Day 1 :

26/08/2023

SDLC : Software Development Life cycle

Water fall model

Requirement gathering 6 months

Plan

Design

Coding / testing

Build the project development mode

Deploy the project production mode

Provide the service

Increment model

V model

Agile model

Sprint : time duration to develop small module 1 or 2 week. Login page, feedback page

Dashboard

DevOps : Development and Operation

Development people develop the application using any language like java, python, etc

Operation team interact with customer or end user client and they are responsible to maintain the application.

Admin

Developer

Tester

Admin

Database designer

Architecture etc

Devops tools

Git and git hub

Maven and Gradle (Java development)

CI and CD tool using Jenkin (Continuous Integration and Continuous deployment or delivery)

Selenium tool (testing)

Ansible tool (monitoring tool as well as configuration tool)

Docker container

Nagios tool

Kubernetes

Git and github

Sub version control which help to record the application flow.

Dev1	login page	
Dev2	java or python code	merge the code
Dev3	database	

Unix commands

ls : this command display all files and folder present in current directory

pwd : print working directory : it show current path of terminal or command prompt.

mkdir foldername: this command is use to create the folder

cd foldername   : move inside a folder

cd ..   : come outside a folder or move to parent directory of current folder

rmdir foldername : to remove folder

touch filename : to create empty file

vi filename : open the file in vi mode

once open hit i key to move inside a vi editor mode

write the contents

esc : to come out from editor mode to normal mode

:wq : write and q quite (save and exit)

cat filename : it is use to read contents from a file

cat means concatenate

Git : Git is version control system which help to track or record changes done in the application or project or app.

Git also known a distributed sub version control.

First create the folder

Then create the file and write the contents

git --version

git init it is use to make local folder as git repository

init command create .git folder insider that current directory

ls -a : it display all files and folder with hidden folder.

git status : this command is use to check the current status of your repository

git add filename : to add files or folder normal local folder to stagging area.

Or

git add . : this command is use to add all files and folder present in

Current directory.

git commit -m “message” : this command use to pass the task from stagging area to

local repository.

git config --global user.email “akash300383@gmail.com”

git config --global user.name "akash"

steps

1. Create folder with any name ie Demo
2. Then create the file with any name ie test and write the contents insider that file.
3. Then open the terminal inside that folder please use pwd
4. git init
5. git status
6. git add .
7. git status
8. git commit -m “message”
9. first time we need to set config details as emailed and name
10. git config --global user.email “akash300383@gmail.com”
11. git config --global user.name "akash"
12. Then please commit using command as git commit -m “done”
13. git status

git branch : branch is like a pointer which hold more than one commit details.

By default git provide default branch. Default branch name may be master or main.

If we want to check branch details present in local repository

git branch

command to create user defined branch

git branch branchname this command is use to create user defined branch

git checkout branchname this command is use to switch from one branch to another branch.

Current branch is master or any other branch

git merge branchname this command add all task in current branch git branch -D branchname this command is use to remove the branch

Demo.java

int a; akash branch

int b; Vikash branch

Remote repository help us to share the code between two or more than one tabme.

Git hub

Git lab

Bitbucket

Aws

Azure

Private cloud etc

git hub : it is a type of remote repository provided by micro soft organization.

Day 2 :

27/08/2023

We want to connect local repository with remote repository

1. Token base authentication
2. SSH Client
   More

   To connect local repository with remote repository

   git remote add origin URL

```
git remote add origin https://github.com/Kaleakash/test_rep.git

git remote add origin https://token@github.com/Kaleakash/test_rep.git

git push -u origin main (it is use to push the code)
```

how to resolve the conflict

1. first create Repo2 folder
2. then open terminal inside that folder
3. create sample file
4. add some data 1st, 2nd
5. using git init make folder as repository
6. git add .
7. git commit -m “done changes in master branch”
8. create the branch
9. git branch akash
10. git checkout akash
11. in akash branch we will add 3rd and 4th message.
12. Then git add .
13. Then git commit -m “in akash branch done some changes in sample file”
14. Create another branch with name as Vikash

15. git checkout -b Vikash (it will create the branch and switch to that branch)

16. in sample file in Vikash we will add the message as 5th and 6th.

17. Then git add .

18. Git commit -m “done change in sample file by Vikash branch”

19. Please move the master branch ie git chechout master.

20. Please verify current branch using command as git branch

21. Then in master branch merge the code from akash branch

22. Git merge akash

23. Using cat sample read the data from sample file

24. Out must be 1st, 2nd, 3rd, 4th

25.

Download or clone the repository

1. Create the folder with any name ie devopstrainig In VM
2. Then open the terminal
3. git clone URL
4. git clone https://github.com/Kaleakash/devops_aug_2023_trainig_batch.git
5. use ls command to see downloaded folder
6. using cd command please move inside that folder.
7. cd devops_aug_2023_trainig_batch
8. ls command to see the more than one file.

if we do any changes in local repository
we need to add, commit and push

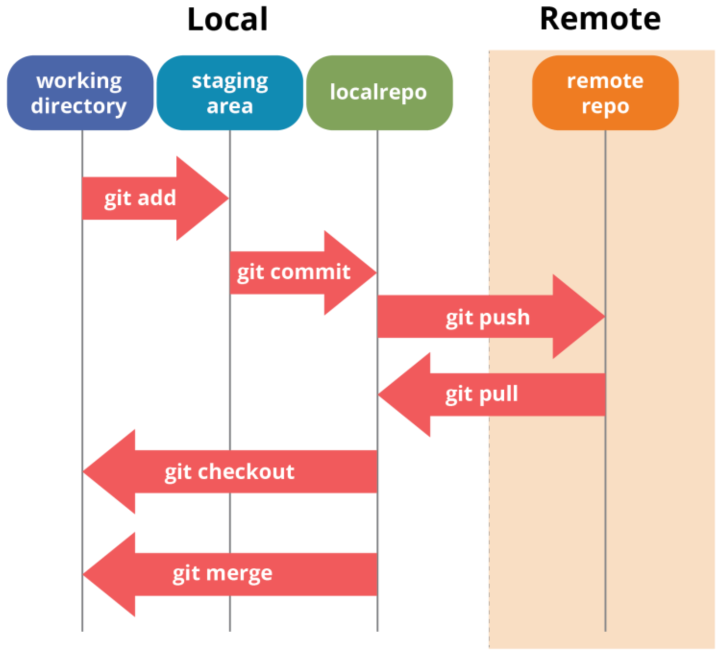
```
git add .
git commit -m “done some changes in file”
git push -u origin main
```

1. open the terminal inside a repository folder
2. make sure .git folder present using command verify ls -a
3. git pull

git clone URL : it help to download fresh repository in local machine

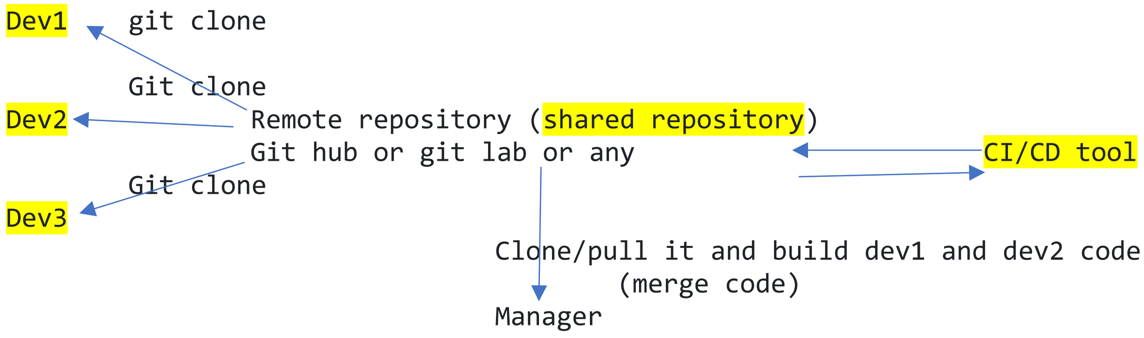
git pull : it will pull new updated from remote to local repository

Git	Vs	Git hub
Git is Command line or GUI tool which Help to interact with any remote repository		Remote repository provided by micro soft.



CI and CD tools

Continuous Integration and Continuous delivery or deployment



Dev1 git clone

Git clone

Dev2 Remote repository (shared repository)

Git hub or git lab or any CI/CD tool

Git clone

Dev3

Clone/pull it and build dev1 and dev2 code

(merge code)

Manager

java	Git hub	Jenkin
python	Bit bucket	GoCD
angular		

Generally shared repository can be private or public.
While creating or after created that repository we will send the invitation
To all developer to join that repository.

Default branch can be master or main.
Dev1 need to create login page using html and css

Dev2 need to create java or python code
Dev3 need to create database tables.
If they do all their task in main or master branch after changes done they can add, commit and push the code to shared repository.

Don’t do your task in main or master branch. While doing your task please create user defined branch and push that branch in remote repository.

In remote repository we will check user defined branch if code is correct we will merge that code into master or main branch.

Build phase :

You need to compile and run the application using that language.

Javac

Java	java
Py	python
Ng	angular

Dev1 push the code in remote repository

In remote repository we need to verify the code and merge the code. And we need build the application.

After dev2 or dev3 code merge in master or main branch we can build successfully or it generate some error.

CI and CD tools.

Jenkin : it is a type of CI and CD tools. It is an open source ci/cd tool base upon java technologies. Plugin base ci and cd tool. GUI based tool.

Open the browser

http://localhost:8080

it will ask login details

username : admin

password : admin

in Jenkin we need to create the job. Every job responsible to build the project.

Day 3 :

02/09/2023

Open the terminal in VM.

git clone URL

next

git pull (but make sure terminal open inside that folder).

Web Service : Giving the service for web application when both the application running using different technologies

API : Application Programming interface.

Web Service

Java python

XML/JSON

eXtensible markup language

JSON : JavaScript object notation

HDFC XML/JSON HSBC

Micro service :

Please refer the website the set the trigger time using crons

https://crontab.guru/

Day 4 :

03/09/2023

Open the terminal and start /stop jenkin service

sudo service jenkins stop unix

sudo service jenkins start start

user name : admin

password : admin

java -jar jenkins.war

http://localhost:8080

Jenkin provide few pre installed tools like Maven, Gradel, Git, ant etc. These tools help us to run java technologies.

Jenkin Pipeline a pipeline is a collection of event or job which interconnected with each other to perform a specific task.

Maven goal

Clean

Compile

Install jar or war unit test

Test

Package

```
pipeline {
    agent any
    stages {
        stage('Hello') {
            steps {
                echo 'Hello World'
               sh ‘git --version’
              sh ‘v’
            }
        }
    }
}
```

Maven : Maven is open source build tool we use in java technologies to build the project.

Maven goal

Clean : clean complete project doesn’t matter it contains one file or more than one file

Compile

Install : install some dependencies

Test : test the project

Package : creating jar or war file

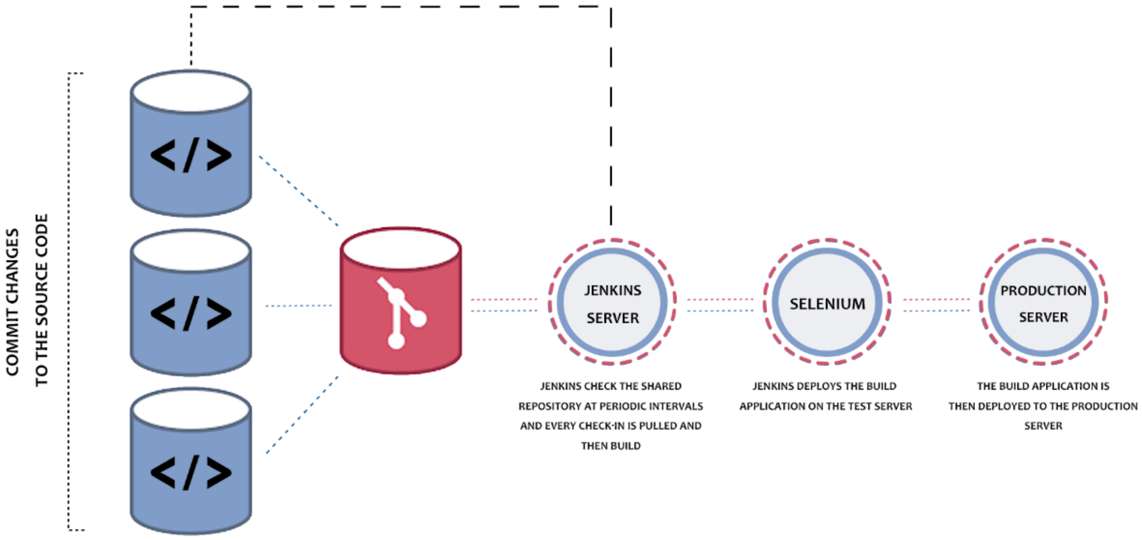
```
pipeline {
    agent any
    tools {
        // Install the Maven version configured as "M3" and add it to the path.
        maven "M3"
    }

    stages {
        stage('Build') {
            steps {
                // Get some code from a GitHub repository
                git 'https://github.com/jglick/simple-maven-project-with-tests.git'

                // Run Maven on a Unix agent.
               sh "mvn -Dmaven.test.failure.ignore=true clean package"

                // To run Maven on a Windows agent, use
                //bat "mvn -Dmaven.test.failure.ignore=true clean package"
            }
            post {
                // If Maven was able to run the tests, even if some of the test
                // failed, record the test results and archive the jar file.
                success {
                    junit '**/target/surefire-reports/TEST-*.xml'
                    archiveArtifacts 'target/*.jar'
                }
```

```
      }
    }
  }
}
```


COMMIT CHANGES
TO THE SOURCE CODE
</>
JENKINS
SERVER
SELENIUM
PRODUCTION
SERVER
JENKINS CHECK THE SHARED REPOSITORY AT PERIODIC INTERVALS AND EVERY CHECK-IN IS PULLED AND THEN BUILD
JENKINS DEPLOYS THE BUILD APPLICATION ON THE TEST SERVER
THE BUILD APPLICATION IS THEN DEPLOYED TO THE PRODUCTION SERVER

If we want to run more than one command with help of normal job.

Day 5 :

Install python in VM

```
sudo apt-get install python3
sudo apt-get install python3-pytest
```

```
py ops.py
```

```
py *.py
```

or

python3 ops.py

https://github.com/Kaleakash/python_jenkins_file.git

git URL which contains jenkin pipe line script to build python program as well as run python program.

Post build

We can send notification through email

We can push this project in production environment.

We can push this project to testing environment ie Selenium

Build can be success or failure.

Docker

Few we to run any application or server or tools.

We need system software. OS ie window, liux, Unix or Mac etc.

Server name : tomcat, IIS, nginx , apache, web logic, jboss, WAS etc

Database server : mysql, oracle, db2 RDBMS

Mongo db, HBase, Neo4j no SQL etc

Tools : SAP, Info metica, IIB, ESB, Portal server etc.

VM : Virtual Machine etc.

VMWare .ios

VMWare help use to do Virtualization.

Guest OS ; it can be unix, linux, window XP etc

Limitation of VMWare or Virtualization

Base machine is Window 11 : with RAM 16 hard disk 1tb

If I want to ru Guest OS with the help of VMWare software

Window XP --→boot up the window XP, we need provide RAM 4 gb and external hard disk

50gb. We need share the base machine resources. Etc.

We want to run 10 VM

Docker : Docker is an advanced OS Virtualization software platform which makes it easy to create, deploy and run the application in Docker container.

Container : run time environment or engine.

JRE : Java Run environment

Node JS : JavaScript run time environment.

Web Container : web container provide run time environment to run the application.

Database Container : it help to store the data in table format.

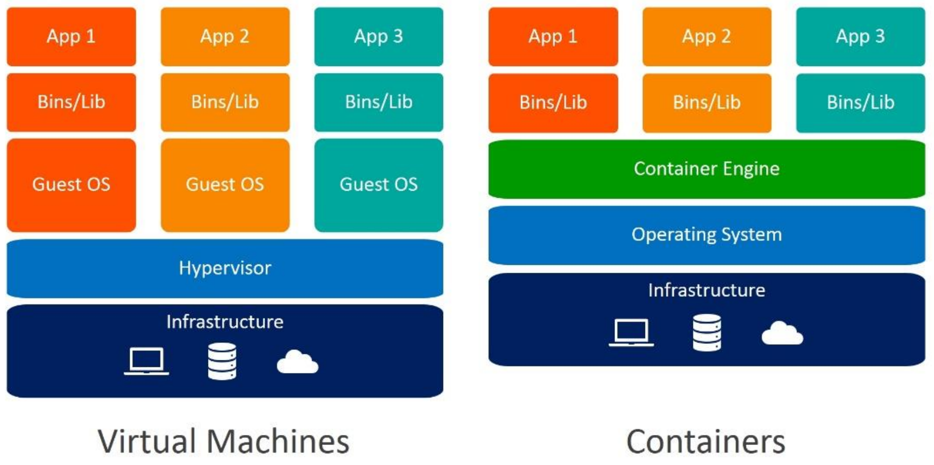
Docker Container : it is unit of deployment or software. Which contains everything to run the application. Ie code, runtime (software), tool and system libraries or database or server etc.

Docker is use to create Containerization application

Virtualization Vs Containerization

Virtualization is an abstract version of physical machine or OS or Guest OS.

Containerization is the abstract version of an application or server or tool or etc.



Virtual Machines

Containers

But run Docker in base machine we require docker engine.

Mkdir

Open the Terminal and

Write the command as

docker --version this command provide docker version

docker info this command provide docker details

docker pull imageName : this command is use to pull the image from docker hub to local machine.

docker images

docker pull hello-word this command is use to pull the image

docker run imageName/imageId : this command is use to run the application using docker image.

Docker pull the image by default from Docker.hub

Docker hub is an open source remote repository which contains lot of images

Which we can pull as well as push.

Docker hub provide private as well as public remote repository.

Docker hub is like a git hub.

In Git hub we can push any types of file or folder.

Docker hub contains docker images which is responsible to run the application

Using container.

Like other repository provided by AWS or Azure or Google cloud or private cloud etc.

Please docker hub account.

Dockerfile : A Docker file is a blue print or set of instruction that defines

How our images is build. Or Docker file use to create the image.

Docker image : Docker images contains everything to run the application.

Or

Doker image are the source code for your containers.

Using docker file we can create the image

Docker Container : instance of images or running process etc.

Once you run the image the running container become up and it will run that application which we

Mention in docker file which create image.

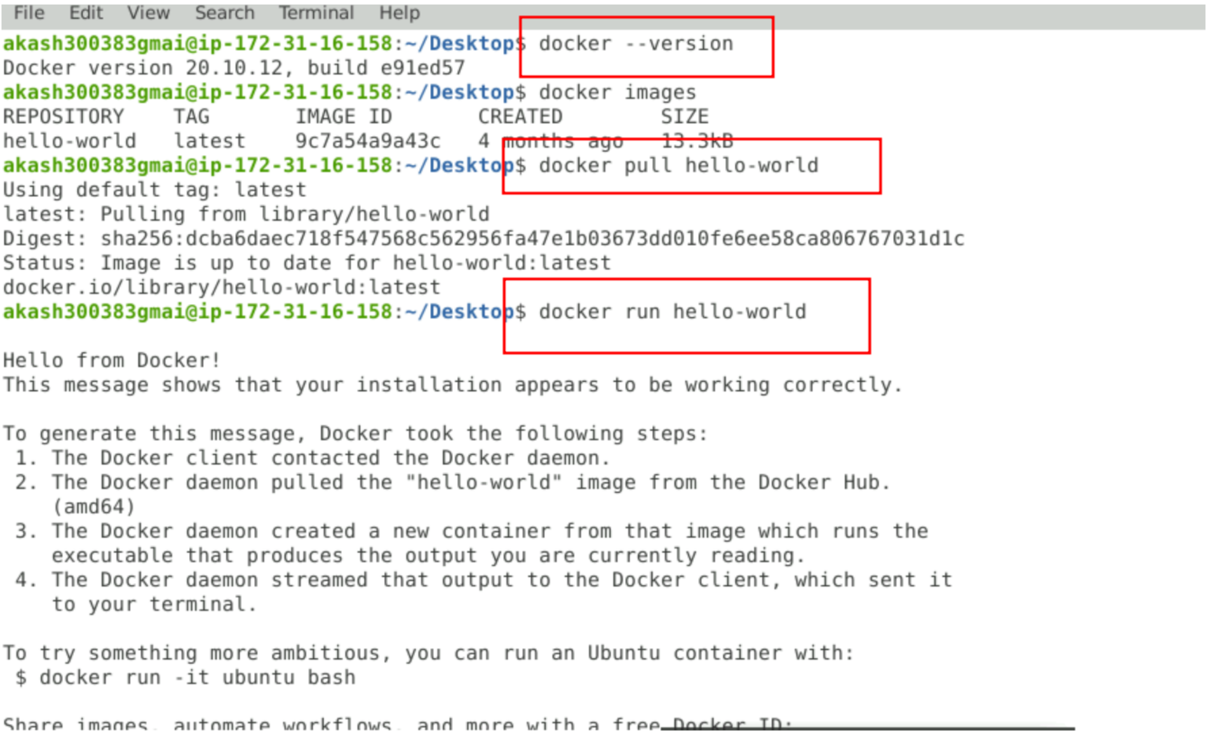
docker ps	this command is use to display running container
docker ps -a	this command is use to display all container ie running as well as stopped mode.

docker run --name c-container hello-world this command is use

run the container with specific name or custom name

Day 6 :

10/09/2023



```
akash300383gmai@ip-172-31-16-158:~/Desktop$ docker --version
Docker version 20.10.12, build e91ed57
akash300383gmai@ip-172-31-16-158:~/Desktop$ docker images
REPOSITORY    TAG       IMAGE ID       CREATED         SIZE
hello-world   latest    9c7a54a9a43c   4 months ago    13.3kB
akash300383gmai@ip-172-31-16-158:~/Desktop$ docker pull hello-world
Using default tag: latest
latest: Pulling from library/hello-world
Digest: sha256:dcba6daec718f547568c562956fa47e1b03673dd010fe6ee58ca806767031d1c
Status: Image is up to date for hello-world:latest
docker.io/library/hello-world:latest
akash300383gmai@ip-172-31-16-158:~/Desktop$ docker run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
 $ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
```

Creating images

1. creating simple image to display welcome message.

Dockerfile

FROM busybox

CMD ["echo","Welcome docker! This image created by akash"]

docker build -t my-bosybox . -f Dockerfile

docker images

docker run bosybox

-t : tag

-f : file

2. image to run console base application

```
a=10

b=20

sum=a+b

print("sum is",sum)
```

Then create the Dockerfile

```
FROM python:3

ADD myfile.py /

RUN pip install pystrich

CMD ["python","./myfile.py"]
```

1st file pull python image with version 3

2nd add myfile in python image

3rd if required install some plugin base upon requirement.

4th open command prompt and run the python program

then create the image

```
docker build -t my-python . -f Dockerfile
```

```
docker image
```

```
docker run my-python
```

Web Application Image

Html, css, JavaScript, typescript, angular or react js or jquery etc.

Html etc.

Html is use to create the web page or web application.

First create the image for web application and inside the folder create the file with

Below code

```
<html>
    <head>


    </head>
    <body>
        <h1>Welcome to my web page created by Akash Kale!</h1>
    </body>


</html>
```

save the file with name as index.html

and run or open this file in chrome browser.

http://www.google.com	: production env or live server
http://localhost:8080	run on local machine with local server
	dev env
or	
http://127.0.0.1:8080	default ip for every machine.

To run the web application we need server

Tomcat

Apache

IIS

Nginx

Etc

We use nginx open source server to create image for web application.

Server always run on port number :

Tomcat	8080
Nginx	80
MySQL Database	3306
Jenkins	8080

Etc

If image contains web application with run server then we need to use the command as

```
docker run -d -p 80:80 imageName/imageId
```

right side port actual port number 80

publish port number can be same or different 80

-d : background or detached mode

-p : publish

index.html

```
<html>
    <head>


    </head>
    <body>
        <h1>Welcome to my web page created by Akash Kale!</h1>
    </body>

</html>
```

save the file with name as index.html

and run or open this file in chrome browser.

Dockerfile

```
FROM nginx:1.6
COPY index.html /usr/share/nginx/html
```

```
docker build -t my-web . -f Dockerfile
```

```
docker run -d -p 80:80 my-web
```

using docker ps

if run please open browser and type as http://localhost:80

docker stop containerId/containerName stop container

docker start containerId/containerName start container

docker rm containerId/containerName remove container but first stop then remove

docker rm containerId/containerName -f without stop we can remove

docker rmi imageName/imageId if image is not link with any container or running container we can remove if we get error please first remove that container and then remove image

```
docker rmi imageName/imageId -f
```

now we will publish our local image into remote repository ie docker hub

```
docker login
```

it will ask your docker hub account

id and password

my-web

```
docker tag imageName dockerHubAccountId/imageName:version
```

version is like a tag

```
docker tag my-web akashkale/my-web:1.0
```

after created tag now you can push the image

```
docker push dockerHubAccount/imageName:tag
docker push akashkale/my-web:1.0
```

Application

Docker image — Docker image

To run html page — run my spring or python program,

REST API

frontend technology ↔ backend technology

http://178.0.0.:80

html, css, js, typescript	java (spring boot)	store the data in file system or database ie mysql or
angular or react or vue js	asp.net	oracle
	python	we want store and retrieve the data from database. mysql database
	node with express js	
	etc	

Front end	backend	database
Angular	java	mysql
React	php	mysql

Network — network

Public — private

Public -→ frontend and backend container

Private → backend and database container

One image is responsible to run one application or modules (micro service)

Front end	backend	database
Image	image	image
Container1	Container2	Container3

http: — TCP

docker compose and Docker swarm   and Kubernetes

docker compose it a toolkit which help to run more than one container with help of yaml or yml etc.

Docker compose, Docker Swarm and Kubernetes are responsible to run more than one container.

Those container execute independently as well as they can communicate with each others base upon

Their requirements.

Day 7 :

16/09/2023

Docker compose it a tool kit which is responsible to run more than one container using configuration file .yml or .yaml

docker-compose build   it build custom images

docker images

docker-compose up   pull pre defined images if required

and run all images part of that docker compose file

docker compose up --build -d

it will build it and run in background ie detached mode.

please open another terminal

docker ps

please verify all three container running or not.

docker network ls   it is use to verify all network

```
version: '3.3'
services:
  my-first-container:
    image: nginx
    ports:
      - 80:80
  my-another-container:
    image: akashkale/my-web:1.0
    ports:
      - 81:80
```

```
docker-compose build
docker-compose up
or
 docker-compose up --build -d                              detached mode
docker-compose down
```

Docker Swarm or Docker Kubernetes

Docker compose is use to run more than one container and all container must be running in same node / same machine ie desktop or cloud machine.

Node word refer to physical machine or cloud machine or device.

Atul if we use different machine then we need to use different docker compose.

All machine are connected using ip address.

Front end Machine	backend machine	database machine
Container	container	container

If number of client increase to access the application may be front end or backend or database.

We need up scale up upon on demand.

Kubernetes : Kubernetes is container management tool or K8S. It is also known as orchestration tool

Orchestration tool is responsible to deploying more than one container, scheduling, scaling and load balancing, configuration etc Etc.

Kubernetes is responsible to maintain more than one container those container can be run in same machine or difference machine ie node.

Docker Swarm Vs Kubernetes

Docker Swarm is part of Docker

1. No auto scaling
2. Does auto load balancing
3. Easy to develop the application
4. No GUI

Kubernetes is part of google

1. Auto scaling (up and down on demand)
2. We can do manually auto load balancing
3. Complicate to do configuration.
4. We can use GUI base upon tools.

Node : Node refer to machine or device or physical machine or cloud machine.

Cluster : it is a collection of host or combination of node (server or client). That helps you to aggregate their availability of resources. Like RAM, CPU, Disk, pool etc.

Public and private id address

http://198.78.56.45:80 public outside a cluster.

http://198.1.2.56 private

http://198.1.2.57

http://198.1.2.58

http://198.1.2.59

http://198.78.56.45:80

Namespace : it is a logical cluster or environment. Namespace is like package. It is widely used method which is scoping or dividing a cluster.

Java application → java-app

Python application → python-app

Angular application → angular -app

Pods : Kubernetes is responsible to run more than one container. In Kubernetes container can't communicate with each other directly. All container must be wrap in a functional unit and that unit is known as pods.

Each pods are responsible to run one container or more than one container.

Node contains more than one pods. Each pods can contains more than one container and each container responsible to run one application.

By default, the pods in only accessible by its internal IP address within a cluster.

to communicate more than one pods within a cluster we need service.

Service helps us to expose container from pods

Project

We can create one cluster or more than one cluster

Inside each cluster we can add one or more than one node.(machine).

Each node contains one or more than one pods. Those pods are part of same namespace or different namespace.

Each pods contains more than one container. And each container responsible to run the application. That application can be java, python, php or node js.

Kubeadm : tools provided by Kubernetes which help to develop Kubernetes application

Unix or Linux non window. Kubeadm support cluster features.

Minikube in your local machine.

Minikube ie open source tools which provide single cluster environment for Kubernetes

To deploy the application.

It is GUI base.

kubeadm

kind

Docker desktop

Kubectl : is a command line interface which help to interact with Kubernetes

Cluster

Private cloud provider provide Kubernetes cluster.

Service

Day 8 :

17/09/2023

Please Pull repository in your local machine or VM if Git present or download

https://github.com/Kaleakash/docker-compose-repository.git

then open the terminal

```
docker-compose --version
```

```
docker-compose up --build -d
```

```
docker images
```

```
docker ps
```

after running on container

open the browser

http://localhost:81

then application open

store the data

if you want to stop

```
docker-compose down
```

```
docker run -it alpine
apk add openjdk11
apk add git
git clone https://github.com/Kaleakash/jenkinjava.git
cd jenkinjava
javac Demo.java
java Demo
```

Dockerfile

```
docker run -it alpine                              size
apk add openjdk11                                  size
apk add git                                        size
git clone https://github.com/Kaleakash/jenkinjava.git
cd jenkinjava
javac Demo.java
java Demo
```

Dockerfile

```
FROM openjdk:8
```

```
COPY Demo.java .
RUN javac Demo.java
CMD [“java”,”Demo”]
```

Git --→ Git Hub -→ Jenkin -→

In Jenkin We can run docker image (Jenkin Pipe Line)

VSCode editor

https://code.visualstudio.com/download

Please create Jenkin pipeline job

And provide Git URL of my project

https://github.com/Kaleakash/docker-compose-repository.git

```
docker-compose up --build -d
```

but make sure docker running as well as docker-compose running.

Or

Create index.html

Create the image for index.html

Please create docker compose file to create image and run the container.

Push this code in git hub

Then create jenkin job or pipeline with trigger and run dockerc-compose file in jenkin environment

Then in Jenkin we need to configure authentication details for Docker hub.

AWS we need to create three instance

All required software we need to install.

Instance type must be medium 2 CPU

Master Node

Worker1 node

Worker2 node

Day 9:

Installed docker

Installed minikube local machine

We need to start minikube start it will download all required images

and start the container.

To start minikube we required minimum

CPUs=2, Memory=4000MB

docker image

docker ps

to open the minikube dashboard

minikube dashboard

kubectl it is a command line interface which help to interact with cluster.

kubectl cluster-info

```
akashkale/my-simple-kuberneties:tagname:1.0
```

using these 2 ways we can deploy our application in cluster environment.

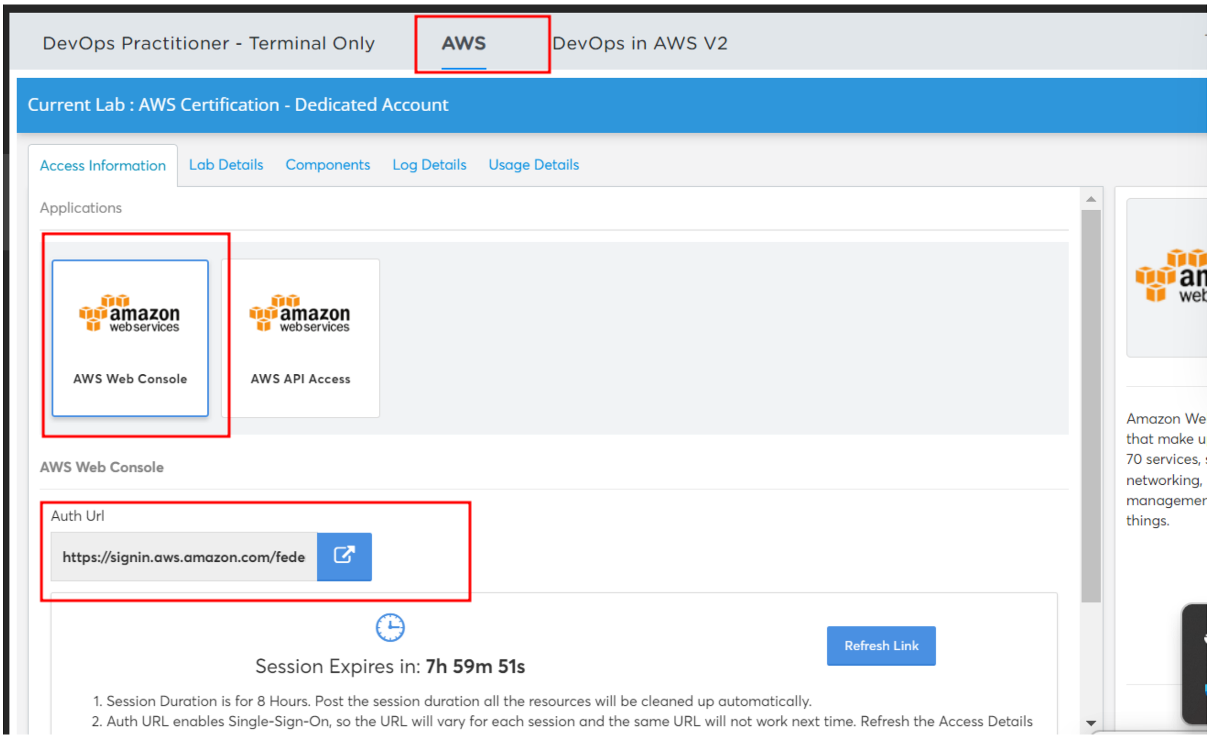
using imperative command

using declarative command

```
kubectl create deployment my-app --image=  akashkale/my-simple-kuberneties:1.0
```

```
kubectl get deployment
kubectl get pods
kubectl expose deployment my-app –type=LoadBalancer --port=80
kubectl get service
minikube service my-app
```

creating instance in AWS



Current Lab : AWS Certification - Dedicated Account

Auth Url: https://signin.aws.amazon.com/fede

Session Expires in: **7h 59m 51s**

1. Session Duration is for 8 Hours. Post the session duration all the resources will be cleaned up automatically.
2. Auth URL enables Single-Sign-On, so the URL will vary for each session and the same URL will not work next time. Refresh the Access Details

Amazon We
that make u
70 services,
networking,
managemer
things.

EC2 instance

(Amazon Elastic Compute Cloud)

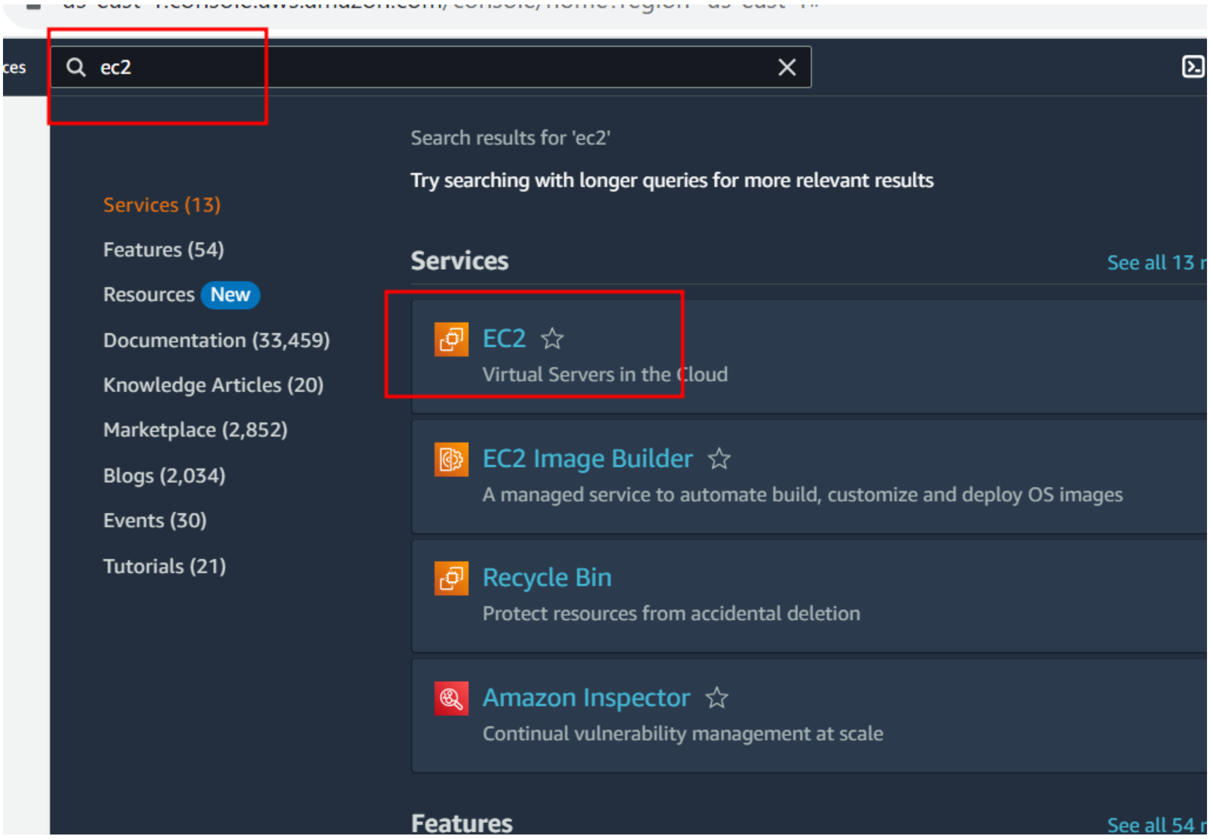
It is use to create Virtual Lab machine using any OS.

To connect that OS we can use command prompt or GUI application.

Then we installed all required software which help deploy our application.

That VM provide Unique IP Address.

Public and private IP Address.



us-east-1.console.aws.amazon.com/console/home?region=us-east-1#

ces

ec2

Search results for 'ec2'

Try searching with longer queries for more relevant results

Services (13)

Features (54)

Resources New

Documentation (33,459)

Knowledge Articles (20)

Marketplace (2,852)

Blogs (2,034)

Events (30)

Tutorials (21)

Services

See all 13 r

EC2 ☆

Virtual Servers in the Cloud

EC2 Image Builder ☆

A managed service to automate build, customize and deploy OS images

Recycle Bin

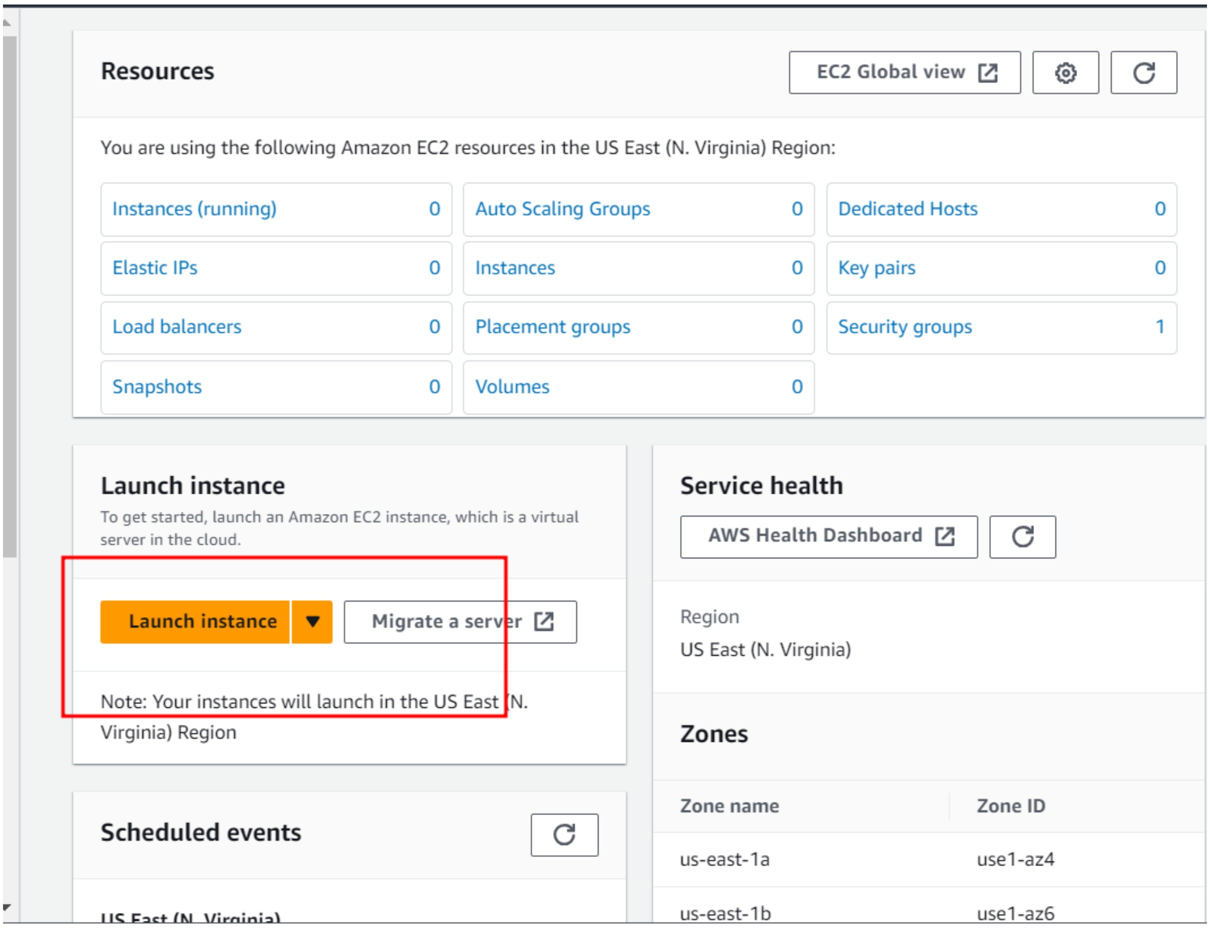
Protect resources from accidental deletion

Amazon Inspector ☆

Continual vulnerability management at scale

Features

See all 54 r



Resources

You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:

Instances (running)	0	Auto Scaling Groups	0	Dedicated Hosts	0
Elastic IPs	0	Instances	0	Key pairs	0
Load balancers	0	Placement groups	0	Security groups	1
Snapshots	0	Volumes	0		

Launch instance

To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.

Note: Your instances will launch in the US East (N. Virginia) Region

Scheduled events

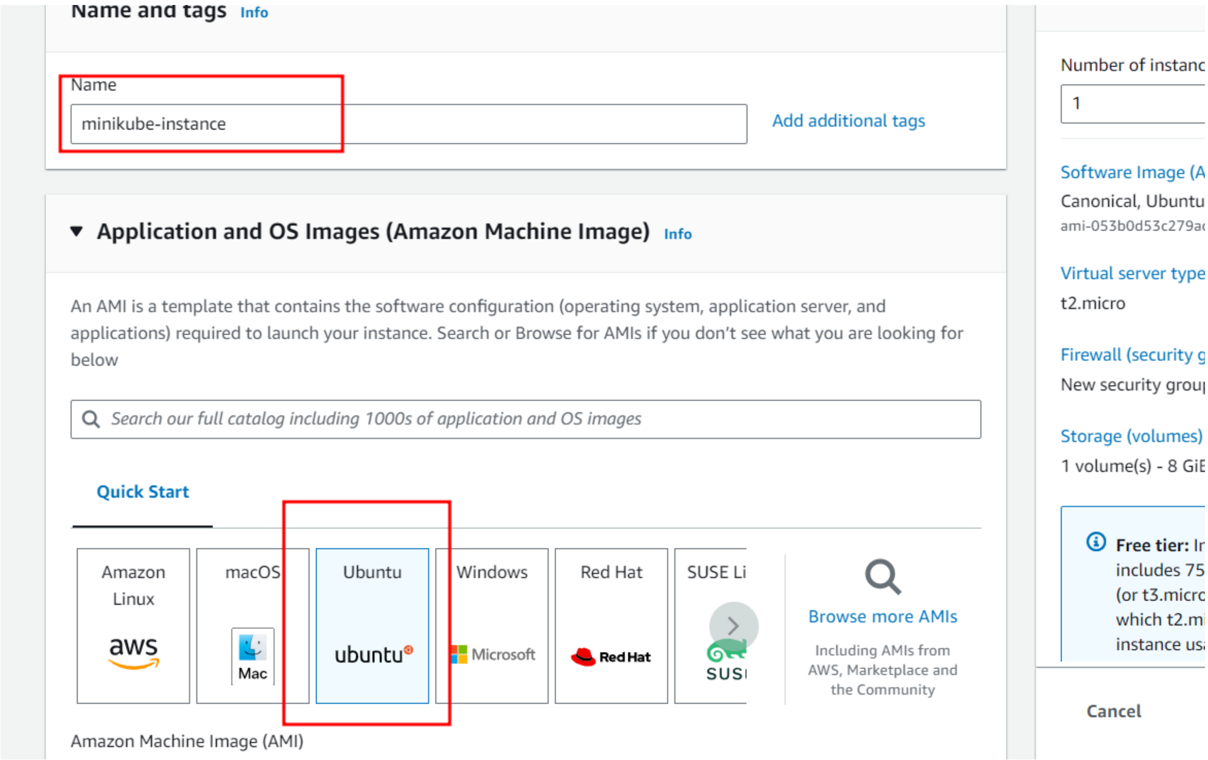
US East (N. Virginia)

Service health

Region
US East (N. Virginia)

Zones

Zone name	Zone ID
us-east-1a	use1-az4
us-east-1b	use1-az6



Name and tags Info

Name: minikube-instance

Application and OS Images (Amazon Machine Image) Info

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

Search our full catalog including 1000s of application and OS images
Quick Start
Amazon Linux
aws
macOS
Mac
Ubuntu
ubuntu
Windows
Microsoft
Red Hat
Red Hat
SUSE Li
SUSE
Browse more AMIs
Including AMIs from AWS, Marketplace and the Community

Amazon Machine Image (AMI)

Number of instanc
1

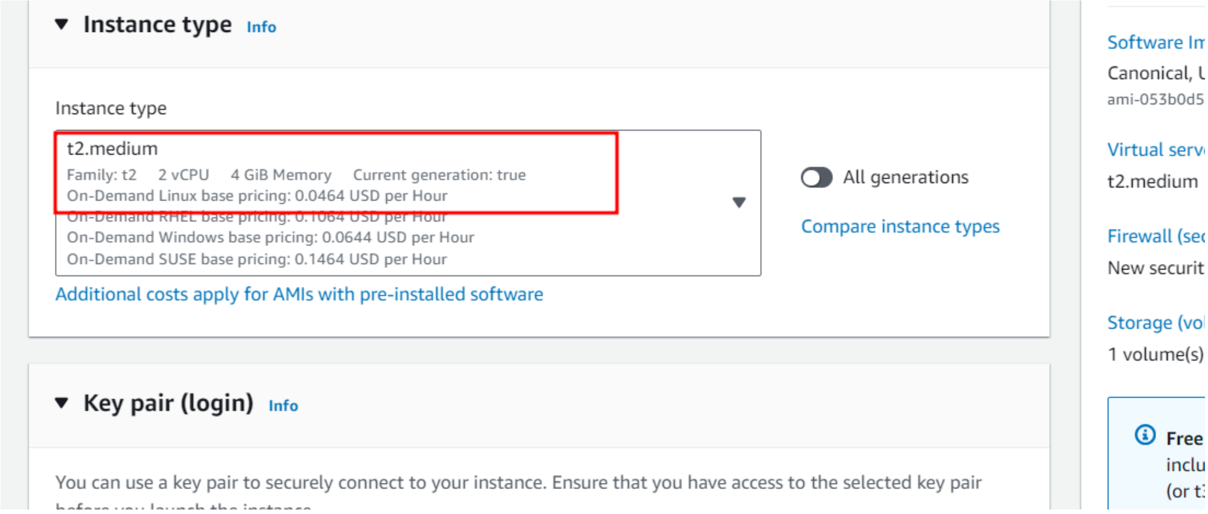
Software Image (A
Canonical, Ubuntu
ami-053b0d53c279a

Virtual server type
t2.micro

Firewall (security g
New security grou

Storage (volumes)
1 volume(s) - 8 GiE

Free tier: Ir includes 75 (or t3.micrc which t2.mi instance us



▼ Instance type Info

Instance type

t2.medium
Family: t2 2 vCPU 4 GiB Memory Current generation: true
On-Demand Linux base pricing: 0.0464 USD per Hour
On-Demand RHEL base pricing: 0.1064 USD per Hour
On-Demand Windows base pricing: 0.0644 USD per Hour
On-Demand SUSE base pricing: 0.1464 USD per Hour

All generations

Compare instance types

Additional costs apply for AMIs with pre-installed software

▼ Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair

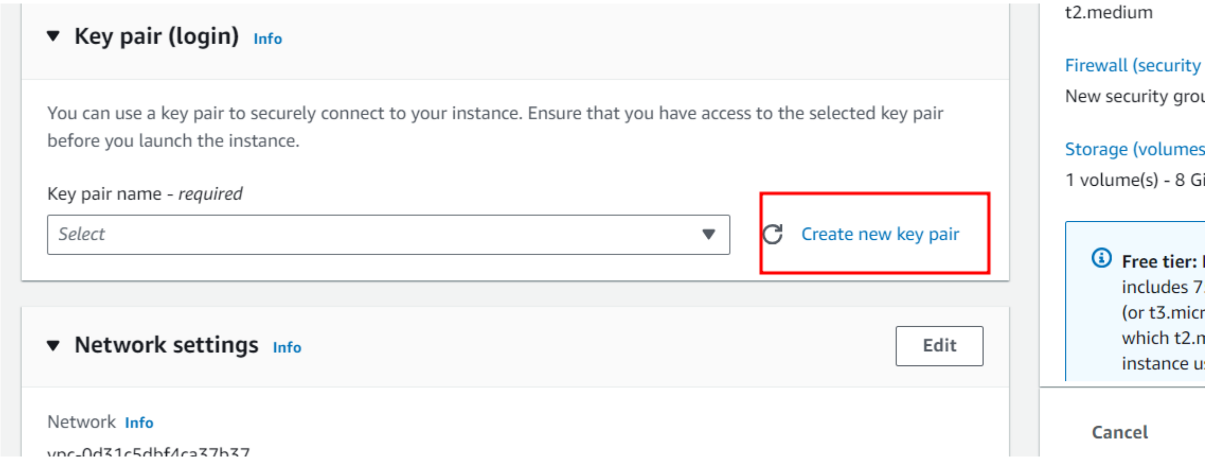
Software Im
Canonical, U
ami-053b0d5

Virtual serv
t2.medium

Firewall (sec
New securit

Storage (vol
1 volume(s)

Free
inclu
(or t3



▼ Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

Select ▼

Create new key pair

▼ Network settings Info

Edit

Network Info

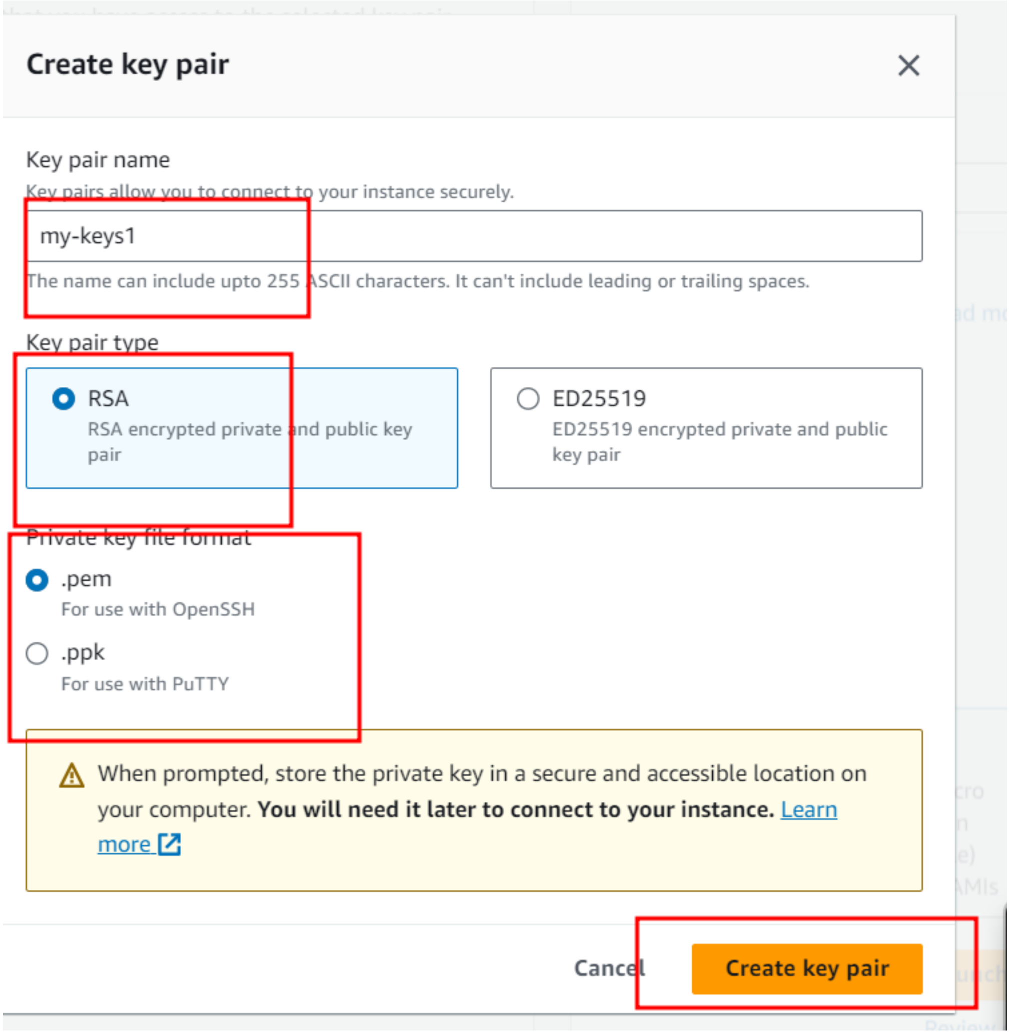
t2.medium

Firewall (security
New security grou

Storage (volumes
1 volume(s) - 8 Gi

Free tier: I
includes 7
(or t3.micr
which t2.n
instance u

Cancel



Create key pair

Key pair name

Key pairs allow you to connect to your instance securely.

my-keys1

The name can include upto 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type

● RSA
RSA encrypted private and public key pair

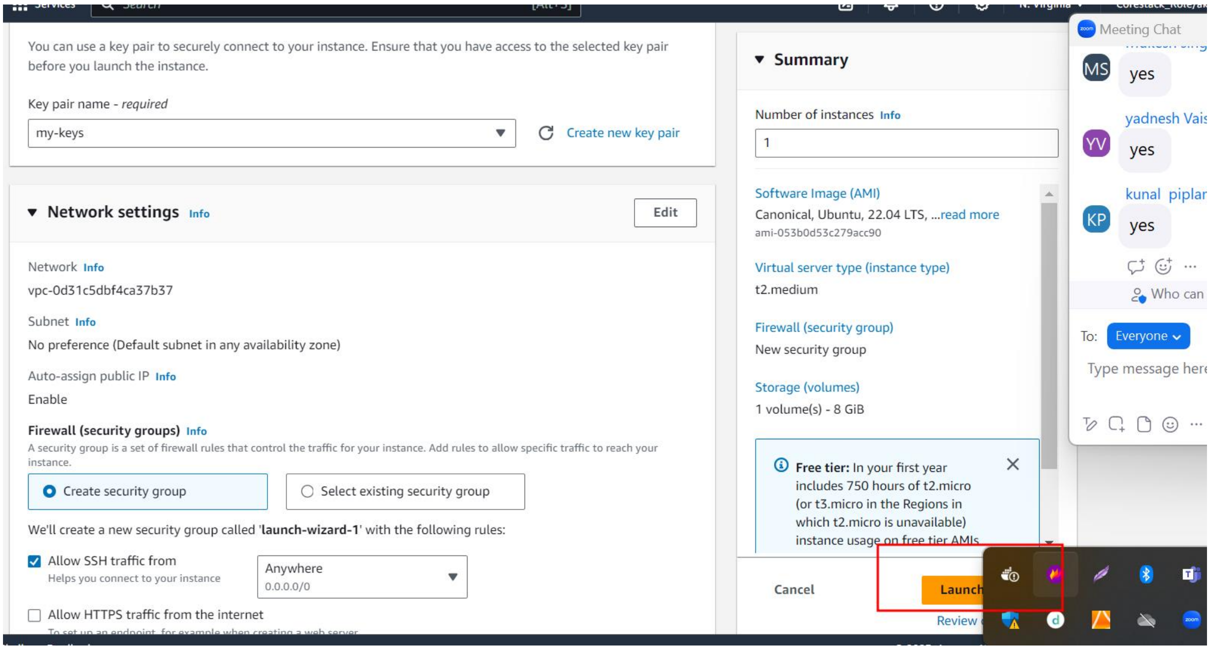
○ ED25519
ED25519 encrypted private and public key pair

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



You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

my-keys

Network settings

Network Info
vpc-0d31c5dbf4ca37b37

Subnet Info
No preference (Default subnet in any availability zone)

Auto-assign public IP Info
Enable

Firewall (security groups) Info
A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

● Create security group ○ Select existing security group

We'll create a new security group called '**launch-wizard-1**' with the following rules:

☑ Allow SSH traffic from — Anywhere 0.0.0.0/0
Helps you connect to your instance

☐ Allow HTTPS traffic from the internet

Summary

Number of instances Info
1

Software Image (AMI)
Canonical, Ubuntu, 22.04 LTS, ...read more
ami-053b0d53c279acc90

Virtual server type (instance type)
t2.medium

Firewall (security group)
New security group

Storage (volumes)
1 volume(s) - 8 GiB

Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs

Meeting Chat

MS yes

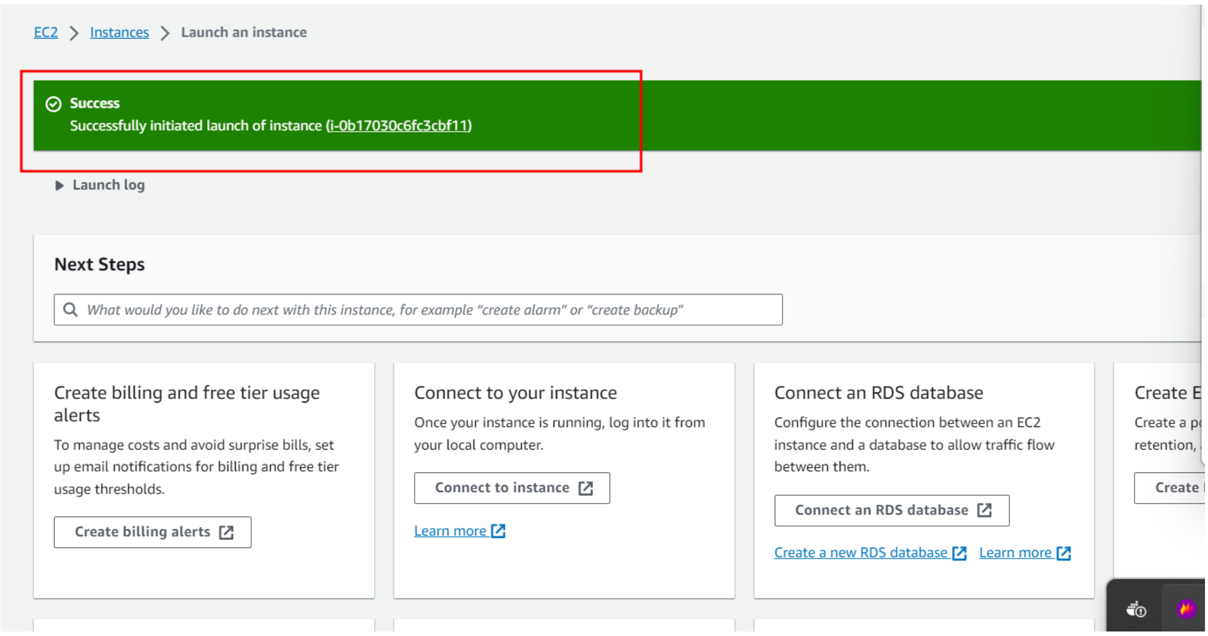
yadnesh Vais
YV yes

kunal piplar
KP yes

Who can

To: Everyone

Type message here



EC2 > Instances > Launch an instance

Success
Successfully initiated launch of instance (i-0b17030c6fc3cbf11)

▸ Launch log

Next Steps

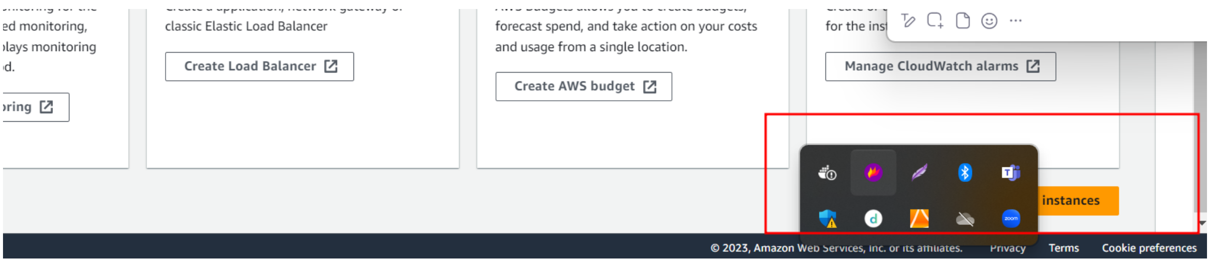
What would you like to do next with this instance, for example "create alarm" or "create backup"

Create billing and free tier usage alerts
To manage costs and avoid surprise bills, set up email notifications for billing and free tier usage thresholds.
Create billing alerts

Connect to your instance
Once your instance is running, log into it from your local computer.
Connect to instance
Learn more

Connect an RDS database
Configure the connection between an EC2 instance and a database to allow traffic flow between them.
Connect an RDS database
Create a new RDS database Learn more

Create E
Create a po
retention,
Create



ed monitoring,
plays monitoring
d.
oring

classic Elastic Load Balancer
Create Load Balancer

forecast spend, and take action on your costs and usage from a single location.
Create AWS budget

for the ins
Manage CloudWatch alarms

instances

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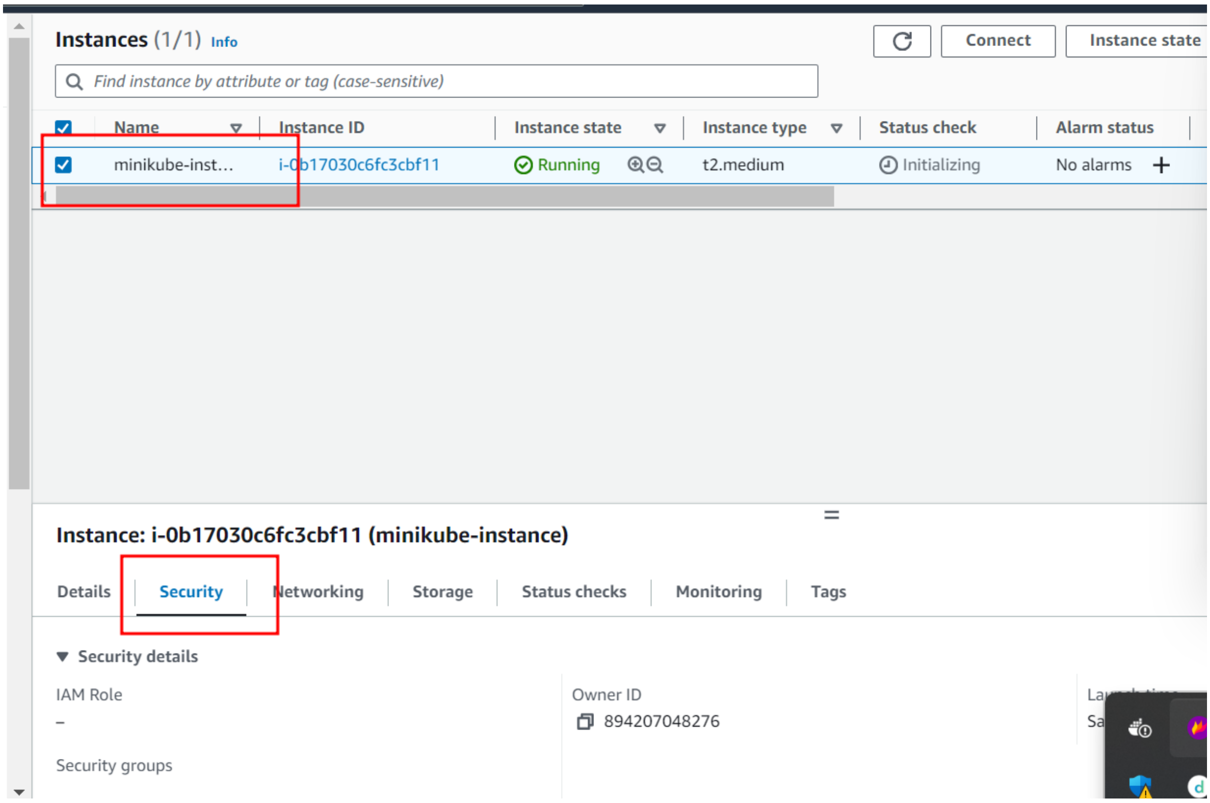


Instances (1/1) Info

Connect Instance state

Find instance by attribute or tag (case-sensitive)

☑	Name	Instance ID	Instance state	Instance type	Status check	Alarm status
☑	minikube-inst...	i-0b17030c6fc3cbf11	Running	t2.medium	Initializing	No alarms +

Instance: i-0b17030c6fc3cbf11 (minikube-instance)

Details | Security | Networking | Storage | Status checks | Monitoring | Tags

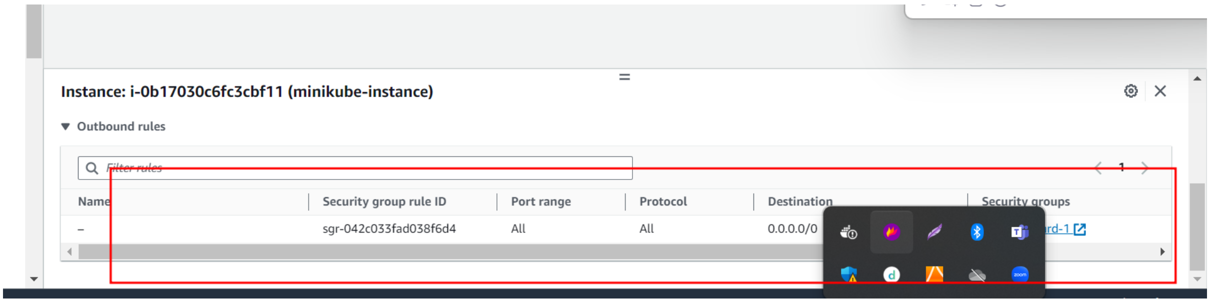
▼ Security details

IAM Role
–

Owner ID
894207048276

Security groups

Scroll down

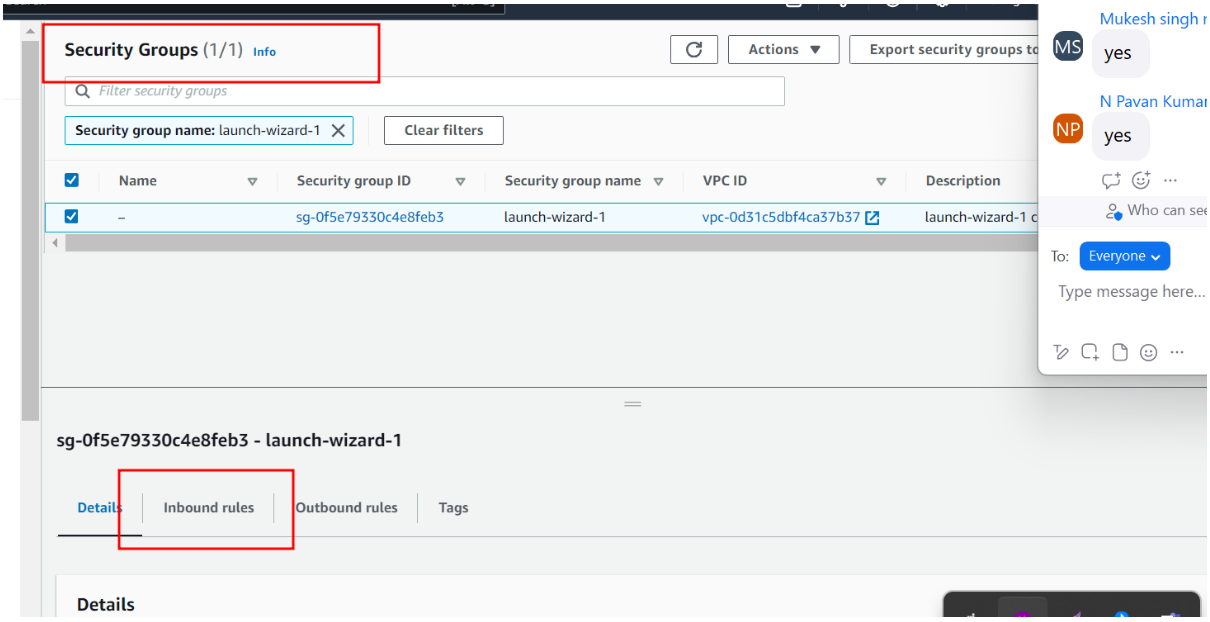


Instance: i-0b17030c6fc3cbf11 (minikube-instance)

▼ Outbound rules

Name	Security group rule ID	Port range	Protocol	Destination	Security groups
–	sgr-042c033fad038f6d4	All	All	0.0.0.0/0	rd-1

Launch security group



Security Groups (1/1) Info

Actions ▼
Export security groups to
Filter security groups
Security group name: launch-wizard-1 ✕
Clear filters

☑	Name	Security group ID	Security group name	VPC ID	Description
☑	–	sg-0f5e79330c4e8feb3	launch-wizard-1	vpc-0d31c5dbf4ca37b37	launch-wizard-1 c

Mukesh singh r

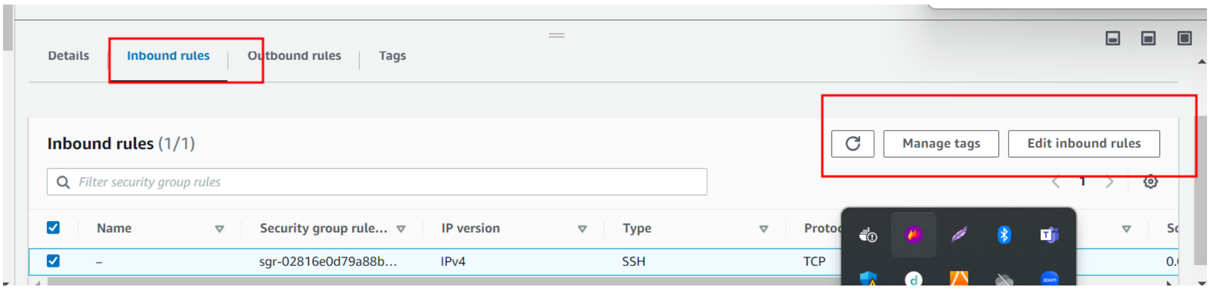
MS yes

N Pavan Kumar

NP yes

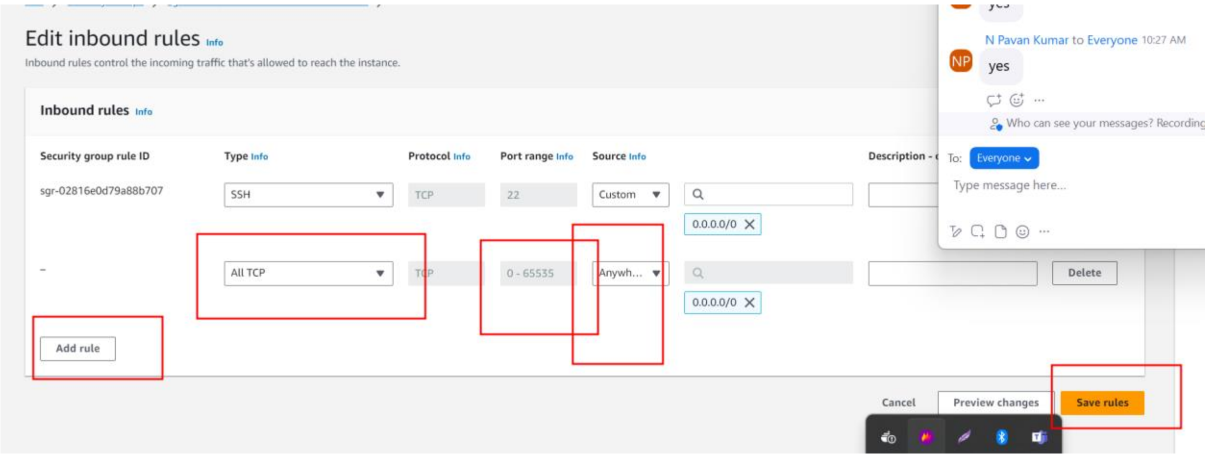
sg-0f5e79330c4e8feb3 - launch-wizard-1

Details



Inbound rules (1/1)

☑	Name	Security group rule...	IP version	Type	Protoc	Sc
☑	–	sgr-02816e0d79a88b...	IPv4	SSH	TCP	0.(



Edit inbound rules Info

Inbound rules control the incoming traffic that's allowed to reach the instance.

Inbound rules Info

Security group rule ID	Type Info	Protocol Info	Port range Info	Source Info		Description -
sgr-02816e0d79a88b707	SSH	TCP	22	Custom	0.0.0.0/0	
–	All TCP	TCP	0 - 65535	Anywh...	0.0.0.0/0	Delete

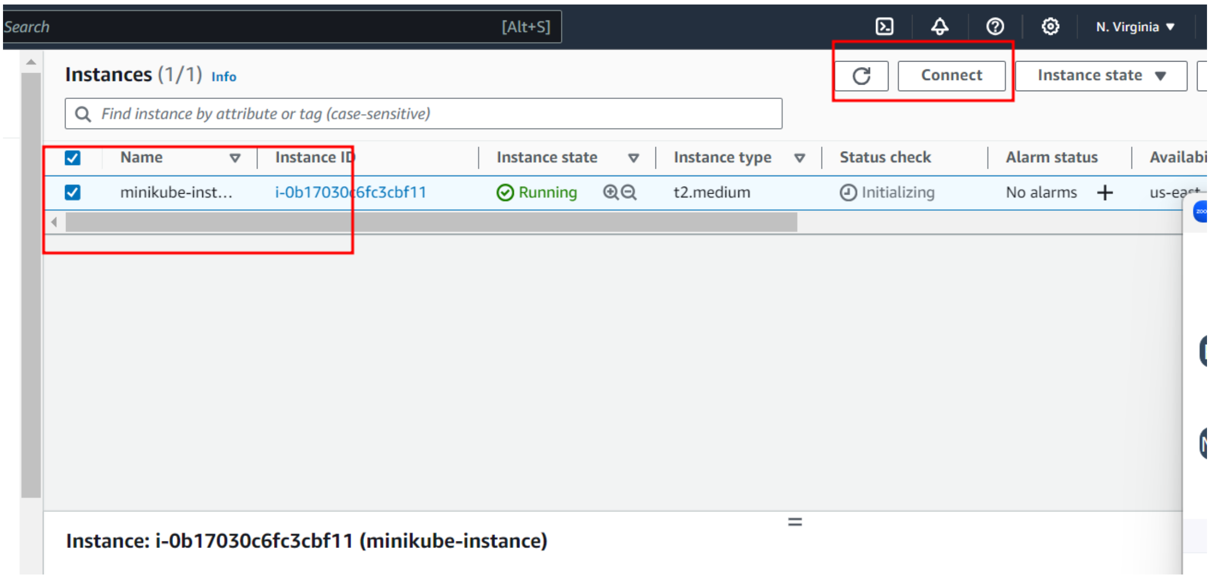
N Pavan Kumar to Everyone 10:27 AM

NP yes

Who can see your messages? Recording

To: Everyone

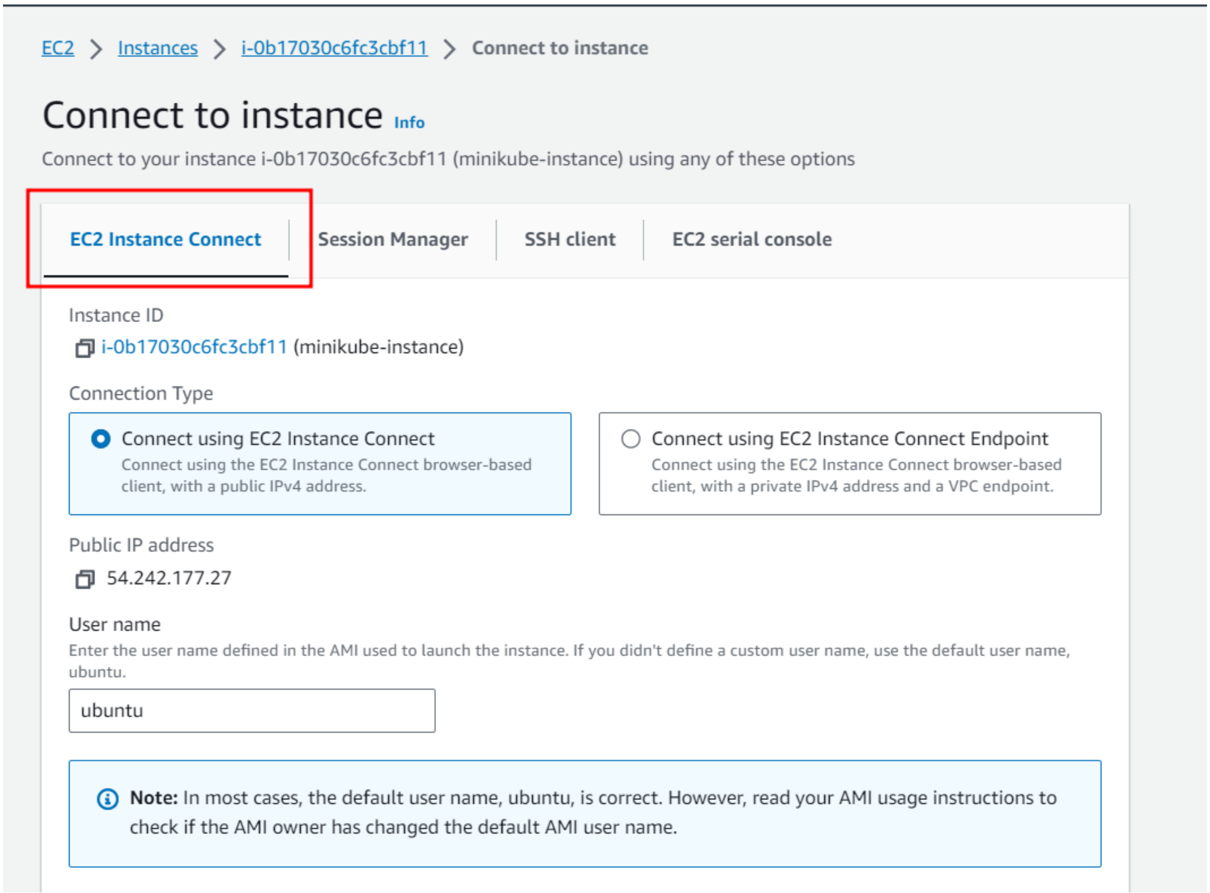
Type message here...



Instances (1/1) Info

☑	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availabi
☑	minikube-inst...	i-0b17030c6fc3cbf11	Running	t2.medium	Initializing	No alarms	us-east

Instance: i-0b17030c6fc3cbf11 (minikube-instance)



EC2 > Instances > i-0b17030c6fc3cbf11 > Connect to instance

Connect to instance Info

Connect to your instance i-0b17030c6fc3cbf11 (minikube-instance) using any of these options

Instance ID

i-0b17030c6fc3cbf11 (minikube-instance)

Connection Type

● Connect using EC2 Instance Connect
Connect using the EC2 Instance Connect browser-based client, with a public IPv4 address.

○ Connect using EC2 Instance Connect Endpoint
Connect using the EC2 Instance Connect browser-based client, with a private IPv4 address and a VPC endpoint.

Public IP address

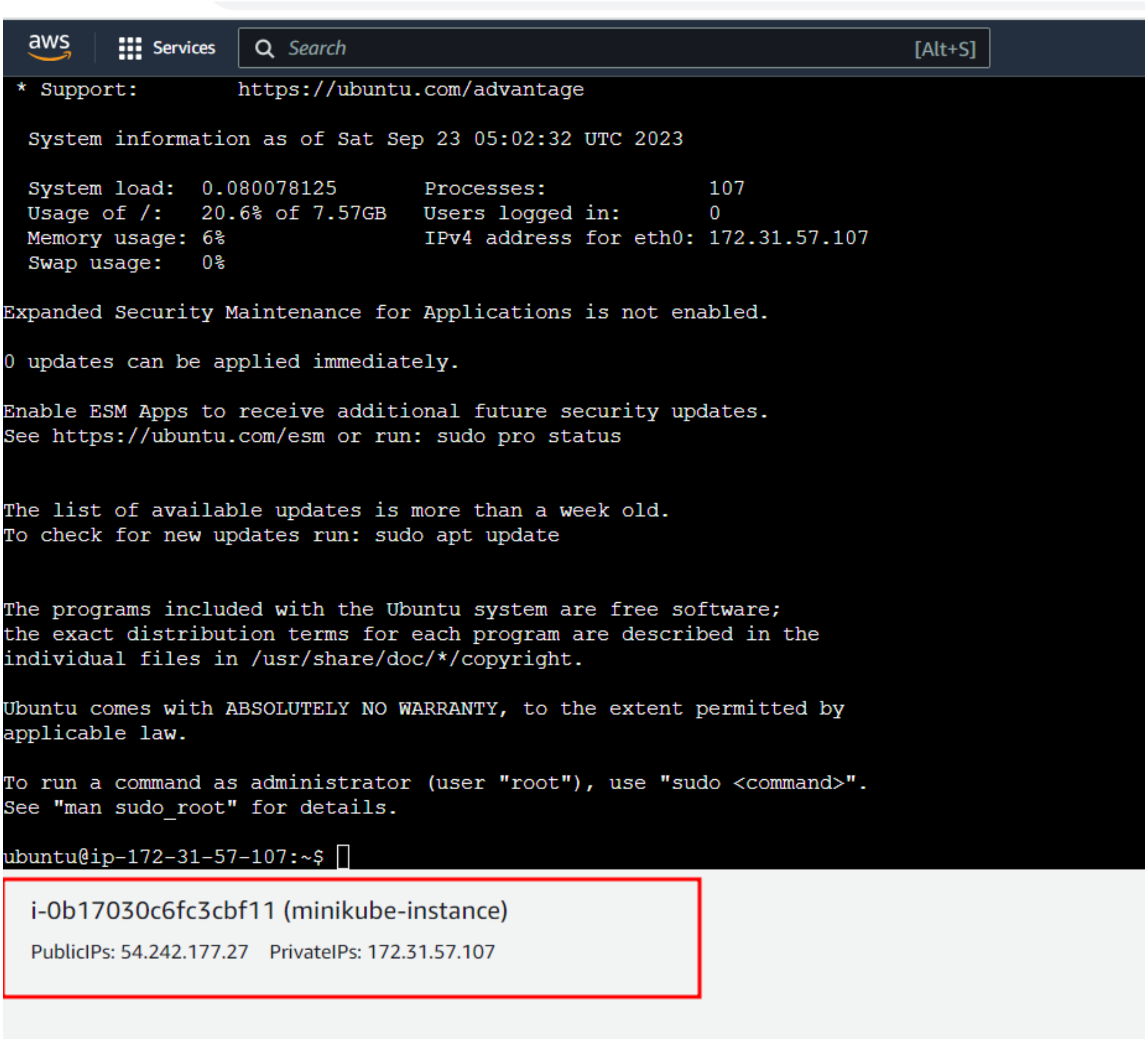
54.242.177.27

User name

Enter the user name defined in the AMI used to launch the instance. If you didn't define a custom user name, use the default user name, ubuntu.

ubuntu

Note: In most cases, the default user name, ubuntu, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name.



```
 * Support:        https://ubuntu.com/advantage

  System information as of Sat Sep 23 05:02:32 UTC 2023

  System load:  0.080078125       Processes:             107
  Usage of /:   20.6% of 7.57GB   Users logged in:       0
  Memory usage: 6%                IPv4 address for eth0: 172.31.57.107
  Swap usage:   0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

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


The list of available updates is more than a week old.
To check for new updates run: sudo apt update


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.

ubuntu@ip-172-31-57-107:~$ 
```

i-0b17030c6fc3cbf11 (minikube-instance)

PublicIPs: 54.242.177.27   PrivateIPs: 172.31.57.107

Installed required software in EC2 instance.

First create the EC2 instance

move to root user

sudo su

root -> curl -s https://packages.cloud.google.com/apt/doc/apt-key.gpg | apt-key add - download

root -> sudo echo deb http://apt.kubernetes.io/ kubernetes-xenial main > /etc/apt/sources.list.d/kubernetes.list

```
root      ->  sudo apt-get update
```

```
root  ->   sudo apt install docker.io kubectl
```

install docker and kubectl

Now check the status of docker

```
root -> sudo systemctl status docker
```

Cntr + C : exit terminal

```
root -> sudo systemctl restart docker
```

```
root - > sudo systemctl stop docker
```

```
root -> sudo systemctl start docker
```

```
root -> sudo systemctl daemon-reload
```

Test the program

```
root -> docker run hello-world
```

To check the kubectl version

```
root -> kubectl version
```

Now we will install docker-compose

```
root --> sudo curl -L "https://github.com/docker/compose/releases/download/v2.20.0/docker-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose
```

```
root -> sudo chmod +x /usr/local/bin/docker-compose
```

install the minikube

```
root -> sudo apt install -y curl wget apt-transport-https
```

```
root -> curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
```

```
root --> sudo install minikube-linux-amd64 /usr/local/bin/minikube
```

```
root --> minikube version
```

```
                                        root --> sudo apt-get install -y conntrack

                                        root --> sudo apt update && sudo apt upgrade
```

now exits from root user using command as

```
root -> exit
```

Then add the docker in user group using the command as

```
ubuntu -> sudo usermod -aG docker $USER && newgrp docker
```

Now check the

ubuntu --> docker images

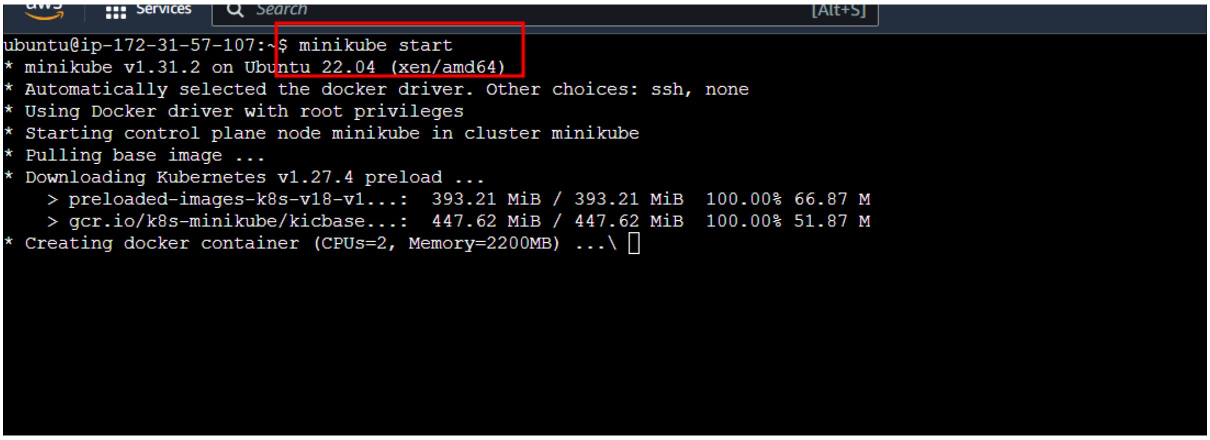
ubuntu --> docker ps

ubuntu --> minikube start

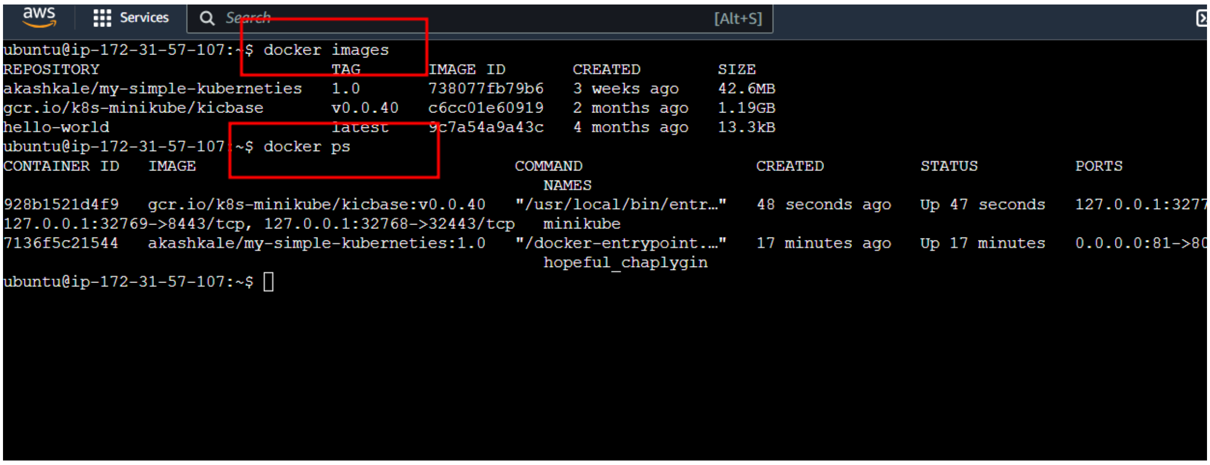
After installed all required software or tool

Then run the command as

minikube start



```
ubuntu@ip-172-31-57-107:~$ minikube start
* minikube v1.31.2 on Ubuntu 22.04 (xen/amd64)
* Automatically selected the docker driver. Other choices: ssh, none
* Using Docker driver with root privileges
* Starting control plane node minikube in cluster minikube
* Pulling base image ...
* Downloading Kubernetes v1.27.4 preload ...
    > preloaded-images-k8s-v18-v1...:  393.21 MiB / 393.21 MiB  100.00% 66.87 M
    > gcr.io/k8s-minikube/kicbase...:  447.62 MiB / 447.62 MiB  100.00% 51.87 M
* Creating docker container (CPUs=2, Memory=2200MB) ...\ 
```



```
ubuntu@ip-172-31-57-107:~$ docker images
REPOSITORY                     TAG       IMAGE ID       CREATED        SIZE
akashkale/my-simple-kuberneties   1.0       738077fb79b6   3 weeks ago    42.6MB
gcr.io/k8s-minikube/kicbase    v0.0.40   c6cc01e60919   2 months ago   1.19GB
hello-world                    latest    9c7a54a9a43c   4 months ago   13.3kB
ubuntu@ip-172-31-57-107:~$ docker ps
CONTAINER ID   IMAGE                                 COMMAND                  CREATED          STATUS          PORTS
                                        NAMES
928b1521d4f9   gcr.io/k8s-minikube/kicbase:v0.0.40   "/usr/local/bin/entr…"   48 seconds ago   Up 47 seconds   127.0.0.1:3277
127.0.0.1:32769->8443/tcp, 127.0.0.1:32768->32443/tcp   minikube
7136f5c21544   akashkale/my-simple-kuberneties:1.0   "/docker-entrypoint.…"   17 minutes ago   Up 17 minutes   0.0.0.0:81->80
                                        hopeful_chaplygin
ubuntu@ip-172-31-57-107:~$ 
```

kubectl cluster-info it provide cluster information ie minikube

we need to create 3 instance

1 master node

kubeadm init

it will provide us token which help to join that cluster

public ip and private ip

2 workder1node and worker2node

Worker node 1

Kubectl join token with IPAddress

Worker node 2

Kubectl join token with IPAddress

kubectl get pods

kubectl get service

kubectl get deployment

kubectl get namespace

```
akashkale/my-simple-kuberneties:1.0
```

```
nginx:latest
```

```
kubectl create deployment my-deploy —-image=akashkale/my-simple-kuberneties:1.0
```

deployment provide meta data for pods

pods are use to run more than one container in Kubernetes cluster

```
kubectl delete deployment deploymentname
```

```
kubectl delete pod podname
```

```
kubectl create deployment my-deploy2 --image=akashkale/my-simple-kuberneties:1.0 --replicas=3
```

we created totally 3 pods using replicas option

this command is use to find details about specific pods.

```
kubectl describe pod my-deploy2-58f6c6545b-lzlr4
```

if we want to expose our pods which is part of cluster we need to use service with type of service.

```
kubectl expose deployment my-deploy1 --name=my-ser1 --type=NodePort --port=80
```

my-demploy1 deployment name

my-ser1 service name

type of serie NodePort

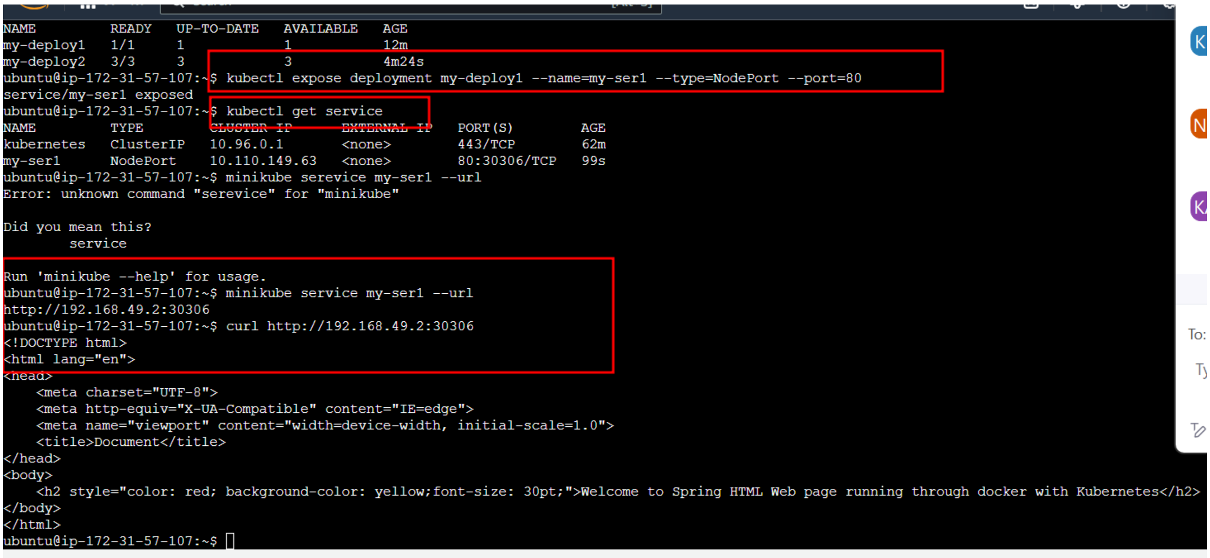
port number of my application 80

```
kubectl get service
```

if type is NodePort we can access that service within a cluster environment.

To check that service IP Address we need to run the command as

```
minikube service servicename --ur
```



```
NAME         READY   UP-TO-DATE   AVAILABLE   AGE
my-deploy1   1/1     1            1           12m
my-deploy2   3/3     3            3           4m24s
ubuntu@ip-172-31-57-107:~$ kubectl expose deployment my-deploy1 --name=my-ser1 --type=NodePort --port=80
service/my-ser1 exposed
ubuntu@ip-172-31-57-107:~$ kubectl get service
NAME         TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)        AGE
kubernetes   ClusterIP   10.96.0.1        <none>        443/TCP        62m
my-ser1      NodePort    10.110.149.63    <none>        80:30306/TCP   99s
ubuntu@ip-172-31-57-107:~$ minikube serevice my-ser1 --url
Error: unknown command "serevice" for "minikube"

Did you mean this?
        service

Run 'minikube --help' for usage.
ubuntu@ip-172-31-57-107:~$ minikube service my-ser1 --url
http://192.168.49.2:30306
ubuntu@ip-172-31-57-107:~$ curl http://192.168.49.2:30306
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>
<body>
    <h2 style="color: red; background-color: yellow;font-size: 30pt;">Welcome to Spring HTML Web page running through docker with Kubernetes</h2>
</body>
</html>
ubuntu@ip-172-31-57-107:~$
```

NodePort we can access service within cluster node ip address ie minikube

ClusterIp we can access that service using cluster Ip Address.

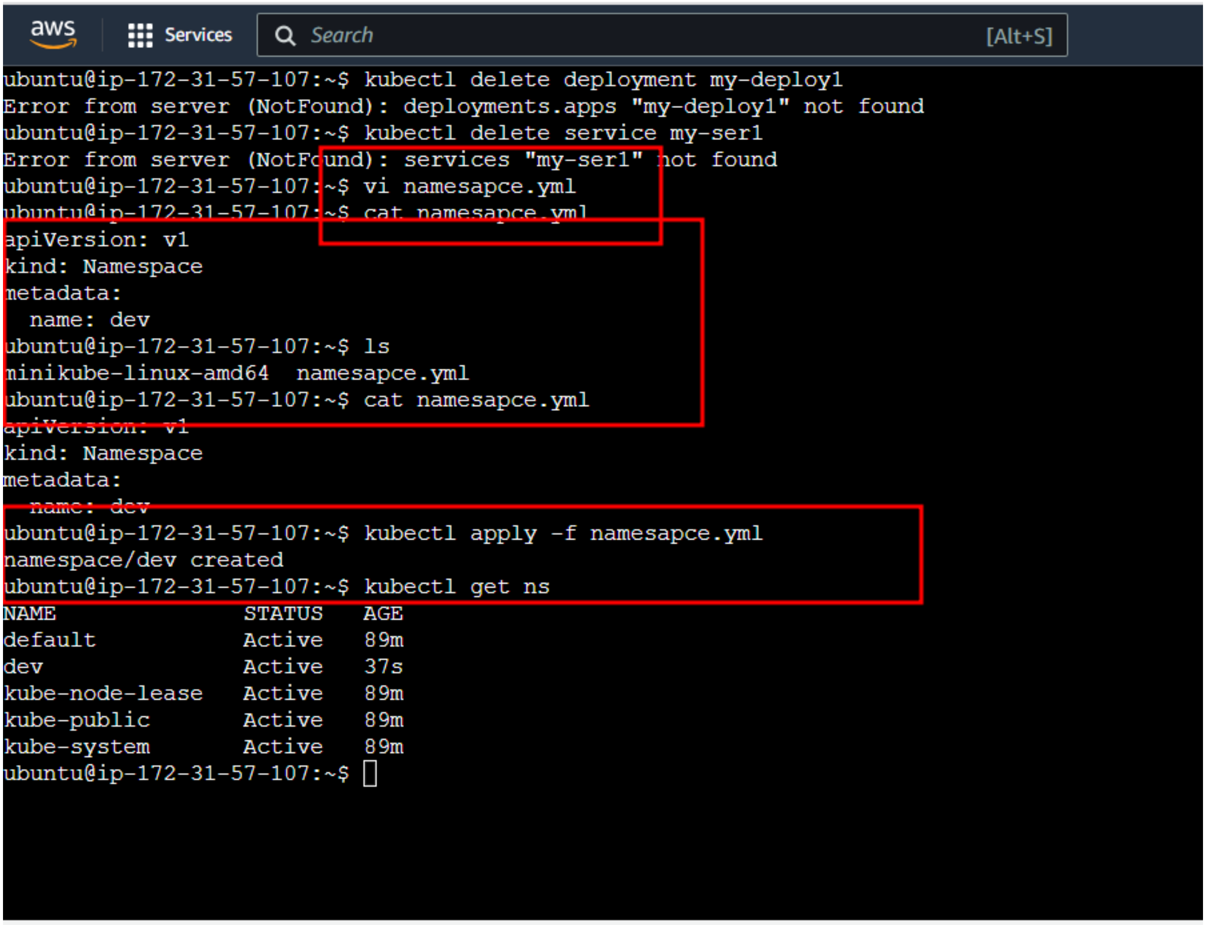
LoadBalancer then we can access that application using external Ip address outside cluster.

Please do clean up activity

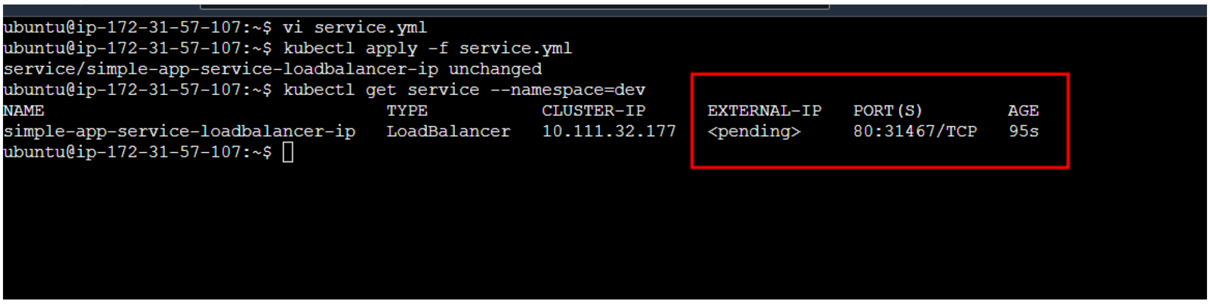
Delete service, deployment

We need to use declarative mode

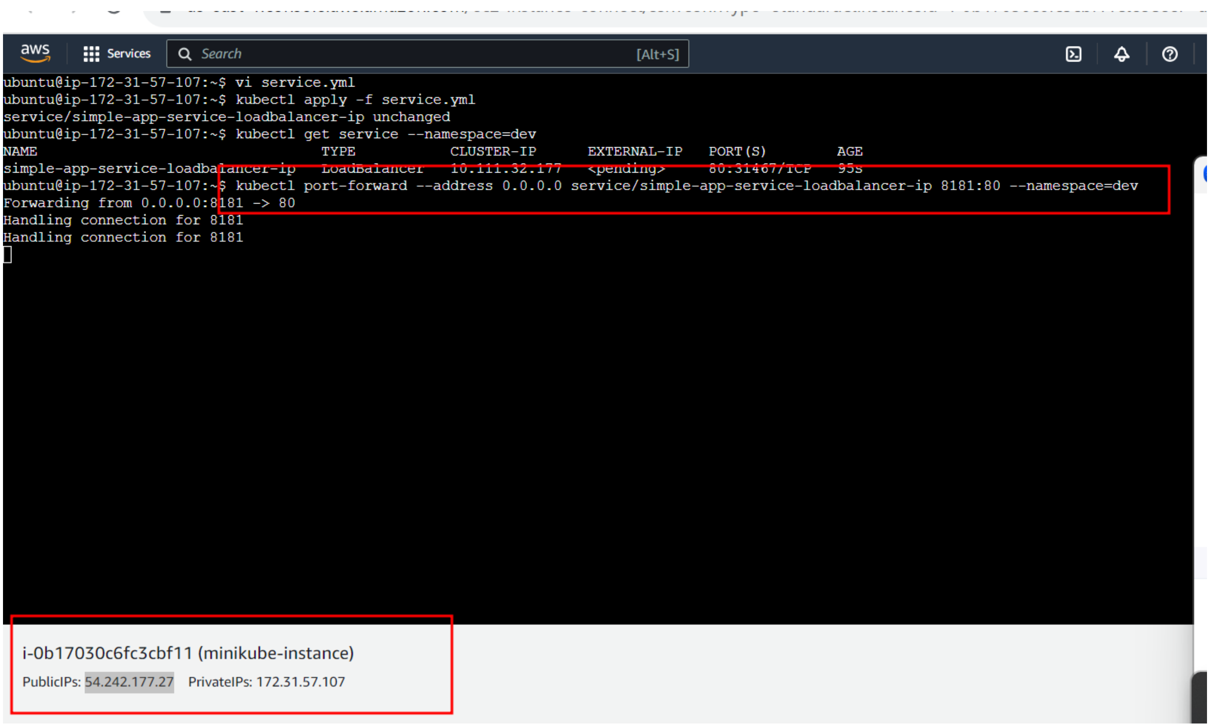
Write all deployment, service, namespace, pods in yml file.



```
ubuntu@ip-172-31-57-107:~$ kubectl delete deployment my-deploy1
Error from server (NotFound): deployments.apps "my-deploy1" not found
ubuntu@ip-172-31-57-107:~$ kubectl delete service my-ser1
Error from server (NotFound): services "my-ser1" not found
ubuntu@ip-172-31-57-107:~$ vi namesapce.yml
ubuntu@ip-172-31-57-107:~$ cat namesapce.yml
apiVersion: v1
kind: Namespace
metadata:
  name: dev
ubuntu@ip-172-31-57-107:~$ ls
minikube-linux-amd64  namesapce.yml
ubuntu@ip-172-31-57-107:~$ cat namesapce.yml
apiVersion: v1
kind: Namespace
metadata:
  name: dev
ubuntu@ip-172-31-57-107:~$ kubectl apply -f namesapce.yml
namespace/dev created
ubuntu@ip-172-31-57-107:~$ kubectl get ns
NAME              STATUS   AGE
default           Active   89m
dev               Active   37s
kube-node-lease   Active   89m
kube-public       Active   89m
kube-system       Active   89m
ubuntu@ip-172-31-57-107:~$ 
```



```
ubuntu@ip-172-31-57-107:~$ vi service.yml
ubuntu@ip-172-31-57-107:~$ kubectl apply -f service.yml
service/simple-app-service-loadbalancer-ip unchanged
ubuntu@ip-172-31-57-107:~$ kubectl get service --namespace=dev
NAME                                 TYPE           CLUSTER-IP      EXTERNAL-IP   PORT(S)        AGE
simple-app-service-loadbalancer-ip   LoadBalancer   10.111.32.177   <pending>     80:31467/TCP   95s
ubuntu@ip-172-31-57-107:~$ 
```

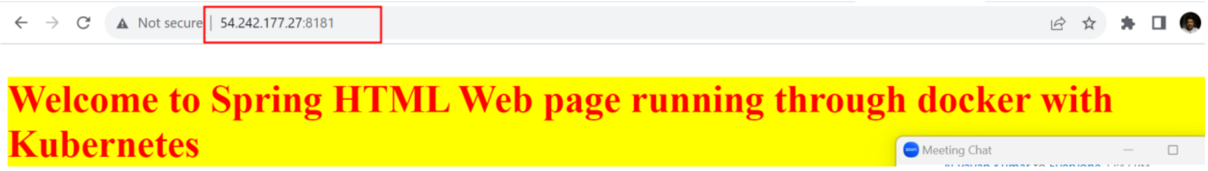


```
ubuntu@ip-172-31-57-107:~$ vi service.yml
ubuntu@ip-172-31-57-107:~$ kubectl apply -f service.yml
service/simple-app-service-loadbalancer-ip unchanged
ubuntu@ip-172-31-57-107:~$ kubectl get service --namespace=dev
NAME                                 TYPE           CLUSTER-IP      EXTERNAL-IP   PORT(S)          AGE
simple-app-service-loadbalancer-ip   LoadBalancer   10.111.32.177   <pending>     80:31467/TCP     95s
ubuntu@ip-172-31-57-107:~$ kubectl port-forward --address 0.0.0.0 service/simple-app-service-loadbalancer-ip 8181:80 --namespace=dev
Forwarding from 0.0.0.0:8181 -> 80
Handling connection for 8181
Handling connection for 8181
```

i-0b17030c6fc3cbf11 (minikube-instance)

PublicIPs: 54.242.177.27   PrivateIPs: 172.31.57.107

Now open your application with ec2 instance Ip Address with expose port number



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https://github.com/Kaleakash/kuberentes_yml_files