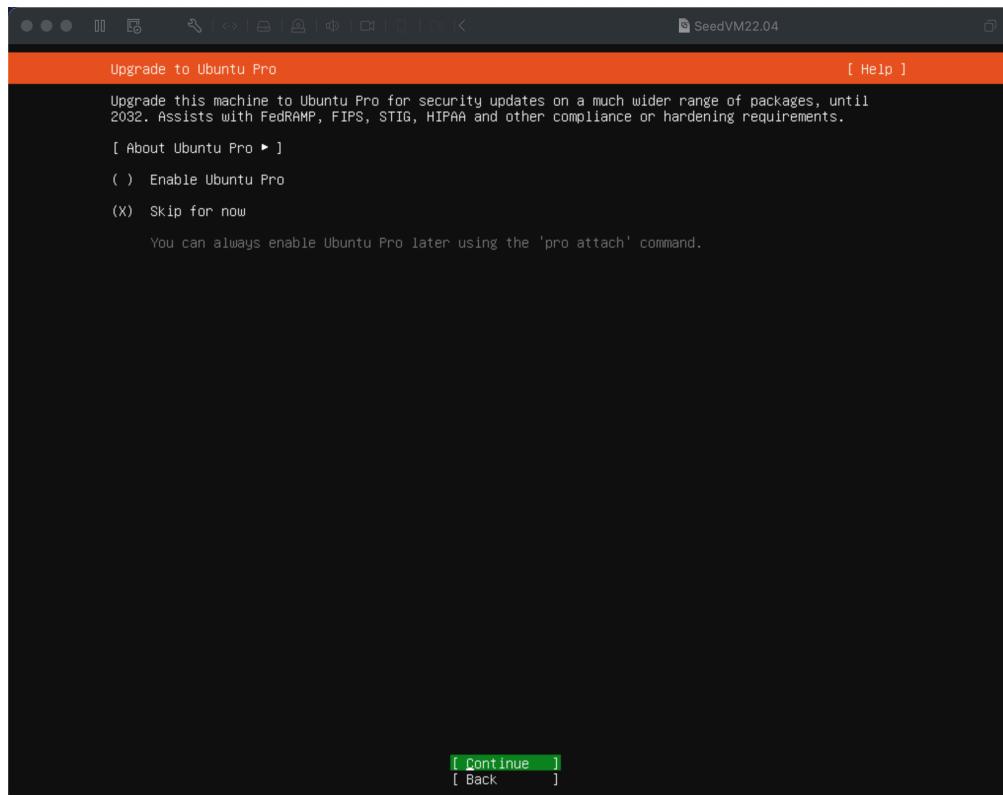
For Profile Configuration, create a user with name `seed` and select a password (you can use the standard password `dees` that we use for all SEED VMs). Then select `Done`.



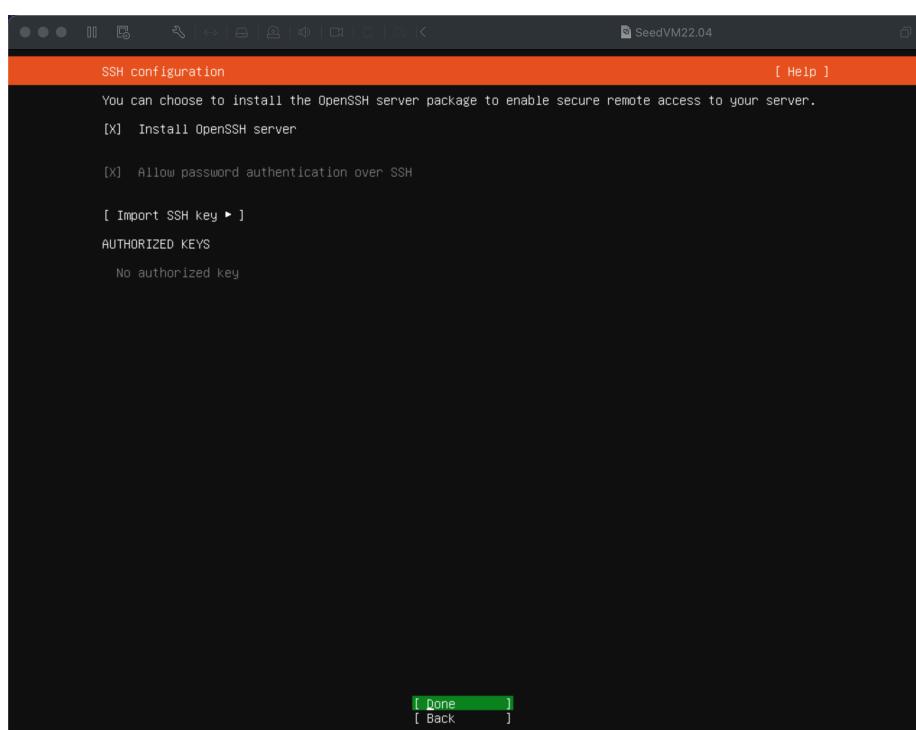
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Select Continue directly.



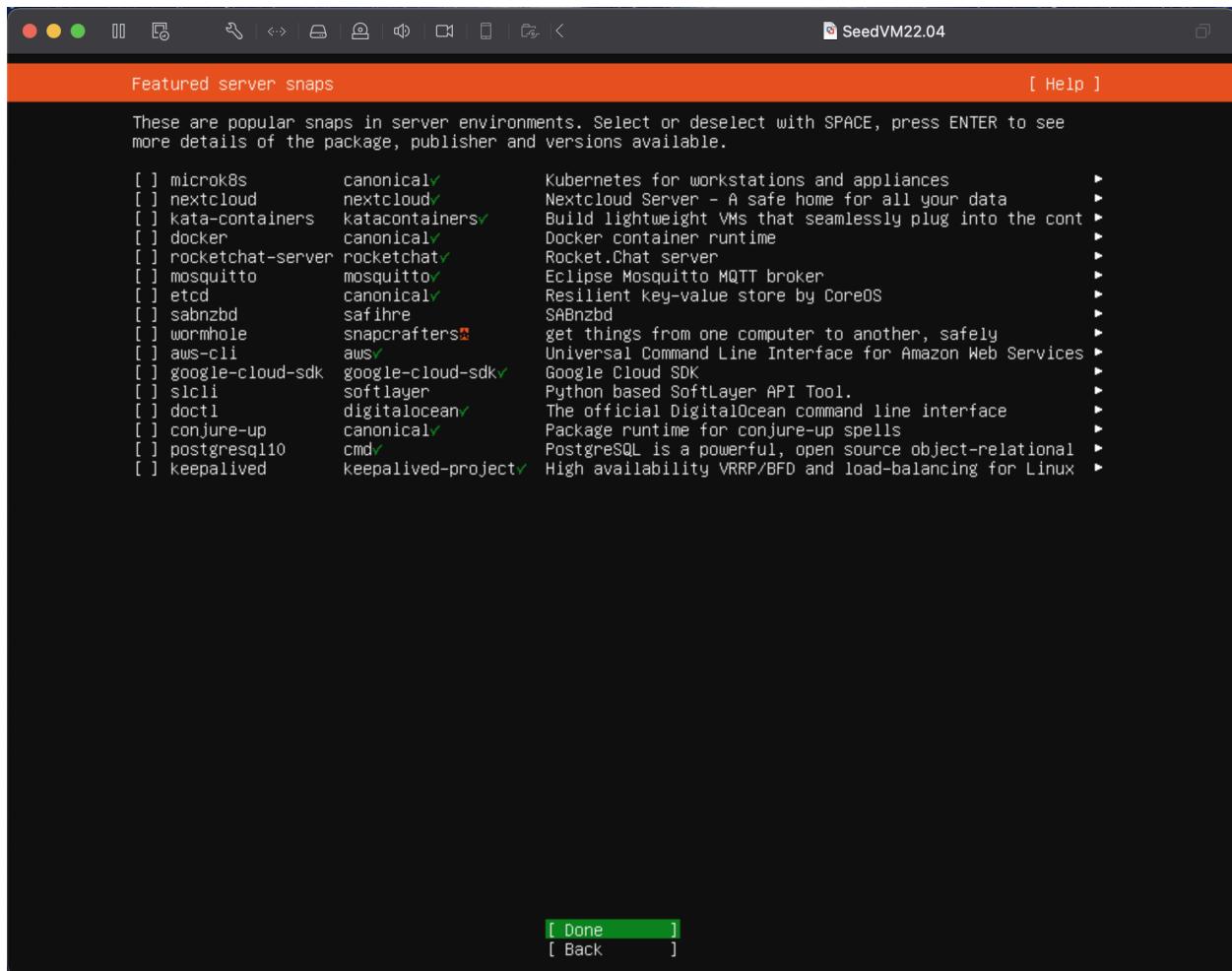
For SSH Configuration, we recommend you to enable it, so select Install OpenSSH server and Done.



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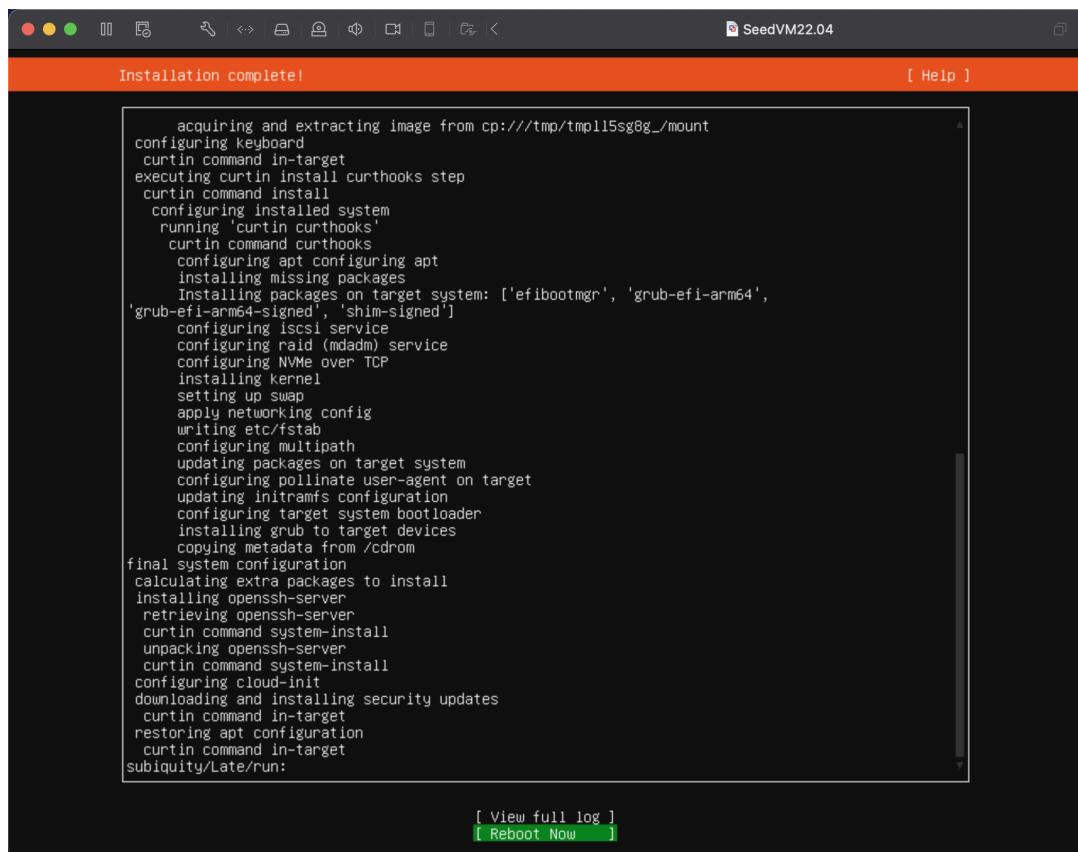
For Featured Server Snaps, select Done directly.



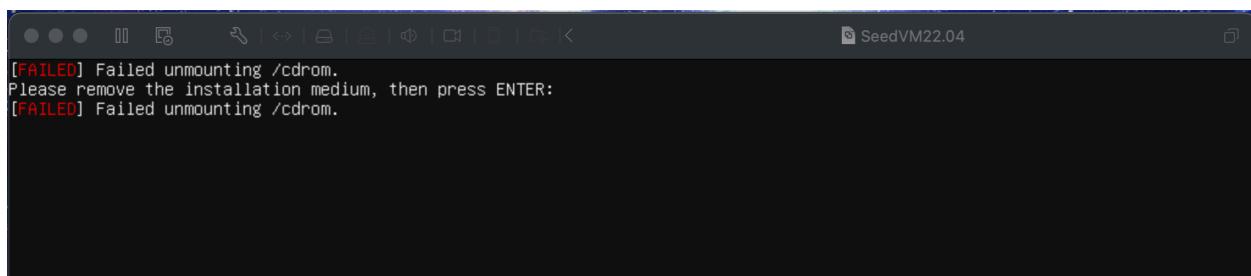
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Wait until it finishes the installation and select **Reboot Now**



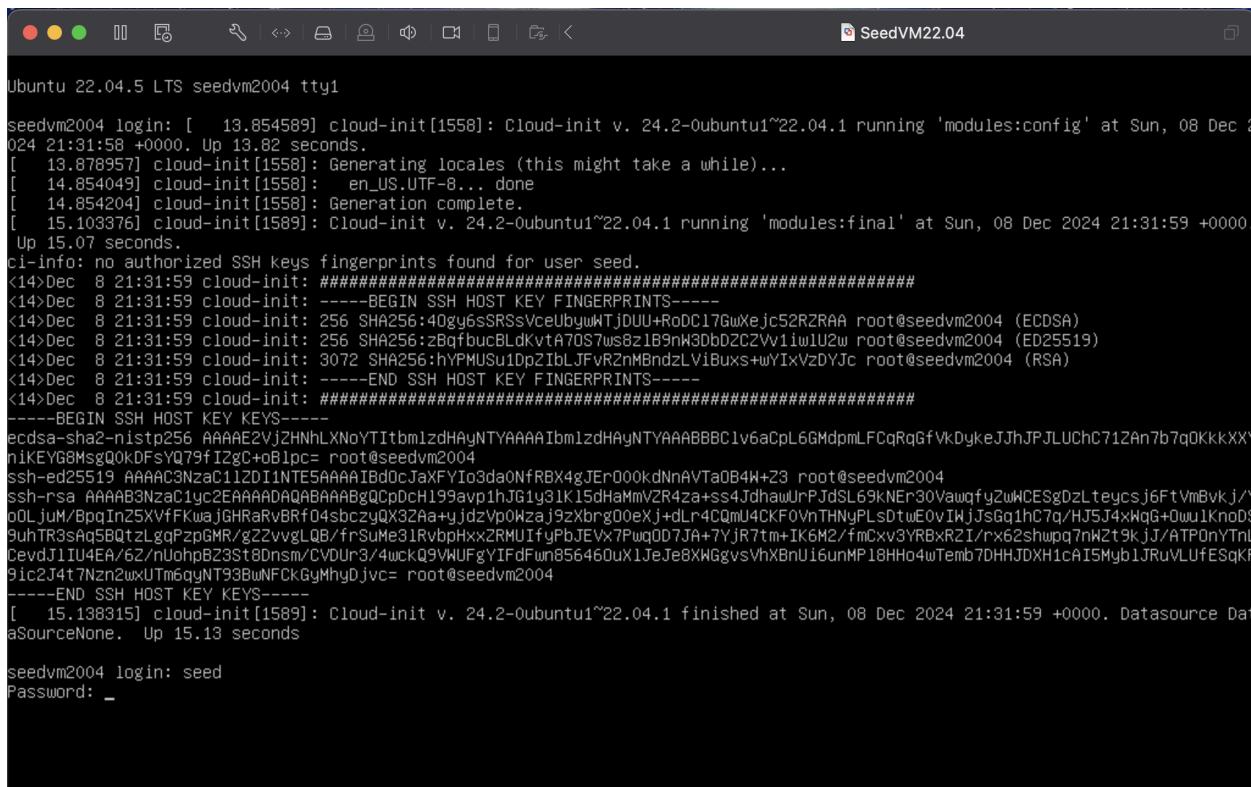
Maybe you will encounter a situation like Failed unmounting /cdrom, press enter directly.



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After the cloud-init operation, press enter and login to your account:



```

Ubuntu 22.04.5 LTS seedvm2004 tty1

seedvm2004 login: [ 13.854589] cloud-init[1558]: Cloud-init v. 24.2-0ubuntu1~22.04.1 running 'modules:config' at Sun, 08 Dec 2024 21:31:58 +0000. Up 13.82 seconds.
[ 13.878957] cloud-init[1558]: Generating locales (this might take a while)...
[ 14.854049] cloud-init[1558]: en_US.UTF-8... done
[ 14.854204] cloud-init[1558]: Generation complete.
[ 15.103376] cloud-init[1589]: Cloud-init v. 24.2-0ubuntu1~22.04.1 running 'modules:final' at Sun, 08 Dec 2024 21:31:59 +0000.
Up 15.07 seconds.
ci-info: no authorized SSH keys fingerprints found for user seed.
<14>Dec 8 21:31:59 cloud-init: ##### BEGIN SSH HOST KEY FINGERPRINTS #####
<14>Dec 8 21:31:59 cloud-init: 256 SHA256:40gy6sSRSSvCeUbywWTJDUU+RoDC17GwXejc52RZRAA root@seedvm2004 (ECDSA)
<14>Dec 8 21:31:59 cloud-init: 256 SHA256:zBqfbucBLdKvtA7OS7ws8z1B9nW3DbdZC2Vv1iw1U2w root@seedvm2004 (ED25519)
<14>Dec 8 21:31:59 cloud-init: 3072 SHA256:hYPMUSu1pZ1bLJFvRzMBndzLViBuxs+wYIxVzDYJc root@seedvm2004 (RSA)
<14>Dec 8 21:31:59 cloud-init: -----END SSH HOST KEY FINGERPRINTS-----
<14>Dec 8 21:31:59 cloud-init: ##### END SSH HOST KEY FINGERPRINTS #####
-----BEGIN SSH HOST KEY KEYS-----
ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbm1zdHAYNTYAAAAIBm1zdHAYNTYAAAABBB1v6aCpL6GMdpmlFCqRqGfVkJhJPJLUChC712An7b7qOKKKXXY
n1KEYQ8MsQ0KDFSYQ79fI2gC+oBlpc= root@seedvm2004
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIBd0cJaXFYIo3da0NfRBX4gJEr000kdNnAVTa0B4W+Z3 root@seedvm2004
ssh-rsa AAAAB3NzaC1yc2EAAADQABAAAABgQCpDCH199avp1hJ61y31k15dHaMmvZR4za+ss4JdhawUrPJdSL69kNEr30VawqfyZwWCESgDzLteyjcsj6FtVmBvk.j/Y
oDLjuM.BpqIn25XVfFKwajGHRarvBRf04sbczyQX32Aa+ujdzVp0H2aj9zXbrg00eXj+dLr4Q0mu4CKFOVnTHNyPLsDtuE0vIWjjsG01hC7q/HJ5J4xh0G+0w1Kn0DS
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CevdJ1IU4EA/6Z/nUohpB23St8Dnsm/CVDUrn3/4uickQ9vNUFgYIFdfun856460uX1Je.Je8XWggvsVhxBnUi6umMP18HHo4wTemb7DHHDJDXH1CA15Myb1JRuVLufESqKF
9ic2J4t7Nz2uxUTm6qyNT93BwNFCKGyMhgDjvc= root@seedvm2004
-----END SSH HOST KEY KEYS-----
[ 15.138315] cloud-init[1589]: Cloud-init v. 24.2-0ubuntu1~22.04.1 finished at Sun, 08 Dec 2024 21:31:59 +0000. Datasource Data
aSourceNone. Up 15.13 seconds

seedvm2004 login: seed
Password: _

```

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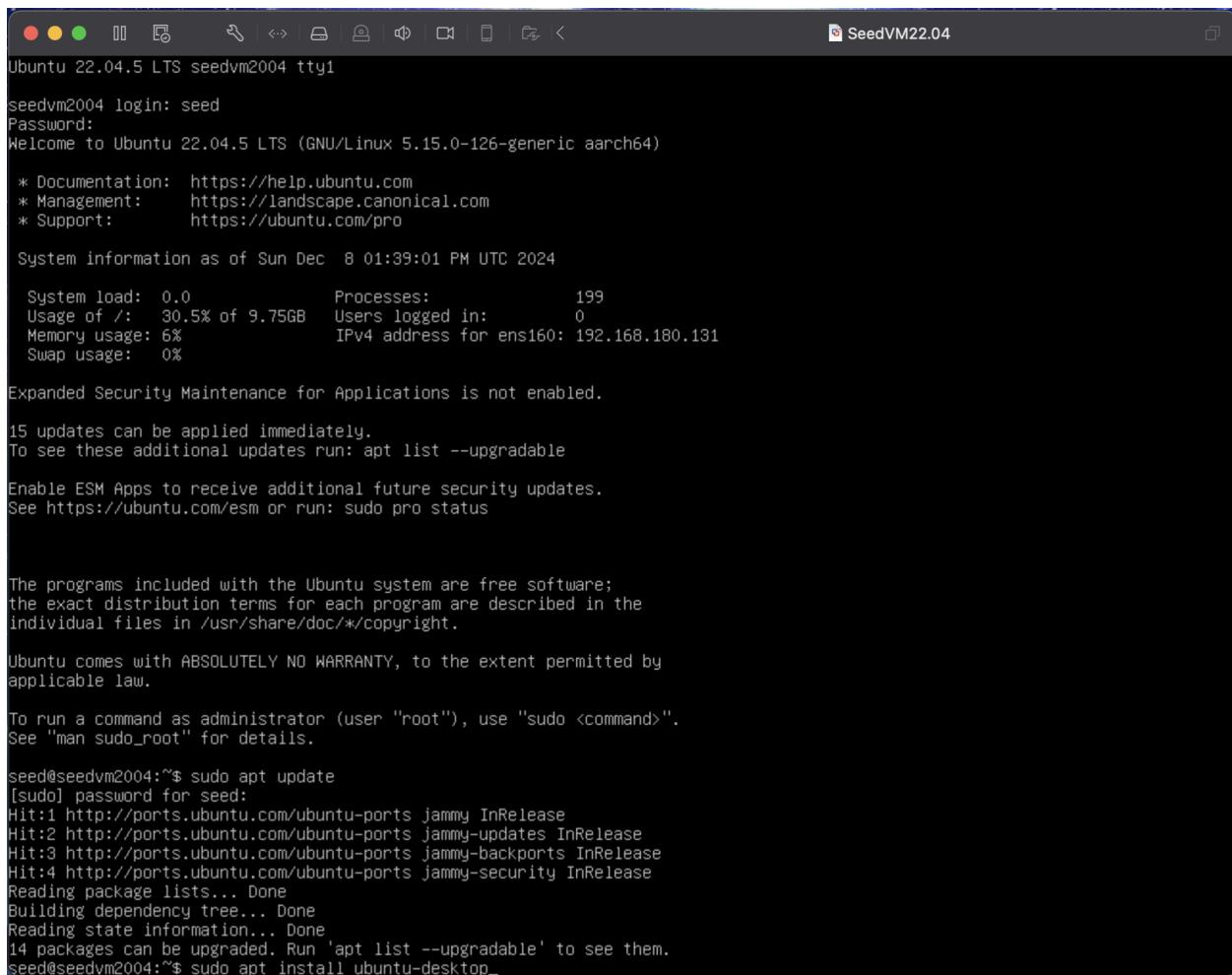
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#### Step 2.4: Install Ubuntu Desktop

In most SEED labs, we need to have a GUI to check the result. We will install ubuntu-desktop in the VM to get it.

Use `sudo apt update` first and

```
sudo apt install ubuntu-desktop
```



```
Ubuntu 22.04.5 LTS seedvm2004 tty1
seedvm2004 login: seed
Password:
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 5.15.0-126-generic aarch64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Sun Dec  8 01:39:01 PM UTC 2024

System load: 0.0          Processes:           199
Usage of /: 30.5% of 9.75GB   Users logged in:      0
Memory usage: 6%           IPv4 address for ens160: 192.168.180.131
Swap usage:  0%

Expanded Security Maintenance for Applications is not enabled.

15 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

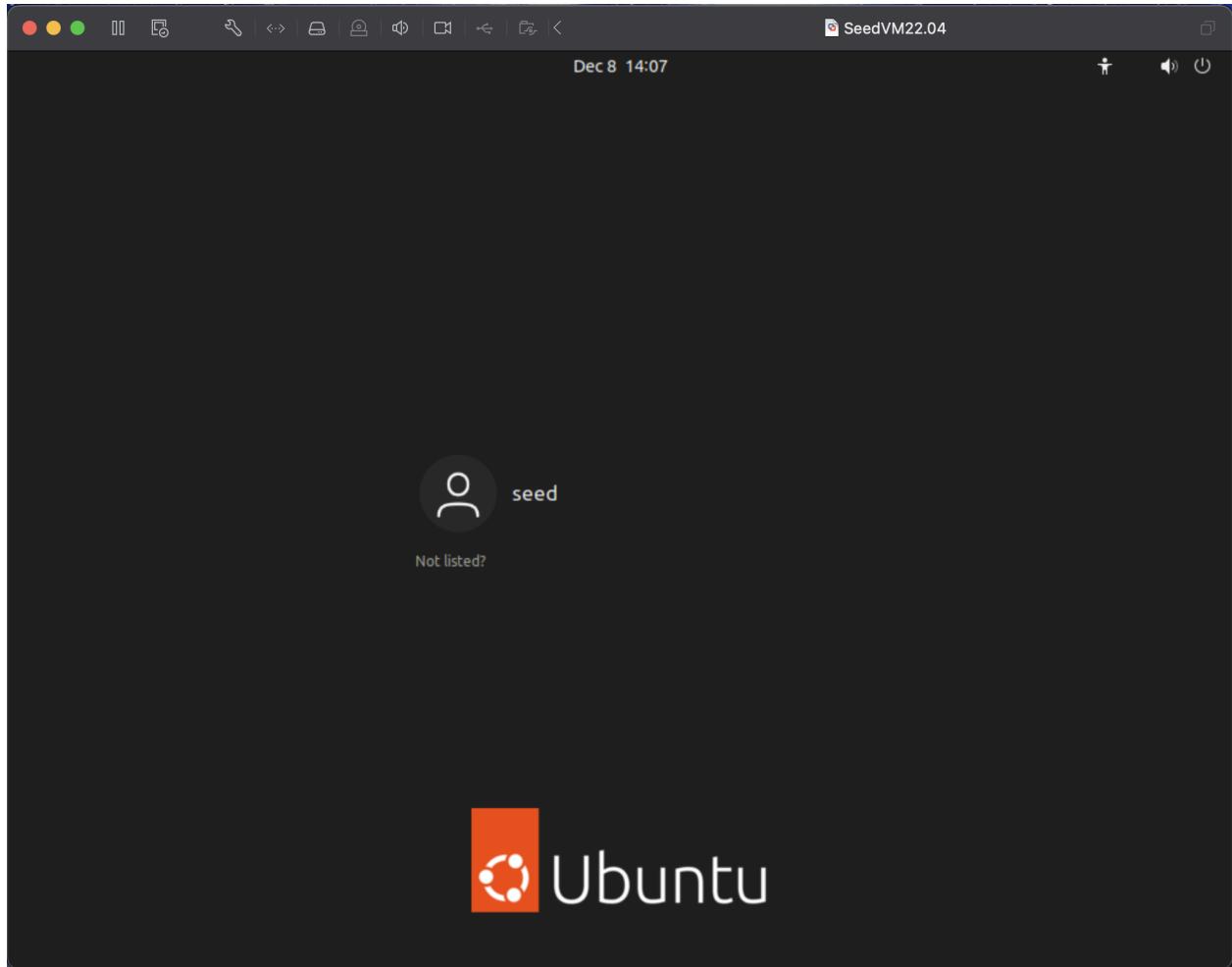
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

seed@seedvm2004:~$ sudo apt update
[sudo] password for seed:
Hit:1 http://ports.ubuntu.com/ubuntu-ports jammy InRelease
Hit:2 http://ports.ubuntu.com/ubuntu-ports jammy-updates InRelease
Hit:3 http://ports.ubuntu.com/ubuntu-ports jammy-backports InRelease
Hit:4 http://ports.ubuntu.com/ubuntu-ports jammy-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
14 packages can be upgraded. Run 'apt list --upgradable' to see them.
seed@seedvm2004:~$ sudo apt install ubuntu-desktop
```

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Wait until it finishes the installation. This may take a long time. Then `sudo reboot` and we will get the GUI we want!



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## Step 3: Lab Setup for Apple Silicon Machines

We are now ready to install all the software packages needed for the SEED labs.

Do not upgrade your Ubuntu version!

- Step 3.1: Setup Bidirectional Shared Clipboard
- Step 3.2: Install the Software

### Step 3.1: Setup Bidirectional Shared Clipboard

In the default setting, the copy-and-paste does not work between your host Apple machine and the VM running inside VMware Fusion. This is quite inconvenient. You can install `vmware tools` to set up a bidirectional shared clipboard. Run the following commands.

```
sudo apt-get upgrade
sudo apt-get install open-vm-tools-desktop -y
sudo reboot
```

### Step 3.2: Install the Software

Go to terminal, first download `curl` using

```
sudo apt-get install curl
```

Download [src-arm.zip](#) from the link or using the following `curl` command.

```
curl -o src-arm.zip https://seedsecuritylabs.org/setup/src-arm.zip
```

In order to unzip the file, we first need to install the `unzip` program using the following command. After that, unzip the file.

```
sudo apt update
sudo apt -y install unzip
unzip src-arm.zip
```

After unzipping the file, you will see a `src-arm` folder. Enter this folder, and run the following command to install software and configure the system.

```
sudo ./install.sh
```

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- Note: This shell script will download and install all the software needed for the SEED labs. The whole process will take a few minutes. Please don't leave, because you will be asked twice to make choices:
- During the installation of Wireshark, you will be asked whether non-superuser should be able to capture packets. **Select No.**

After the script finishes, we can switch to the `seed` account using the following command:

```
sudo su seed
```