System Setup

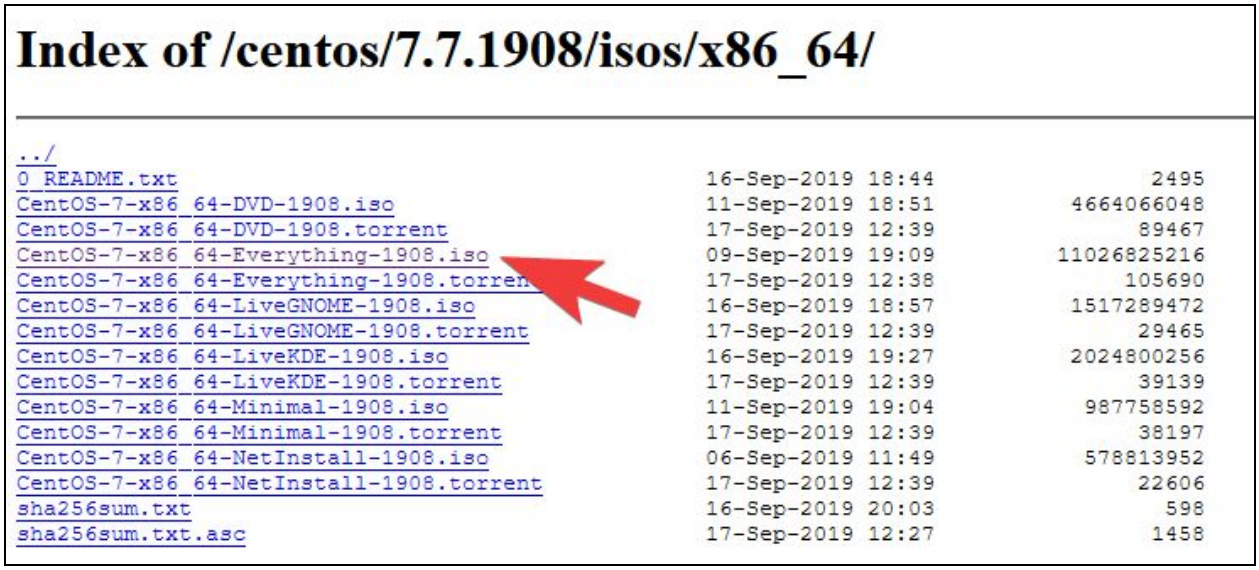
Creating two new virtual servers running CentOS and Ubuntu operating systems. Servers will be installed as a virtual machine using VMware Workstation version 15.5.0. This document will assume you have VMware installed with a valid license.

Setting up CentOS

CentOS version used during installation: 7.7.1908

NOTE: CentOS 8 was attempted, but installation into the virtual machine had run into difficulties and was unable to proceed, thus we went with 7.

1. First, obtain the iso file for CentOS. Choose from the mirrors on this page: http://isoredirect.centos.org/centos/7/isos/x86_64/ . Ensure you choose the "Everything" iso file.

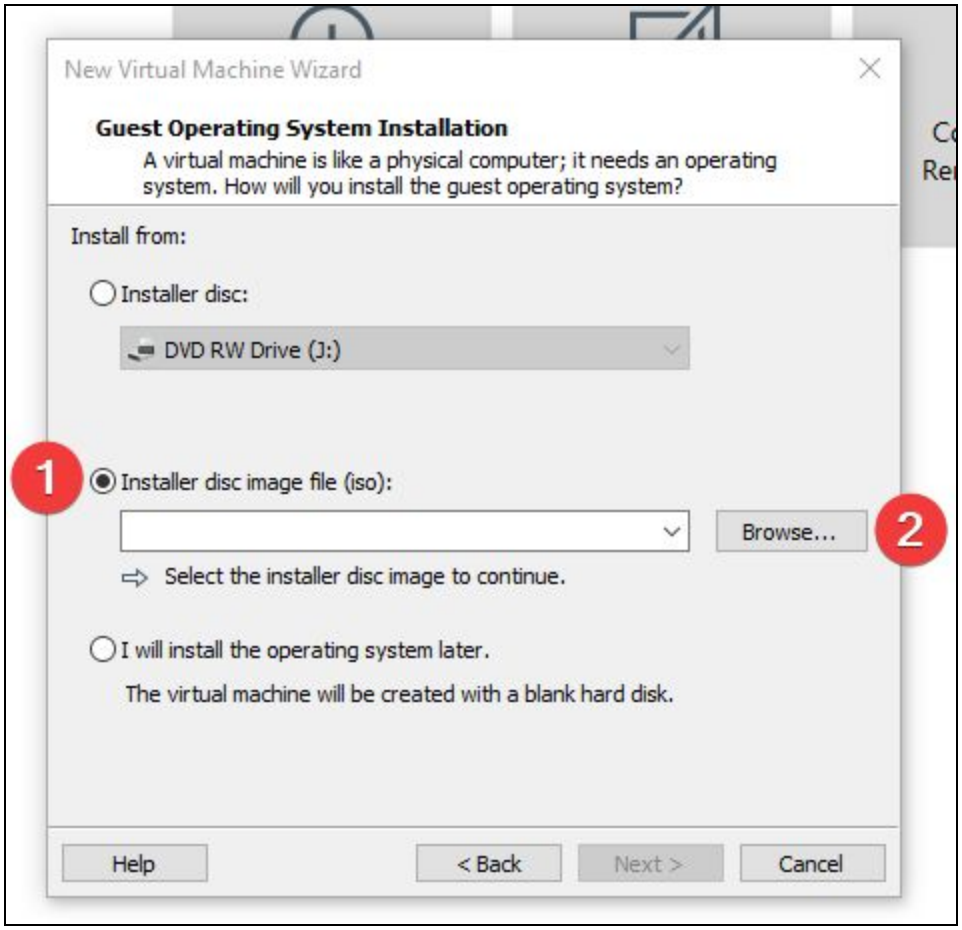


Index of /centos/7.7.1908/isos/x86_64/

../		
0_README.txt	16-Sep-2019 18:44	2495
CentOS-7-x86_64-DVD-1908.iso	11-Sep-2019 18:51	4664066048
CentOS-7-x86_64-DVD-1908.torrent	17-Sep-2019 12:39	89467
CentOS-7-x86_64-Everything-1908.iso	09-Sep-2019 19:09	11026825216
CentOS-7-x86_64-Everything-1908.torrent	17-Sep-2019 12:38	105690
CentOS-7-x86_64-LiveGNOME-1908.iso	16-Sep-2019 18:57	1517289472
CentOS-7-x86_64-LiveGNOME-1908.torrent	17-Sep-2019 12:39	29465
CentOS-7-x86_64-LiveKDE-1908.iso	16-Sep-2019 19:27	2024800256
CentOS-7-x86_64-LiveKDE-1908.torrent	17-Sep-2019 12:39	39139
CentOS-7-x86_64-Minimal-1908.iso	11-Sep-2019 19:04	987758592
CentOS-7-x86_64-Minimal-1908.torrent	17-Sep-2019 12:39	38197
CentOS-7-x86_64-NetInstall-1908.iso	06-Sep-2019 11:49	578813952
CentOS-7-x86_64-NetInstall-1908.torrent	17-Sep-2019 12:39	22606
sha256sum.txt	16-Sep-2019 20:03	598
sha256sum.txt.asc	17-Sep-2019 12:27	1458

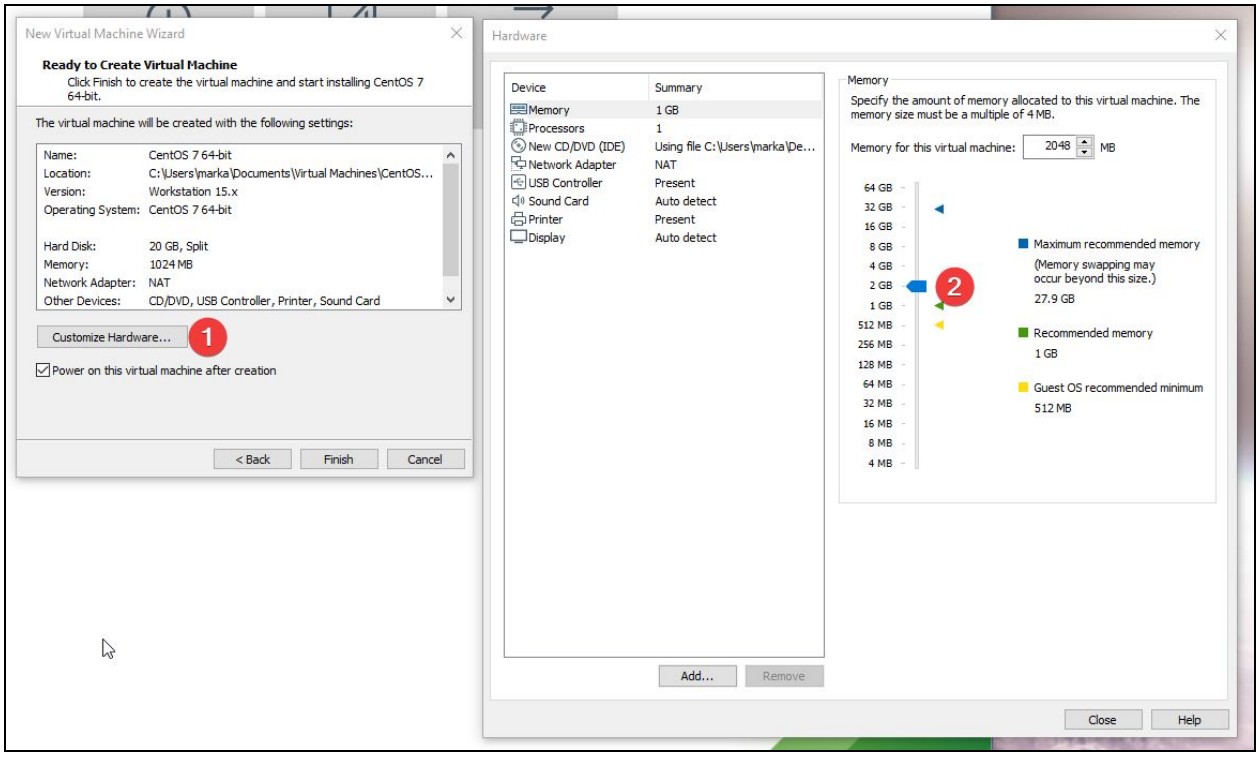
2. In VMware, click "Create a New Virtual Machine."
3. Typical configuration is OK. Click next.

4. Click the button next to “Install disk image to file” then browse to the location of your CentOS iso file. Click next.



5. Choose a suitable name and location for your machine. This is your preference. Click next.
6. Choose a maximum disk size. We will remain with the default 20GB. We will also remain with the option for splitting the disk into multiple files. Click next.
7. Click “Customize Hardware…”
8. Choose the necessary amount of memory you will need for your machine. We will change the value to 2GB by dragging the slider or entering 2048 into the text field

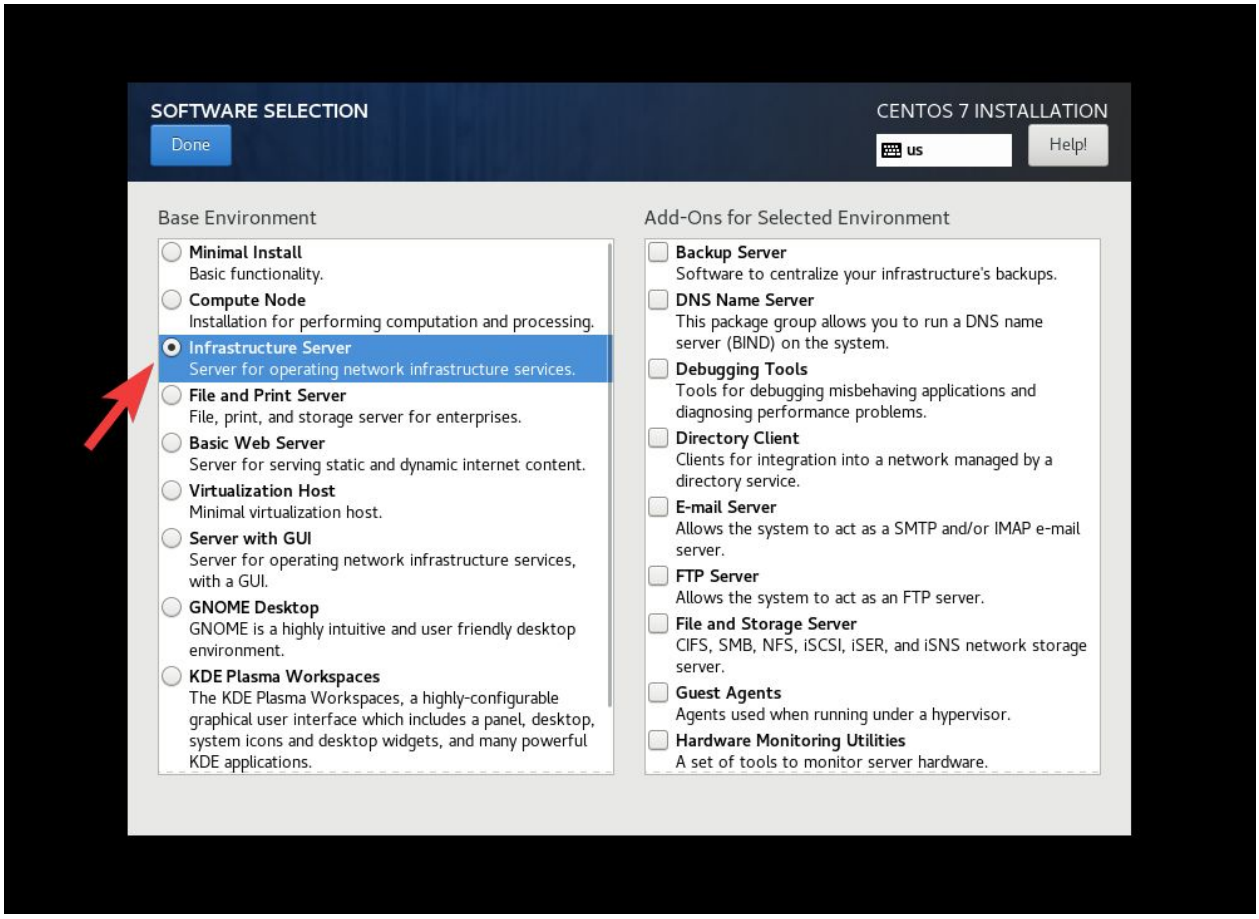
at the top. Close the hardware page.



9. Ensure “Power on this virtual machine after creation” is checked. Click finish.
10. Your machine will now load. Select the option to install CentOS 7 then follow the on screen instructions.
11. Choose your language. Click next.
12. Click “Software Selection.” For the base environment, choose Infrastructure Server (or whichever other environment is relevant).

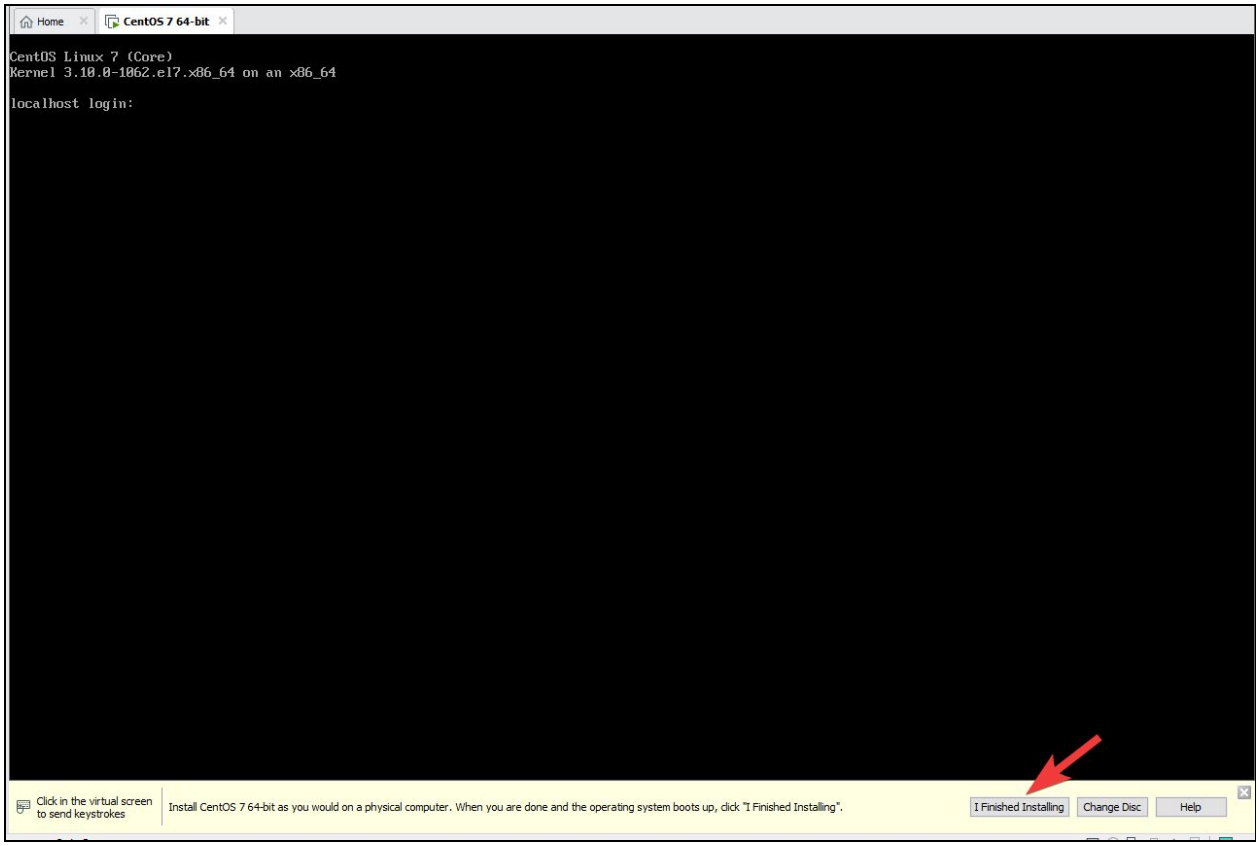
This step is an important change. Do not choose minimal install or an install with a GUI.

Click done. This will take several seconds to process the change.



13. If Installation Destination has a yellow warning icon, click it. Ensure the 20GB disk is selected then click done. Just clicking in and then out of that page was enough to make the warning icon go away for me.
14. Click begin installation. The installation will now begin. This will take several minutes to complete. While you are waiting, you should set the root password and add information for another user account. Doing either will not interrupt the installation process.
15. Once the installation is complete, click reboot.

16. After booting, you will be met with the login screen. On VMware, click “I finished installing.”



17. Login with your user account.

> **Note:** For CentOS, the internet interface will not be enabled by default. Enter the command **ifconfig** to show interfaces. The first one, ens33, will be needed to access the internet.

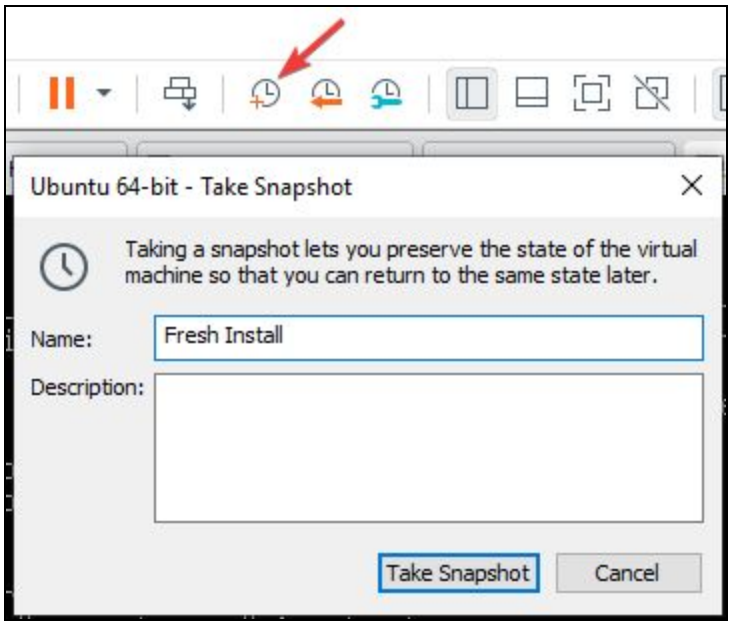
```
[maules@localhost ~]$ ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        ether 00:0c:29:ce:e0:41  txqueuelen 1000  (Ethernet)
        RX packets 84  bytes 23493 (22.9 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 128  bytes 11136 (10.8 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 128  bytes 11136 (10.8 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

18. Enter **sudo ifup ens33** to activate this interface. After doing this, if you enter **ifconfig** again, you will see the ens33 interface now has an IP address. This command will need to be run every time the machine is started. To avoid that, the configuration will be changed to automatically start the interface.
19. Navigate to /etc/sysconfig/network-scripts/ and **sudo vi ifcfg-eth0**
20. Change the line **ONBOOT=no** to **ONBOOT=yes**
21. Save the file, and the interface will not automatically start every boot.

> For more information on this, read the FAQ on the CentOS wiki at https://wiki.centos.org/FAQ/CentOS7 . See point #2

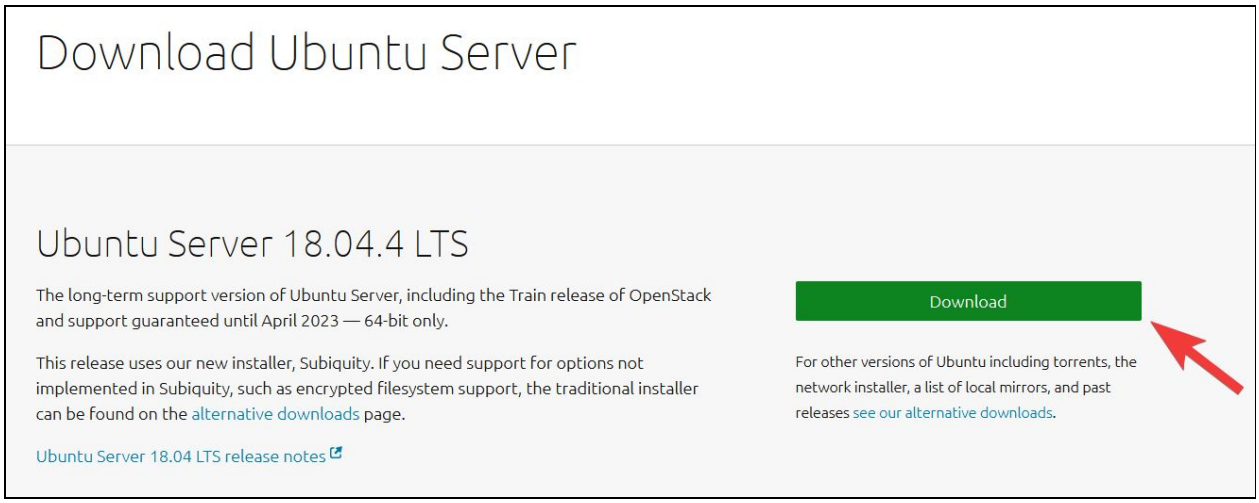
22. Your CentOS installation is done! It is **strongly** recommended to take a snapshot of the virtual machine.



Setting up Ubuntu

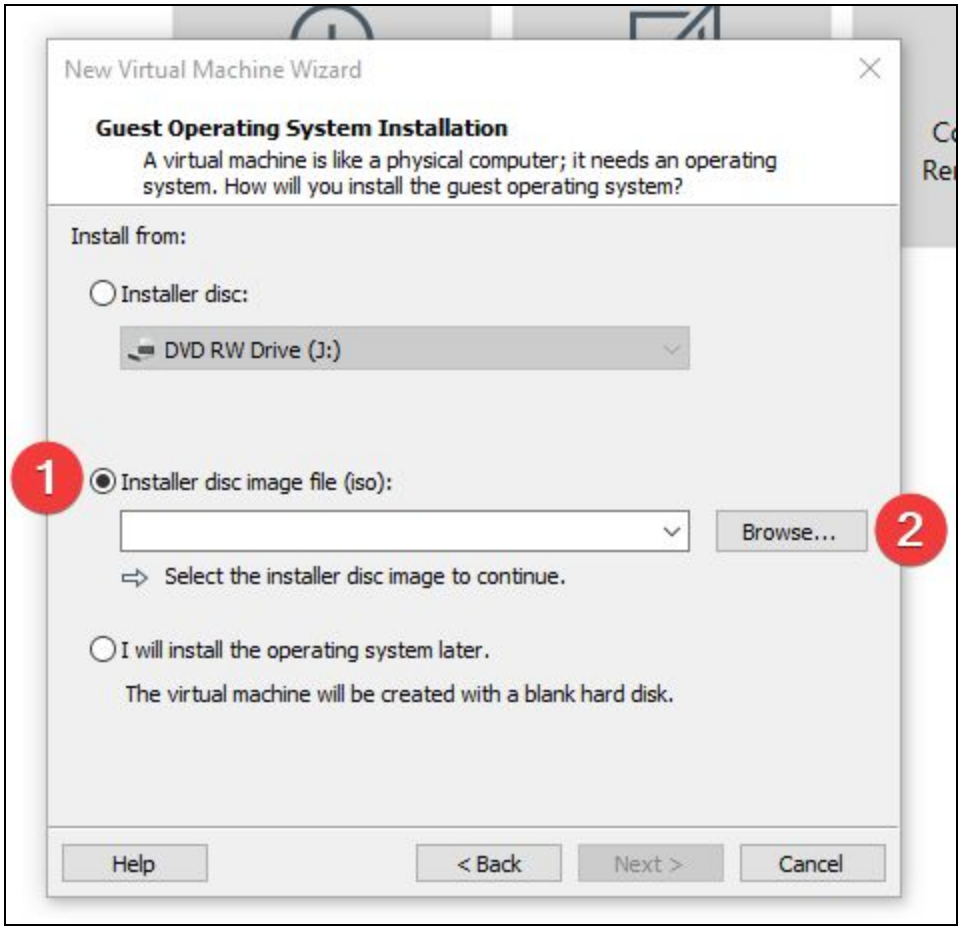
Ubuntu server version used during installation: 18.04.4 LTS

1. First, obtain the iso file for Ubuntu. Click download on this page: https://ubuntu.com/download/server .



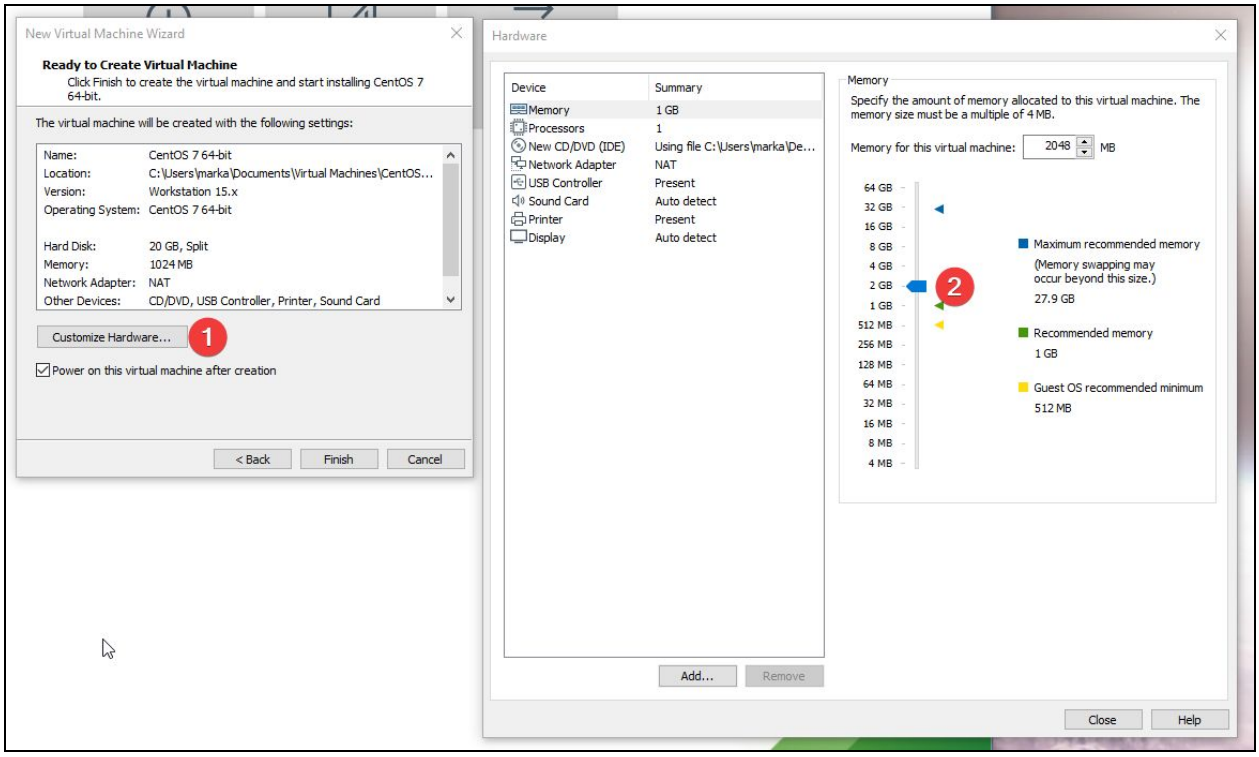
2. In VMware, click “Create a New Virtual Machine.”
3. Typical configuration is OK. Click next.

4. Click the button next to “Install disk image to file” then browse to the location of your Ubuntu iso file. Click next.

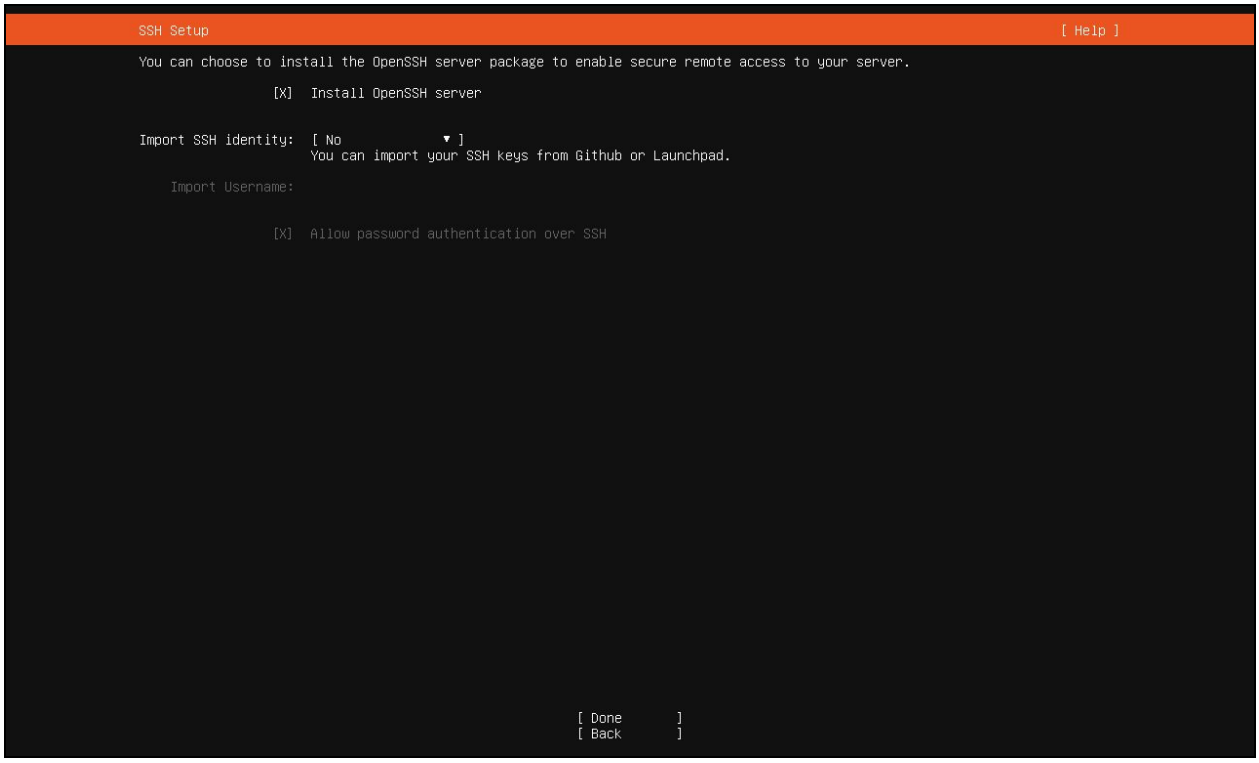


5. Choose a suitable name and location for your machine. This is your preference. Click next.
6. Choose a maximum disk size. We will remain with the default 20GB. We will also remain with the option for splitting the disk into multiple files. Click next.
7. Click “Customize Hardware…”
8. Choose the necessary amount of memory you will need for your machine. We will change the value to 2GB by dragging the slider or entering 2048 into the text field

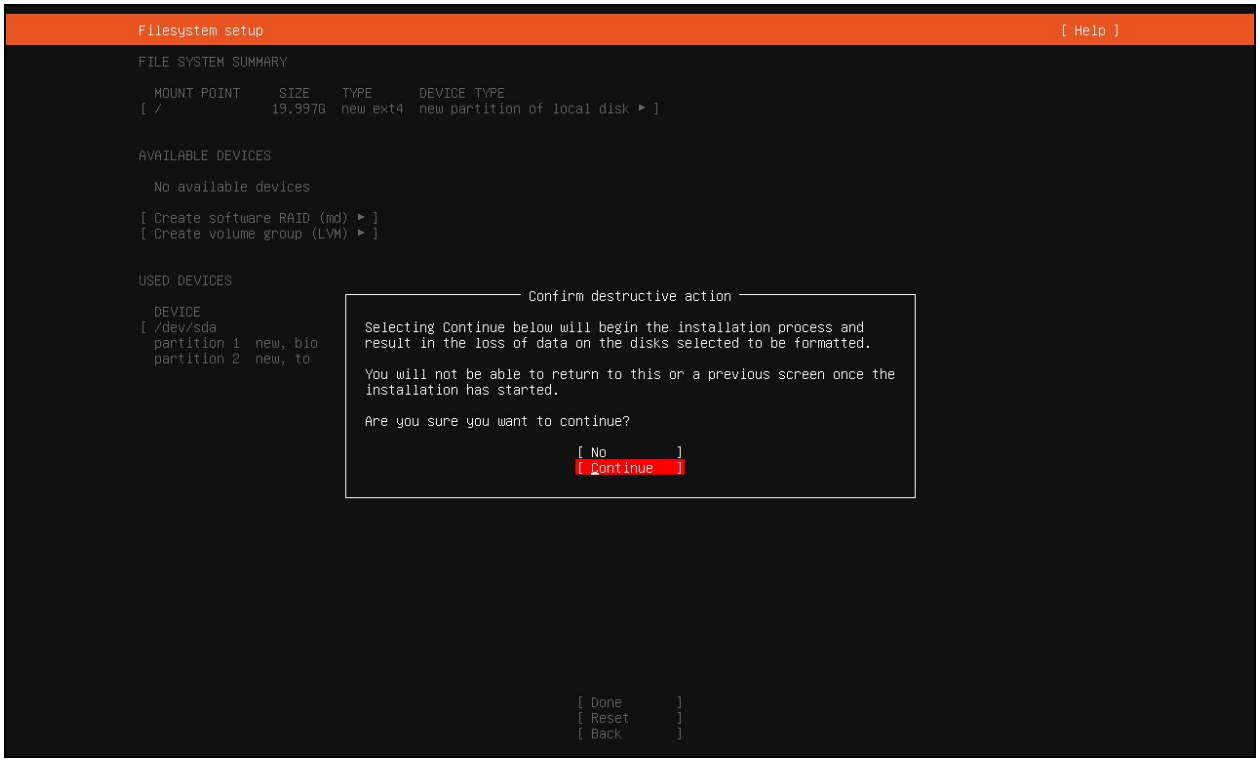
at the top. Close the hardware page.



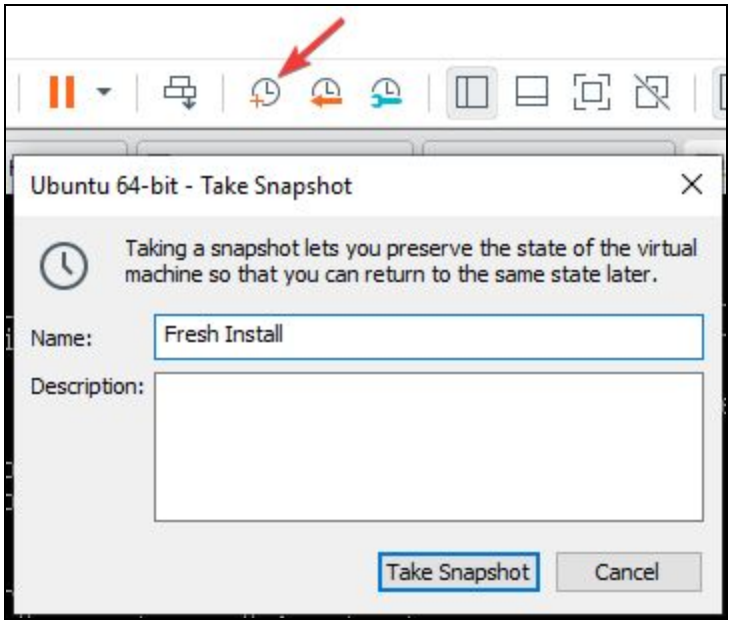
9. Ensure “Power on this virtual machine after creation” is checked. Click finish.
10. Once your machine is loaded, follow all of the on screen instructions. You can leave everything as default and continue through all the pages until you reach SSH setup, where you will want to select OpenSSH server to be installed.



Note: A page will appear asking you to confirm destructive action. This will not affect the drive on your host PC. This will only affect the 20GB of free space allocated to the virtual machine. None of your data will be lost by continuing.

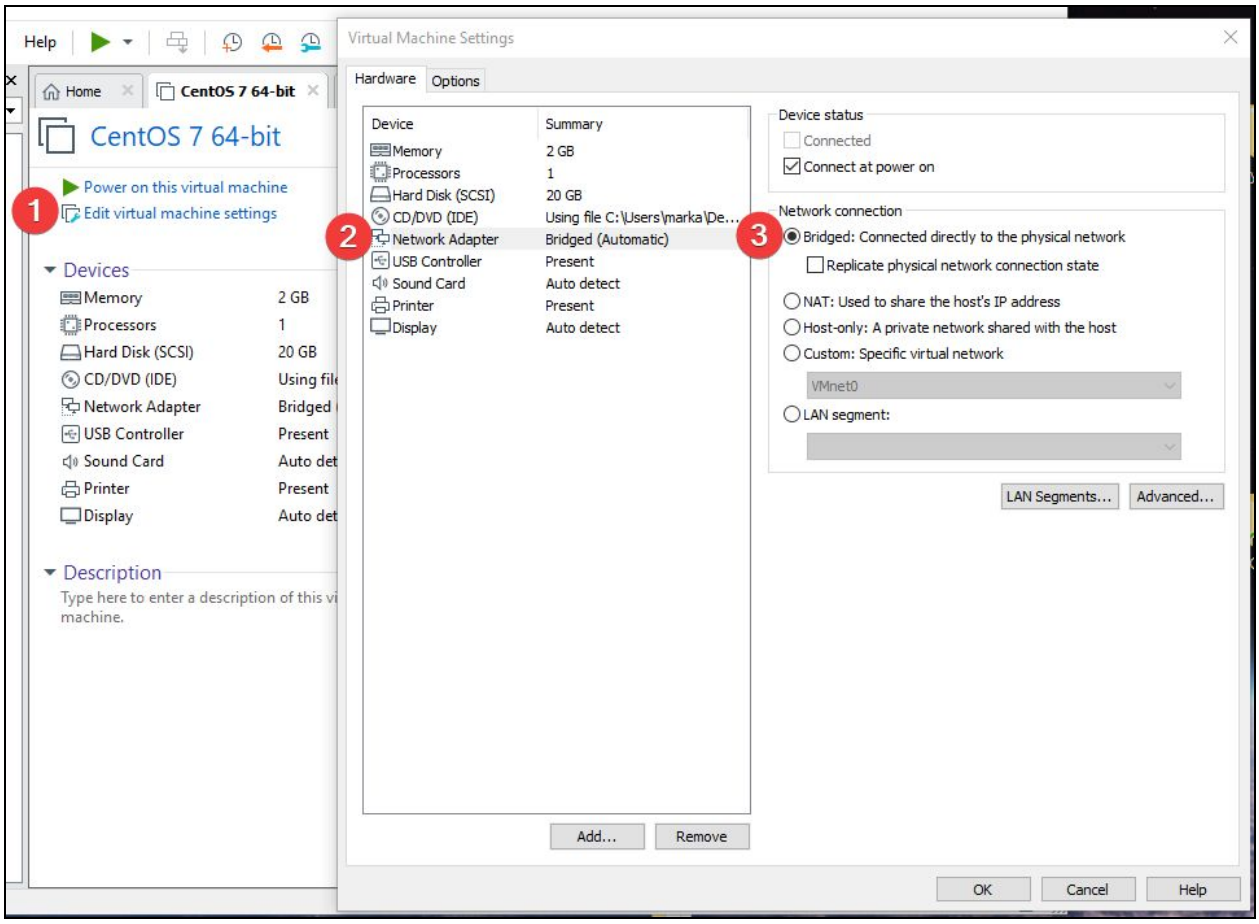


11. You will not need to select any server snaps on the next page. Click continue to begin installation.
12. After that has completed, wait for downloads and updates to be completed. Then click reboot.
13. You will have your login screen open. Your Ubuntu installation is complete! It is **strongly** recommended to take a snapshot of the virtual machine.



Connecting to the Virtual Machines

1. For each of your virtual machines, power them down and then click edit virtual machine settings.
2. In the list, click on Network Adapter, and then change the network connection to Bridged. Click OK.



This allows our virtual machines to connect to the same network that our host PC is connected to. It will allow the machines to get their own IP addresses on our network.

3. Currently, both machines will listen on port 22 for an incoming SSH connection. One of the machines will need to listen on a different port if we would like to be able to have both machines running and connect to either. We will change the port from 22 to 2222 on the Ubuntu server.
4. Navigate to **/etc/ssh/** and enter the command **sudo vi sshd_config**.
5. Find the line that says **Port 22**, uncomment it by removing the **#**, and then change **22** to **2222**. Save the file.
6. Add the new 2222 port to the firewall by entering **sudo ufw allow 2222/tcp**.

7. Restart the SSH service by entering **sudo service ssh restart**. SSH should now be listening to port 2222 and you should be able to connect from within your network.

   For more information on this, read “How to change the ssh port on Linux or Unix server” at https://www.cyberciti.biz/faq/howto-change-ssh-port-on-linux-or-unix-server/

8. In order to connect from outside of your local network, you will need to configure your router to port forward **22** to your CentOS machine and **2222** to your Ubuntu machine. Instructions can not be given as routers and services widely vary.

Transferring Files to/from the Machines

1. To transfer files from a Windows machine to your virtual machines, you can use WinSCP from: https://winscp.net/eng/index.php .
2. When opened, you will be prompted with a login. Enter the login information for either of your virtual machines to be connected. Remember to change the port number if connecting to the Ubuntu server.