Build And Deploy a grid for Chrome and Firefox based testing

Step 1: Launch AWS EC2 Instance:-

Go to AWS EC2 Console.

Launch a new instance with the following settings:

-Name: SeleniumGridServer

- Amazon Machine Image: Ubuntu Server 22.04 LTS (Free Tier)

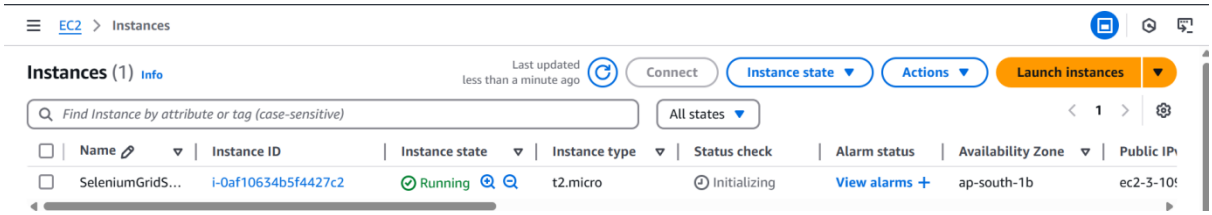
- Instance Type: t2.micro

- Key Pair: Create New Key Pair or select one

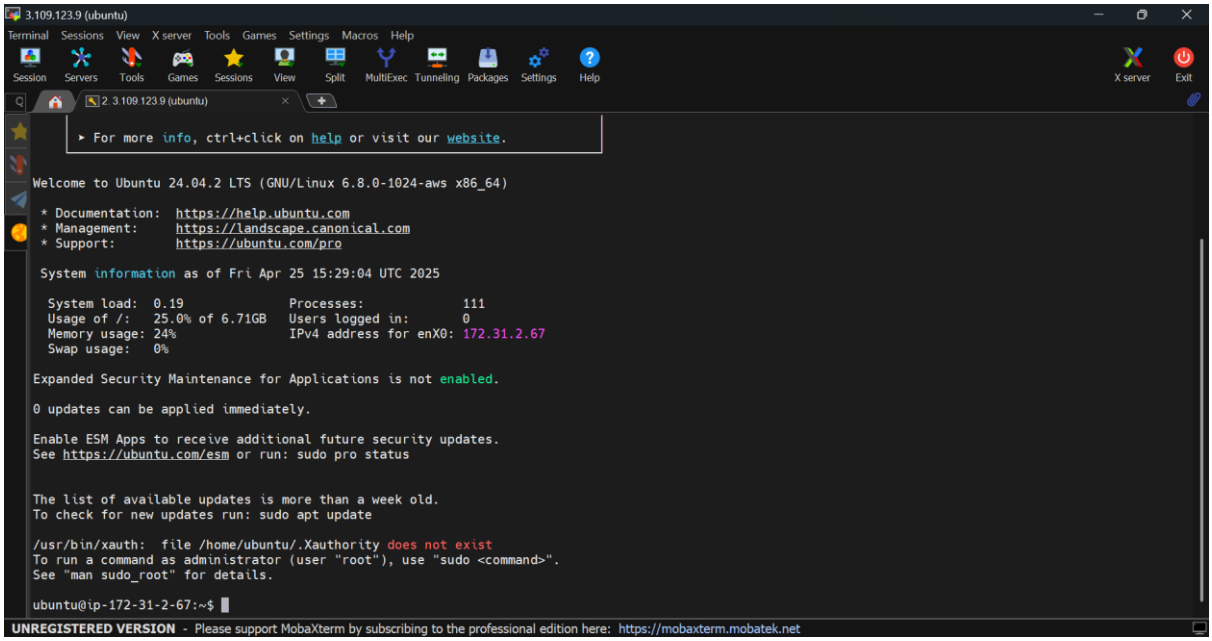
- Add Security Group Rule:

    1)SSH (default)

    2)Custom TCP (port:4444,Sourcetype:Anywhere)



Step 2: Connect to EC2 Instance via Mobaxtream:-



Step 3: Install Docker and Docker Compose:-

1. sudo apt update

```
ubuntu@ip-172-31-2-67:~$ sudo apt update
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [
126 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
 [126 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Pack
ages [15.0 MB]
Get:5 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:6 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translatio
n-en [5982 kB]
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Comp
onents [3871 kB]
Get:8 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 c-n-
f Metadata [301 kB]
Get:9 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Pa
ckages [269 kB]
Get:10 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Transla
tion-en [118 kB]
Get:11 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 C
omponents [35.0 kB]
Get:12 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 c
```

To Install Docker

2. sudo apt install -y docker.io

```
ubuntu@ip-172-31-2-67:~$ sudo apt install -y docker.io
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base pigz runc ubuntu-fan
Suggested packages:
  ifupdown aufs-tools cgroupfs-mount | cgroup-lite debootstrap docker-buildx
  docker-compose-v2 docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base docker.io pigz runc
  ubuntu-fan
0 upgraded, 8 newly installed, 0 to remove and 68 not upgraded.
Need to get 78.6 MB of archives.
After this operation, 302 MB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 pigz
 amd64 2.8-1 [65.6 kB]
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 bridge-u
tils amd64 1.7.1-1ubuntu2 [33.9 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64
runc amd64 1.1.12-0ubuntu3.1 [8599 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64
containerd amd64 1.7.24-0ubuntu1~24.04.2 [37.0 MB]
Get:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64
dns-root-data all 2024071801~ubuntu0.24.04.1 [5918 B]
Get:6 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 dnsmasq-
base amd64 2.90-2build2 [375 kB]
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe am
d64 docker.io amd64 26.1.3-0ubuntu1~24.04.1 [32.4 MB]
Get:8 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 ubun
tu-fan all 0.12.16 [35.2 kB]
```

To start and enable Docker

3. sudo systemctl start docker
4. sudo systemctl enable docker

To Install Docker Compose

5. sudo curl -L "https://github.com/docker/compose/releases/download/v2.17.3/docker-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose

```
ubuntu@ip-172-31-2-67:~$ sudo curl -L "https://github.com/docker/compose/releas
es/download/v2.17.3/docker-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/d
ocker-compose
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
  0     0    0     0    0     0      0      0 --:--:-- --:--:-- --:--:--     0
100 51.9M  100 51.9M    0     0  8479k      0  0:00:06  0:00:06 --:--:-- 10.7M
ubuntu@ip-172-31-2-67:~$
```

6. sudo chmod +x /usr/local/bin/docker-compose
   To Check versions
7. docker –version

```
ubuntu@ip-172-31-2-67:~$ docker --version
Docker version 26.1.3, build 26.1.3-0ubuntu1~24.04.1
ubuntu@ip-172-31-2-67:~$
```

8. docker-compose –version

```
ubuntu@ip-172-31-2-67:~$ sudo docker-compose --version
Docker Compose version v2.17.3
ubuntu@ip-172-31-2-67:~$
```

Step 4: Create Selenium Grid with Docker Compose:-

1. mkdir selenium-grid && cd selenium-grid
2. nano docker-compose.yml
   Paste this code:

```
version: "3"
services:
 selenium-hub:
   image: selenium/hub:4.0.0-rc-2-20210930
   container_name: seleniumHub
   ports:
    - "4444:4444"
 chrome:
   image: selenium/node-chrome:4.0.0-rc-2-20210930
   container_name: chromeNode
   depends_on:
    - selenium-hub
   environment:
    - SE_EVENT_BUS_HOST=selenium-hub
    - SE_EVENT_BUS_PUBLISH_PORT=4442
    - SE_EVENT_BUS_SUBSCRIBE_PORT=4443
   shm_size: 2g

 firefox:
   image: selenium/node-firefox:4.0.0-rc-2-20210930
   container_name: firefoxNode
   depends_on:
    - selenium-hub
   environment:
    - SE_EVENT_BUS_HOST=selenium-hub
    - SE_EVENT_BUS_PUBLISH_PORT=4442
    - SE_EVENT_BUS_SUBSCRIBE_PORT=4443
   shm_size: 2g
```

Save (Ctrl + O, Enter), then exit (Ctrl + X)

Step 5: Start the Selenium Grid:-

To Run the grid:

```
sudo docker-compose up -d
```

```
ubuntu@ip-172-31-2-67:~/selenium-grid$ sudo docker-compose up -d
[+] Running 37/3
 ✔ firefox 17 layers [####################]      0B/0B      Pulled          29.2s
 ✔ selenium-hub 12 layers [###############]      0B/0B      Pulled          11.9s
 ✔ chrome 5 layers [######]      0B/0B      Pulled                          33.0s
[+] Running 4/4
 ✔ Network selenium-grid_default  Crea...                                    0.1s
 ✔ Container seleniumHub          Started                                    1.2s
 ✔ Container chromeNode           Started                                    1.8s
 ✔ Container firefoxNode          Started                                    1.8s
ubuntu@ip-172-31-2-67:~/selenium-grid$
```

To Check containers:

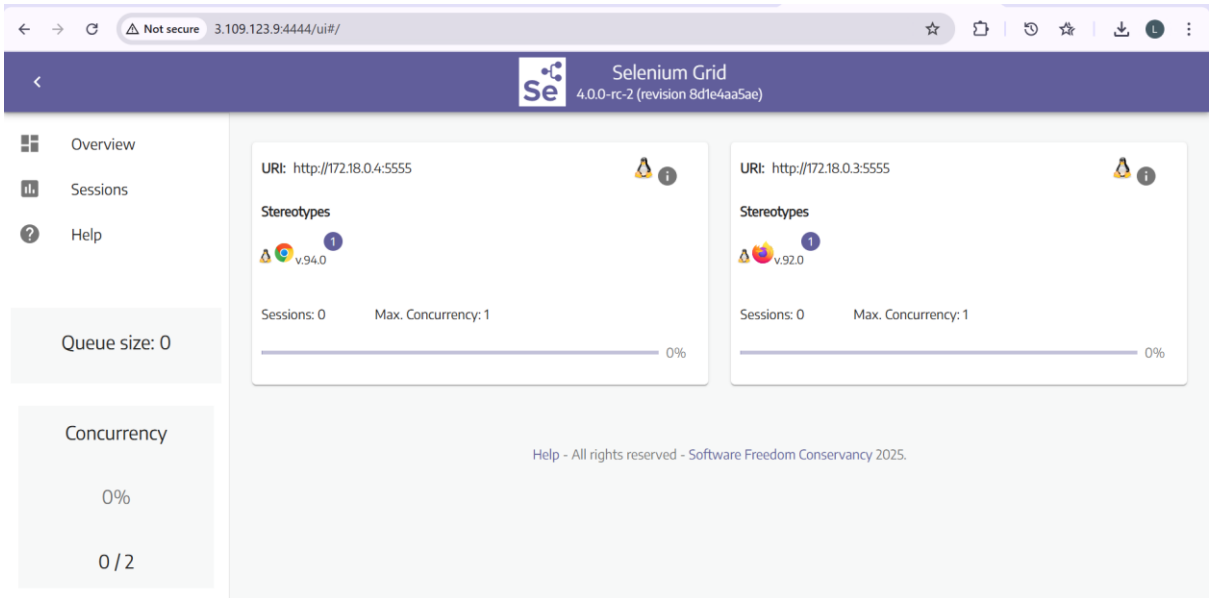
sudo docker ps

```
ubuntu@ip-172-31-2-67:~/selenium-grid$ sudo docker ps
CONTAINER ID   IMAGE                                              COMMAND
     CREATED          STATUS          PORTS
                NAMES
75ae2ee9df58   selenium/node-firefox:4.0.0-rc-2-20210930   "/opt/bin/entry_poin
…"   28 seconds ago   Up 26 seconds   5900/tcp
                firefoxNode
7d1dd507c1fd   selenium/node-chrome:4.0.0-rc-2-20210930    "/opt/bin/entry_poin
…"   28 seconds ago   Up 26 seconds   5900/tcp
                chromeNode
eb0cb7be7006   selenium/hub:4.0.0-rc-2-20210930            "/opt/bin/entry_poin
…"   29 seconds ago   Up 27 seconds   4442-4443/tcp, 0.0.0.0:4444->4444/tcp, ::
:4444->4444/tcp   seleniumHub
ubuntu@ip-172-31-2-67:~/selenium-grid$
```

Step 6: Access Selenium Grid UI:-

Open in your browser:

http://<Your-EC2-Public-IP>:4444/ui



Step 7: Run a Sample Python Test:-
Create a Virtual Environment:

Install Python and Selenium:

sudo apt install python3-venv python3-full -y

```
ubuntu@ip-172-31-2-67:~/selenium-grid$ sudo apt install python3-venv python3-fu
ll -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  2to3 blt fontconfig-config fonts-dejavu-core fonts-dejavu-mono
  fonts-mathjax idle idle-python3.12 javascript-common libfontconfig1
  libjs-jquery libjs-mathjax libjs-underscore libpython3.12-testsuite
  libtk8.6 libxft2 libxrender1 libxss1 net-tools python3-doc python3-examples
  python3-lib2to3 python3-pip-whl python3-setuptools-whl python3-tk
  python3.12-doc python3.12-examples python3.12-full python3.12-venv
  tk8.6-blt2.5 x11-common
Suggested packages:
  blt-demo apache2 | lighttpd | httpd fonts-mathjax-extras fonts-stix
  libjs-mathjax-doc tk8.6 python3-dev tix python3-tk-dbg python3.12-dev
The following NEW packages will be installed:
  2to3 blt fontconfig-config fonts-dejavu-core fonts-dejavu-mono
  fonts-mathjax idle idle-python3.12 javascript-common libfontconfig1
  libjs-jquery libjs-mathjax libjs-underscore libpython3.12-testsuite
  libtk8.6 libxft2 libxrender1 libxss1 net-tools python3-doc python3-examples
  python3-full python3-lib2to3 python3-pip-whl python3-setuptools-whl
  python3-tk python3-venv python3.12-doc python3.12-examples python3.12-full
  python3.12-venv tk8.6-blt2.5 x11-common
0 upgraded, 33 newly installed, 0 to remove and 68 not upgraded.
Need to get 32.1 MB of archives.
After this operation, 163 MB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 pyth
```

python3 -m venv venv

source venv/bin/activate
pip install selenium
nano test_grid.py

Paste below code:

```
from selenium import webdriver

from selenium.webdriver.common.by import By

browser = "chrome"

GRID_URL = "http://localhost:4444/wd/hub"

options = None

if browser == "chrome":

    options = webdriver.ChromeOptions()

elif browser == "firefox":

    options = webdriver.FirefoxOptions()

else:

    raise Exception("Unsupported browser!")

driver = webdriver.Remote(

command_executor=GRID_URL,

    options=options
```

```
)
driver.get("https://www.google.com")
print("Title:", driver.title)
driver.quit()
```

Save (Ctrl + O, Enter), then exit (Ctrl + X)

```
python3 test_grid.py
```