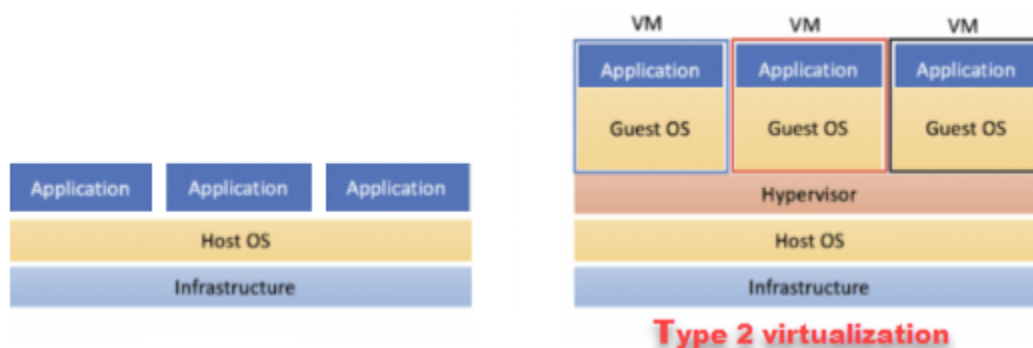


# Installation

## Virtualisation

To install servers that offer services (such as a minecraft server!) you will need a server with a public IP address. Usually you would go to a cloud provider where you can rent a server for a fixed fee / month. For this course we will simulate this process by using a virtual machine.

Virtualisation is a concept where you can run a computer system with an operating system virtually on another system. This makes it possible to have multiple *guest operating systems* with their own virtual hardware on one *host system*.



For this course we want to use and install the operating system **Ubuntu server** in a virtual environment. For this course we will use a debian based distro.

☰ Download the **.iso** file for Ubuntu server using [this link](#). A **.iso** file is an exact copy of a CD/DVD. You will use this later to install the operating system in your virtual machine.

## Get Ubuntu Server

### Option 1: Manual server installation



USB or DVD image based physical install

- ✓ OS security guaranteed until April 2027
- ✓ Extended security maintenance until April 2032
- ✓ Commercial support for enterprise customers

[Download Ubuntu Server 22.04.1 LTS](#)

[Alternative downloads >](#)

[Alternative architectures >](#)

[Read the Ubuntu Server 22.04 LTS release notes](#)

Option 1 - Manual server installation

Option 2 - Instant Ubuntu VMs

Option 3 - Automated server provisioning



## Virtualisation software

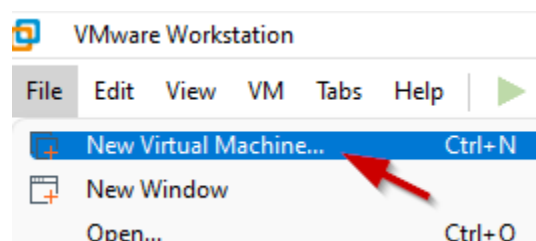
To use virtualisation there are several options. The most common virtualisation software is:

- VMware Workstation
- Virtualbox
- Hyper-V

In this course we will use and support VMware Workstation but the other software packages have the same purpose. Students of PXL University College will get a free educational license to use VMware Workstation pro through [BrightSpace](#).

## Create a new VM

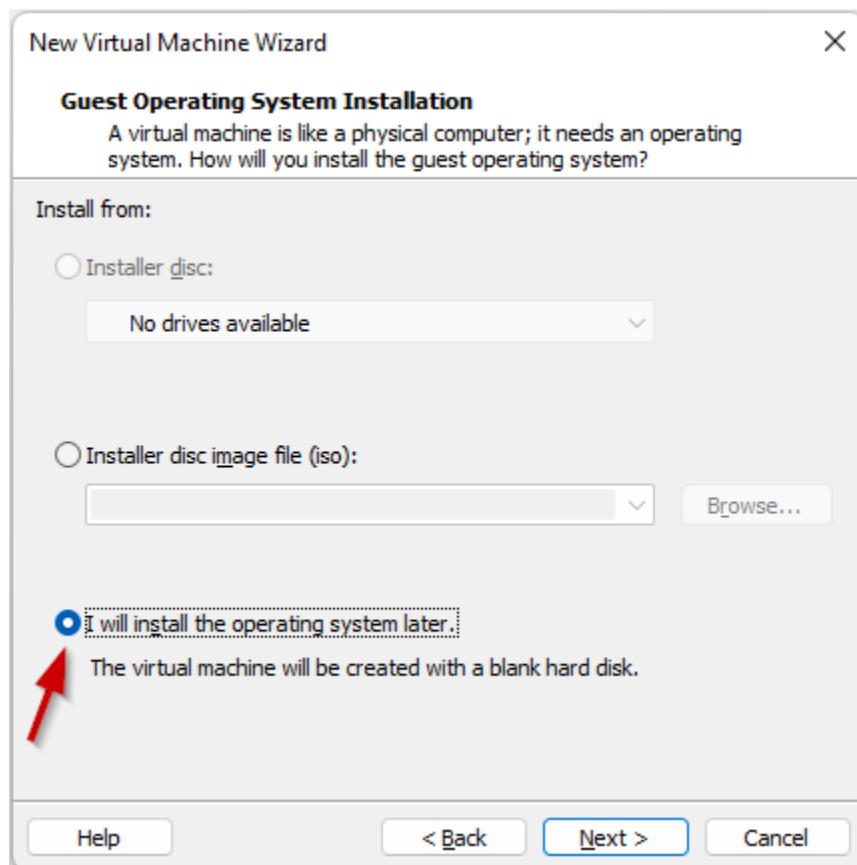
To create a new virtual machine (VM) in VMWare you go to the menu **file > New virtual machine**. The wizard to create a new VM will appear.



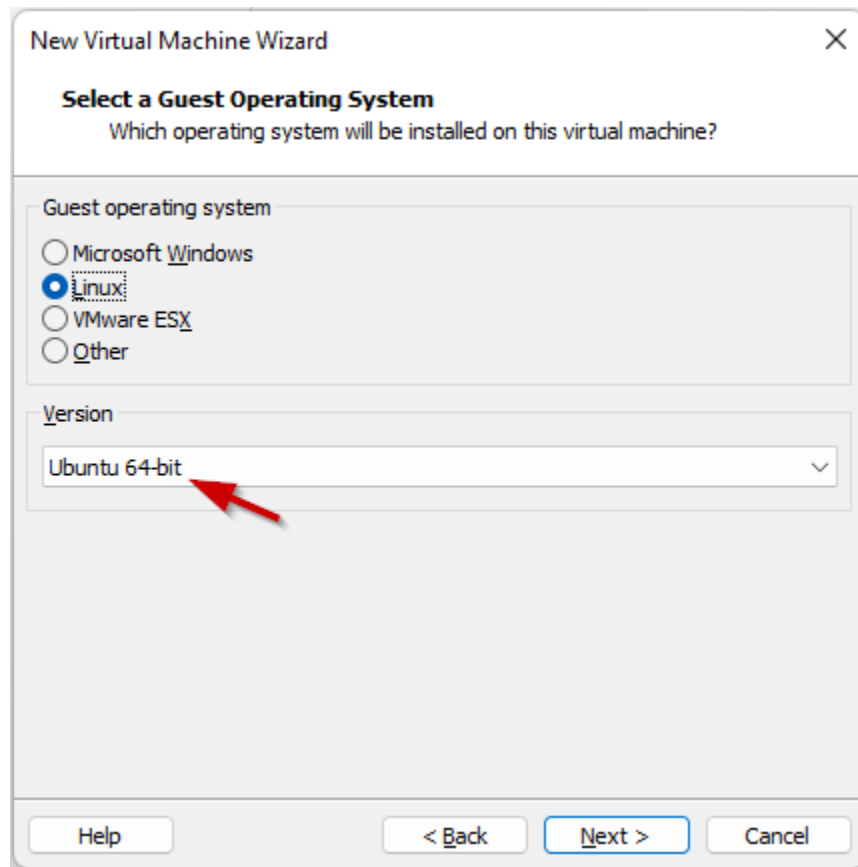
In the first screen we select the option **Typical** :



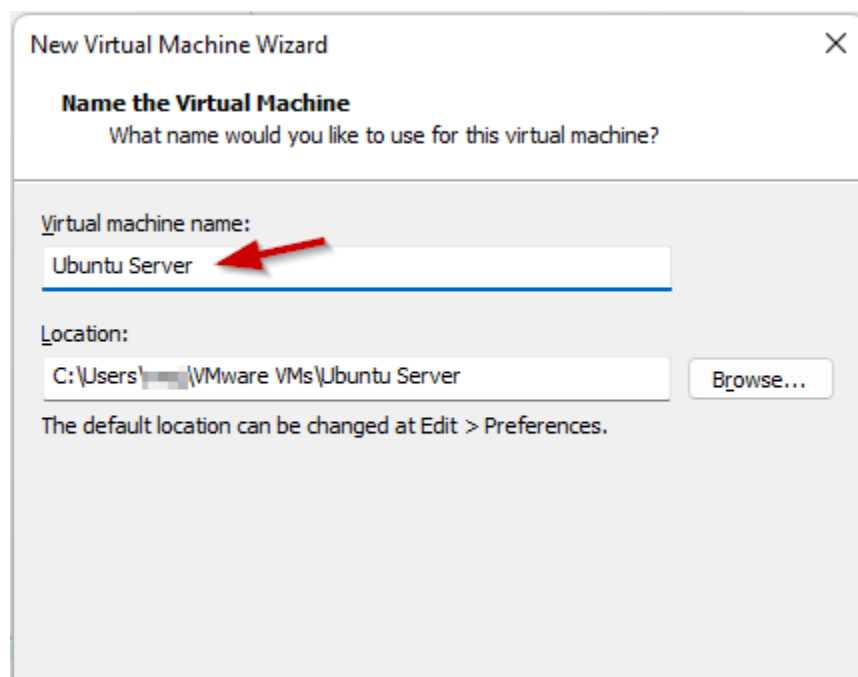
Next we choose to **install the operating system later** :

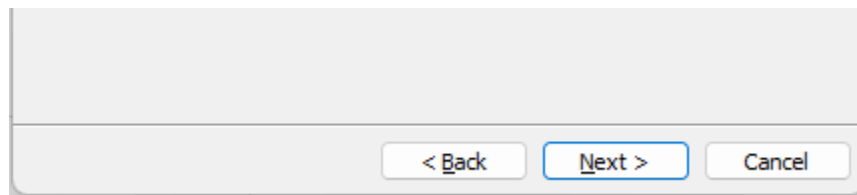


Next we choose the operating system **Linux** . In the version dropdown we select **Ubuntu 64 bit** . This is the Linux distribution that we will use during this course.

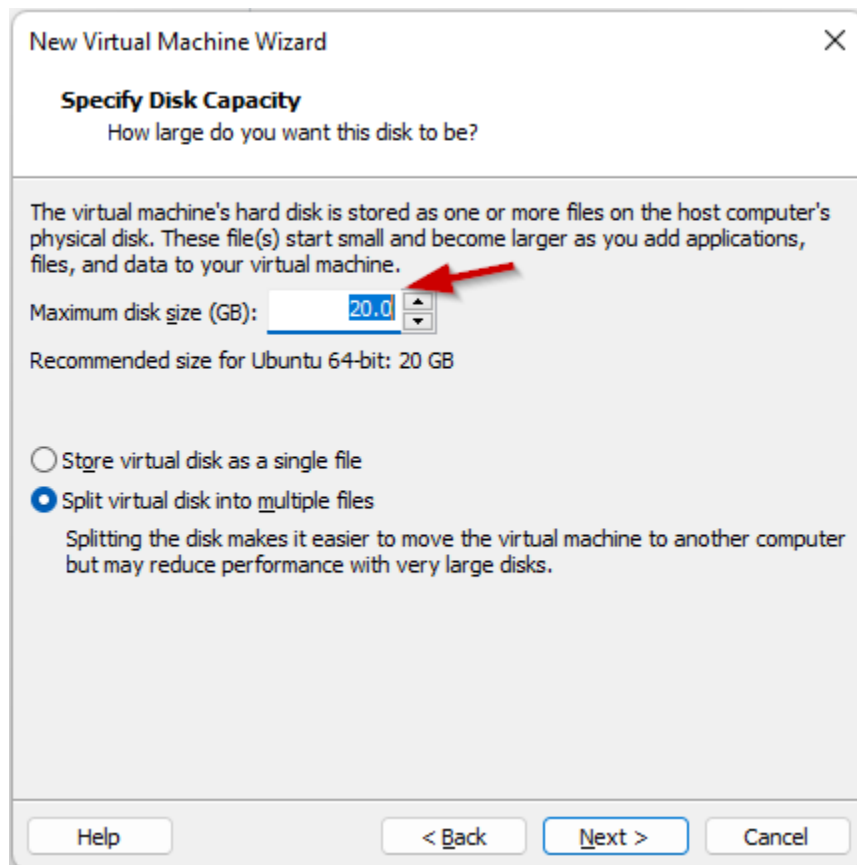


In the next screen we give the virtual machine a name. You can also specify a different folder to store the virtual machine on your computer.

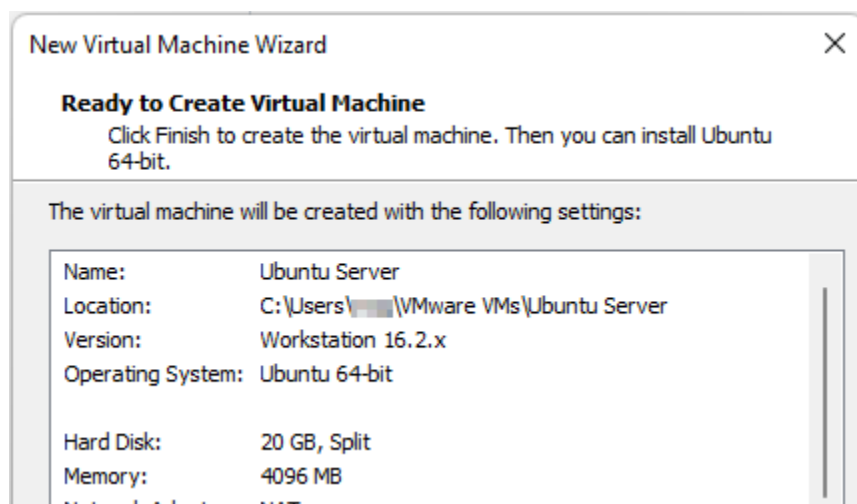


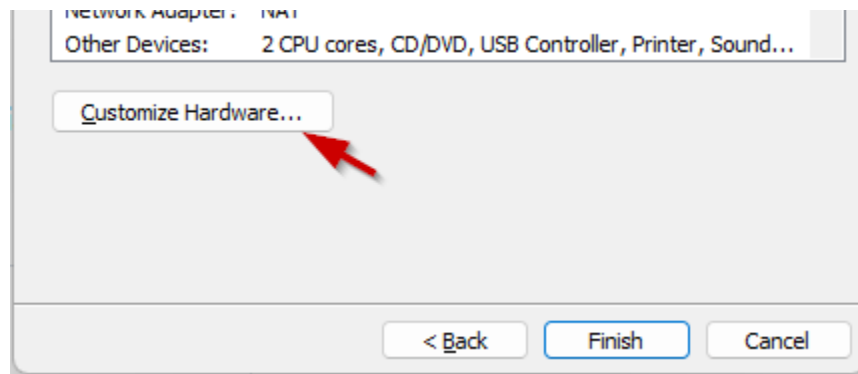


In the next screen we configure the virtual hddisk size for the VM. We will create a disk that has 20GB storage. We can expand this later if needed:

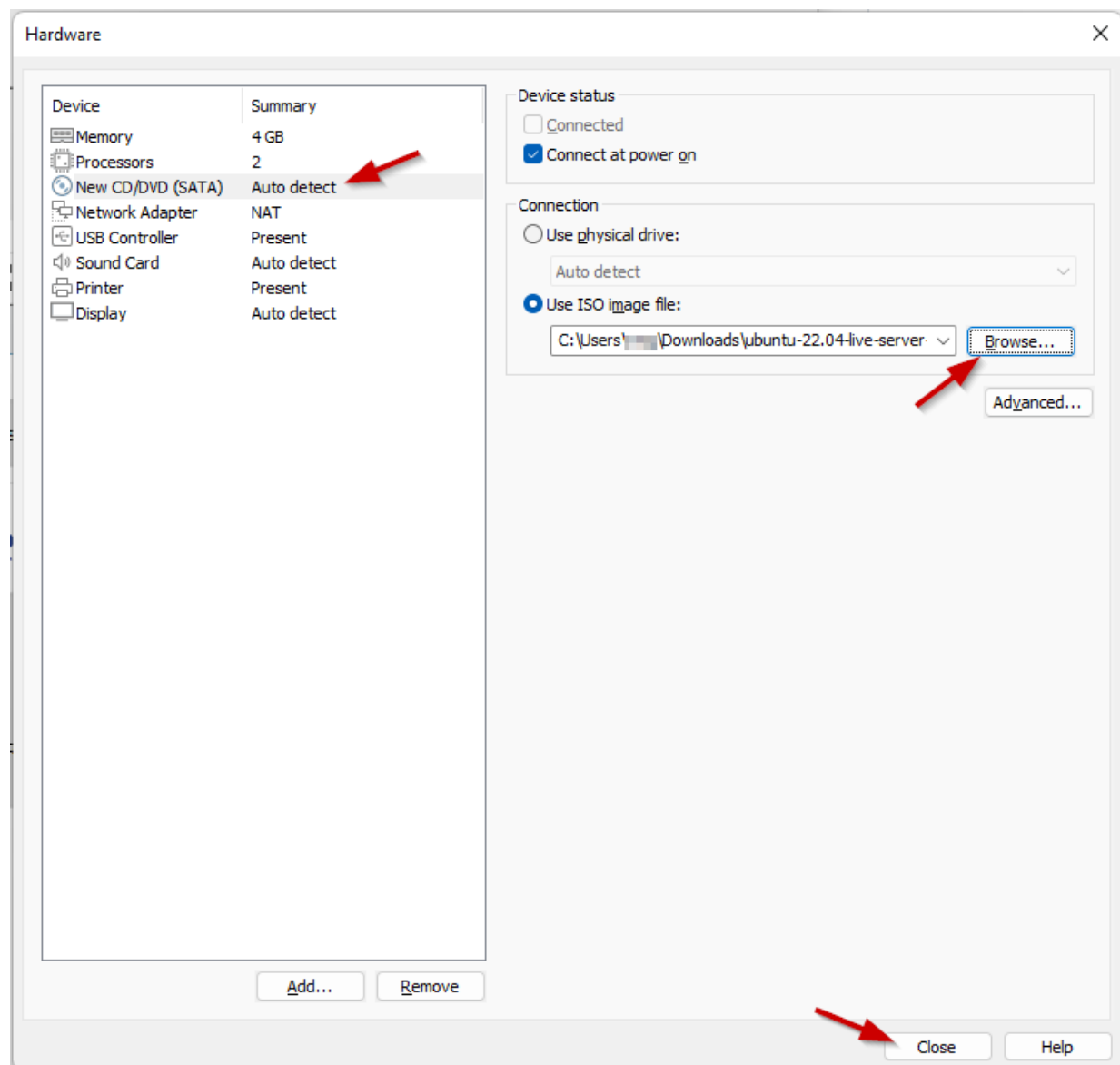


We have to click on **Customize Hardware** to configure the virtual machine a little more:



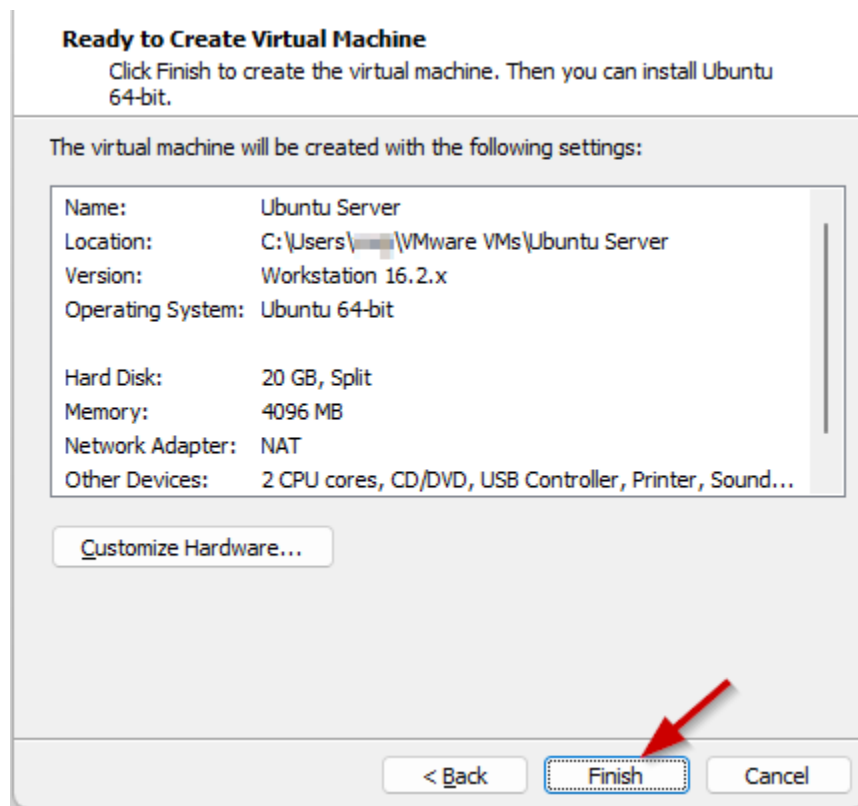


We still need to link the Ubuntu-server ISO file to the virtual CD-rom drive. We do this by selecting **New CD/DVD** and browsing to the downloaded **iso** file:

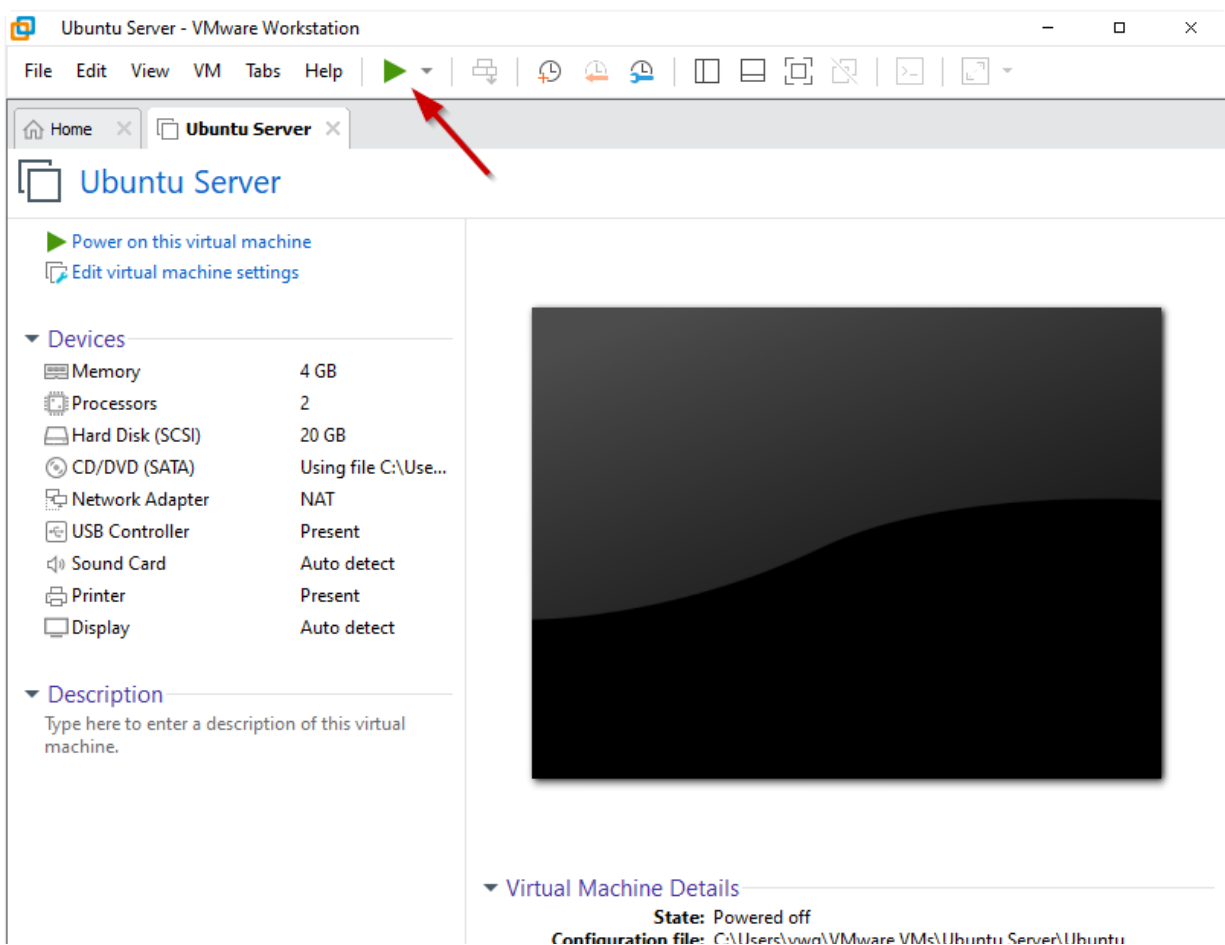


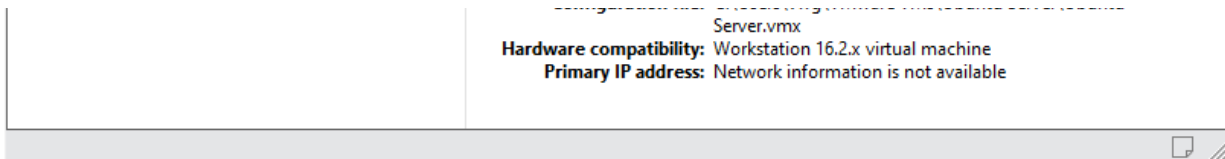
Click on **Finish** and the virtual machine will be created.





You can now boot the VM by clicking the green arrow icon. This will boot the virtual machine and run the installation process.





## Installation Ubuntu server

As described before we will use the distro Ubuntu. After creating and booting the virtual machine there will be an installation process that we need to run through. You will notice that there is no mouse pointer available. We will use the keypoint arrow keys & enter key to navigate through the steps.

**i** Does booting the VM result in the error **This host supports Intel VT-x, but Intel VT-x is disabled** ? You will have to activate the VT-X option in the BIOS of your laptop. More information can be found in [this article](#).

**i** If you want to leave your VM and get your mouse back in the OS of your laptop (=Windows) you'll have to press **CTRL+ALT** !

We make the choice to Try or Install:





We start the installation process by selecting the language. We choose English:

```
Willkommen! Bienvenue! Welcome! Добро пожаловать! Willkommen! [ Help ]
Use UP, DOWN and ENTER keys to select your language.
[ Asturianu ]
[ Bahasa Indonesia ]
[ Català ]
[ Deutsch ]
[ English ]
[ English (UK) ]
[ Español ]
[ Français ]
[ Galego ]
[ Hrvatski ]
[ Latviski ]
[ Lietuviškai ]
[ Magyar ]
[ Nederlands ]
[ Norsk bokmål ]
[ Polski ]
[ Português ]
[ Suomi ]
[ Svenska ]
[ Čeština ]
[ Ελληνικά ]
[ Беларуская ]
[ Русский ]
[ Српски ]
[ Українська ]
```

We skip the installer update:

```
Installer update available [ Help ]
Version 22.05.1 of the installer is now available (22.04.2 is currently running).
You can read the release notes for each version at:
    https://github.com/canonical/subiquity/releases
If you choose to update, the update will be downloaded and the installation will continue from here.

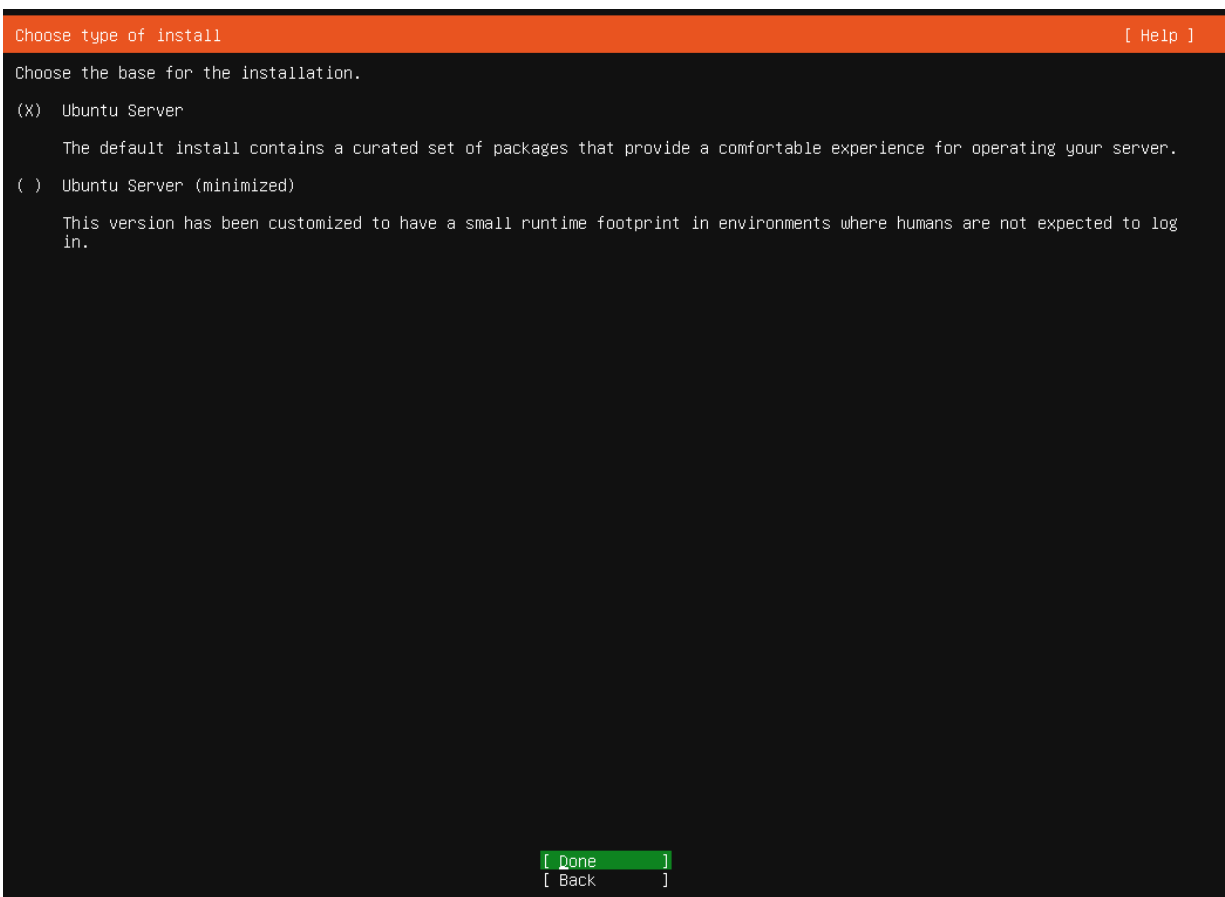
[ Update to the new installer ]
[ Continue without updating ]
[ Back ]
```

Choose the correct keyboard layout. For **azerty** select **Belgian** :

```
Keyboard configuration [ Help ]
Please select your keyboard layout below, or select "Identify keyboard" to detect your layout automatically.
```



In the next 7 steps we don't make any changes. We just press **Done** or **Continue** :



Network connections [ Help ]

Configure at least one interface this server can use to talk to other machines, and which preferably provides sufficient access for updates.

NAME	TYPE	NOTES	
[ ens33	eth	-	▶ ]
DHCPv4 192.168.109.130/24			
00:0c:29:e4:20:ab / Intel Corporation / 82545EM Gigabit Ethernet Controller (Copper) (PRO/1000 MT Single Port Adapter)			

[ Create bond ▶ ]

[ Done ]  
[ Back ]

Configure proxy [ Help ]

If this system requires a proxy to connect to the internet, enter its details here.

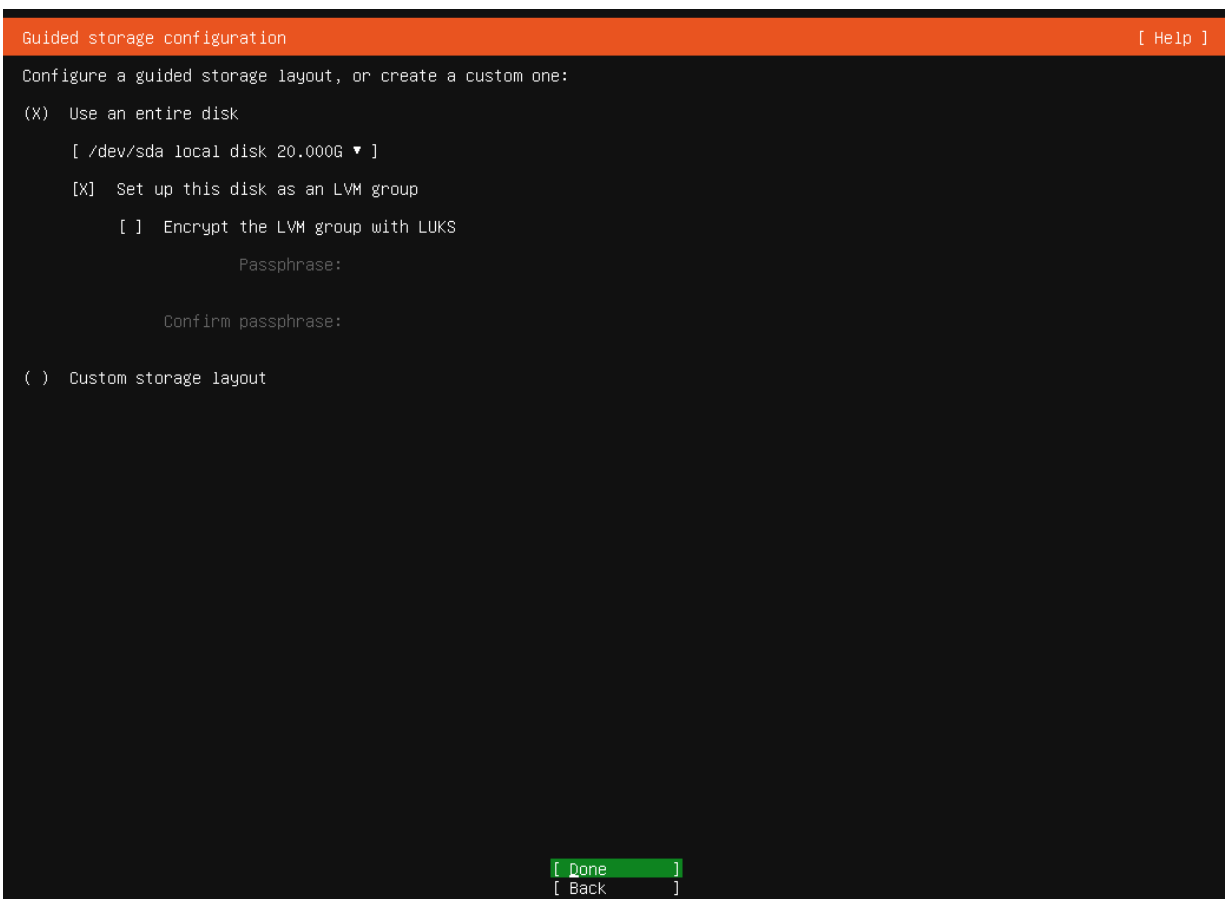
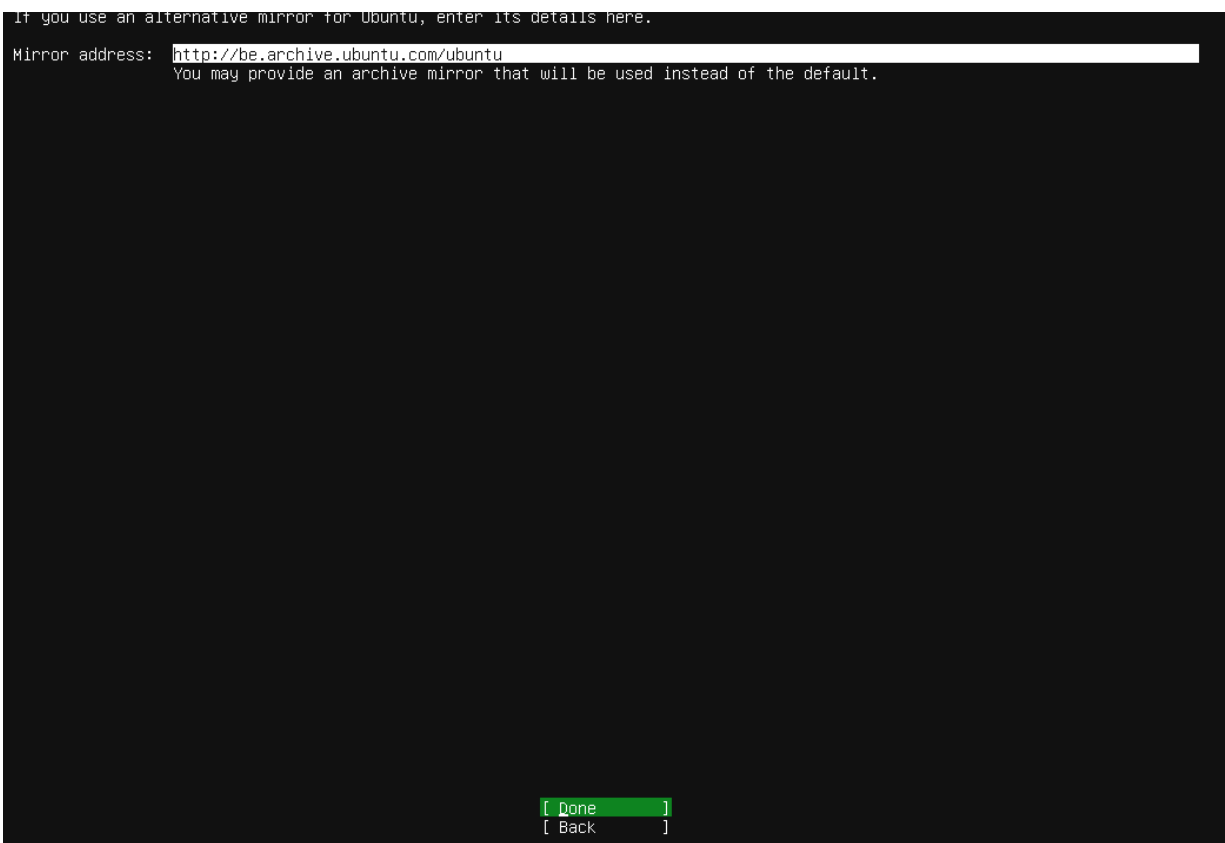
Proxy address:

If you need to use a HTTP proxy to access the outside world, enter the proxy information here. Otherwise, leave this blank.

The proxy information should be given in the standard form of "http://[[user][:pass]@]host[:port]/".

[ Done ]  
[ Back ]

Configure Ubuntu archive mirror [ Help ]



```

MOUNT POINT      SIZE      TYPE      DEVICE TYPE
[ /               10.000G   new ext4   new LVM logical volume ▶ ]
[ /boot          1.771G   new ext4   new partition of local disk ▶ ]

AVAILABLE DEVICES

DEVICE                                TYPE                                SIZE
[ ubuntu-vg (new)                     LVM volume group                   18.222G ▶ ]
free space                             8.222G ▶

[ Create software RAID (md) ▶ ]
[ Create volume group (LVM) ▶ ]

USED DEVICES

DEVICE                                TYPE                                SIZE
[ ubuntu-vg (new)                     LVM volume group                   18.222G ▶ ]
ubuntu-lv    new, to be formatted as ext4, mounted at / 10.000G ▶

[ /dev/sda                                local disk                         20.000G ▶ ]
partition 1  new, BIOS grub spacer                               1.000M ▶
partition 2  new, to be formatted as ext4, mounted at /boot    1.771G ▶
partition 3  new, PV of LVM volume group ubuntu-vg              18.225G ▶

[ Done ]
[ Reset ]
[ Back ]

```

```

Storage configuration [ Help ]

FILE SYSTEM SUMMARY

MOUNT POINT      SIZE      TYPE      DEVICE TYPE
[ /               10.000G   new ext4   new LVM logical volume ▶ ]
[ /boot          1.771G   new ext4   new partition of local disk ▶ ]

AVAILABLE DEVICES

DEVICE                                TYPE                                SIZE
[ ubuntu-vg (new)                     LVM volume group                   18.222G ▶ ]
free space                             8.222G ▶

[ Create software RAID (md) ▶ ]
[ Create volume group (

USED DEVICES

DEVICE                                TYPE                                SIZE
[ ubuntu-vg (new)                     LVM volume group                   18.222G ▶ ]
ubuntu-lv    new, to

[ /dev/sda                                local disk                         20.000G ▶ ]
partition 1  new, BIOS grub spacer                               1.000M ▶
partition 2  new, to be formatted as ext4, mounted at /boot    1.771G ▶
partition 3  new, PV of LVM volume group ubuntu-vg              18.225G ▶

Confirm destructive action

Selecting Continue below will begin the installation process and
result in the loss of data on the disks selected to be formatted.

You will not be able to return to this or a previous screen once the
installation has started.

Are you sure you want to continue?

[ No ]
[ Continue ]

[ Done ]
[ Reset ]
[ Back ]

```

Next up we create a user account that we use to login to the operating system. We use following credentials:

**username:** student  
**server name:** linux-ess  
**password:** pxl

Profile setup

[ Help ]

Enter the username and password you will use to log in to the system. You can configure SSH access on the next screen but a password is still needed for sudo.

Your name:

Your server's name:   
The name it uses when it talks to other computers.

Pick a username:

Choose a password:

Confirm your password:

[ Done ]

For Extra Packages we will only opt to install **SSH server** :

SSH Setup

[ Help ]

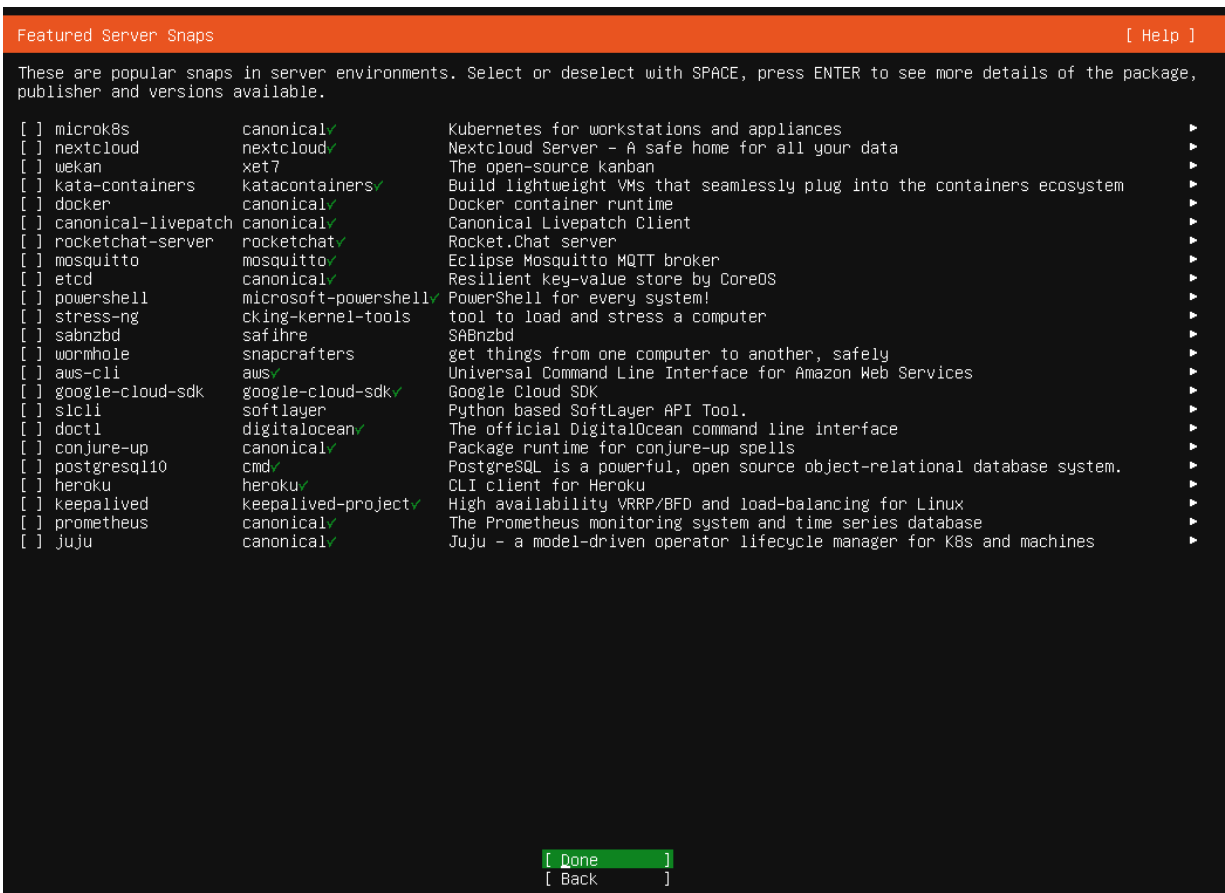
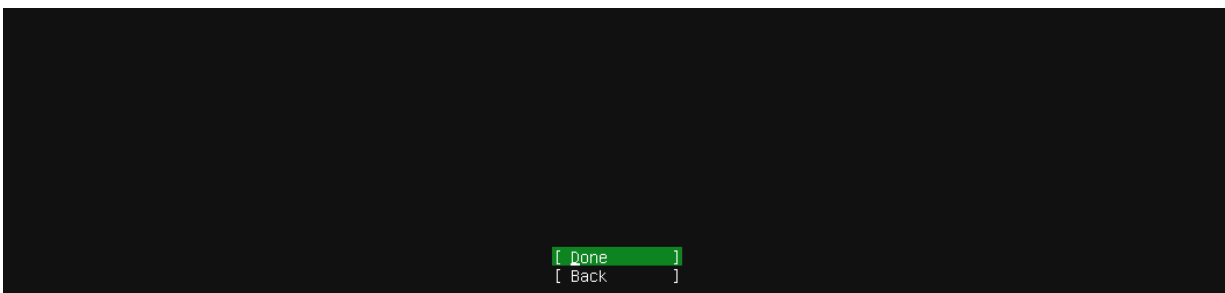
You can choose to install the OpenSSH server package to enable secure remote access to your server.

☒ Install OpenSSH server

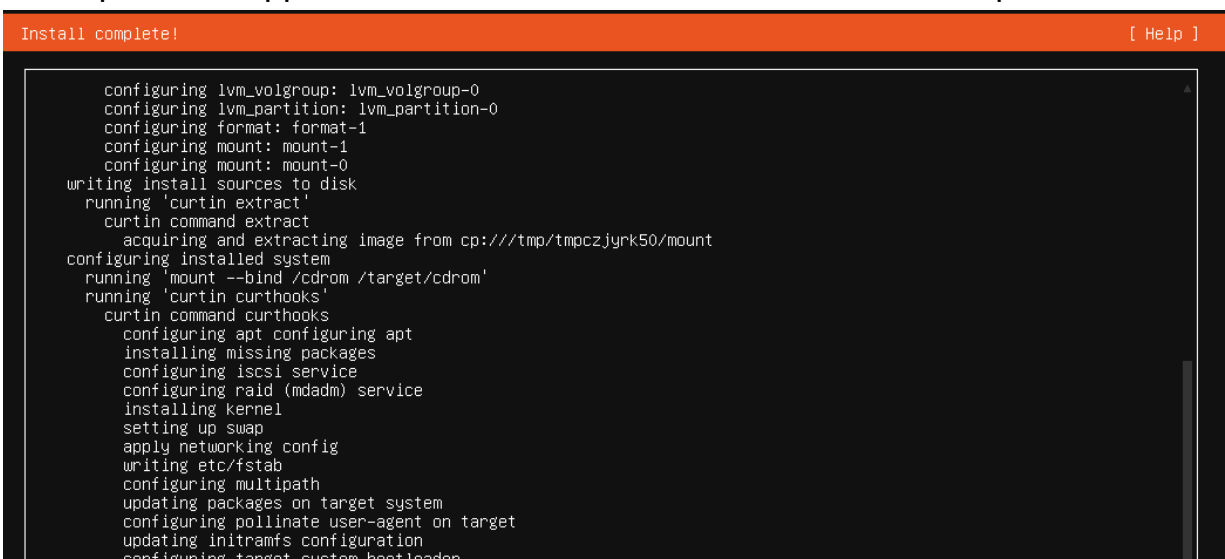
Import SSH identity:   
You can import your SSH keys from GitHub or Launchpad.

Import Username:

☒ Allow password authentication over SSH



The operating system will be installed and configured. After a while the **Reboot now** option will appear. This indicates that the installation is complete:



```

installing grub to target devices
finalizing installation
running 'curtin hook'
  curtin command hook
executing late commands
final system configuration
  configuring cloud-init
  calculating extra packages to install
  downloading and installing security updates
  curtin command in-target
  restoring apt configuration
  curtin command in-target
subiquity/Late/run

[ View full log ]
[ Reboot Now ]

```

During the Reboot process you will have to press the **enter** key on your keyboard :

```

Unmounting /rofs...
Unmounting /run/credentials/systemd-sysusers.service...
Unmounting /run/snapd/ns/1xd.mnt...
Unmounting Mount unit for core20, revision 1405...
Unmounting Mount unit for 1xd, revision 22923...
Unmounting Mount unit for snapd, revision 15534...
Unmounting Mount unit for subiquity, revision 3359...
Unmounting /target/boot...
Unmounting /tmp/tmpx8vjxb94/root.dir...
Unmounting /tmp/tmpx8vjxb94/ubuntu-server-minimal.squashfs.dir...
Unmounting /tmp/tmpx8vjxb94/ubuntu-server-minimal.ubuntu-server.squashfs.dir...
[FAILED] Failed unmounting /cdrom.
[ OK ] Unmounted /media/filesystem.
[ OK ] Unmounted /media/full.
[ OK ] Unmounted /media/minimal.
[ OK ] Unmounted /rofs.
[ OK ] Unmounted /run/credentials/systemd-sysusers.service.
[ OK ] Unmounted /run/snapd/ns/1xd.mnt.
[ OK ] Unmounted Mount unit for core20, revision 1405.
[ OK ] Unmounted Mount unit for 1xd, revision 22923.
[ OK ] Unmounted Mount unit for snapd, revision 15534.
[ OK ] Unmounted Mount unit for subiquity, revision 3359.
[ OK ] Unmounted /tmp/tmpx8vjxb94/ubuntu-server-minimal.squashfs.dir.
[ OK ] Unmounted /tmp/tmpx8vjxb94/ubuntu-server-minimal.ubuntu-server.squashfs.dir.
      Unmounting /run/snapd/ns...
[ OK ] Unmounted /run/snapd/ns.
[ OK ] Unmounted /target/boot.
      Unmounting /target...
[ OK ] Unmounted /tmp/tmpx8vjxb94/root.dir.
      Unmounting /tmp...
[ OK ] Unmounted /tmp.
[ OK ] Stopped target Swaps.
[ OK ] Unmounted /target.
[ OK ] Stopped target Preparation for Local File Systems.
[ OK ] Reached target Unmount All Filesystems.
      Stopping Monitoring of LVM2 mirrors, snapshots etc. using dmeventd or progress polling...
      Stopping Device-Mapper Multipath Device Controller...
[ OK ] Stopped Create Static Device Nodes in /dev.
[ OK ] Stopped Create System Users.
[ OK ] Stopped Device-Mapper Multipath Device Controller.
[ OK ] Stopped Remount Root and Kernel File Systems.
[ OK ] Stopped Monitoring of LVM2 mirrors, snapshots etc. using dmeventd or progress polling.
[ OK ] Reached target System Shutdown.
      Starting Shuts down the "live" preinstalled system cleanly...
Please remove the installation medium, then press ENTER:
      Unmounting /cdrom...
[FAILED] Failed unmounting /cdrom.

```

Once the server is rebooted, you will have to press the **enter** key again to see the login prompt.

```

linux-essentials login: [ 31.274222] cloud-init[1512]: Cloud-init v. 22.1-14-g2e17a0d6-0ubuntu1~22.04.5 running 'modules:config' at Tue, 07 Jun 2022 08:15:20 +0000. Up 31.20 seconds.
[ 31.390485] cloud-init[1512]: Generating locales (this might take a while)...
[ 34.195748] cloud-init[1512]:   en_US.UTF-8... done
[ 34.195888] cloud-init[1512]: Generation complete.
[ 34.975662] cloud-init[1548]: Cloud-init v. 22.1-14-g2e17a0d6-0ubuntu1~22.04.5 running 'modules:final' at Tue, 07 Jun 2022 08:15:24 +0000. Up 34.91 seconds.
ci-info: no authorized SSH keys fingerprints found for user student.
<14>Jun  7 08:15:24 cloud-init: #####
<14>Jun  7 08:15:24 cloud-init: -----BEGIN SSH HOST KEY FINGERPRINTS-----
<14>Jun  7 08:15:24 cloud-init: 1024 SHA256:PIGC8XftzGs/QACod5shROCD0IjeunoVW9nyEP3NwTo root@linux-essentials (DSA)
<14>Jun  7 08:15:24 cloud-init: 256 SHA256:iBnRgbrStG153sz+MMNwUx5KHMf5x8KmH+136Dpc7hM root@linux-essentials (ECDSA)

```



```
sentials (ED25519)
<14>Jun  7 08:15:24 cloud-init: 256 SHA256:1Q53VKYeBQLXuWqsFOEoCeHtB2391zS8DVWEVgXiU6Y root@linux-essentials (ED25519)
<14>Jun  7 08:15:24 cloud-init: 3072 SHA256:RrpcesEL8BKKvZiQnvE1Q1STWBK714f4wWLxVpD0xQo root@linux-essentials (RSA)
<14>Jun  7 08:15:24 cloud-init: -----END SSH HOST KEY FINGERPRINTS-----
<14>Jun  7 08:15:24 cloud-init: #####
-----BEGIN SSH HOST KEY KEYS-----
ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBB0+4cifrbYVVRaJm41ApFbZ4vo4D3y0GuxUuQ2D0rfTv1b1TDUcJZW9fNbNojrL/anwbIA+E25MbgHbRKA40Fe+6w= root@linux-essentials
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAINuskdRhVrhCV2ms0b7df2w/WEjCv6SquWBb/uz00x2j root@linux-essentials
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQGDTPgtPypQ70gDtJ1qhLp7h61QzND8imbdfD3R1D91wMnf41qaCcQXS8ik+YirYui5+8aiJ4yS6kXAwFnL2wD1rhEUviMXe4QnCii1F2Wvzo0gcijc0gndsPwQ0IXr0Y+vFmAeuBT60BhJp9xvP0DQqDx2b2h34BYgPs9+AScgVhT3mkPgMrC88Wt+r18T81hEK9IwoLIFyfsW06.jcX0BTAqxPTFdIg7ePn09KHF1/jRf/tEiCt8a6U60qbnZUPW4SgS/xtp+agH62DvuTFz80Qd2/yUzozNmJicWb1s7FWdkQVagDN1df1ytIDHovnxD9vi0+VxsKLYFXk5jNLRq1G/zX0FfifQVw6sg7gdreqR7w0hFBsvqv07S5muBRNqX7GGWYn+/DX/NxGzc6ymcyk84aRSY189sqmSBnb3mVJq32QiXUQThmvd1e5SKeNzQPzkS3Xtts5Ny1XeVViX9WBA8IKBSTNbkkXtNdsKVhX13GELtgC9ihRqqVd3hHboWM= root@linux-essentials
-----END SSH HOST KEY KEYS-----
[ 35.141543] cloud-init[1548]: Cloud-init v. 22.1-14-g2e17a0d6-0ubuntu1~22.04.5 finished at Tue, 07 Jun 2022 08:15:24 +0000. Datasource DataSourceNone. Up 35.13 seconds
[ 35.143885] cloud-init[1548]: 2022-06-07 08:15:24,738 - cc_final_message.py[WARNING]: Used fallback datasource
Press <enter> to see login
```

[< Previous](#)

## 1 Introduction

[Next >](#)

## Lab