Automated Cloud-Based Testing for Mobile Application Amazon Using Appium

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Introduction

- This is the project report for the Project 1: **To Improve the Automated Cloud-Based Testing for Mobile Application Amazon Using Appium** for "Learn Mobile Automation and Cloud Testing" course of Simplilearn.
- Project submitted by : Krishnaveni Rajan
- Email Id: krishnaveni07.rajan@gmail.com
- Submission Date: 05-November-2021
- Language/Tools Used : Java, TestNg, Android Studio, Appium, Eclipse, AWS, Docker
- CI/CD : GitHub, Jenkins, Maven

Problem Statement

Amazon Web Services (abbreviated AWS) is a collection of remote computing services (also called web services) that together make a cloud computing platform, offered over the Internet by Amazon for an infrastructure. Let's consider the Amazon application which uses Devops tools like (Jenkins/Appium/Docker) for improved automated testing infrastructure, continuous integration, continuous deployment, and continuous delivery.

Requirements Detail

1. Create Maven project for the Swiggy application. (https://www.swiggy.com/)
2. Write an Appium script.
3. Create an AWS account in console.
4. Set up user/policies in IAM to perform actions with respect to service.
5. Set up SSH and the user should be able to connect the ec2 machine from their local (Mac/Linux).
6. Create an IAM user that can perform to create EC2 instance, S3 bucket, creating EBS volume, and mounting in AWS console.
7. Set up Jenkins server by installing Jenkins in ec2 and by installing required plugins like Docker/Selenium in Jenkins.
8. Set up Docker for containerizing your application on Docker.
9. Create a CI/CD pipeline in Jenkins with Appium test cases and containerizing the application using Docker.

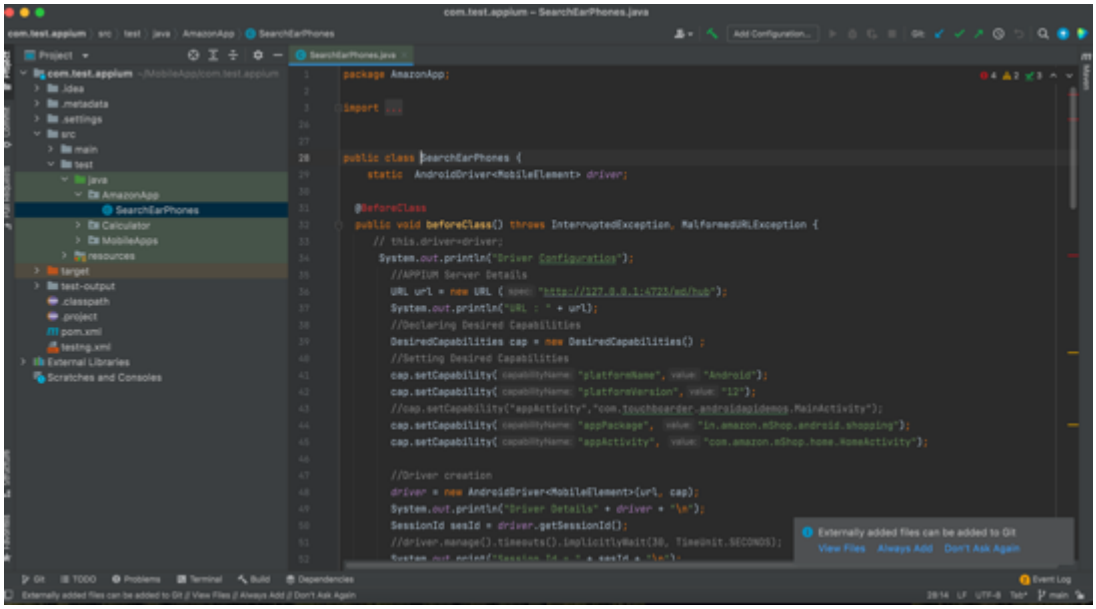
Solution

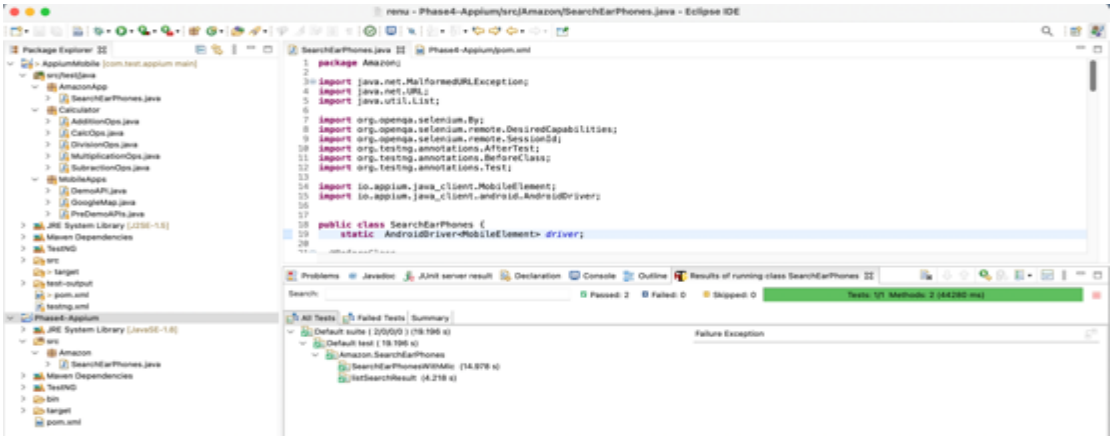
- Amazon mobile application to find the ‘Earphones with microphones’ scenario is taken for automation.
    - Simulated mobile of Android 12 version was created using Android Studio
    - Device was added with desired capability on the Appium
    - Elements were identified using XPath, ID on the Appium Inspector
    - Details collected for the Amazon mobile application is automated using TestNg, Android Driver and the same is pushed to GitHub @ https://github.com/krajan07/Phase4-Appium.git

- On the AWS Console Management a new user named ‘krishna’ was created with policy to create instance, add volume, S3 bucket.
    - IAM was used for the User and Group creation
    - Login in to the AWS as ‘krishna’ user a new instance of Amazon Linux instance was created
    - S3 bucket was created
    - A new volume was created to match the region of the instance that was created.
    - Volume was added and removed from the instance using krishna user in AWS Console
- Amazon Linux instance created on AWS was connected from the MAC laptop using the .pem key
    - The volume added was mounted, assigned and new directory was created
    - Later the volume was unmounted before removing from AWS console
    - Docker was installed on this instance
    - On the docker, Appium and Jenkins containers were created.
- The code committed on the GitHub was created as a job on the Jenkins container running on the AWS.
- Build was triggered and built successfully.

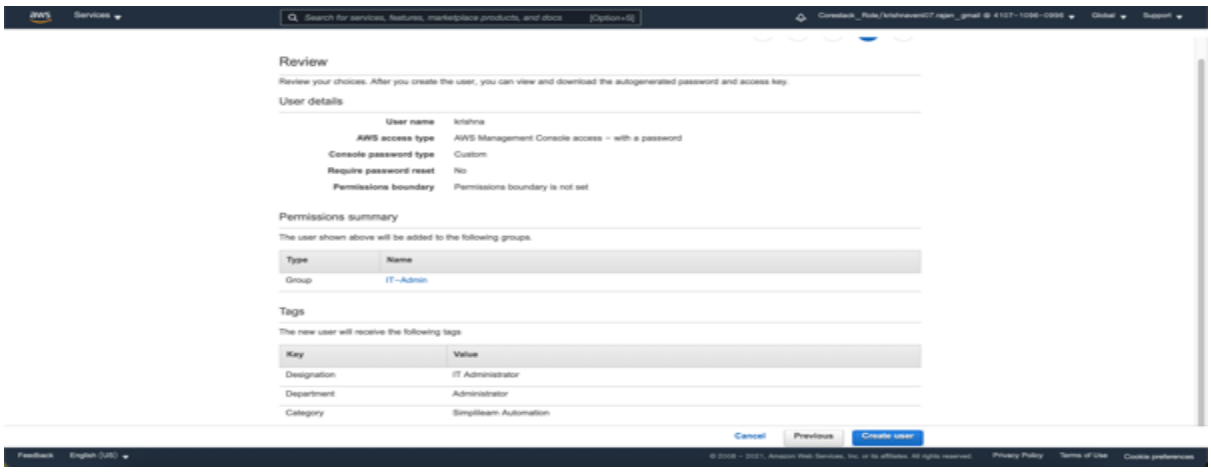
Snapshots

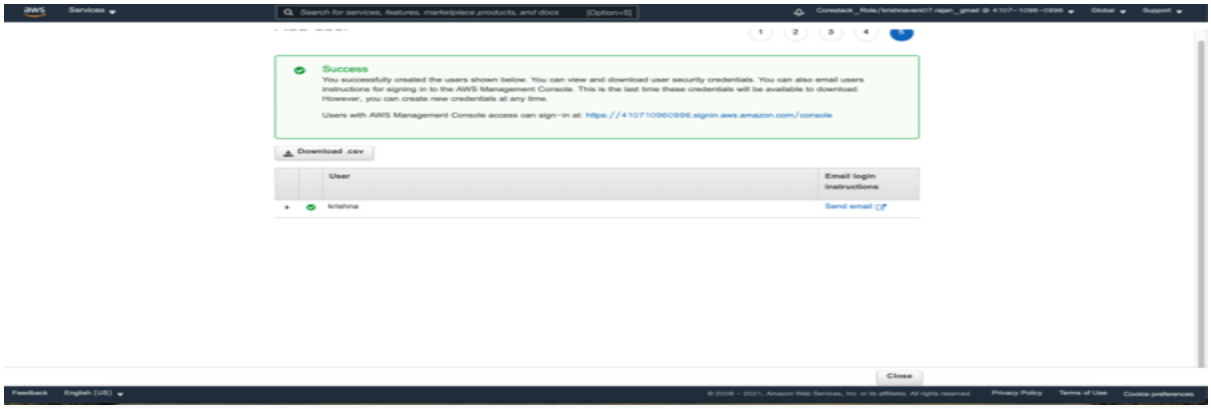
Appium-TestNg Code on Eclipse

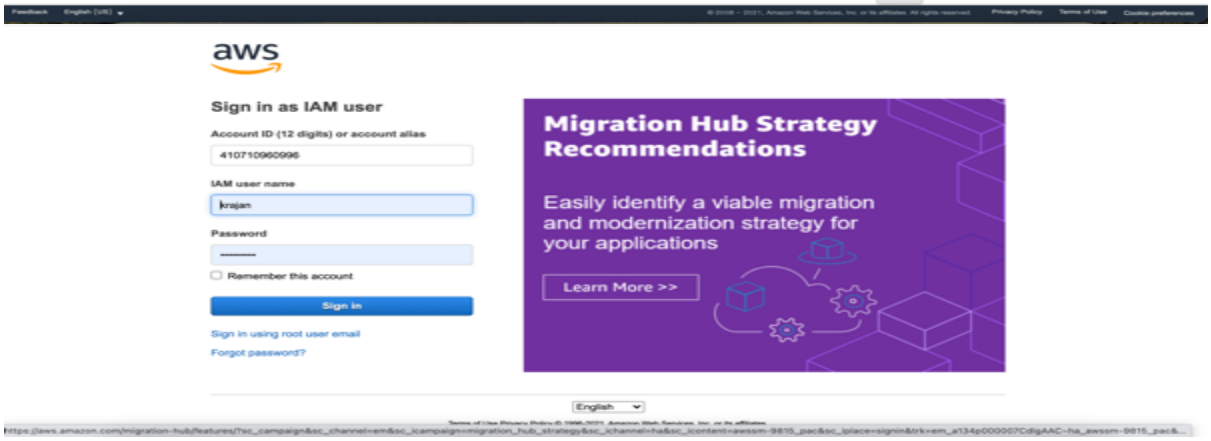


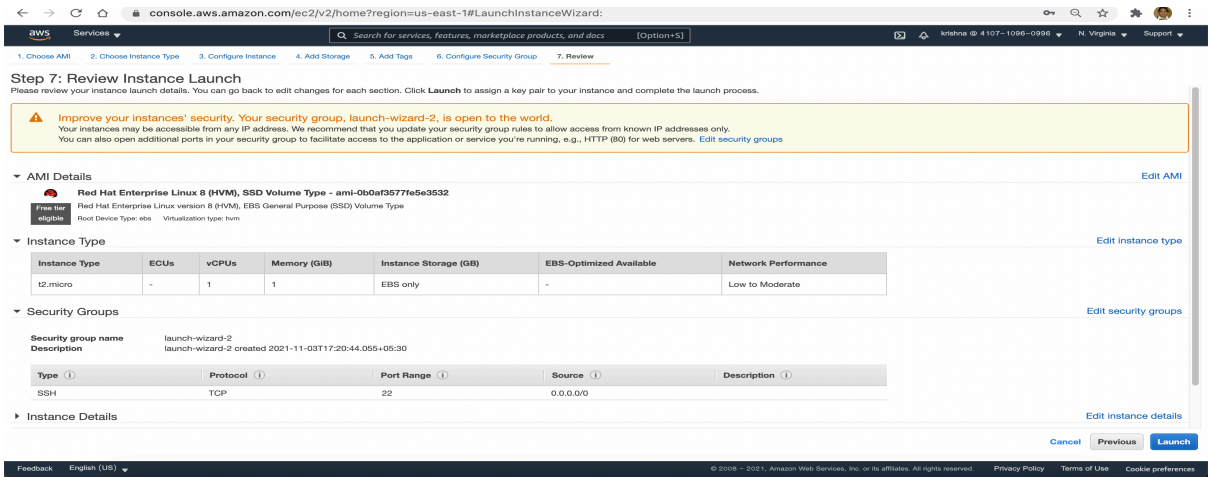


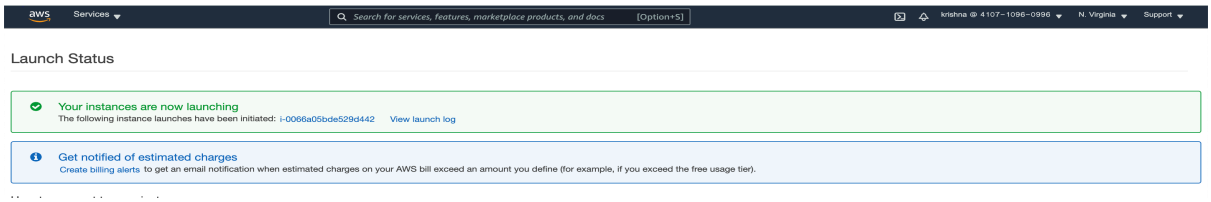
AWS Activities – Instance Creation, IAM, S3, Volume

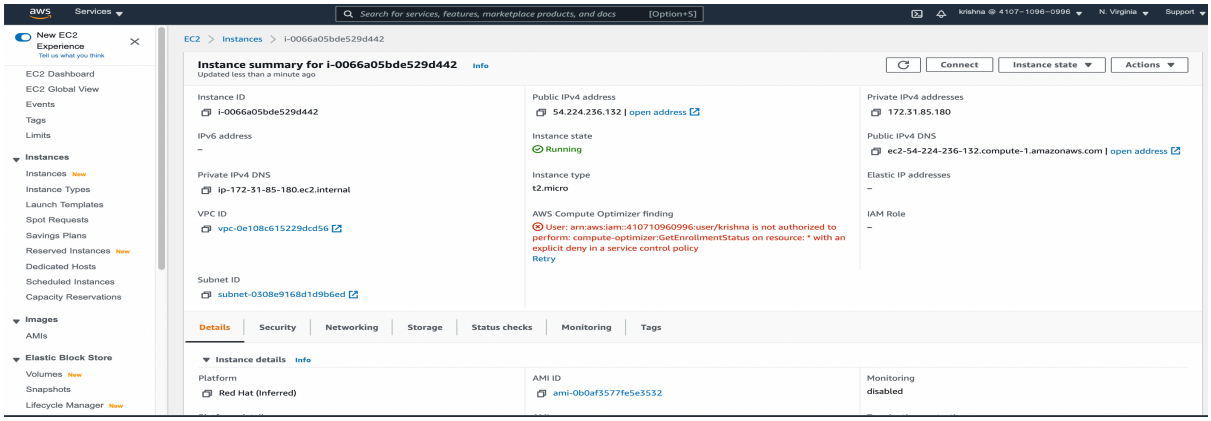



Success
You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.
Users with AWS Management Console access can sign-in at: https://410710960996.signin.aws.amazon.com/console
Download .csv
User
Email login instructions
krishna
Send email
Close

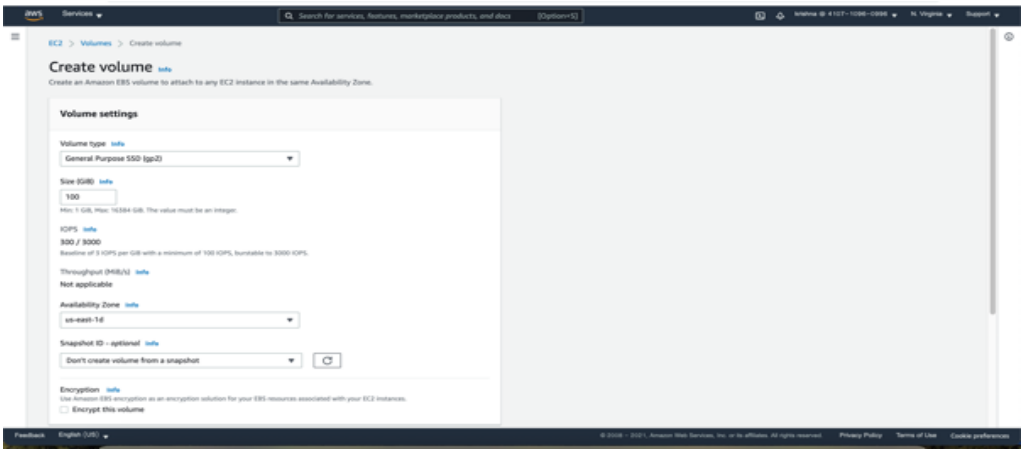

aws
Sign in as IAM user
Account ID (12 digits) or account alias
410710960996
IAM user name
krajan
Password
Remember this account
Sign in
Sign in using root user email
Forgot password?
Migration Hub Strategy Recommendations
Easily identify a viable migration and modernization strategy for your applications
Learn More >>
English

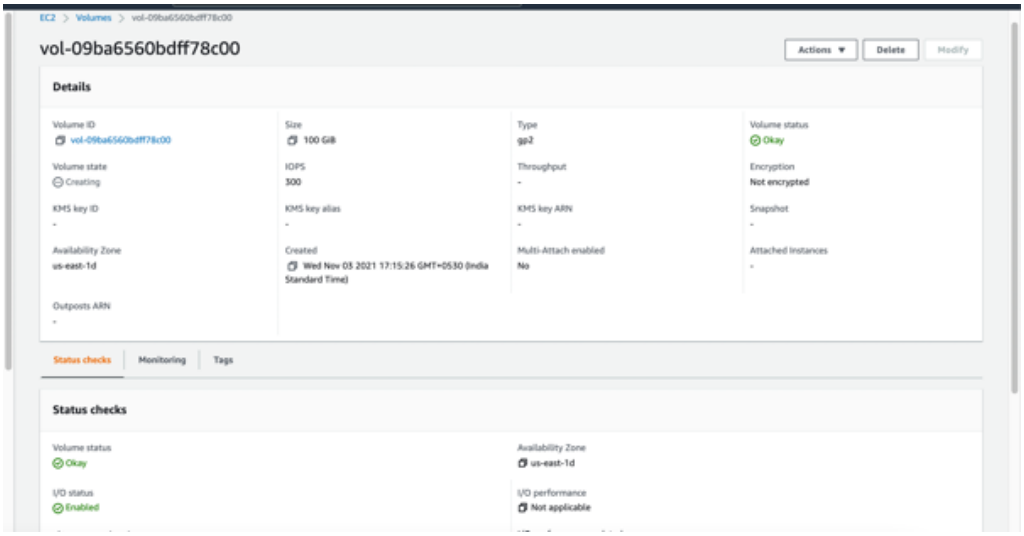

console.aws.amazon.com/ec2/v2/home?region=us-east-1#LaunchInstanceWizard:
Services
Search for services, features, marketplace products, and docs [Option+S]
krishna @ 4107-1096-0996
N. Virginia
Support
1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Add Tags
6. Configure Security Group
7. Review
Step 7: Review Instance Launch
Please review your instance launch details. You can go back to edit changes for each section. Click Launch to assign a key pair to your instance and complete the launch process.
Improve your instances' security. Your security group, launch-wizard-2, is open to the world.
Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.
You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. Edit security groups
AMI Details
Edit AMI
Red Hat Enterprise Linux 8 (HVM), SSD Volume Type - ami-0b0af3577fe5e3532
Free tier eligible
Red Hat Enterprise Linux version 8 (HVM), EBS General Purpose (SSD) Volume Type
Root Device Type: ebs Virtualization type: hvm
Instance Type
Edit instance type
Instance Type | ECUs | vCPUs | Memory (GiB) | Instance Storage (GB) | EBS-Optimized Available | Network Performance
t2.micro | - | 1 | 1 | EBS only | - | Low to Moderate
Security Groups
Edit security groups
Security group name launch-wizard-2
Description launch-wizard-2 created 2021-11-03T17:20:44.055+05:30
Type | Protocol | Port Range | Source | Description
SSH | TCP | 22 | 0.0.0.0/0
Instance Details
Edit instance details
Cancel
Previous
Launch
Feedback
English (US)
© 2008 - 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.
Privacy Policy
Terms of Use
Cookie preferences

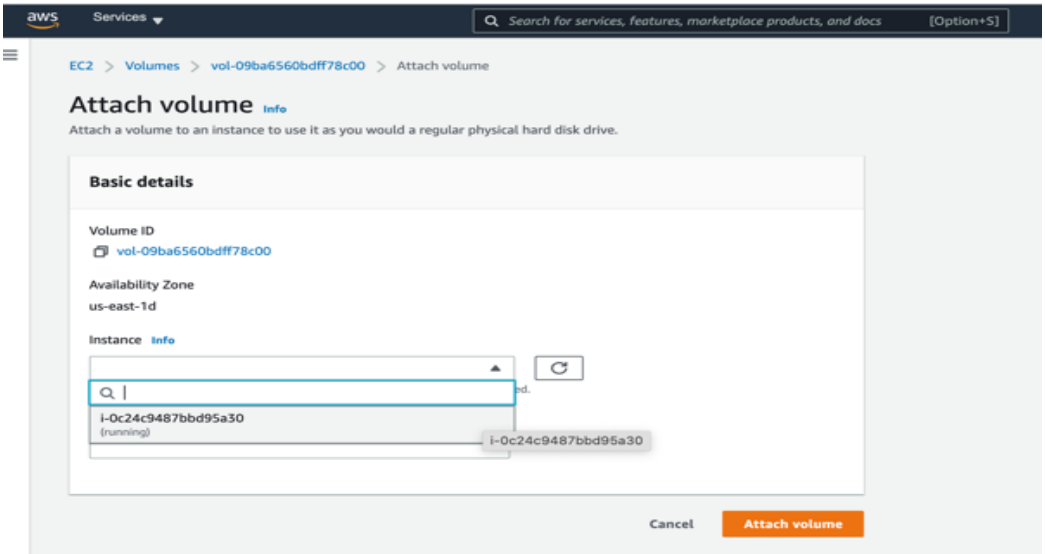

Services
Search for services, features, marketplace products, and docs [Option+S]
krishna @ 4107-1096-0996
N. Virginia
Support
Launch Status
Your instances are now launching
The following instance launches have been initiated: i-0068a05bde529d442 View launch log
Get notified of estimated charges
Create billing alerts to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).

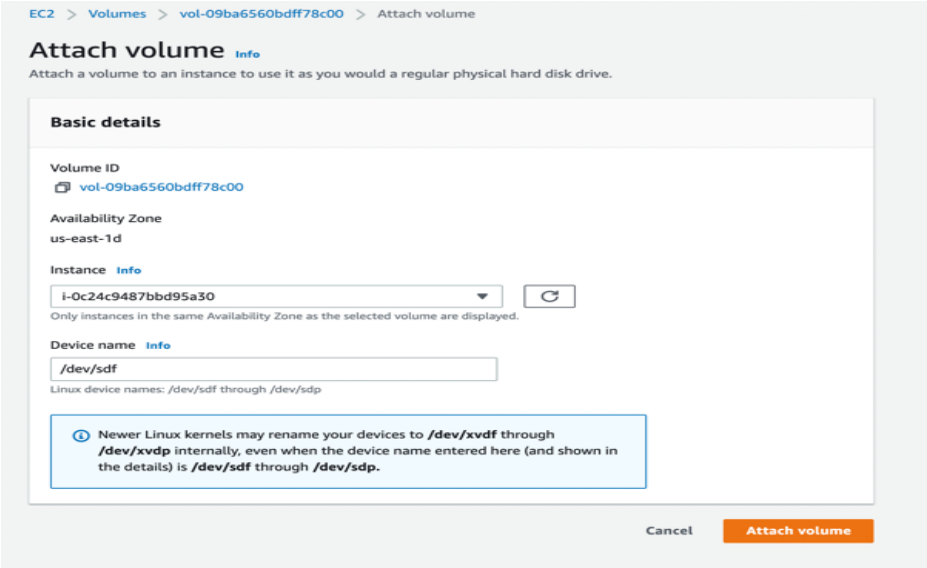

Instance summary for i-0066a05bde529d442
Instance ID
i-0066a05bde529d442
Public IPv4 address
54.224.236.132 | open address
Private IPv4 addresses
172.31.85.180
IPv6 address
–
Instance state
Running
Public IPv4 DNS
ec2-54-224-236-132.compute-1.amazonaws.com | open address
Private IPv4 DNS
ip-172-31-85-180.ec2.internal
Instance type
t2.micro
Elastic IP addresses
–
VPC ID
vpc-0e108c615229dcd56
AWS Compute Optimizer finding
IAM Role
–
Subnet ID
subnet-0308e9168d1d9b6ed
Details
Security
Networking
Storage
Status checks
Monitoring
Tags
Platform
Red Hat (Inferred)
AMI ID
ami-0b0af3577fe5e3532
Monitoring
disabled

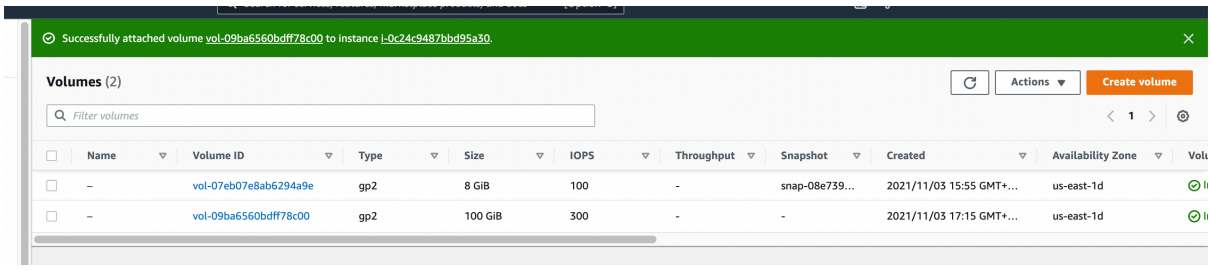

EC2 Management Console
Volumes (1)
Actions
Create volume
Name
Volume ID
Type
Size
IOPS
Throughput
Snapshot
Created
Availability Zone

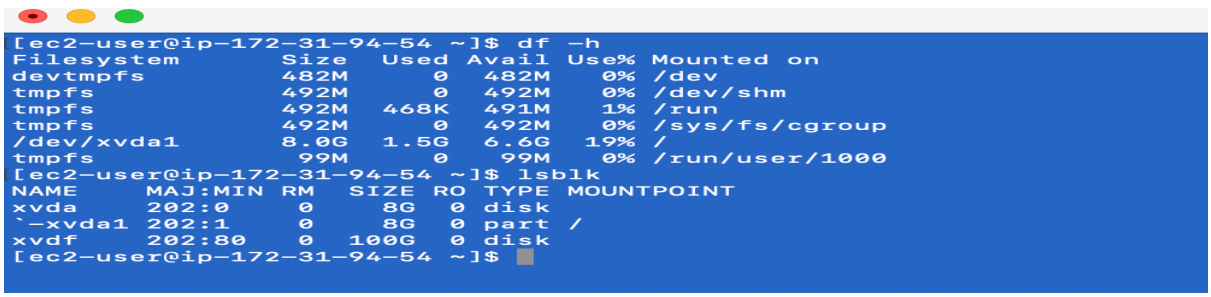

Create volume
Volume settings
Volume type
General Purpose SSD (gp2)
Size (GiB)
100
IOPS
300 / 3000
Throughput (MiB/s)
Not applicable
Availability Zone
us-east-1d
Snapshot ID - optional
Don't create volume from a snapshot
Encryption
Encrypt this volume


vol-09ba6560bdff78c00
Actions
Delete
Modify
Details
Volume ID
Size
100 GiB
Type
gp2
Volume status
Okay
Volume state
Creating
IOPS
300
Throughput
Encryption
Not encrypted
KMS key ID
KMS key alias
KMS key ARN
Snapshot
Availability Zone
us-east-1d
Created
Wed Nov 03 2021 17:15:26 GMT+0530 (India Standard Time)
Multi-Attach enabled
No
Attached Instances
Outposts ARN
Status checks
Monitoring
Tags
Status checks
Volume status
Okay
Availability Zone
us-east-1d
I/O status
Enabled
I/O performance
Not applicable

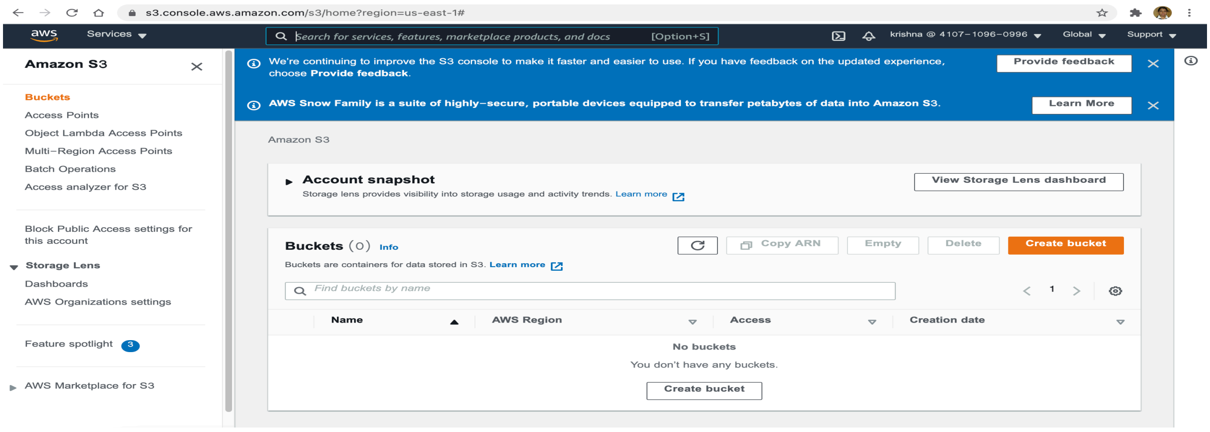

aws
Services
Search for services, features, marketplace products, and docs
[Option+S]
EC2 > Volumes > vol-09ba6560bdff78c00 > Attach volume
Attach volume Info
Attach a volume to an instance to use it as you would a regular physical hard disk drive.
Basic details
Volume ID
vol-09ba6560bdff78c00
Availability Zone
us-east-1d
Instance Info
i-0c24c9487bbd95a30
(running)
i-0c24c9487bbd95a30
Cancel
Attach volume

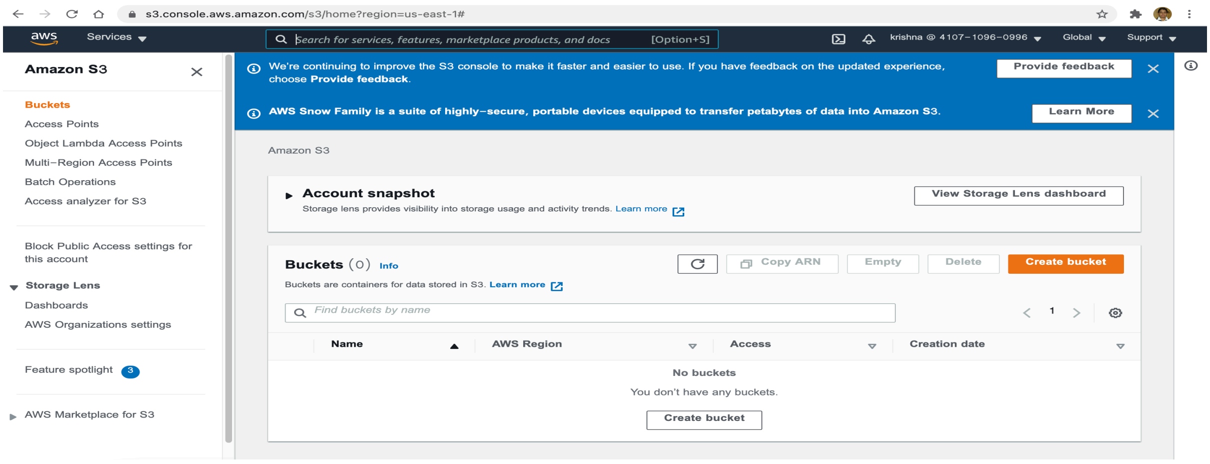

EC2 > Volumes > vol-09ba6560bdff78c00 > Attach volume
Attach volume Info
Attach a volume to an instance to use it as you would a regular physical hard disk drive.
Basic details
Volume ID
vol-09ba6560bdff78c00
Availability Zone
us-east-1d
Instance Info
i-0c24c9487bbd95a30
Only instances in the same Availability Zone as the selected volume are displayed.
Device name Info
/dev/sdf
Linux device names: /dev/sdf through /dev/sdp
Newer Linux kernels may rename your devices to /dev/xvdf through /dev/xvdp internally, even when the device name entered here (and shown in the details) is /dev/sdf through /dev/sdp.
Cancel
Attach volume

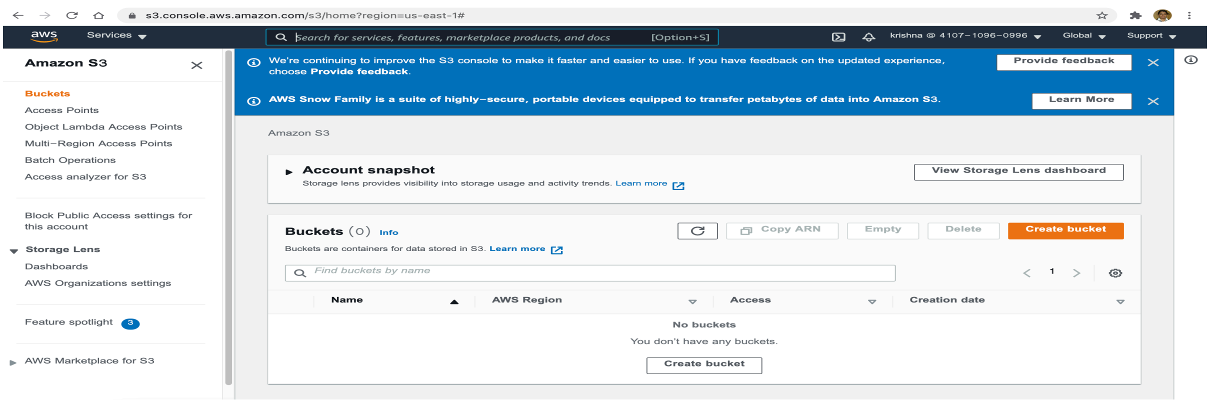

Successfully attached volume vol-09ba6560bdff78c00 to instance i-0c24c9487bbd95a30.
Volumes (2)
Actions
Create volume
Filter volumes
Name
Volume ID
Type
Size
IOPS
Throughput
Snapshot
Created
Availability Zone
vol-07eb07e8ab6294a9e
gp2
8 GiB
100
snap-08e739...
2021/11/03 15:55 GMT+...
us-east-1d
vol-09ba6560bdff78c00
gp2
100 GiB
300
2021/11/03 17:15 GMT+...
us-east-1d

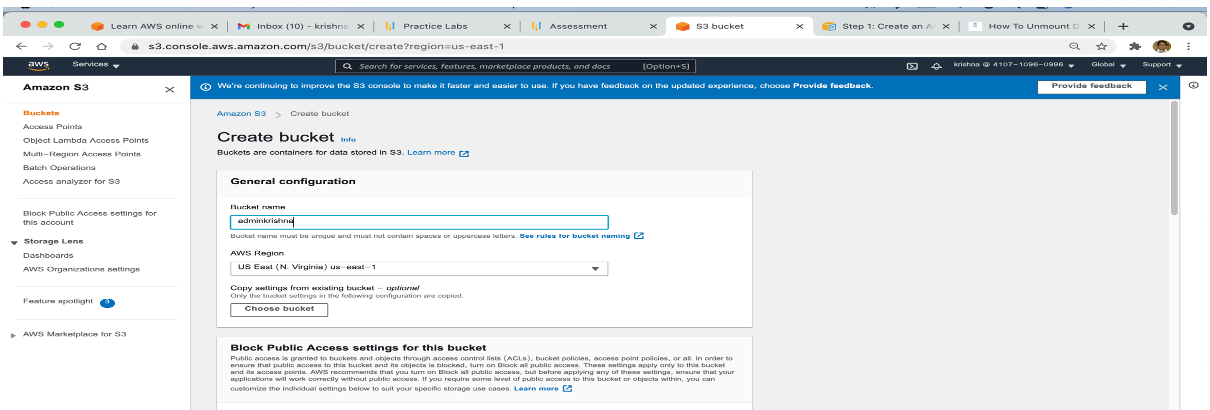

[ec2-user@ip-172-31-94-54 ~]$ df -h
Filesystem Size Used Avail Use% Mounted on
devtmpfs 482M 0 482M 0% /dev
tmpfs 492M 0 492M 0% /dev/shm
tmpfs 492M 468K 491M 1% /run
tmpfs 492M 0 492M 0% /sys/fs/cgroup
/dev/xvda1 8.0G 1.5G 6.6G 19% /
tmpfs 99M 0 99M 0% /run/user/1000
[ec2-user@ip-172-31-94-54 ~]$ lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda 202:0 0 8G 0 disk
`-xvda1 202:1 0 8G 0 part /
xvdf 202:80 0 100G 0 disk
[ec2-user@ip-172-31-94-54 ~]$

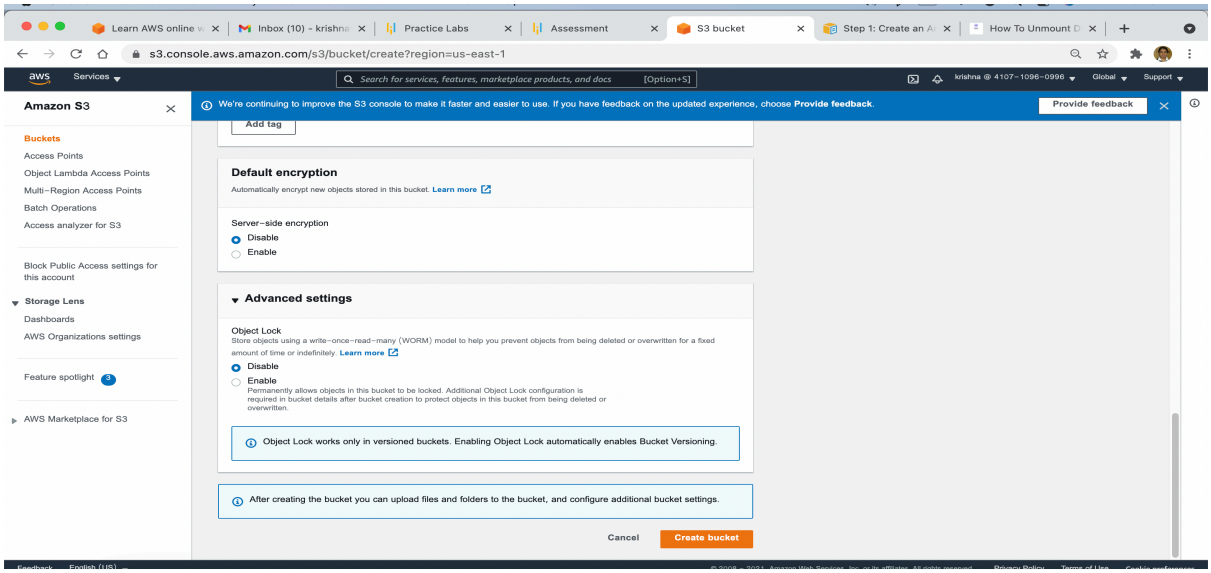
```
keys — ec2-user@ip-172-31-

[ec2-user@ip-172-31-94-54 ~]$ sudo file -s /dev/xvda1
/dev/xvda1: SGI XFS filesystem data (blksz 4096, inosz 512, v2 dirs)
[ec2-user@ip-172-31-94-54 ~]$ sudo file -s /dev/xvdf
/dev/xvdf: data
[ec2-user@ip-172-31-94-54 ~]$ sudo lsblk -f
NAME    FSTYPE LABEL UUID                                 MOUNTPOINT
xvda
`-xvda1 xfs    /     f22063bb-28ab-42bc-ba62-b9130b861ee7 /
xvdf
[ec2-user@ip-172-31-94-54 ~]$ sudo mkfs -t xfs /dev/xvdf
meta-data=/dev/xvdf              isize=512    agcount=4, agsize=6553600 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=1, sparse=0
data     =                       bsize=4096   blocks=26214400, imaxpct=25
         =                       sunit=0      swidth=0 blks
naming   =version 2              bsize=4096   ascii-ci=0 ftype=1
log      =internal log           bsize=4096   blocks=12800, version=2
         =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                   extsz=4096   blocks=0, rtextents=0
[ec2-user@ip-172-31-94-54 ~]$ sudo lsblk -f
NAME    FSTYPE LABEL UUID                                 MOUNTPOINT
xvda
`-xvda1 xfs    /     f22063bb-28ab-42bc-ba62-b9130b861ee7 /
xvdf    xfs          adb9e5a7-c0d4-43d1-a096-57aad42419a5
[ec2-user@ip-172-31-94-54 ~]$ sudo file -s /dev/xvdf
/dev/xvdf: SGI XFS filesystem data (blksz 4096, inosz 512, v2 dirs)
[ec2-user@ip-172-31-94-54 ~]$

[ec2-user@ip-172-31-94-54 ~]$ sudo mount /dev/xvdf /data
[ec2-user@ip-172-31-94-54 ~]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        482M     0  482M   0% /dev
tmpfs           492M     0  492M   0% /dev/shm
tmpfs           492M  468K  491M   1% /run
tmpfs           492M     0  492M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  1.5G  6.6G  19% /
tmpfs            99M     0   99M   0% /run/user/1000
/dev/xvdf       100G  135M  100G   1% /data
[ec2-user@ip-172-31-94-54 ~]$

[ec2-user@ip-172-31-94-54 data]$ df -h /data
Filesystem      Size  Used Avail Use% Mounted on
/dev/xvdf       100G  135M  100G   1% /data
[ec2-user@ip-172-31-94-54 data]$ mkdir checkdir
mkdir: cannot create directory 'checkdir': Permission denied
[ec2-user@ip-172-31-94-54 data]$ chown -R ec2-user:ec2-user /data
chown: changing ownership of '/data': Operation not permitted
[ec2-user@ip-172-31-94-54 data]$ sudo chown -R ec2-user:ec2-user /data
[ec2-user@ip-172-31-94-54 data]$ mkdir checkdir
[ec2-user@ip-172-31-94-54 data]$ ls -ltr
total 0
drwxrwxr-x 2 ec2-user ec2-user 6 Nov  3 12:04 checkdir
[ec2-user@ip-172-31-94-54 data]$

[ec2-user@ip-172-31-94-54 /]$ sudo umount /dev/xvdf
[ec2-user@ip-172-31-94-54 /]$ df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        482M     0  482M   0% /dev
tmpfs           492M     0  492M   0% /dev/shm
tmpfs           492M  468K  491M   1% /run
tmpfs           492M     0  492M   0% /sys/fs/cgroup
/dev/xvda1      8.0G  1.5G  6.6G  19% /
tmpfs            99M     0   99M   0% /run/user/1000
[ec2-user@ip-172-31-94-54 /]$ sudo lsblk -f
NAME    FSTYPE LABEL UUID                                 MOUNTPOINT
xvda
`-xvda1 xfs    /     f22063bb-28ab-42bc-ba62-b9130b861ee7 /
xvdf    xfs          adb9e5a7-c0d4-43d1-a096-57aad42419a5
[ec2-user@ip-172-31-94-54 /]$
```

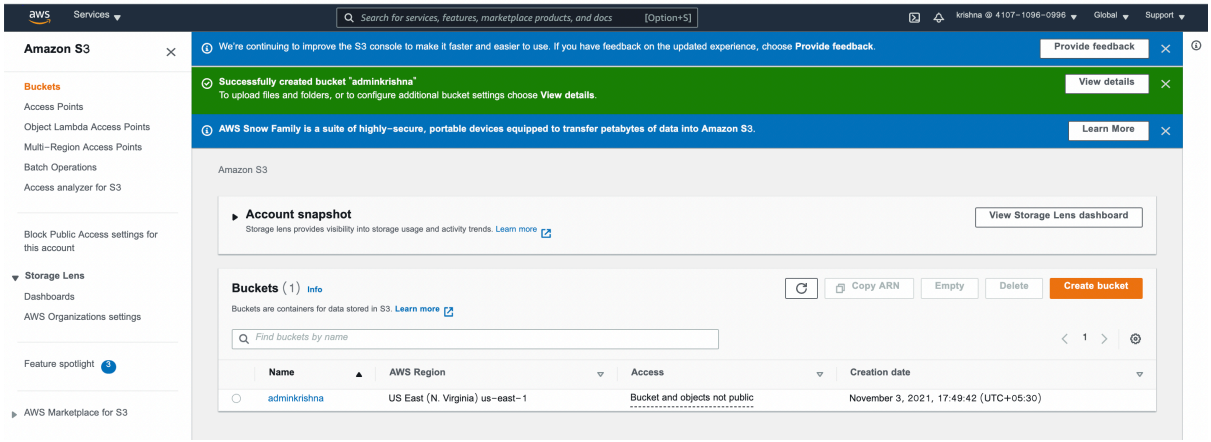

s3.console.aws.amazon.com/s3/home?region=us-east-1#
Services
Search for services, features, marketplace products, and docs
[Option+S]
krishna @ 4107-1096-0996
Global
Support
Amazon S3
Buckets
Access Points
Object Lambda Access Points
Multi-Region Access Points
Batch Operations
Access analyzer for S3
Block Public Access settings for this account
Storage Lens
Dashboards
AWS Organizations settings
Feature spotlight
AWS Marketplace for S3
We're continuing to improve the S3 console to make it faster and easier to use. If you have feedback on the updated experience, choose Provide feedback.
Provide feedback
AWS Snow Family is a suite of highly-secure, portable devices equipped to transfer petabytes of data into Amazon S3.
Learn More
Account snapshot
Storage lens provides visibility into storage usage and activity trends. Learn more
View Storage Lens dashboard
Buckets (0) Info
Copy ARN
Empty
Delete
Create bucket
Buckets are containers for data stored in S3. Learn more
Find buckets by name
Name
AWS Region
Access
Creation date
No buckets
You don't have any buckets.
Create bucket


s3.console.aws.amazon.com/s3/home?region=us-east-1#
Amazon S3
Buckets
Account snapshot
View Storage Lens dashboard
Buckets (0) Info
Create bucket
No buckets
You don't have any buckets.
Create bucket

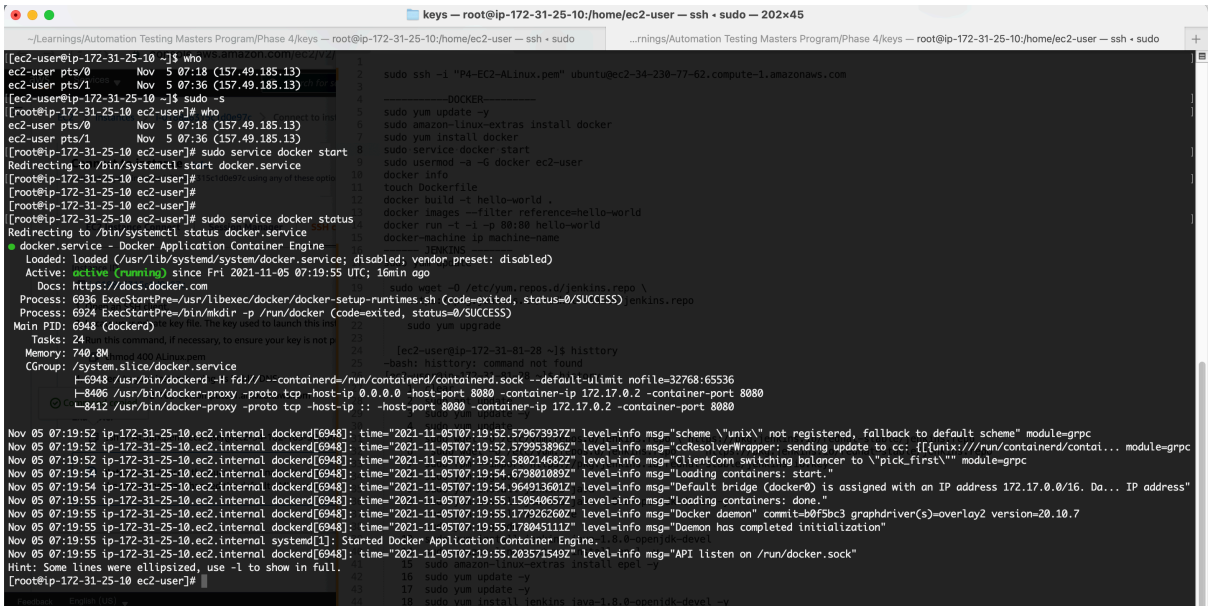

s3.console.aws.amazon.com/s3/home?region=us-east-1#
Amazon S3
Buckets
Account snapshot
View Storage Lens dashboard
Buckets (0) Info
Create bucket
No buckets
You don't have any buckets.
Create bucket

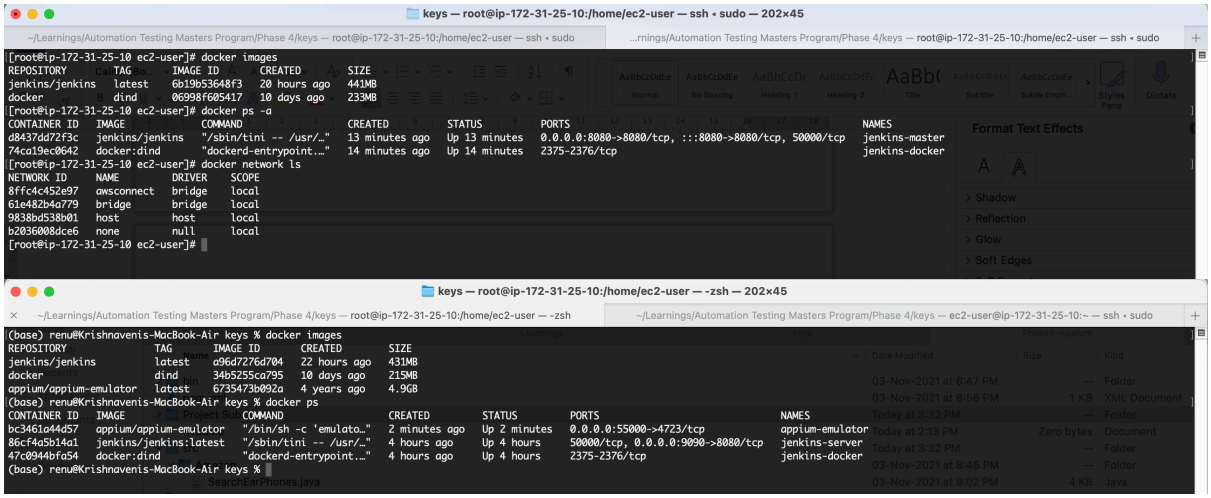

s3.console.aws.amazon.com/s3/bucket/create?region=us-east-1
Amazon S3 > Create bucket
Create bucket Info
Buckets are containers for data stored in S3. Learn more
General configuration
Bucket name
adminkrishna
Bucket name must be unique and must not contain spaces or uppercase letters. See rules for bucket naming
AWS Region
US East (N. Virginia) us-east-1
Copy settings from existing bucket - optional
Only the bucket settings in the following configuration are copied.
Choose bucket
Block Public Access settings for this bucket
Block all public access

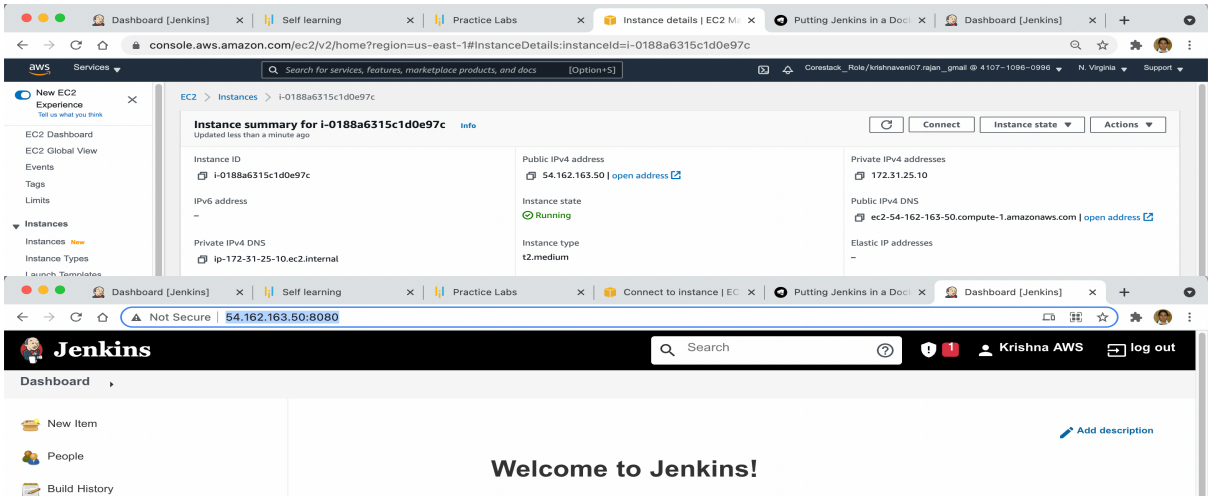


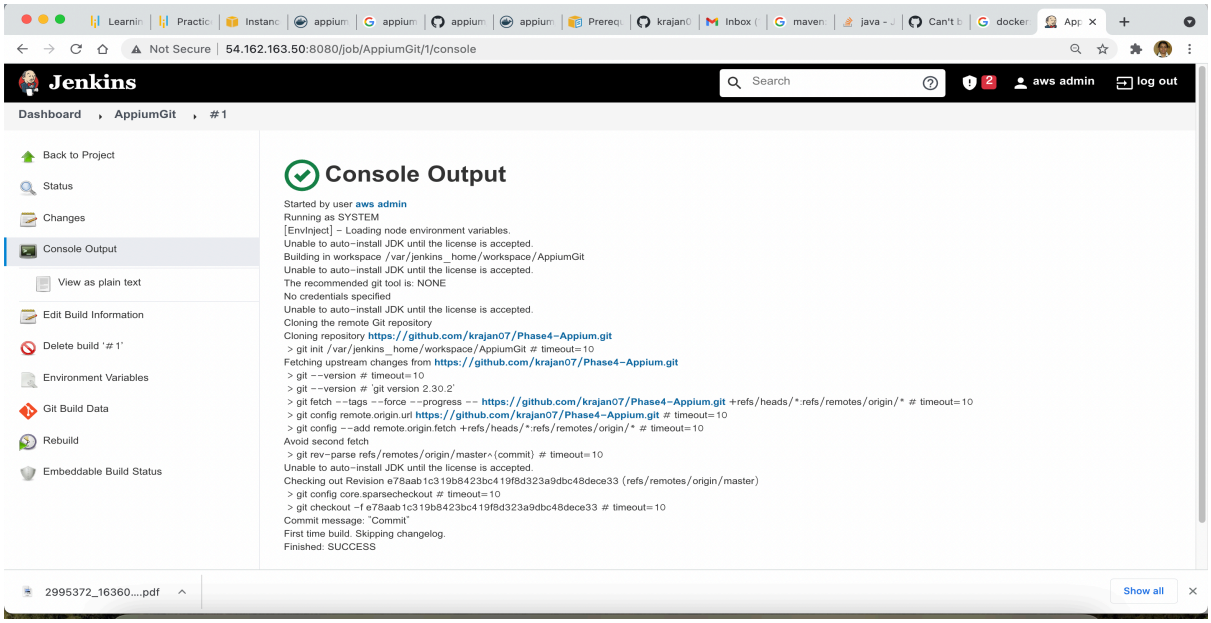


Docker, Jenkins and Build on Jenkins




keys — root@ip-172-31-25-10:/home/ec2-user — ssh ◂ sudo — 202×45
[root@ip-172-31-25-10 ec2-user]# docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
jenkins/jenkins latest 6b19b53648f3 20 hours ago 441MB
docker dind 06998f605417 10 days ago 233MB
[root@ip-172-31-25-10 ec2-user]# docker ps -a
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
d8437dd72f3c jenkins/jenkins "/sbin/tini -- /usr/…" 13 minutes ago Up 13 minutes 0.0.0.0:8080->8080/tcp, :::8080->8080/tcp, 50000/tcp jenkins-master
74ca19ec0642 docker:dind "dockerd-entrypoint.…" 14 minutes ago Up 14 minutes 2375-2376/tcp jenkins-docker
[root@ip-172-31-25-10 ec2-user]# docker network ls
NETWORK ID NAME DRIVER SCOPE
8ffc4c452e97 awsconnect bridge local
61e482b4a779 bridge bridge local
9838bd538b01 host host local
b2036008dce6 none null local
[root@ip-172-31-25-10 ec2-user]#
keys — root@ip-172-31-25-10:/home/ec2-user — -zsh — 202×45
(base) renu@Krishnavenis-MacBook-Air keys % docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
jenkins/jenkins latest a96d7276d704 22 hours ago 431MB
docker dind 34b5255ca795 10 days ago 215MB
appium/appium-emulator latest 6735473b092a 4 years ago 4.9GB
(base) renu@Krishnavenis-MacBook-Air keys % docker ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
bc3461a44d57 appium/appium-emulator "/bin/sh -c 'emulato…" 2 minutes ago Up 2 minutes 0.0.0.0:55000->4723/tcp appium-emulator
86cf4a5b14a1 jenkins/jenkins:latest "/sbin/tini -- /usr/…" 4 hours ago Up 4 hours 50000/tcp, 0.0.0.0:9090->8080/tcp jenkins-server
47c0944bfa54 docker:dind "dockerd-entrypoint.…" 4 hours ago Up 4 hours 2375-2376/tcp jenkins-docker
(base) renu@Krishnavenis-MacBook-Air keys %


Instance summary for i-0188a6315c1d0e97c
Instance ID
i-0188a6315c1d0e97c
Public IPv4 address
54.162.163.50 | open address
Private IPv4 addresses
172.31.25.10
IPv6 address
Instance state
Running
Public IPv4 DNS
ec2-54-162-163-50.compute-1.amazonaws.com | open address
Private IPv4 DNS
ip-172-31-25-10.ec2.internal
Instance type
t2.medium
Elastic IP addresses
Not Secure 54.162.163.50:8080
Jenkins
Search
Krishna AWS
log out
Dashboard
New Item
People
Build History
Add description
Welcome to Jenkins!


Not Secure 54.162.163.50:8080/job/AppiumGit/1/console
Jenkins
Search
aws admin
log out
Dashboard › AppiumGit › #1
Back to Project
Status
Changes
Console Output
View as plain text
Edit Build Information
Delete build '#1'
Environment Variables
Git Build Data
Rebuild
Embeddable Build Status
Console Output
Started by user aws admin
Running as SYSTEM
[EnvInject] - Loading node environment variables.
Unable to auto-install JDK until the license is accepted.
Building in workspace /var/jenkins_home/workspace/AppiumGit
Unable to auto-install JDK until the license is accepted.
The recommended git tool is: NONE
No credentials specified
Unable to auto-install JDK until the license is accepted.
Cloning the remote Git repository
Cloning repository https://github.com/krajan07/Phase4-Appium.git
> git init /var/jenkins_home/workspace/AppiumGit # timeout=10
Fetching upstream changes from https://github.com/krajan07/Phase4-Appium.git
> git --version # timeout=10
> git --version # 'git version 2.30.2'
> git fetch --tags --force --progress -- https://github.com/krajan07/Phase4-Appium.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git config remote.origin.url https://github.com/krajan07/Phase4-Appium.git # timeout=10
> git config --add remote.origin.fetch +refs/heads/*:refs/remotes/origin/* # timeout=10
Avoid second fetch
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
Unable to auto-install JDK until the license is accepted.
Checking out Revision e78aab1c319b8423bc419f8d323a9dbc48dece33 (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10
> git checkout -f e78aab1c319b8423bc419f8d323a9dbc48dece33 # timeout=10
Commit message: "Commit"
First time build. Skipping changelog.
Finished: SUCCESS
2995372_16360....pdf
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