Experiment 10

AIM:-Create a docker image for any application using docker file and push it to Docker Hub.

Step 1:-Connecting AWS Instance Ubuntu using Mobaxterm

1. Login AWS(Amazon Web Services) Account
2. Lunch Instance name Docker
3. Connect to Ubuntu or mobaxterm

(note:-Follow this url for docker file and application—https://github.com/devisar/devopslab)

Step 2:-Create Docker Hub Account and create repository in Docker Hub

Step 3:-Install Docker and Check Status and Start Docker in mobaxterm

1. sudo apt update -y
2. sudo apt install docker.io –y
3. sudo systemctl status docker(come outside use command ctl+z)

```
ubuntu@ip-172-31-90-47:~$ sudo systemctl status docker
● docker.service - Docker Application Container Engine
     Loaded: loaded (/usr/lib/systemd/system/docker.service; enabled; preset: enabled)
     Active: active (running) since Fri 2025-02-28 03:50:40 UTC; 2min 5s ago
TriggeredBy: ● docker.socket
       Docs: https://docs.docker.com
   Main PID: 2110 (dockerd)
      Tasks: 8
     Memory: 35.8M (peak: 38.1M)
        CPU: 253ms
     CGroup: /system.slice/docker.service
             └─2110 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/containerd.sock

Feb 28 03:50:38 ip-172-31-90-47 systemd[1]: Starting docker.service - Docker Application Container Engine...
Feb 28 03:50:38 ip-172-31-90-47 dockerd[2110]: time="2025-02-28T03:50:38.974271527Z" level=info msg="Starting up"
Feb 28 03:50:38 ip-172-31-90-47 dockerd[2110]: time="2025-02-28T03:50:38.975783980Z" level=info msg="detected 127.0.0.53 name
Feb 28 03:50:39 ip-172-31-90-47 dockerd[2110]: time="2025-02-28T03:50:39.094061737Z" level=info msg="Loading containers: star
Feb 28 03:50:39 ip-172-31-90-47 dockerd[2110]: time="2025-02-28T03:50:39.560107166Z" level=info msg="Loading containers: done
Feb 28 03:50:40 ip-172-31-90-47 dockerd[2110]: time="2025-02-28T03:50:40.287913914Z" level=info msg="Docker daemon" commit="2
Feb 28 03:50:40 ip-172-31-90-47 dockerd[2110]: time="2025-02-28T03:50:40.288020817Z" level=info msg="Daemon has completed ini
Feb 28 03:50:40 ip-172-31-90-47 dockerd[2110]: time="2025-02-28T03:50:40.338547546Z" level=info msg="API listen on /run/docke
Feb 28 03:50:40 ip-172-31-90-47 systemd[1]: Started docker.service - Docker Application Container Engine.
lines 1-21/21 (END)
```

Above status command is docker running means no problem if not run use command below to run

4. sudo systemctl start docker

Step 4:- Grant Access

Why we give grant access means

A easy way to verify your Docker installation is by running the below command

docker run hello-world

If the output says:

```
ubuntu@ip-172-31-90-47:~$ docker run hello-world
docker: permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Head "http://%2Fvar%2Frun%2Fdocker.sock/_ping": dial unix /var/run/docker.sock: connect: permiss
ion denied.
See 'docker run --help'.
ubuntu@ip-172-31-90-47:~$
```

This can mean two things,

1. Docker deamon is not running.(start docker using “sudo systemctl start docker”)
2. Your user does not have access to run docker commands.

Grant Access to your user to run docker commands

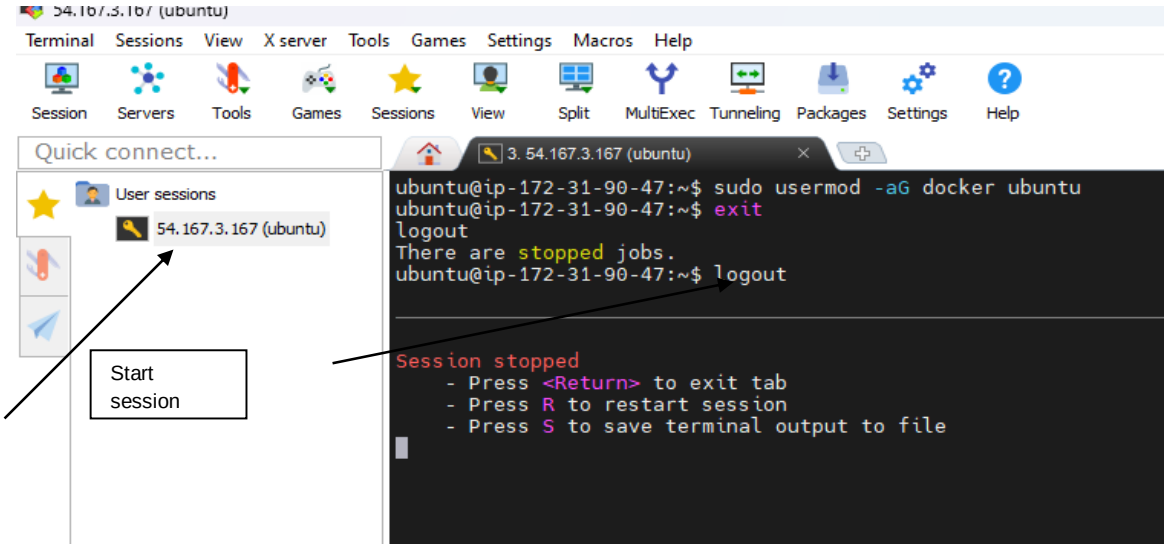
1. sudo usermod -aG docker ubuntu

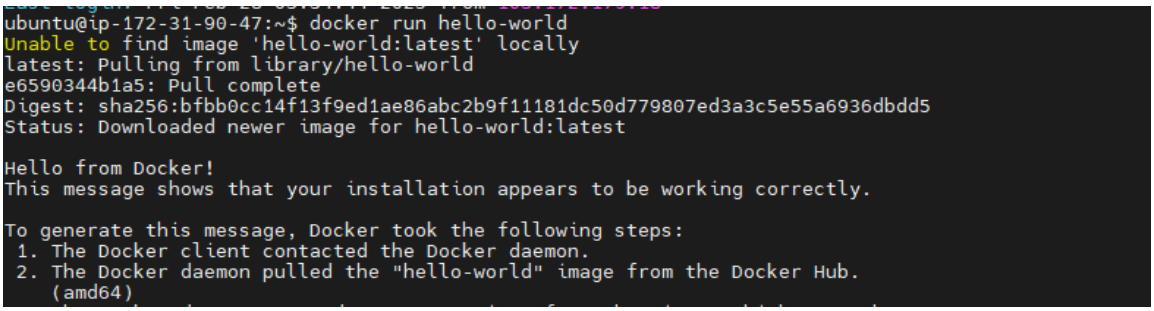
In the above command ubuntu is the name of the user, you can change the username appropriately.

NOTE: : You need to logout and login back for the changes to be reflected.

2. Logout purpose use commands exit or logout

   Again run command “docker run hello-world”





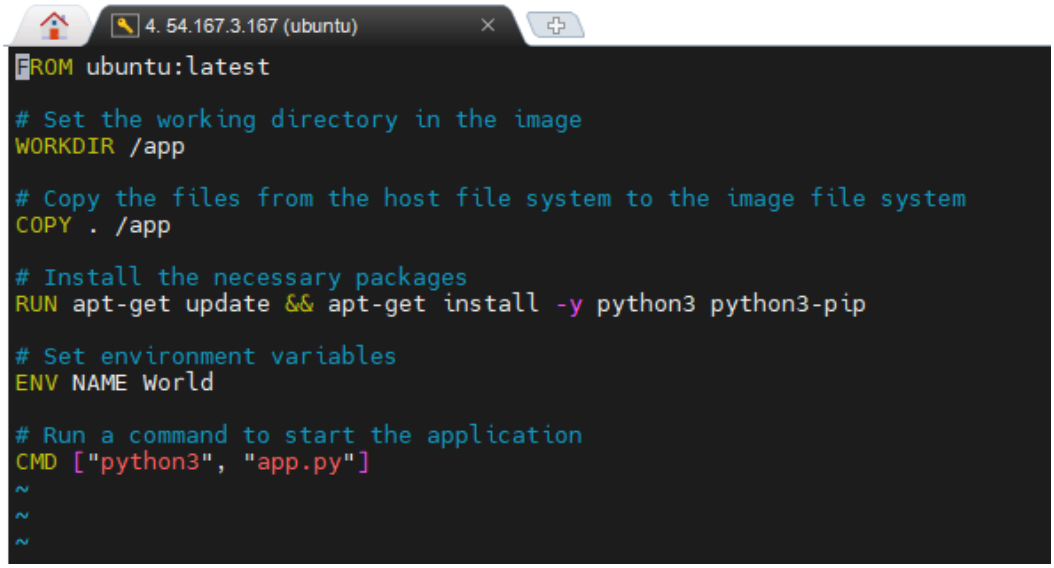
Step 5:-Creating application and Docker file

1. Mkdir docker1
2. cd docker1
3. vim app.py

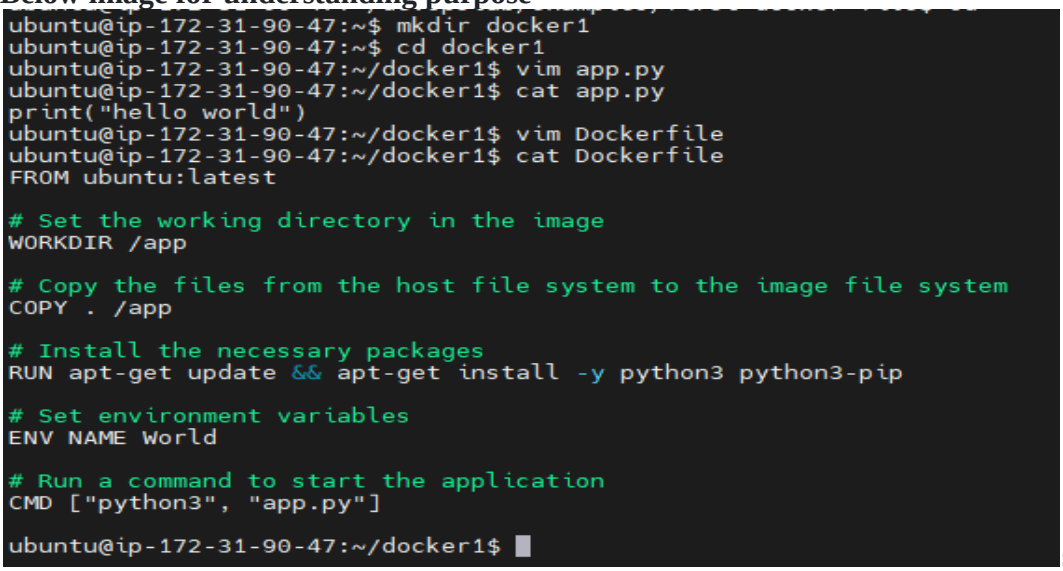
   print(“hello world”)

4. cat app.py

5. vim Dockerfile (below pic commands write lab record) typing command vim before click “i” for insert data after completion Docker file commands save before click esc use :wq!



Below image for understanding purpose



se

Step 6:- Build and Check Docker image

Syntax:- docker build –t dockerhub_username/repositoryname:tag .

1. docker build –t anu1308/dockerimage:latest .
2. docker images

Below images for understanding purpose

```
Build an image from a Dockerfile
ubuntu@ip-172-31-90-47:~/docker1$ docker build -t anu1308/dockerimage:latest .
DEPRECATED: The legacy builder is deprecated and will be removed in a future release.
            Install the buildx component to build images with BuildKit:
            https://docs.docker.com/go/buildx/

Sending build context to Docker daemon  3.072kB
Step 1/6 : FROM ubuntu:latest
latest: Pulling from library/ubuntu
5a7813e071bf: Pull complete
Digest: sha256:72297848456d5d37d1262630108ab308d3e9ec7ed1c3286a32fe09856619a782
Status: Downloaded newer image for ubuntu:latest
 ---> a04dc4851cbc
Step 2/6 : WORKDIR /app
 ---> Running in 490762c2b766
 ---> Removed intermediate container 490762c2b766
 ---> f19d0296889a
Step 3/6 : COPY . /app
 ---> 05e2e2564f3a
Step 4/6 : RUN apt-get update && apt-get install -y python3 python3-pip
 ---> Running in 0cad8878ec6b
Get:1 http://archive.ubuntu.com/ubuntu noble InRelease [256 kB]
Get:2 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:3 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [842 kB]
Get:4 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:5 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:6 http://archive.ubuntu.com/ubuntu noble/restricted amd64 Packages [117 kB]
Get:7 http://archive.ubuntu.com/ubuntu noble/universe amd64 Packages [19.3 MB]
Get:8 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [24.2 kB]
Get:9 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [807 kB]
Get:10 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [1053 kB]
Get:11 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [331 kB]
Get:12 http://archive.ubuntu.com/ubuntu noble/main amd64 Packages [1808 kB]
Get:13 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1131 kB]
Get:14 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [28.8 kB]
Get:15 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [881 kB]
Get:16 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [1336 kB]
Get:17 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [16.0 kB]
Fetched 28.3 MB in 3s (8996 kB/s)
Successfully tagged anu1308/dockerimage:latest
ubuntu@ip-172-31-90-47:~/docker1$ docker images
REPOSITORY            TAG       IMAGE ID       CREATED          SIZE
anu1308/dockerimage   latest    cdbf156a1eda   56 seconds ago   574MB
ubuntu                latest    a04dc4851cbc   4 weeks ago      78.1MB
hello-world           latest    74cc54e27dc4   5 weeks ago      10.1kB
ubuntu@ip-172-31-90-47:~/docker1$
```

Step 7:- Run your First Docker Container

1. docker run -it anu1308/dockerimage:latest

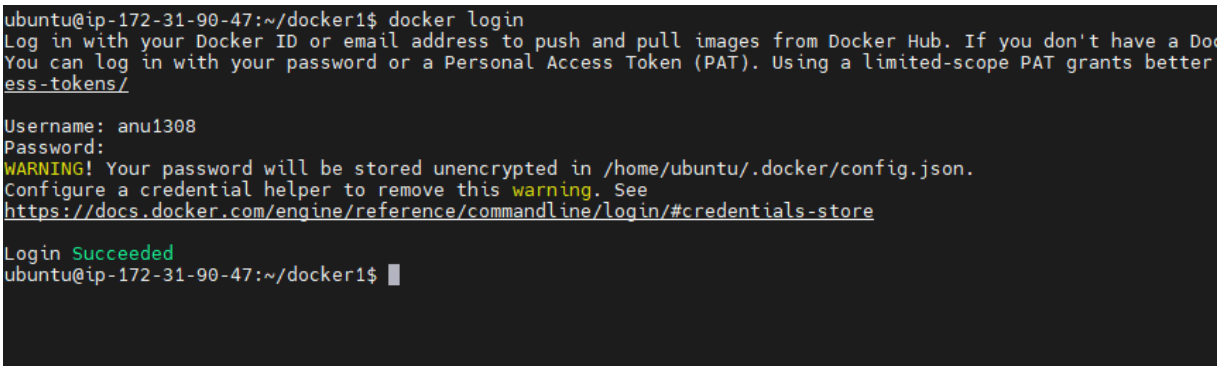
Output

Hello World

```
4. 54.167.3.167 (ubuntu)
ubuntu@ip-172-31-90-47:~/docker1$ docker run -it anu1308/dockerimage:latest
hello world
ubuntu@ip-172-31-90-47:~/docker1$
```

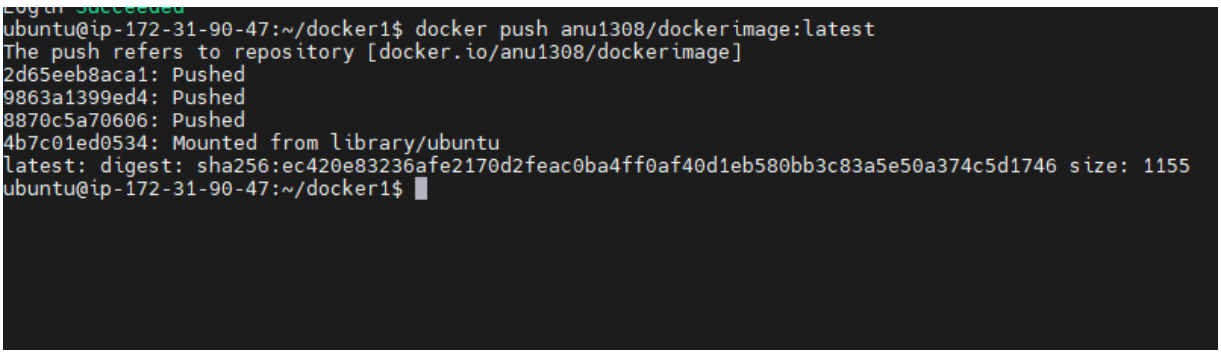
Step 8:-Docker Login

1. docker login

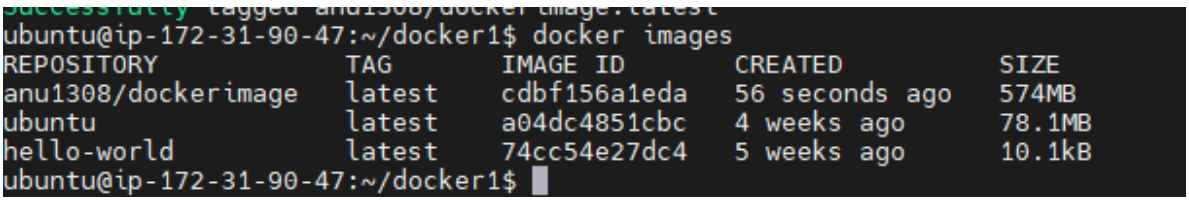


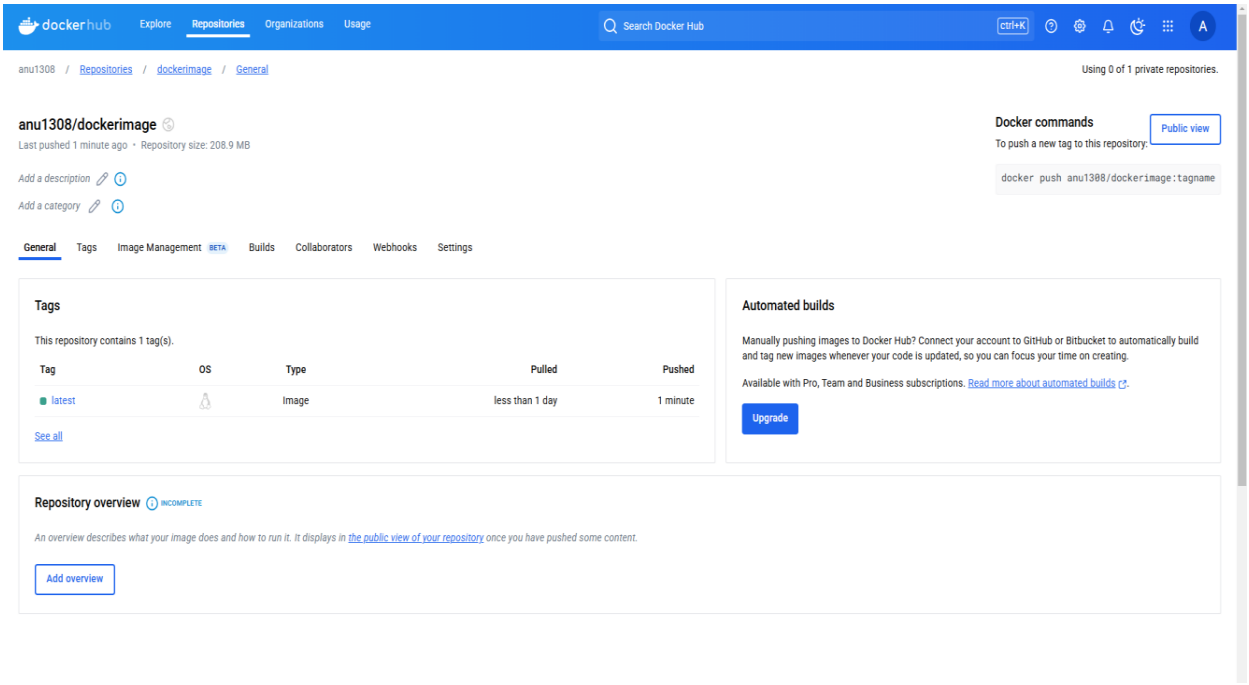
Step 9:- Push the Image to DockerHub and share it with the world

1. docker push anu1308/dockerimage:latest



Output:-





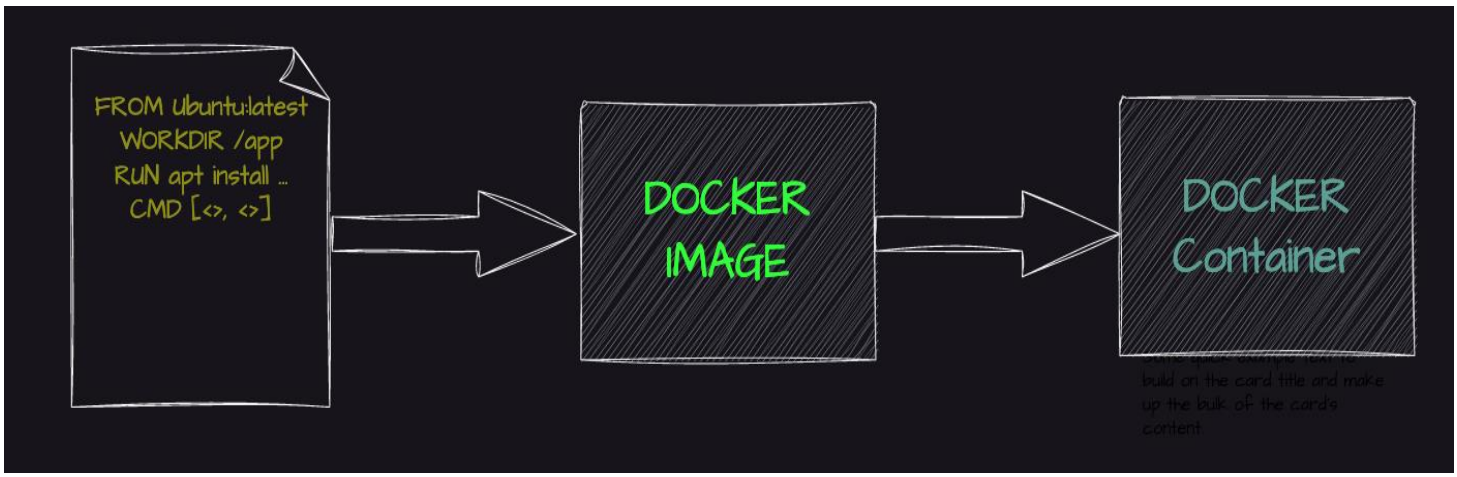
Definitions:-

Docker LifeCycle

We can use the above Image as reference to understand the lifecycle of Docker.

There are three important things,

1. docker build -> builds docker images from Dockerfile
2. docker run -> runs container from docker images
3. docker push -> push the container image to public/private regestries(docker hub) to share the docker images.



What is a container ?

A container is a standard unit of software that packages up code and all its dependencies so the application runs quickly and reliably from one computing environment to another. A Docker container image is a lightweight, standalone, executable package of software that includes everything needed to run an application: code, runtime, system tools, system libraries and settings.

Why are containers light weight ?

Containers are lightweight because they use a technology called containerization, which allows them to share the host operating system's kernel and libraries, while still providing isolation for the application and its dependencies. This results in a smaller footprint compared to traditional virtual machines, as the containers do not need to include a full operating system. Additionally, Docker containers are designed to be minimal, only including what is necessary for the application to run, further reducing their size.

What is Docker ?

Docker is a containerization platform that provides easy way to containerize your applications, which means, using Docker you can build container images, run the images to create containers and also push these containers to container regestries such as DockerHub

Docker daemon

The Docker daemon (dockerd) listens for Docker API requests and manages Docker objects such as images, containers, networks, and volumes. A daemon can also communicate with other daemons to manage Docker services.

Docker client

The Docker client (docker) is the primary way that many Docker users interact with Docker. When you use commands such as docker run, the client sends these commands to dockerd, which carries them out. The docker command uses the Docker API. The Docker client can communicate with more than one daemon.

Docker Desktop

Docker Desktop is an easy-to-install application for your Mac, Windows or Linux environment that enables you to build and share containerized applications and microservices. Docker Desktop includes the Docker daemon (dockerd), the Docker client (docker), Docker Compose, Docker Content Trust, Kubernetes, and Credential Helper. For more information, see Docker Desktop.

Docker registries

A Docker registry stores Docker images. Docker Hub is a public registry that anyone can use, and Docker is configured to look for images on Docker Hub by default. You can even run your own private registry.

When you use the docker pull or docker run commands, the required images are pulled from your configured registry. When you use the docker push command, your image is pushed to your configured registry. Docker objects

When you use Docker, you are creating and using images, containers, networks, volumes, plugins, and other objects. This section is a brief overview of some of those objects.

Dockerfile

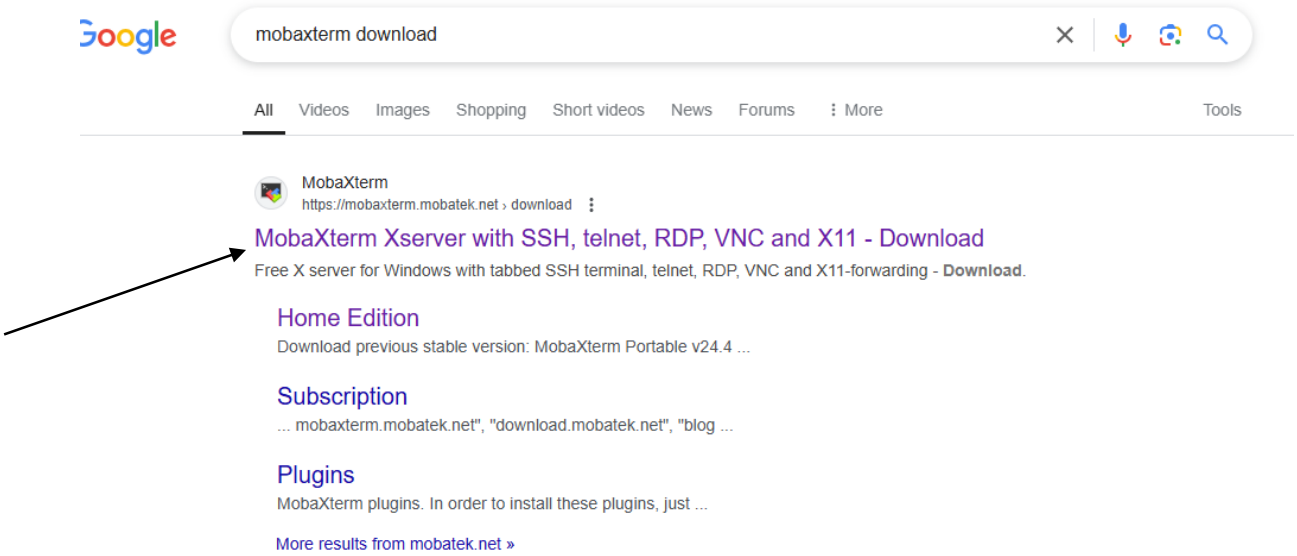
Dockerfile is a file where you provide the steps to build your Docker Image.

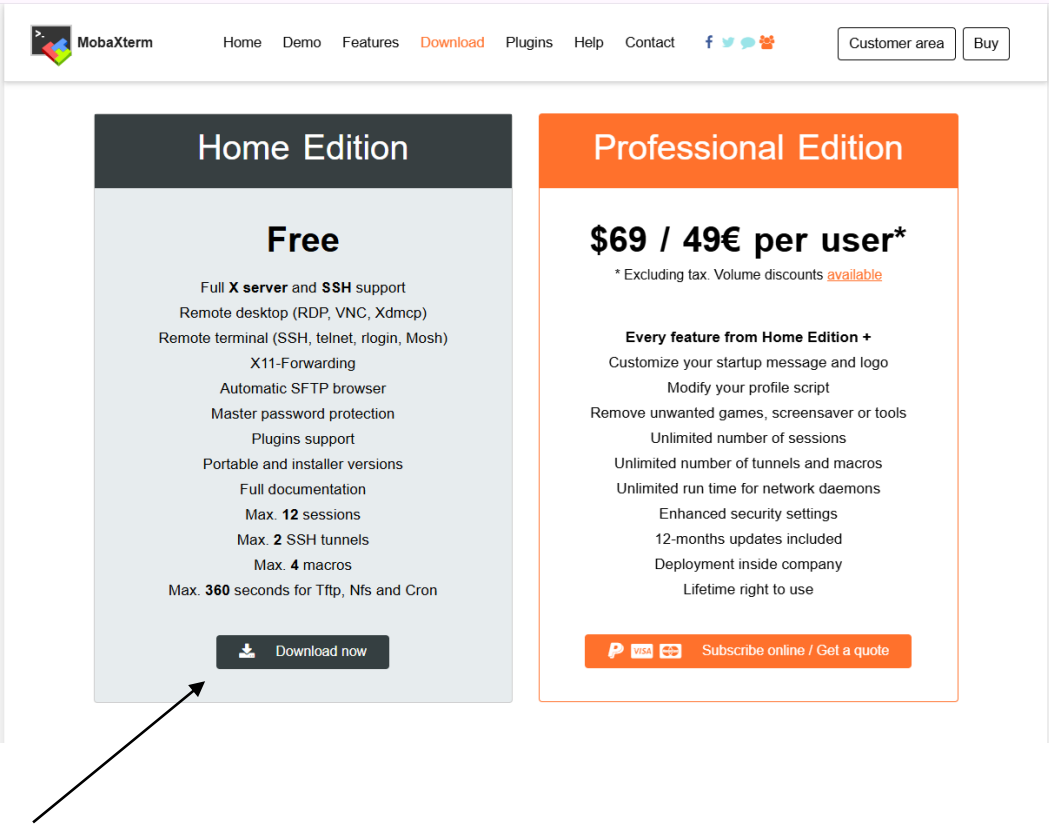
Images

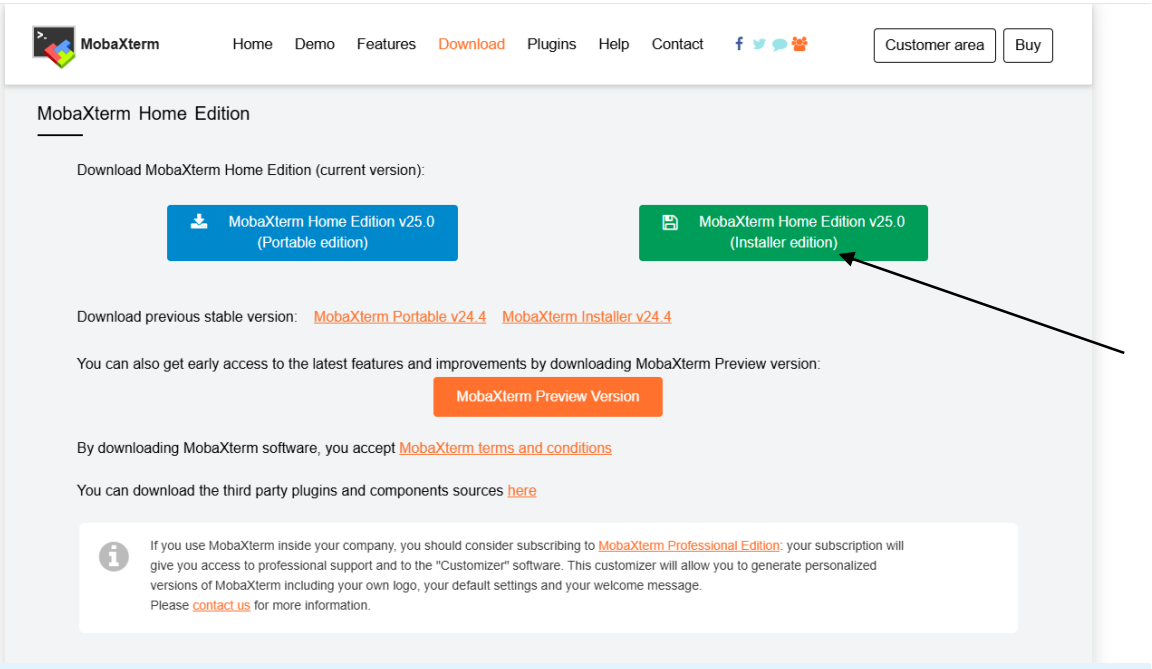
An image is a read-only template with instructions for creating a Docker container. Often, an image is based on another image, with some additional customization. For example, you may build an image which is based on the ubuntu image, but installs the Apache web server and your application, as well as the configuration details needed to make your application run.

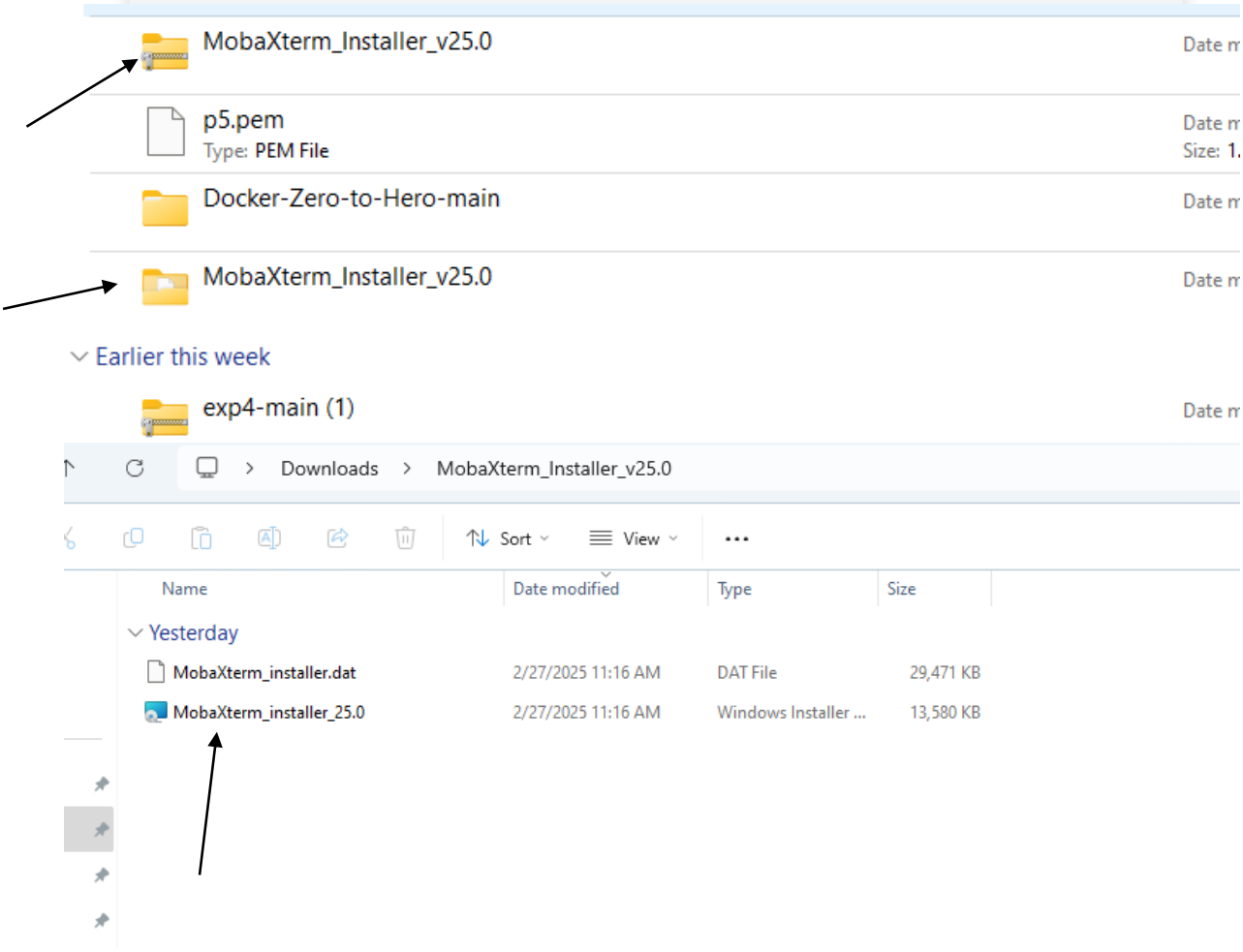
Below Images for Understanding purpose

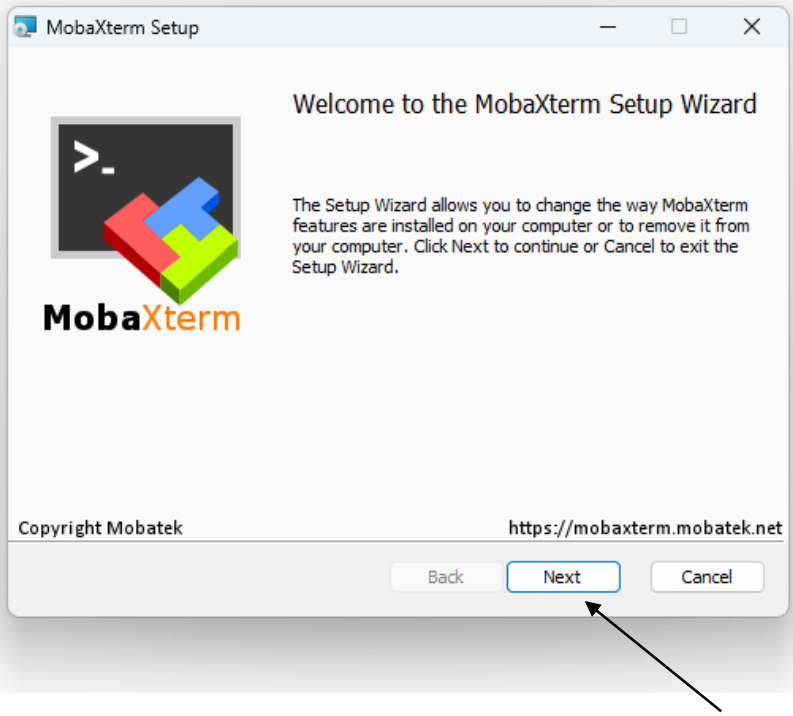
Connecting AWS Instance to Mobaxterm

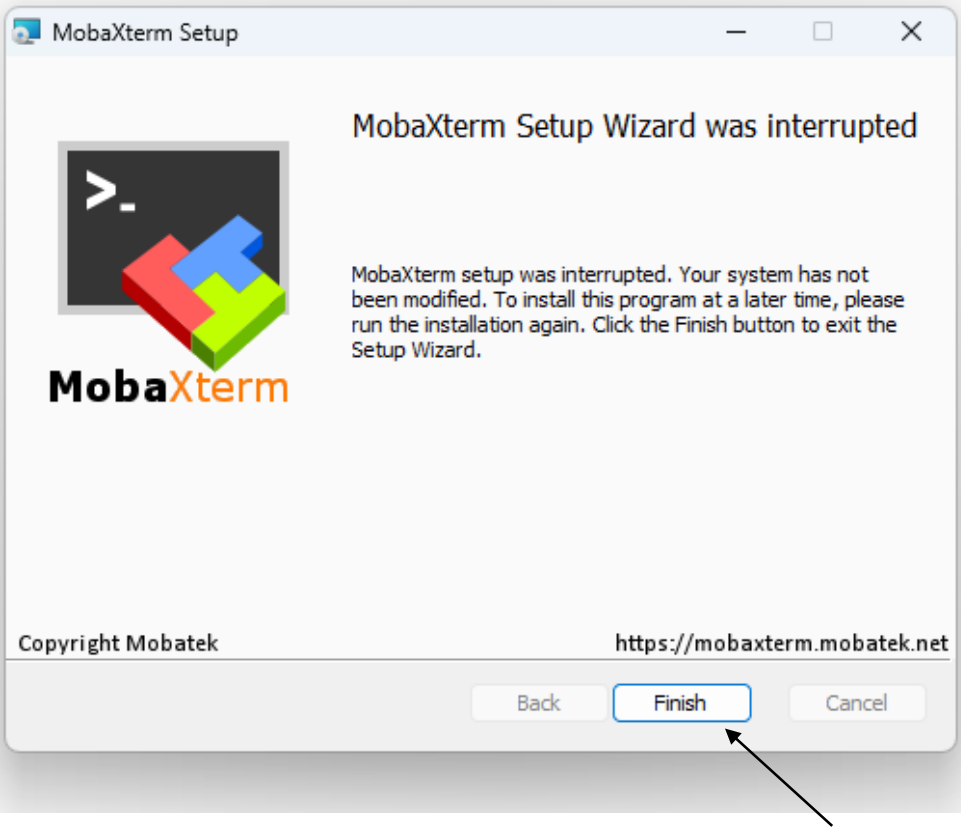


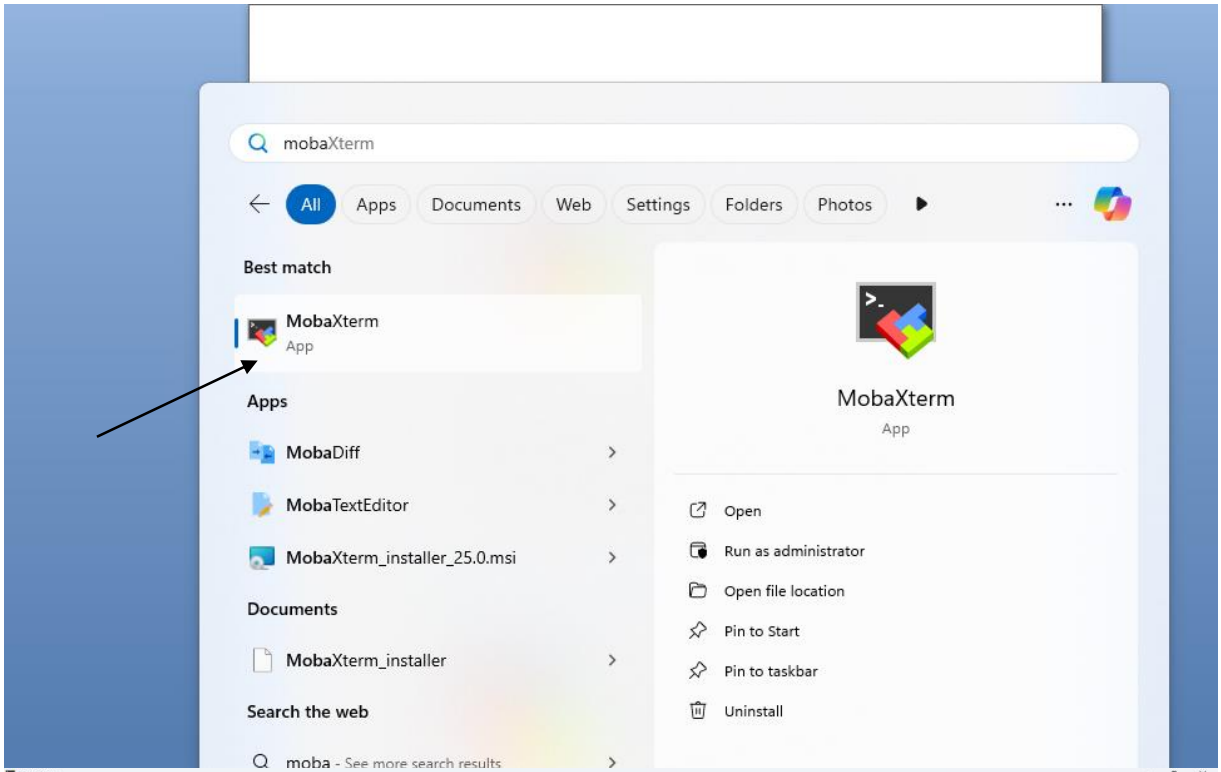

MobaXterm
Home
Demo
Features
Download
Plugins
Help
Contact
Customer area
Buy
Home Edition
Free
Full X server and SSH support
Remote desktop (RDP, VNC, Xdmcp)
Remote terminal (SSH, telnet, rlogin, Mosh)
X11-Forwarding
Automatic SFTP browser
Master password protection
Plugins support
Portable and installer versions
Full documentation
Max. 12 sessions
Max. 2 SSH tunnels
Max. 4 macros
Max. 360 seconds for Tftp, Nfs and Cron
Download now
Professional Edition
$69 / 49€ per user*
* Excluding tax. Volume discounts available
Every feature from Home Edition +
Customize your startup message and logo
Modify your profile script
Remove unwanted games, screensaver or tools
Unlimited number of sessions
Unlimited number of tunnels and macros
Unlimited run time for network daemons
Enhanced security settings
12-months updates included
Deployment inside company
Lifetime right to use
Subscribe online / Get a quote

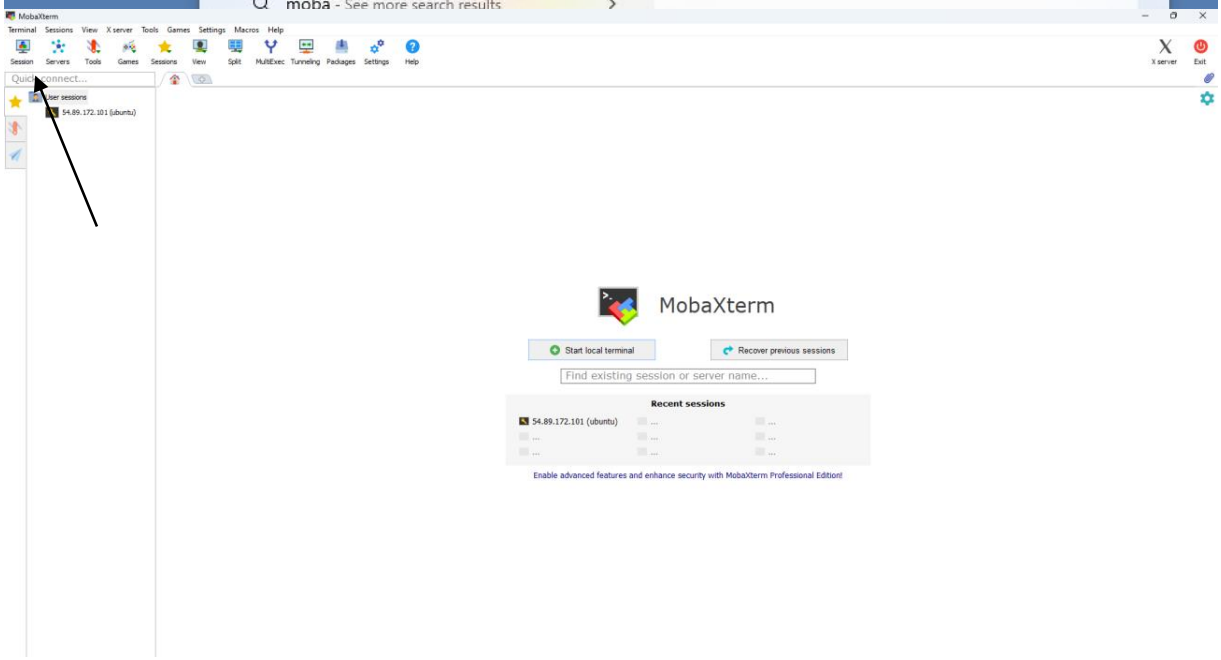

MobaXterm
Home
Demo
Features
Download
Plugins
Help
Contact
Customer area
Buy
MobaXterm Home Edition
Download MobaXterm Home Edition (current version):
MobaXterm Home Edition v25.0 (Portable edition)
MobaXterm Home Edition v25.0 (Installer edition)
Download previous stable version: MobaXterm Portable v24.4 MobaXterm Installer v24.4
You can also get early access to the latest features and improvements by downloading MobaXterm Preview version:
MobaXterm Preview Version
By downloading MobaXterm software, you accept MobaXterm terms and conditions
You can download the third party plugins and components sources here
If you use MobaXterm inside your company, you should consider subscribing to MobaXterm Professional Edition: your subscription will give you access to professional support and to the "Customizer" software. This customizer will allow you to generate personalized versions of MobaXterm including your own logo, your default settings and your welcome message.
Please contact us for more information.


MobaXterm_Installer_v25.0
p5.pem
Type: PEM File
Docker-Zero-to-Hero-main
MobaXterm_Installer_v25.0
Earlier this week
exp4-main (1)
Downloads
MobaXterm_Installer_v25.0
Sort
View
Name
Date modified
Type
Size
Yesterday
MobaXterm_installer.dat
2/27/2025 11:16 AM
DAT File
29,471 KB
MobaXterm_installer_25.0
2/27/2025 11:16 AM
Windows Installer ...
13,580 KB

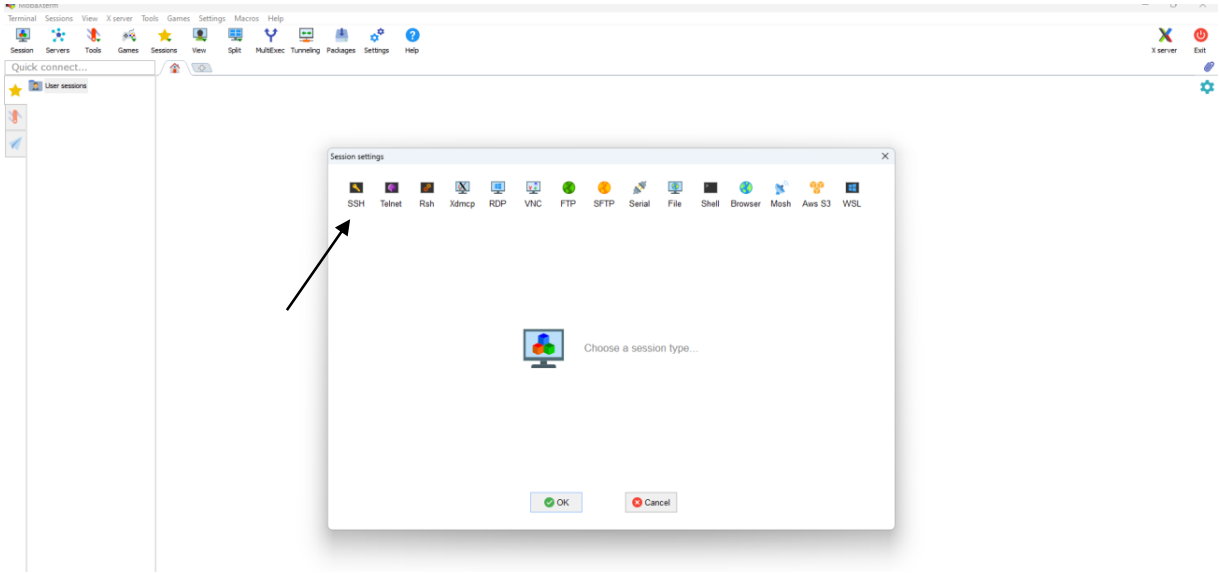

MobaXterm Setup
Welcome to the MobaXterm Setup Wizard
The Setup Wizard allows you to change the way MobaXterm features are installed on your computer or to remove it from your computer. Click Next to continue or Cancel to exit the Setup Wizard.
MobaXterm
Copyright Mobatek
https://mobaxterm.mobatek.net
Back
Next
Cancel

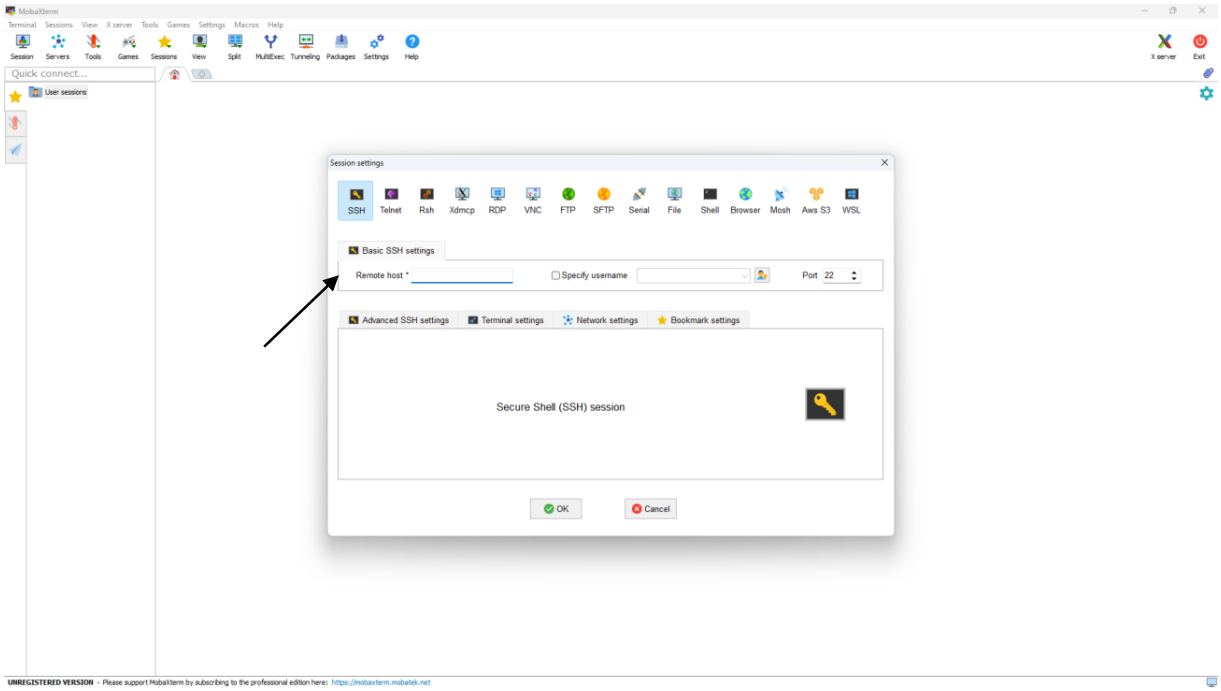

MobaXterm Setup
MobaXterm Setup Wizard was interrupted
MobaXterm setup was interrupted. Your system has not been modified. To install this program at a later time, please run the installation again. Click the Finish button to exit the Setup Wizard.
MobaXterm
Copyright Mobatek
https://mobaxterm.mobatek.net
Back
Finish
Cancel


mobaXterm
All
Apps
Documents
Web
Settings
Folders
Photos
Best match
MobaXterm
App
Apps
MobaDiff
MobaTextEditor
MobaXterm_installer_25.0.msi
Documents
MobaXterm_installer
Search the web
moba - See more search results
MobaXterm
App
Open
Run as administrator
Open file location
Pin to Start
Pin to taskbar
Uninstall

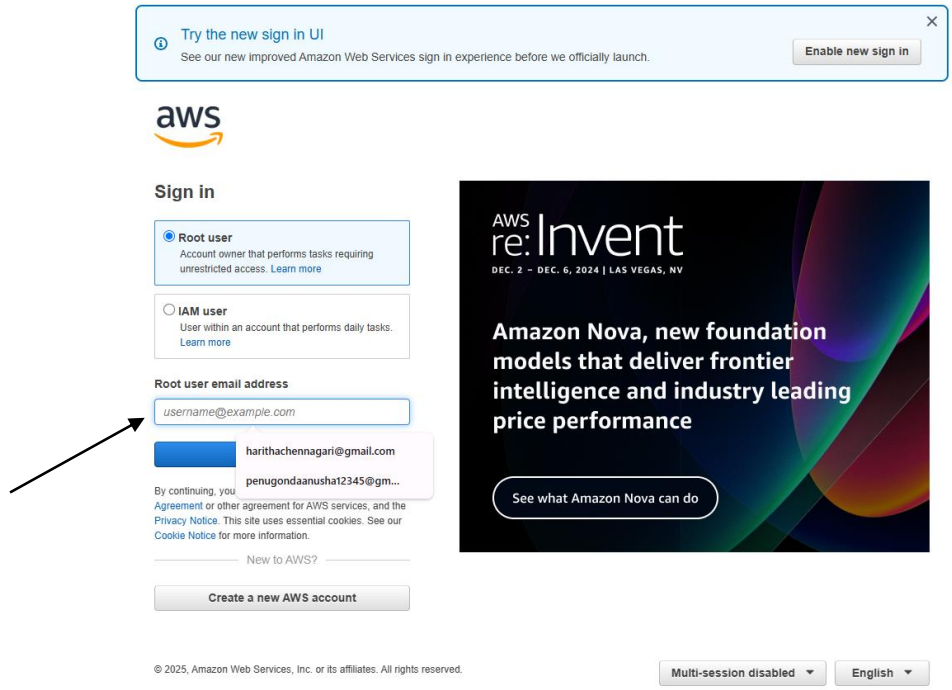


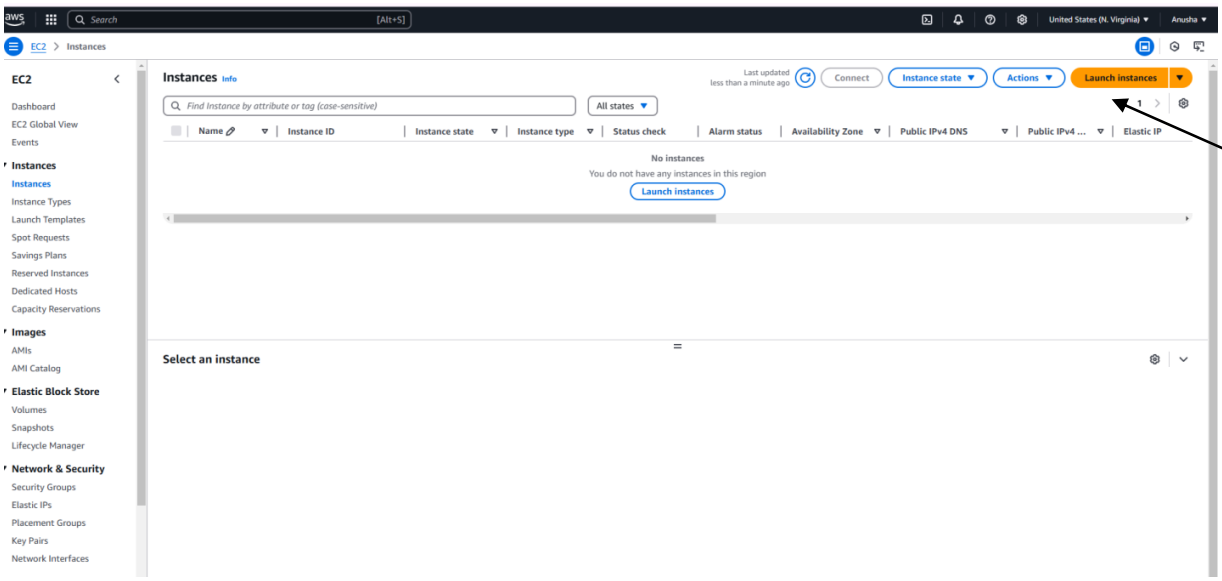
MobaXterm
Start local terminal
Recover previous sessions
Find existing session or server name...
Recent sessions
54.89.172.101 (ubuntu)
Enable advanced features and enhance security with MobaXterm Professional Edition!

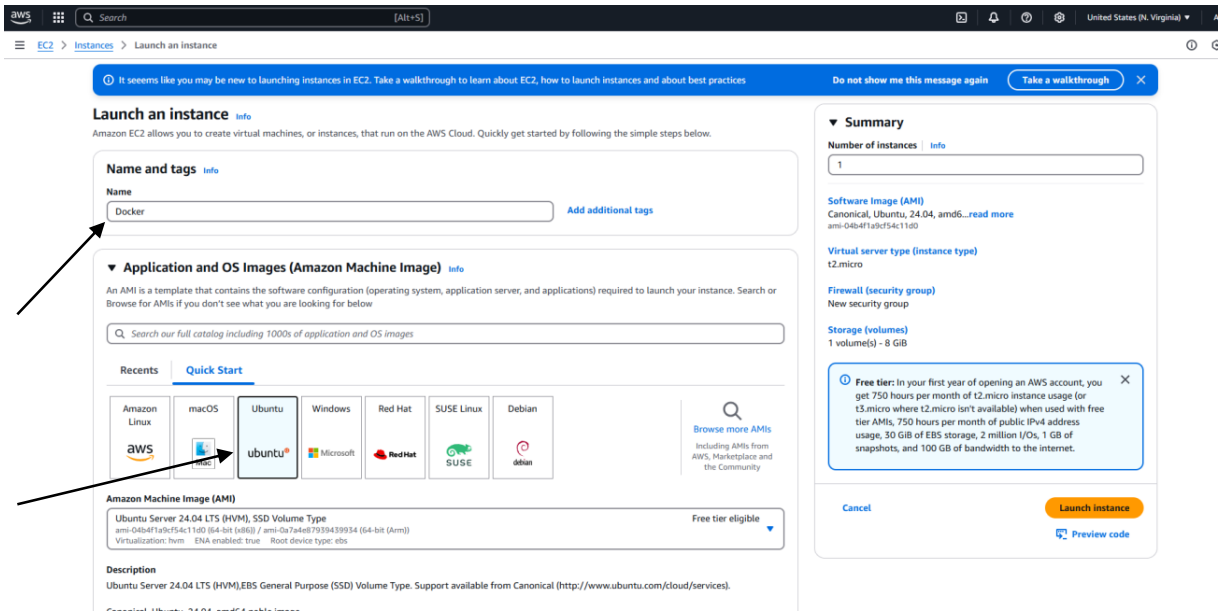


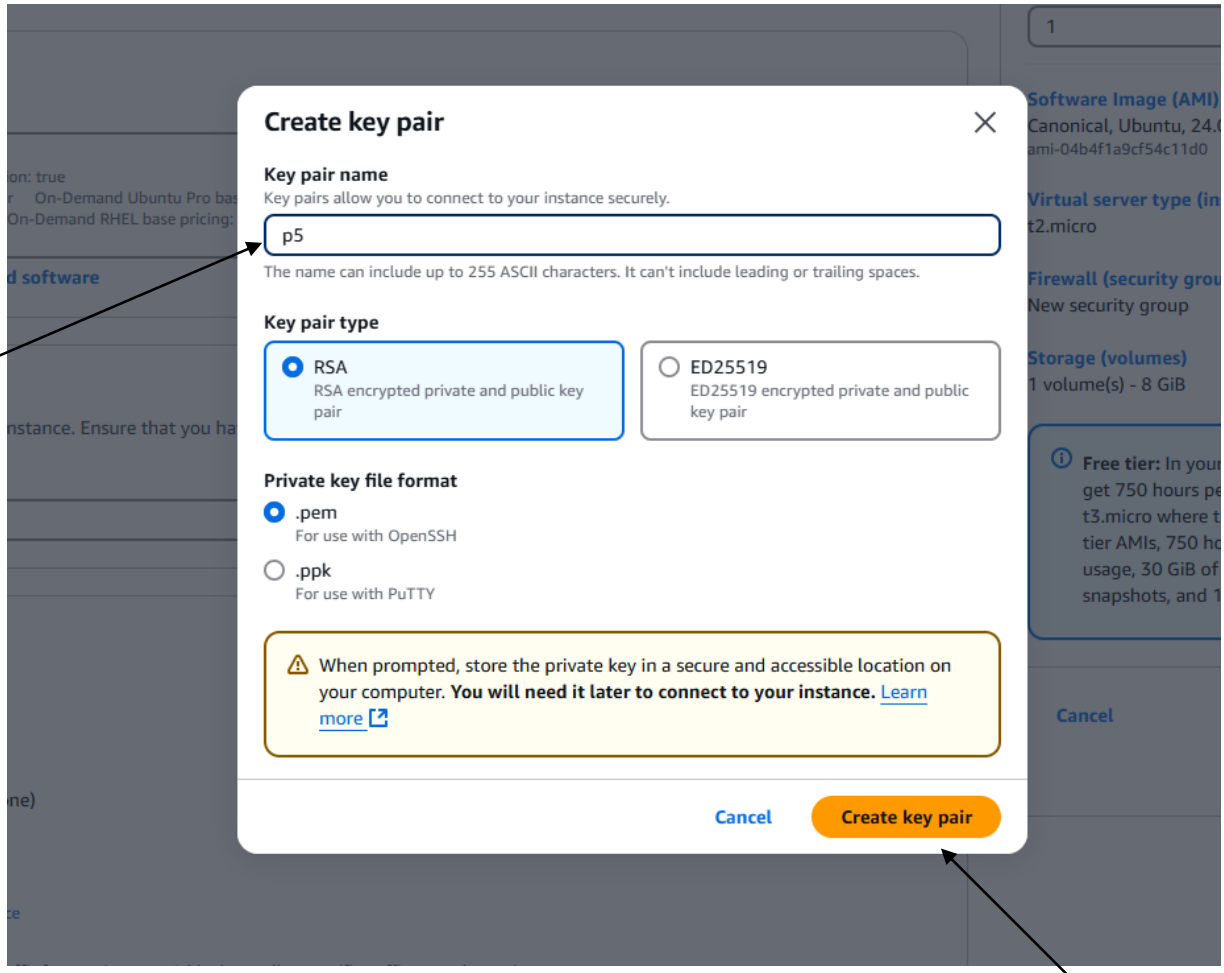


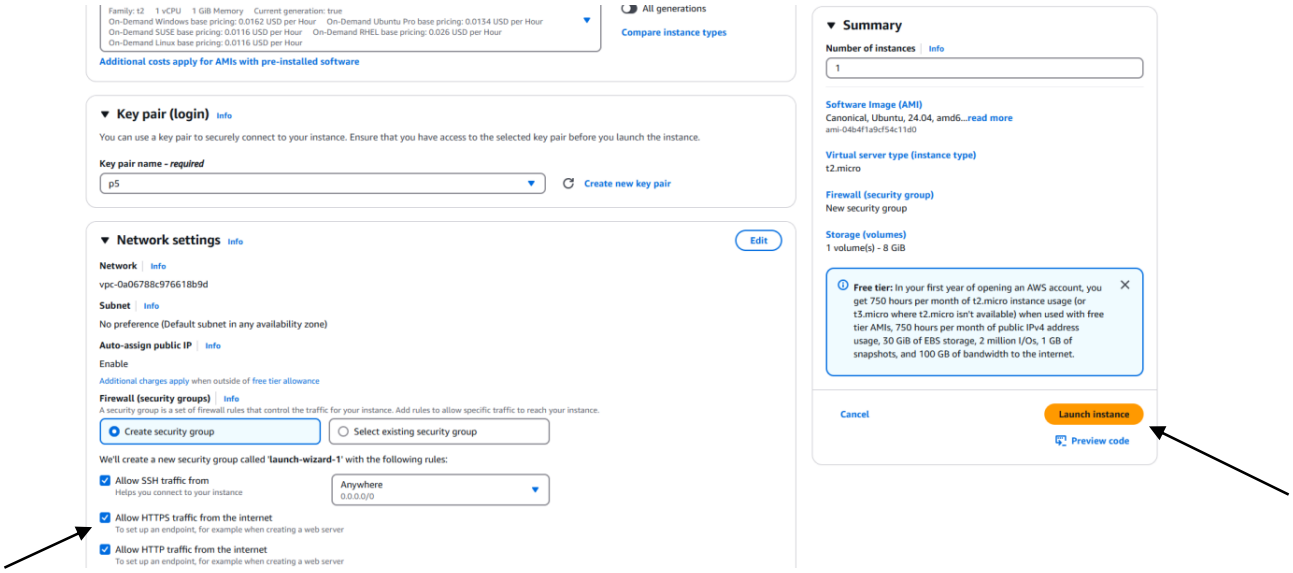
Remote host we want public key and .pem file also so login to AWS Account


Try the new sign in UI
See our new improved Amazon Web Services sign in experience before we officially launch.
Enable new sign in
aws
Sign in
Root user
Account owner that performs tasks requiring unrestricted access. Learn more
IAM user
User within an account that performs daily tasks. Learn more
Root user email address
username@example.com
harithachennagari@gmail.com
penugondaanusha12345@gm...
By continuing, you Agreement or other agreement for AWS services, and the Privacy Notice. This site uses essential cookies. See our Cookie Notice for more information.
New to AWS?
Create a new AWS account
AWS re:Invent
DEC. 2 – DEC. 6, 2024 | LAS VEGAS, NV
Amazon Nova, new foundation models that deliver frontier intelligence and industry leading price performance
See what Amazon Nova can do
© 2025, Amazon Web Services, Inc. or its affiliates. All rights reserved.
Multi-session disabled
English

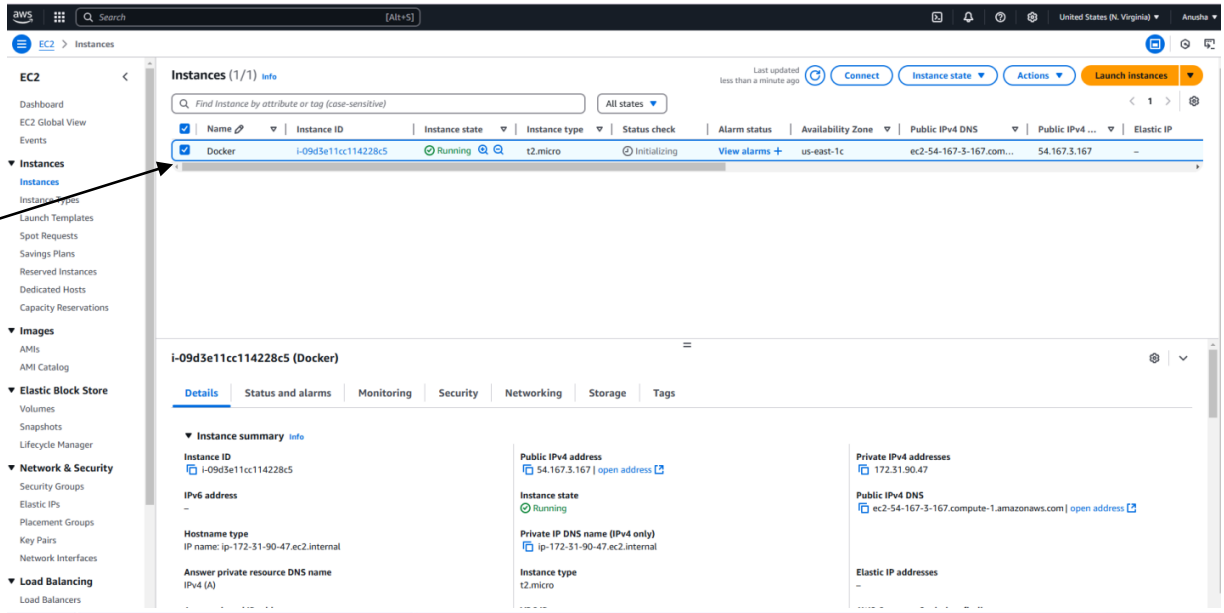

EC2 > Instances
EC2
Dashboard
EC2 Global View
Events
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Capacity Reservations
Images
AMIs
AMI Catalog
Elastic Block Store
Volumes
Snapshots
Lifecycle Manager
Network & Security
Security Groups
Elastic IPs
Placement Groups
Key Pairs
Network Interfaces
Instances Info
Connect
Instance state
Actions
Launch instances
All states
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Availability Zone
Public IPv4 DNS
Elastic IP
No instances
You do not have any instances in this region
Launch instances
Select an instance

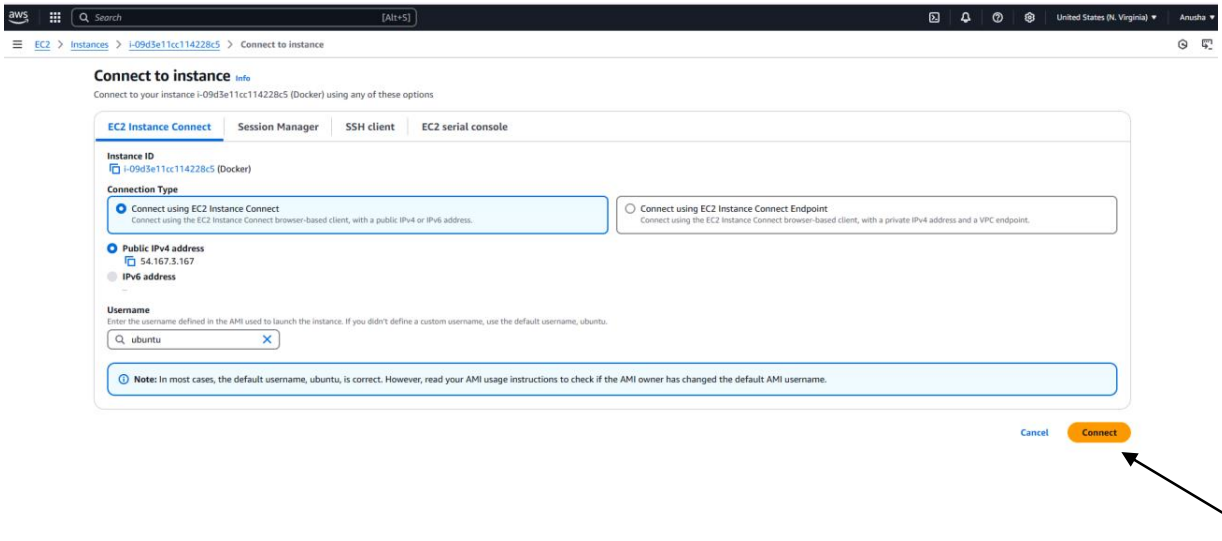

Launch an instance
Name and tags
Docker
Application and OS Images (Amazon Machine Image)
Ubuntu
Summary
Launch instance

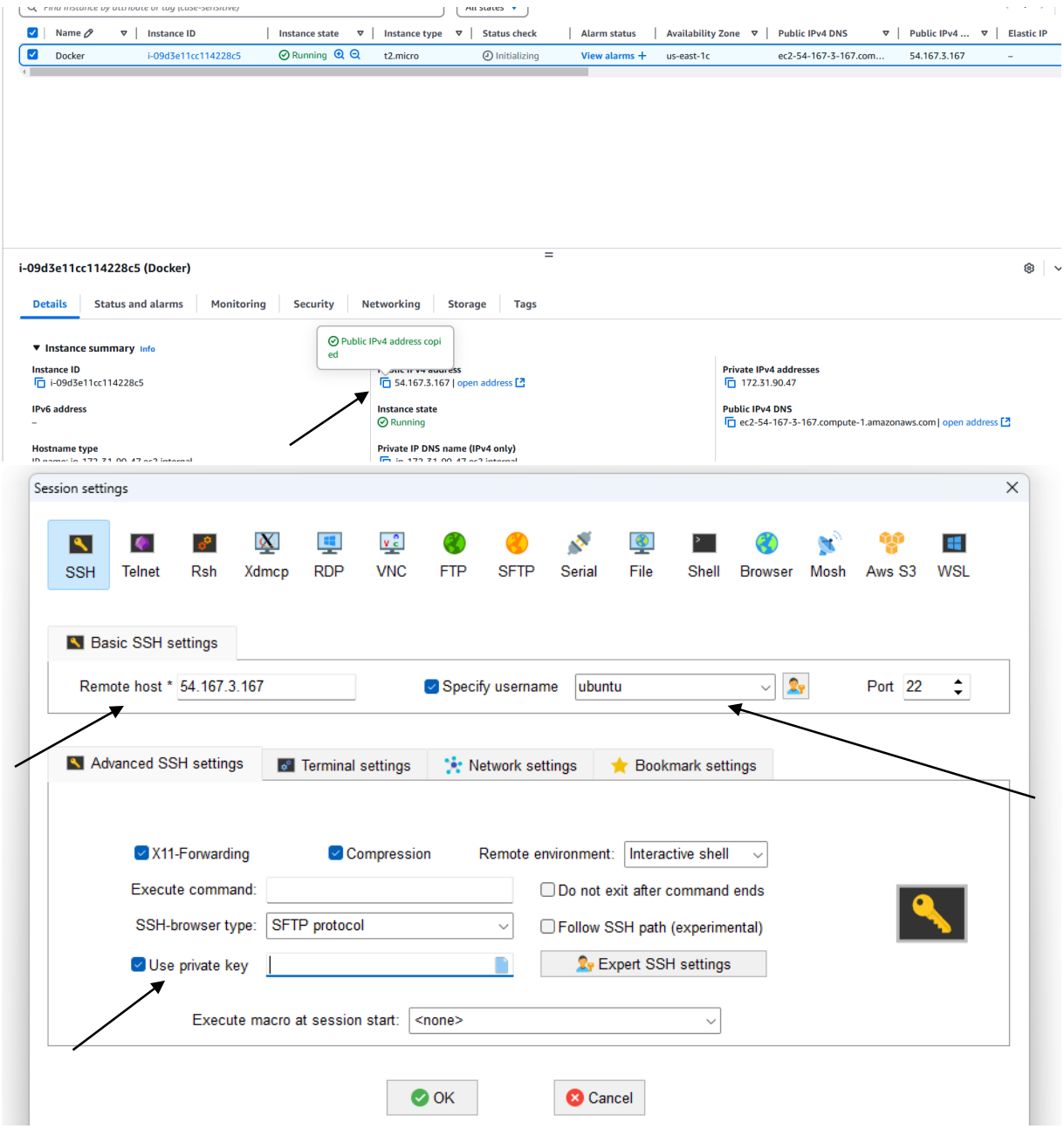

Create key pair
Key pair name
Key pairs allow you to connect to your instance securely.
p5
The name can include up to 255 ASCII characters. It can't include leading or trailing spaces.
Key pair type
RSA
RSA encrypted private and public key pair
ED25519
ED25519 encrypted private and public key pair
Private key file format
.pem
For use with OpenSSH
.ppk
For use with PuTTY
When prompted, store the private key in a secure and accessible location on your computer. You will need it later to connect to your instance. Learn more
Cancel
Create key pair

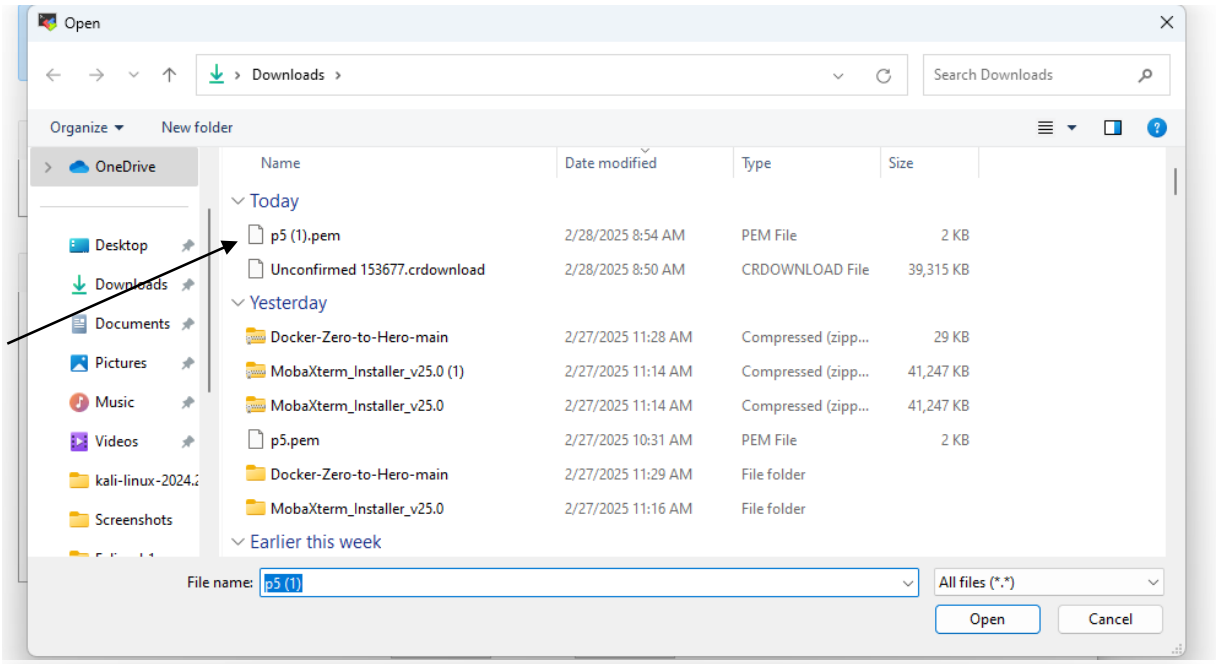


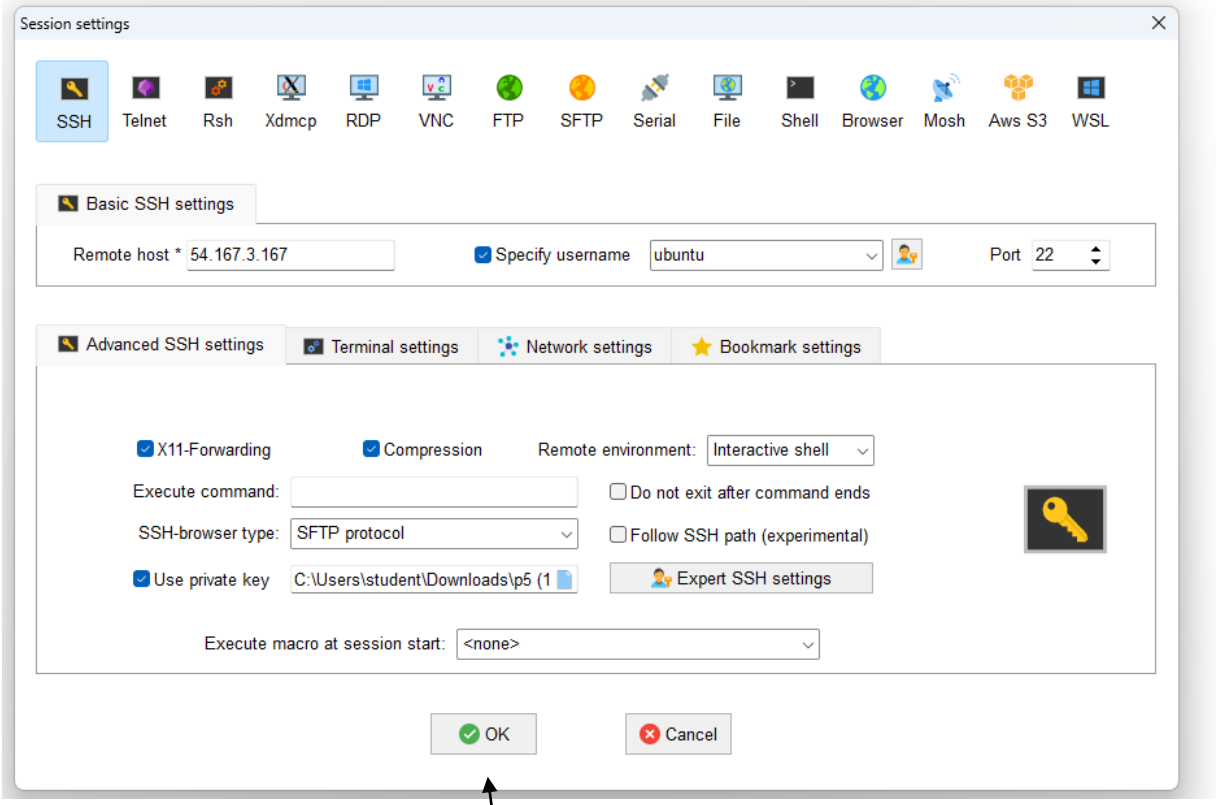
Here you can Directly connect Ubuntu also but better use mobaxterm

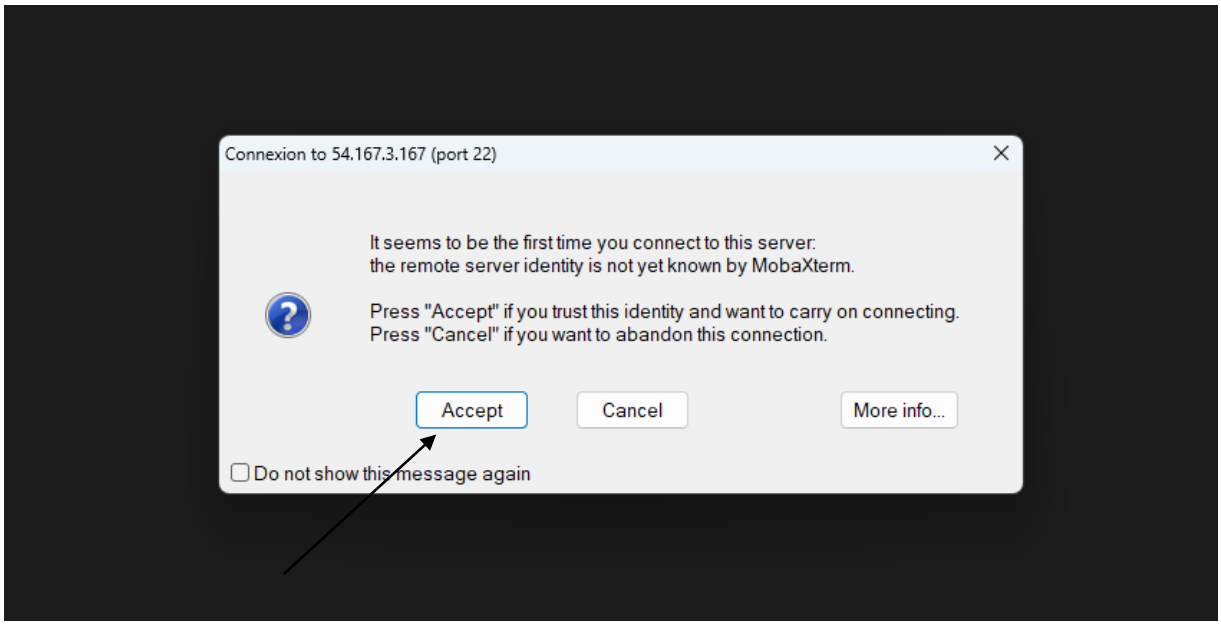


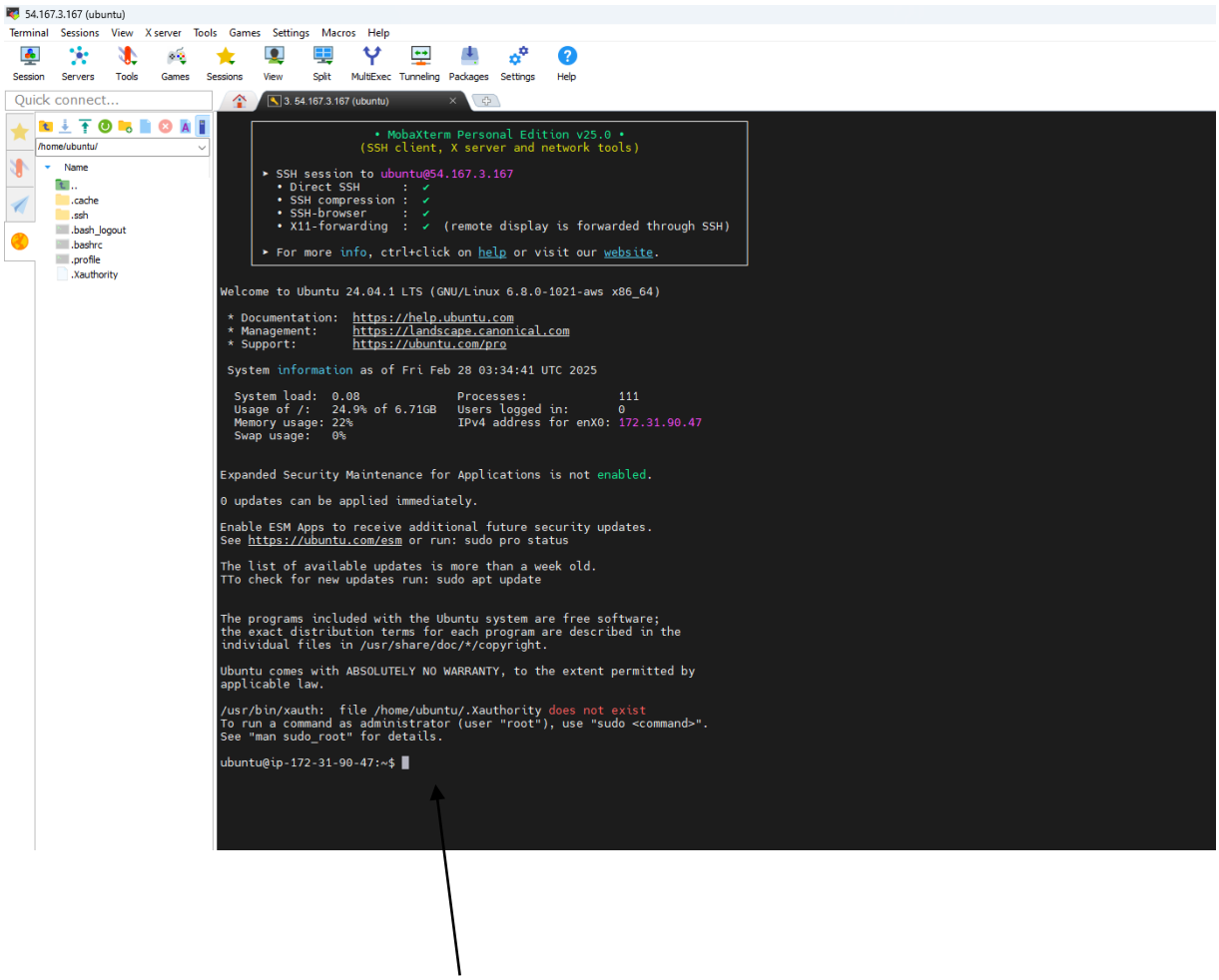



Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Availability Zone
Public IPv4 DNS
Public IPv4 ...
Elastic IP
Docker
i-09d3e11cc114228c5
Running
t2.micro
Initializing
View alarms
us-east-1c
ec2-54-167-3-167.com...
54.167.3.167
i-09d3e11cc114228c5 (Docker)
Details
Status and alarms
Monitoring
Security
Networking
Storage
Tags
Instance summary
Public IPv4 address copied
Instance ID
i-09d3e11cc114228c5
IPv6 address
Hostname type
54.167.3.167 | open address
Instance state
Running
Private IP DNS name (IPv4 only)
Private IPv4 addresses
172.31.90.47
Public IPv4 DNS
ec2-54-167-3-167.compute-1.amazonaws.com | open address
Session settings
SSH
Telnet
Rsh
Xdmcp
RDP
VNC
FTP
SFTP
Serial
File
Shell
Browser
Mosh
Aws S3
WSL
Basic SSH settings
Remote host * 54.167.3.167
Specify username
ubuntu
Port 22
Advanced SSH settings
Terminal settings
Network settings
Bookmark settings
X11-Forwarding
Compression
Remote environment: Interactive shell
Execute command:
Do not exit after command ends
SSH-browser type: SFTP protocol
Follow SSH path (experimental)
Use private key
Expert SSH settings
Execute macro at session start: <none>
OK
Cancel

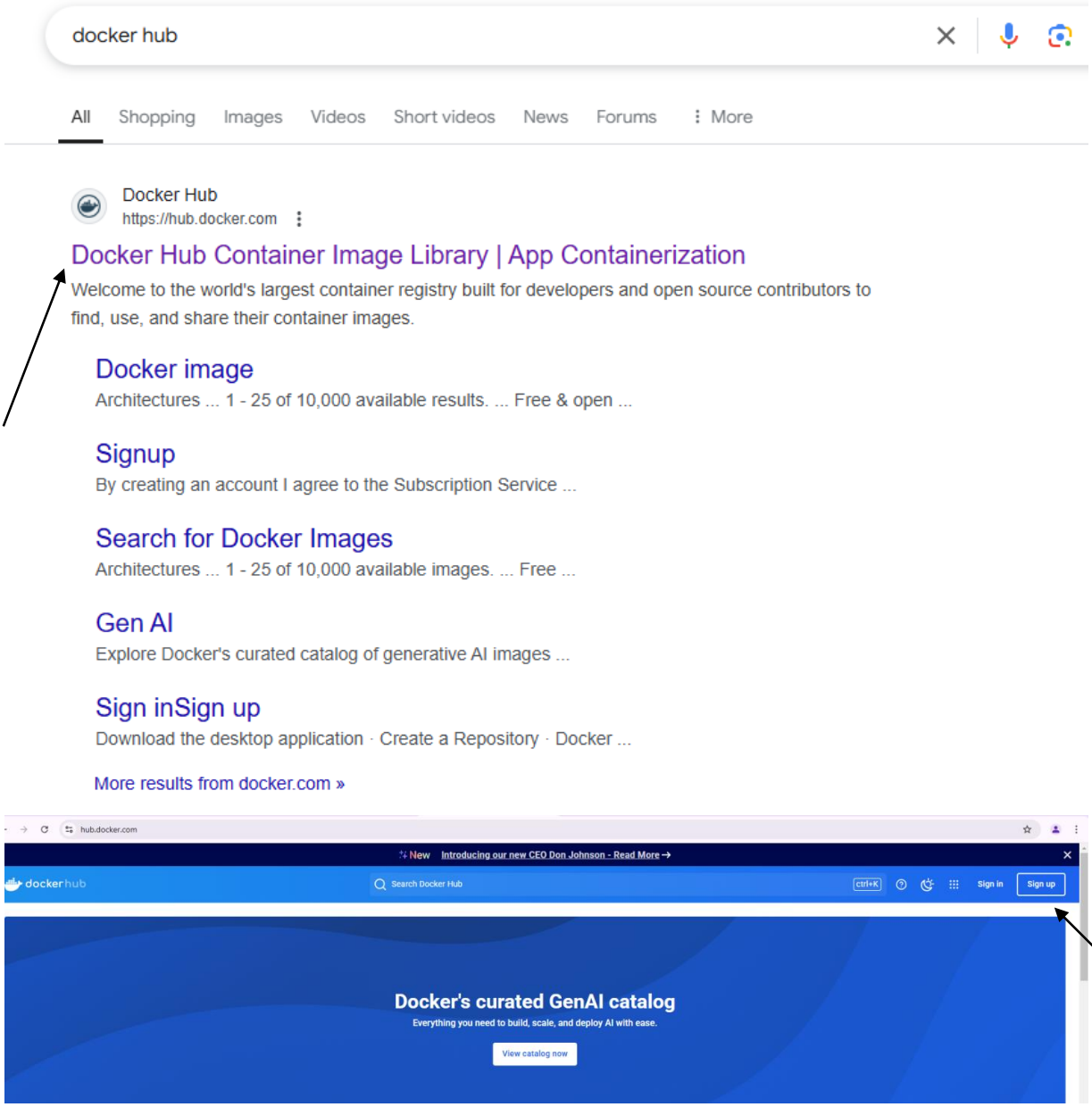

Open
Downloads
Search Downloads
Organize
New folder
OneDrive
Desktop
Downloads
Documents
Pictures
Music
Videos
kali-linux-2024.
Screenshots
Name
Date modified
Type
Size
Today
p5 (1).pem 2/28/2025 8:54 AM PEM File 2 KB
Unconfirmed 153677.crdownload 2/28/2025 8:50 AM CRDOWNLOAD File 39,315 KB
Yesterday
Docker-Zero-to-Hero-main 2/27/2025 11:28 AM Compressed (zipp... 29 KB
MobaXterm_Installer_v25.0 (1) 2/27/2025 11:14 AM Compressed (zipp... 41,247 KB
MobaXterm_Installer_v25.0 2/27/2025 11:14 AM Compressed (zipp... 41,247 KB
p5.pem 2/27/2025 10:31 AM PEM File 2 KB
Docker-Zero-to-Hero-main 2/27/2025 11:29 AM File folder
MobaXterm_Installer_v25.0 2/27/2025 11:16 AM File folder
Earlier this week
File name: p5 (1)
All files (*.*)
Open
Cancel

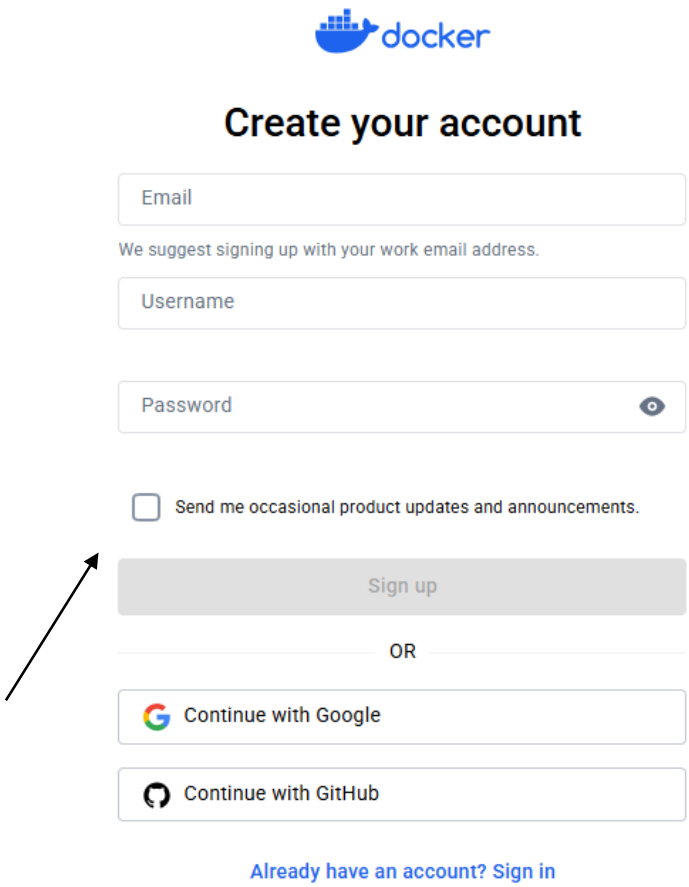

Session settings
SSH
Telnet
Rsh
Xdmcp
RDP
VNC
FTP
SFTP
Serial
File
Shell
Browser
Mosh
Aws S3
WSL
Basic SSH settings
Remote host * 54.167.3.167
Specify username
ubuntu
Port 22
Advanced SSH settings
Terminal settings
Network settings
Bookmark settings
X11-Forwarding
Compression
Remote environment: Interactive shell
Execute command:
Do not exit after command ends
SSH-browser type: SFTP protocol
Follow SSH path (experimental)
Use private key
C:\Users\student\Downloads\p5 (1
Expert SSH settings
Execute macro at session start: <none>
OK
Cancel

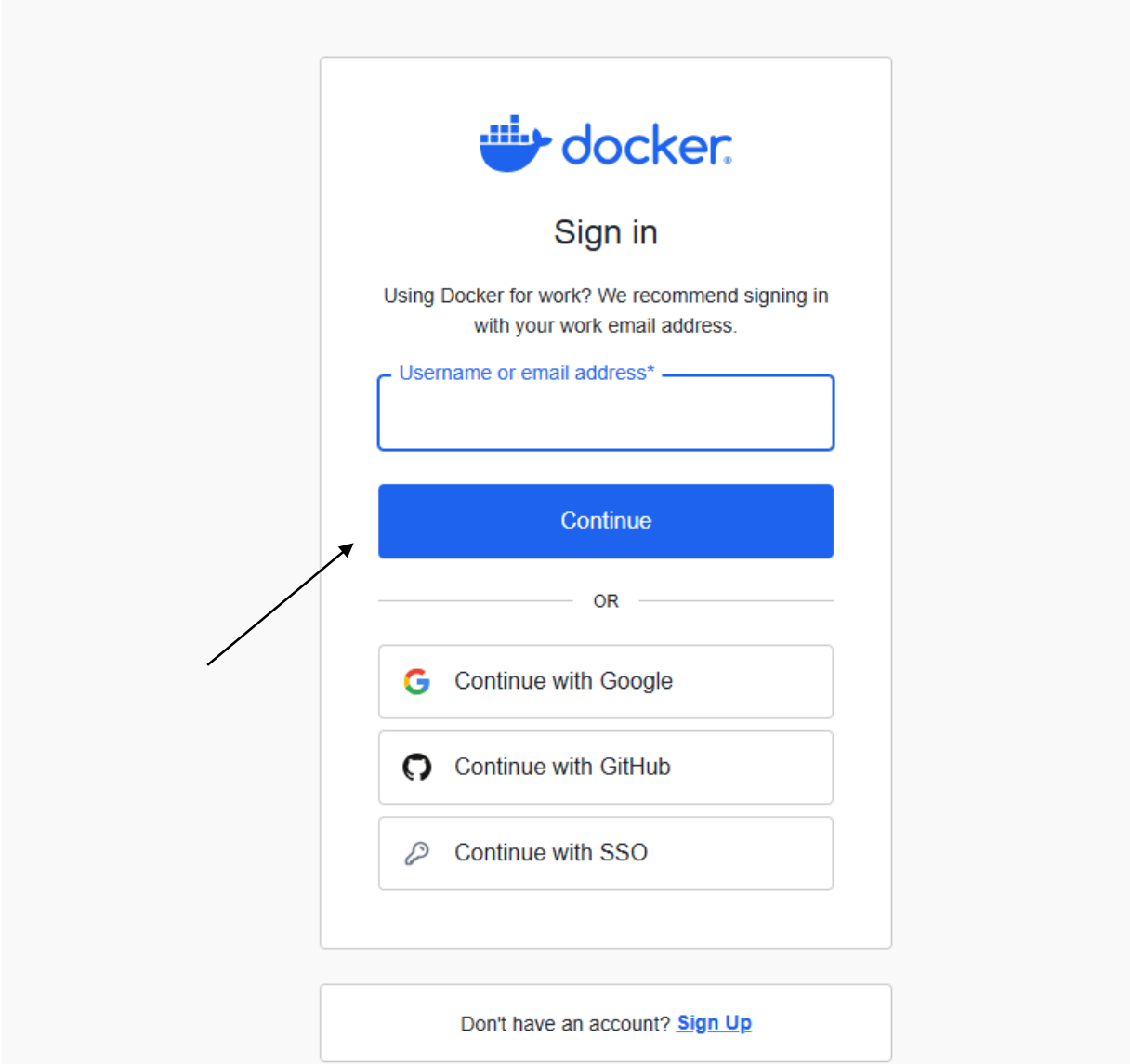


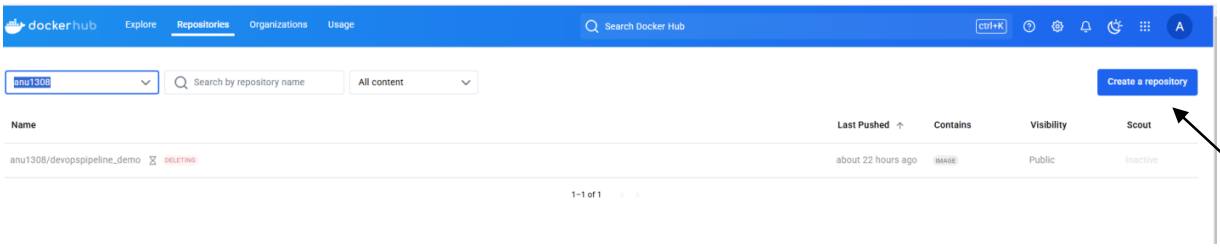


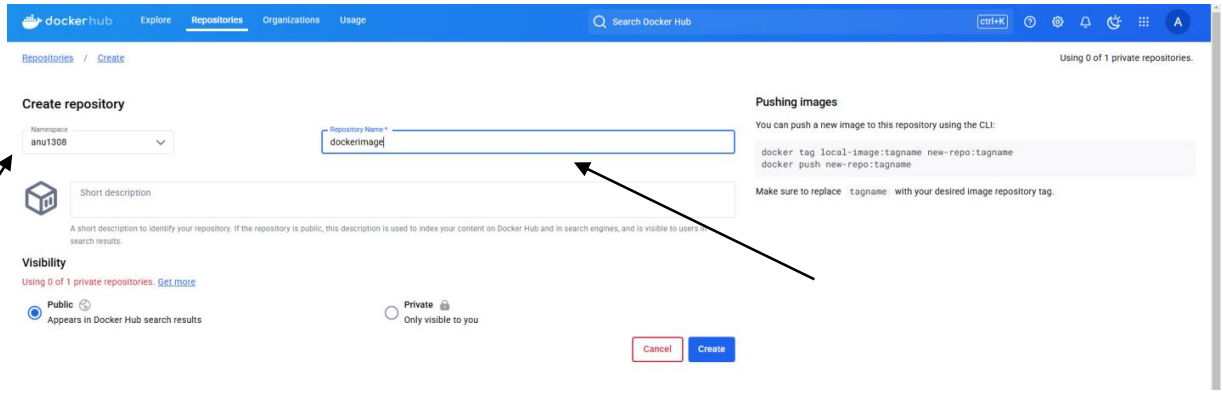
Create Docker Hub Account and create repository in Docker Hub


docker hub
All Shopping Images Videos Short videos News Forums More
Docker Hub
https://hub.docker.com
Docker Hub Container Image Library | App Containerization
Welcome to the world's largest container registry built for developers and open source contributors to find, use, and share their container images.
Docker image
Architectures ... 1 - 25 of 10,000 available results. ... Free & open ...
Signup
By creating an account I agree to the Subscription Service ...
Search for Docker Images
Architectures ... 1 - 25 of 10,000 available images. ... Free ...
Gen AI
Explore Docker's curated catalog of generative AI images ...
Sign inSign up
Download the desktop application · Create a Repository · Docker ...
More results from docker.com »
hub.docker.com
New Introducing our new CEO Don Johnson - Read More
dockerhub
Search Docker Hub
ctrl+K
Sign in
Sign up
Docker's curated GenAI catalog
Everything you need to build, scale, and deploy AI with ease.
View catalog now

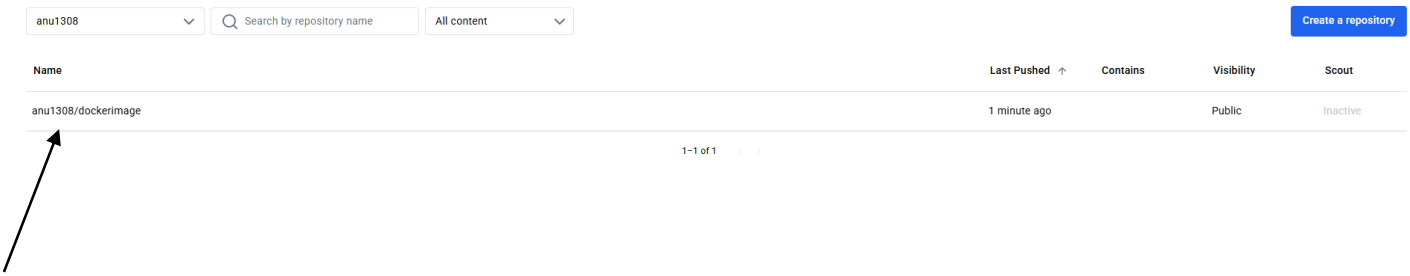

docker
Create your account
Email
We suggest signing up with your work email address.
Username
Password
Send me occasional product updates and announcements.
Sign up
OR
Continue with Google
Continue with GitHub
Already have an account? Sign in


docker
Sign in
Using Docker for work? We recommend signing in with your work email address.
Username or email address*
Continue
OR
Continue with Google
Continue with GitHub
Continue with SSO
Don't have an account? Sign Up


dockerhub
Explore
Repositories
Organizations
Usage
Search Docker Hub
Create a repository
Name
Last Pushed
Contains
Visibility
Scout


dockerhub
Explore
Repositories
Organizations
Usage
Search Docker Hub
Ctrl+K
Repositories / Create
Using 0 of 1 private repositories.
Create repository
Namespace
anu1308
Repository Name *
dockerimage
Short description
A short description to identify your repository. If the repository is public, this description is used to index your content on Docker Hub and in search engines, and is visible to users in search results.
Visibility
Using 0 of 1 private repositories. Get more
Public
Appears in Docker Hub search results
Private
Only visible to you
Cancel
Create
Pushing images
You can push a new image to this repository using the CLI:
docker tag local-image:tagname new-repo:tagname
docker push new-repo:tagname
Make sure to replace tagname with your desired image repository tag.


anu1308
Search by repository name
All content
Create a repository
Name
Last Pushed
Contains
Visibility
Scout
anu1308/dockerimage
1 minute ago
Public
Inactive
1–1 of 1


anu1308
Search by repository name
All content
Create a repository
Name
Last Pushed
Contains
Visibility
Scout
anu1308/dockerimage
1 minute ago
Public
Inactive
1–1 of 1