CI/CD Deployment for SpringBoot Application.

Screenshot.

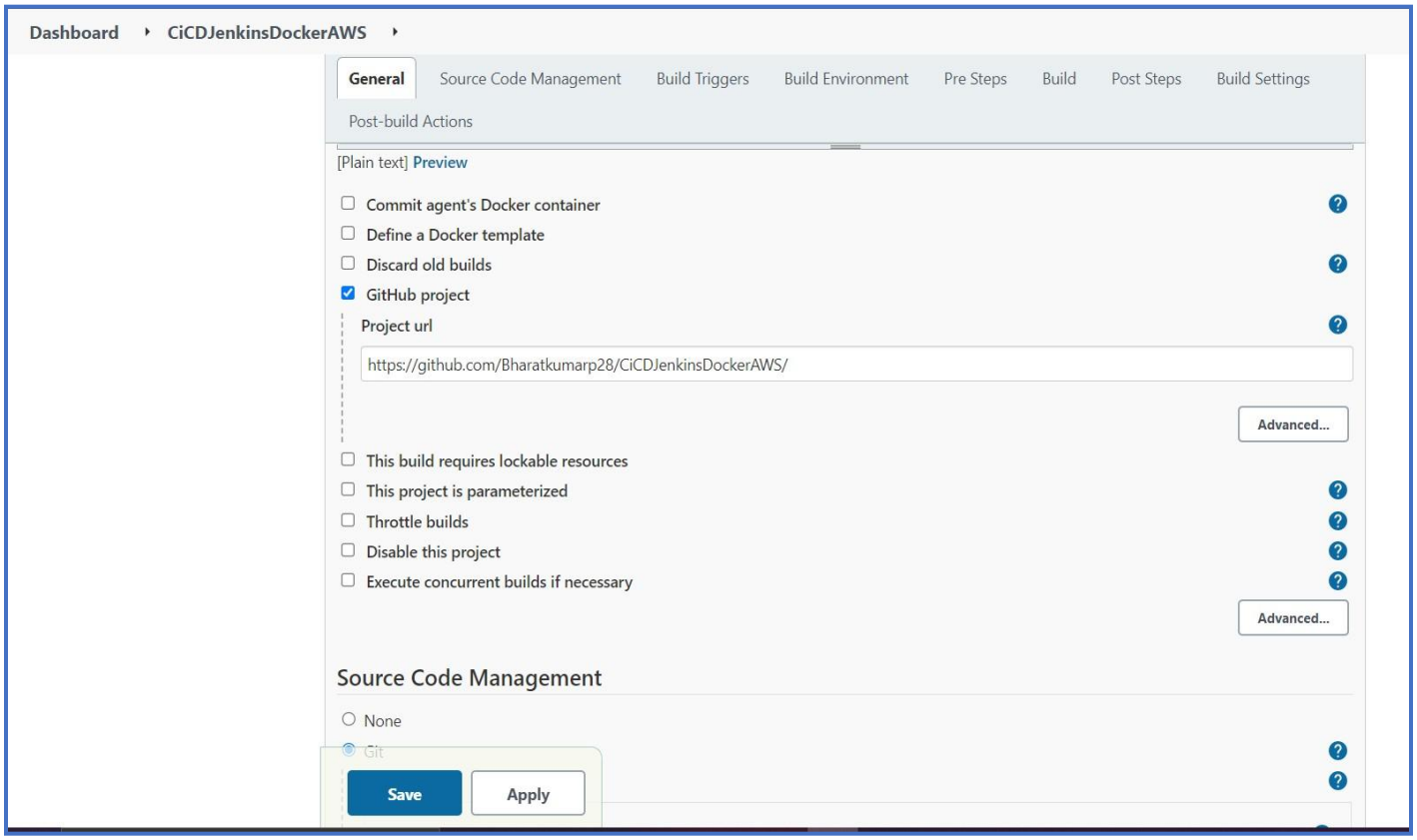
Version History:

Author	Aman Kumar
Purpose	Project Screenshot
Date	26/07/2022
Version	1.0

Configure Jenkins

- Download and install Jenkins in the local machine.
- Login to Jenkins using the address: **http://localhost:8080/**
- Create a new item in the Jenkins as in the below image:

- Configure Jenkins by giving GitHub link and Docker credentials as in the below images:



Dashboard › cicddeployment ›

General | **Source Code Management** | Build Triggers | Build Environment | Pre Steps | Build | Post Steps | Build Settings | Post-build Actions

- ○ None
- ◉ Git

Repositories

Repository URL

https://github.com/tuskhillare/Phase-5-CI-CD-Deployment.git

Credentials

tuskhillare/****** (github) | Add

Advanced...

Add Repository

Branches to build

Branch Specifier (blank for 'any')

*/main

Add Branch

Repository browser

Save | Apply

Dashboard › CiCDJenkinsDockerAWS ›

General | Source Code Management | **Build Triggers** | Build Environment | Pre Steps | Build | Post Steps | Build Settings | Post-build Actions

☑ Poll SCM

Schedule

```
* * * * *
```

⚠ Do you really mean "every minute" when you say "* * * * *"? Perhaps you meant "H * * * *" to poll once per hour

Would last have run at Saturday, January 22, 2022 2:22:48 PM IST; would next run at Saturday, January 22, 2022 2:22:48 PM IST.

☐ Ignore post-commit hooks

Build Environment

- ☐ Delete workspace before build starts
- ☐ Use secret text(s) or file(s)
- ☐ Abort the build if it's stuck
- ☐ Add timestamps to the Console Output
- ☐ Inspect build log for published Gradle build scans
- ☐ Unleash
- ☐ With Ant

Save | Apply

Dashboard › CiCDJenkinsDockerAWS ›

General | Source Code Management | Build Triggers | Build Environment | **Pre Steps** | Build | Post Steps | Build Settings | Post-build Actions

Invoke top-level Maven targets

Maven Version

Maven Install

Goals

install

Advanced...

Docker Build and Publish

Repository Name

ponugub416/cicd

Tag

Docker Host URI

Server credentials

Save | Apply

General | Source Code Management | Build Triggers | Build Environment | **Pre Steps** | Build | Post Steps | Build Settings | Post-build Actions

Docker Build and Publish

Repository Name

tuskhillare/cicd

Tag

Docker Host URI

Server credentials

- none - | Add

Docker registry URL

Registry credentials

tuskhillare/****** (Dockerhub) | Add

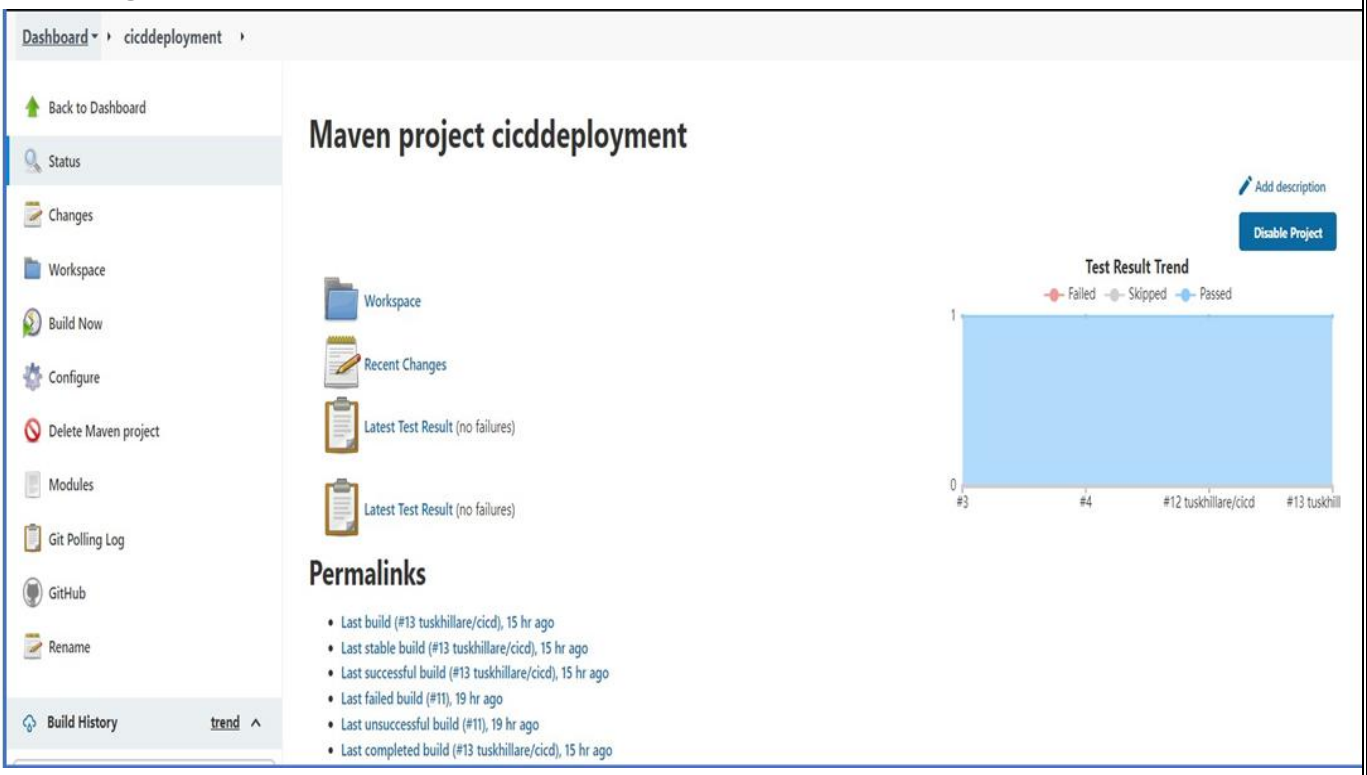
Advanced...

Add pre-build step

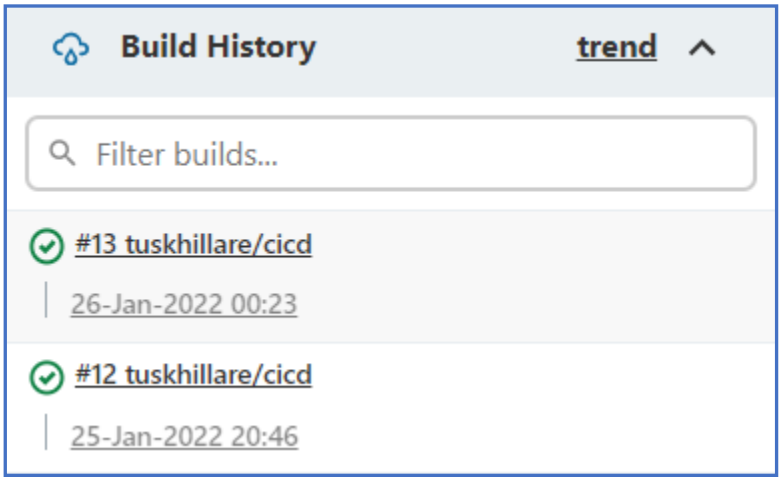
Save | Apply

Build Docker Image File

- We have configured GitHub file with Docker File included and given thedocker hub credential to initiate the docker image file.
- Once done with the configuration of Jenkins apply and save the configs andclick on Build Now:



We can see the Build History in the Build history tab:



- Check the Console output for the any errors/ build completed log:

Dashboard › cicddeployment › #13 tuskhillare/cicd

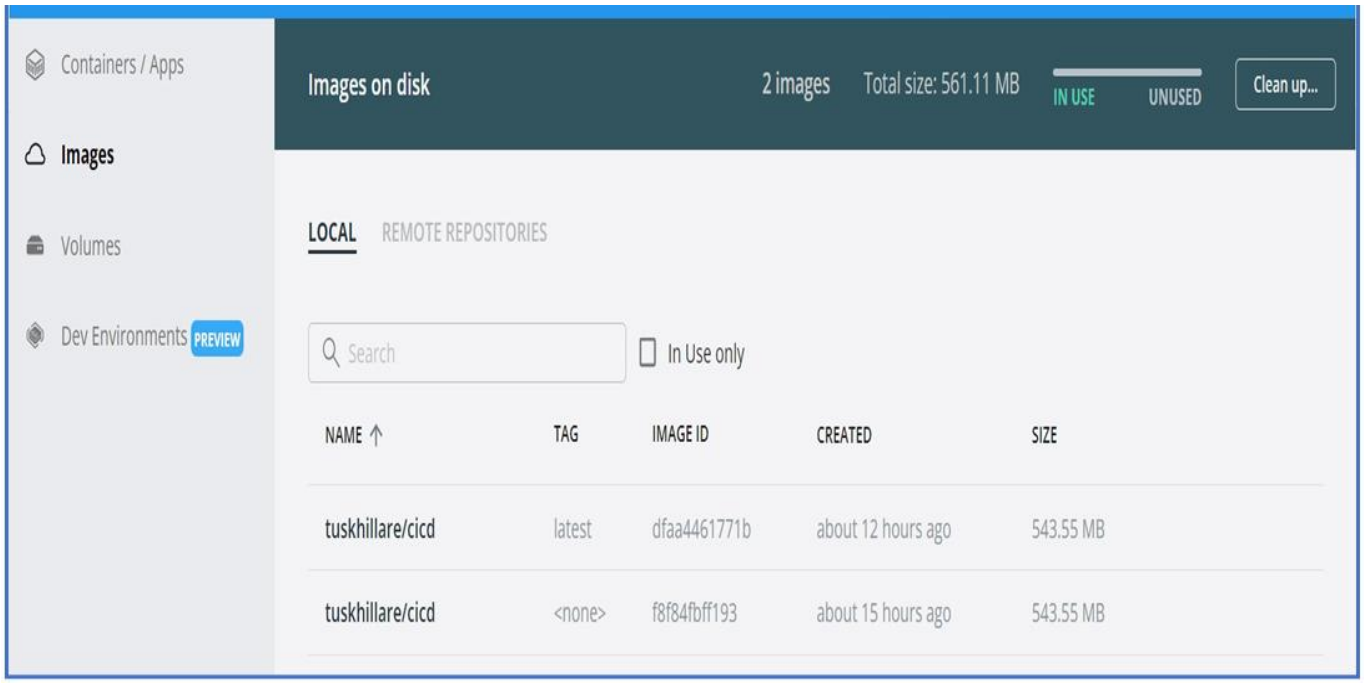
Back to Project
Status
Changes
Console Output
View as plain text
Edit Build Information
Delete build '#13 tuskhillare/cicd'
Polling Log
Git Build Data
Test Result
Redeploy Artifacts
See Fingerprints
Previous Build

Console Output

```
Started by an SCM change
Running as SYSTEM
Building in workspace C:\ProgramData\Jenkins\.jenkins\workspace\cicddeployment
The recommended git tool is: NONE
using credential github
 > C:\Program Files\Git\bin\git.exe rev-parse --resolve-git-dir C:\ProgramData\Jenkins\.jenkins\workspace\cicddeployment\.git # timeout=10
Fetching changes from the remote Git repository
 > C:\Program Files\Git\bin\git.exe config remote.origin.url https://github.com/tuskhillare/Phase-5-CI-CD-Deployment.git # timeout=10
Fetching upstream changes from https://github.com/tuskhillare/Phase-5-CI-CD-Deployment.git
 > C:\Program Files\Git\bin\git.exe --version # timeout=10
 > git --version # 'git version 2.32.0.windows.2'
using GIT_ASKPASS to set credentials github
 > C:\Program Files\Git\bin\git.exe fetch --tags --force --progress -- https://github.com/tuskhillare/Phase-5-CI-CD-Deployment.git +refs/heads/*:refs/remotes/origin/* # timeout=10
 > C:\Program Files\Git\bin\git.exe rev-parse "refs/remotes/origin/main^{commit}" # timeout=10
Checking out Revision a47487d735f181a1febbd6bd15553a28d49a1fcf (refs/remotes/origin/main)
 > C:\Program Files\Git\bin\git.exe config core.sparsecheckout # timeout=10
 > C:\Program Files\Git\bin\git.exe checkout -f a47487d735f181a1febbd6bd15553a28d49a1fcf # timeout=10
Commit message: "Create README.md"
 > C:\Program Files\Git\bin\git.exe rev-list --no-walk 6920d78556c997cb283be6f35c67f85adf795612 # timeout=10
[cicddeployment] $ cmd.exe /C "C:\ProgramData\Jenkins\.jenkins\tools\hudson.tasks.Maven_MavenInstallation\maven_install\bin\mvn.cmd install && exit %%ERRORLEVEL%%"
[INFO] Scanning for projects...
[INFO]
[INFO] -------------------< com.example:CICDDeploymennt >--------------------
[INFO] Building CICDDeploymennt 0.0.1-SNAPSHOT
[INFO] --------------------------------[ war ]---------------------------------
[INFO]
[INFO] --- maven-resources-plugin:3.2.0:resources (default-resources) @ CICDDeploymennt ---
[INFO] Using 'UTF-8' encoding to copy filtered resources
```

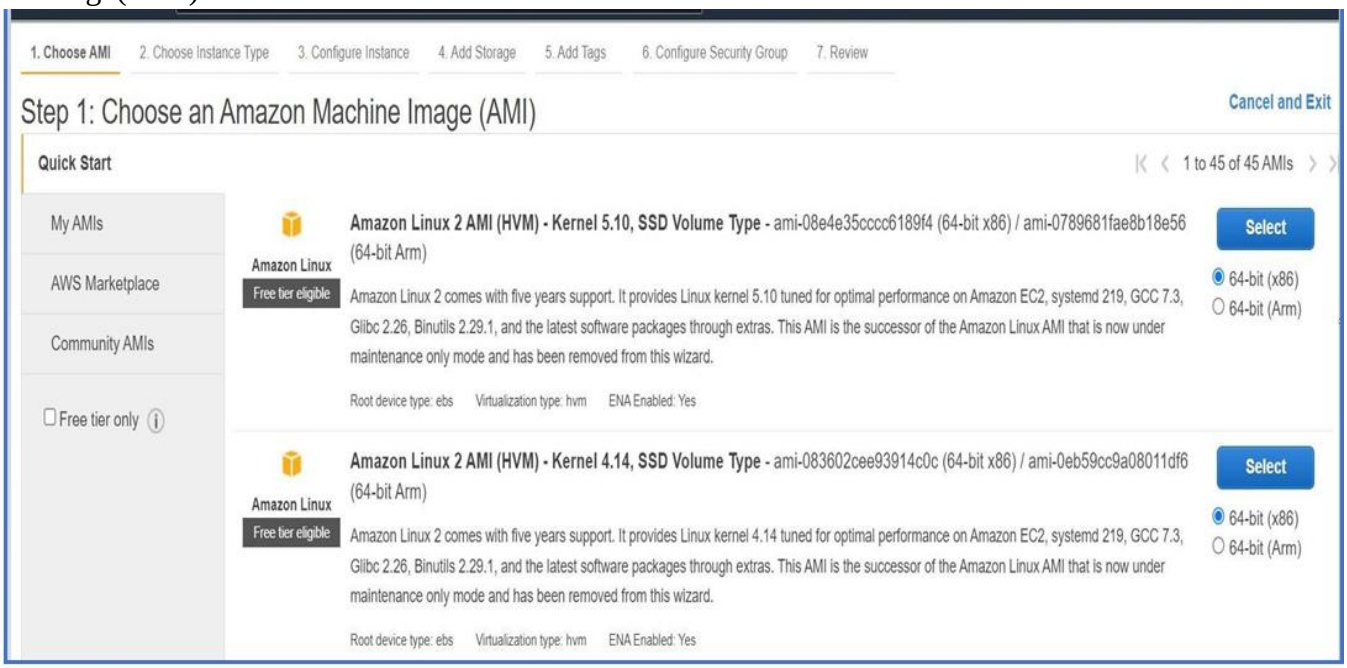
```
 /\\ / ___'_ __ _ _(_)_ __  __ _ \ \ \ \
( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
 \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_\__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::                (v2.6.3)

2022-01-26 00:23:49.176  INFO 15072 --- [           main] c.e.d.CicdDeploymenntApplicationTests    : Starting CicdDeploymenntApplicationTests using Java 1.8.0_271 on LAPTOP-H1JD0KS8 with PID 15072 (started by LAPTOP-H1JD0KS8$ in C:\ProgramData\Jenkins\.jenkins\workspace\cicddeployment)
2022-01-26 00:23:49.180  INFO 15072 --- [           main] c.e.d.CicdDeploymenntApplicationTests    : No active profile set, falling back to default profiles: default
2022-01-26 00:24:00.389  INFO 15072 --- [           main] c.e.d.CicdDeploymenntApplicationTests    : Started CicdDeploymenntApplicationTests in 13.044 seconds (JVM running for 17.785)
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 17.913 s - in com.example.demo.CicdDeploymenntApplicationTests
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO]
[INFO] --- maven-war-plugin:3.3.2:war (default-war) @ CICDDeploymennt ---
[INFO] Packaging webapp
[INFO] Assembling webapp [CICDDeploymennt] in [C:\ProgramData\Jenkins\.jenkins\workspace\cicddeployment\target\CICDDeploymennt-0.0.1-SNAPSHOT]
[INFO] Processing war project
[INFO] Building war: C:\ProgramData\Jenkins\.jenkins\workspace\cicddeployment\target\CICDDeploymennt-0.0.1-SNAPSHOT.war
[INFO]
[INFO] --- spring-boot-maven-plugin:2.6.3:repackage (repackage) @ CICDDeploymennt ---
[INFO] Replacing main artifact with repackaged archive
[INFO]
[INFO] --- maven-install-plugin:2.5.2:install (default-install) @ CICDDeploymennt ---
[INFO] Installing C:\ProgramData\Jenkins\.jenkins\workspace\cicddeployment\target\CICDDeploymennt-0.0.1-SNAPSHOT.war to C:\Windows\system32\config\systemprofile\.m2\repository\com\example\CICDDeploymennt\0.0.1-SNAPSHOT\CICDDeploymennt-0.0.1-SNAPSHOT.war
[INFO] Installing C:\ProgramData\Jenkins\.jenkins\workspace\cicddeployment\pom.xml to C:\Windows\system32\config\systemprofile\.m2\repository\com\example\CICDDeploymennt\0.0.1-SNAPSHOT\CICDDeploymennt-0.0.1-SNAPSHOT.pom
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
```

- Once the Build is completed login to Docker Hub (Desktop/URL) and see if the image has been createdand pushed to the Docker hub as in the below image:

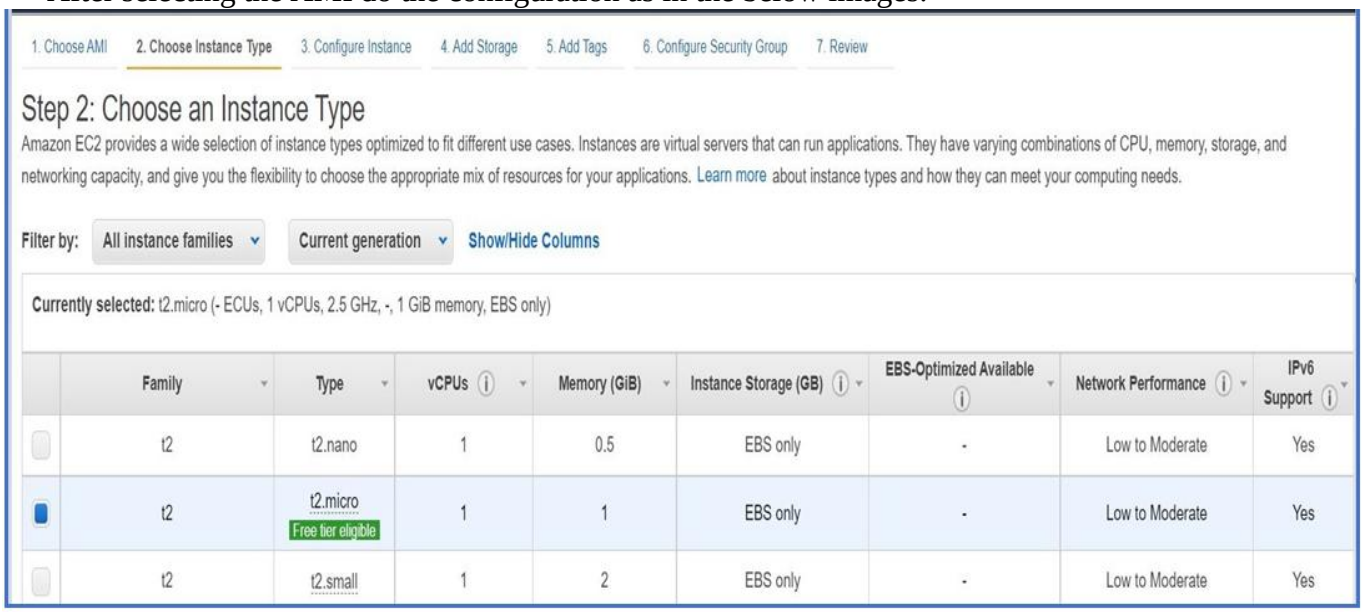


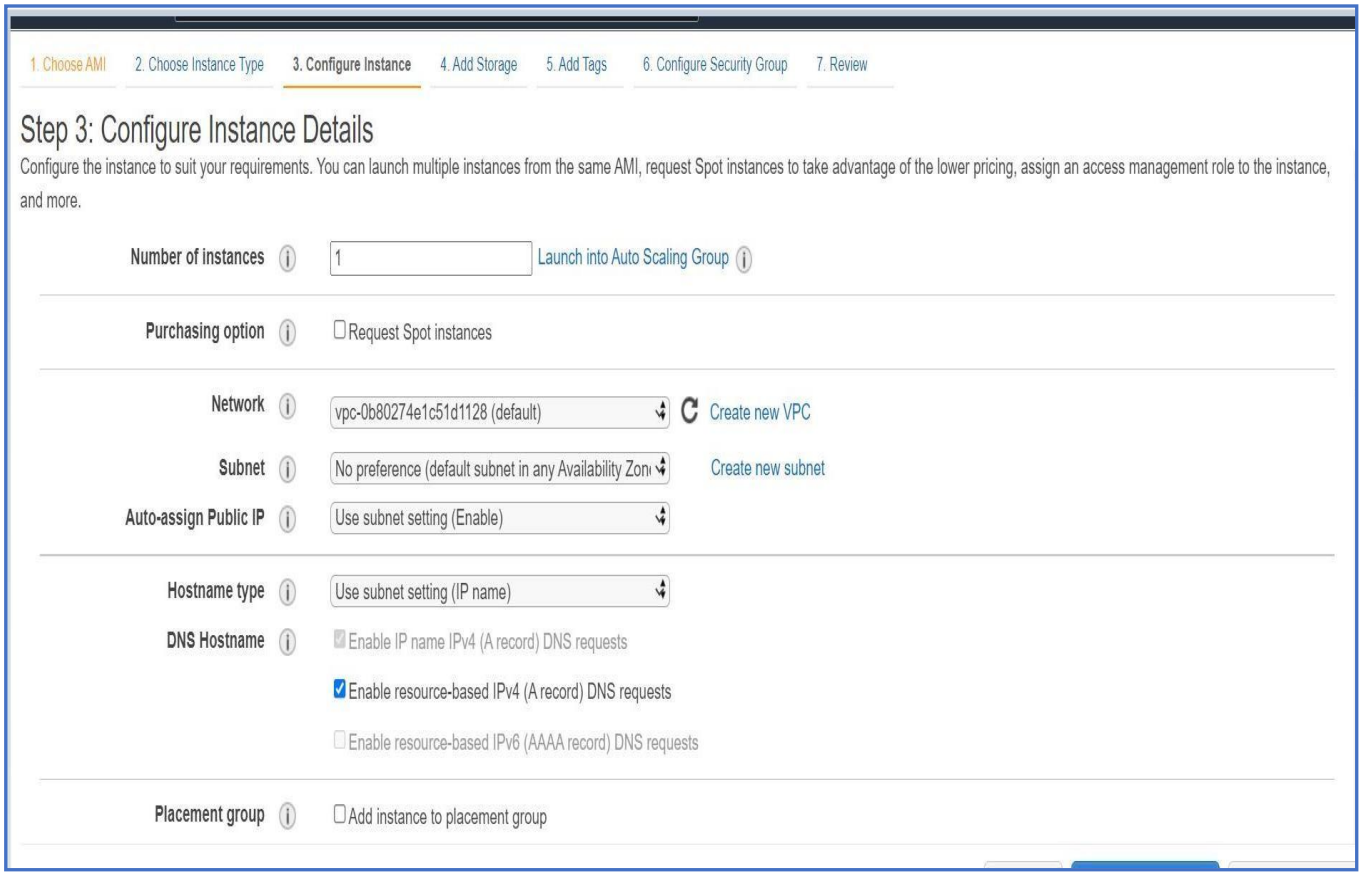
A. AWS EC2 instance and Deploy

- Login to Amazon AWS and choose to launch a new instance by selecting the Amazon Machine Image(AMI)



- After selecting the AMI do the configuration as in the below images:





1. Choose AMI | 2. Choose Instance Type | 3. Configure Instance | 4. Add Storage | 5. Add Tags | 6. Configure Security Group | 7. Review

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. Learn more about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encryption
Root	/dev/xvda	snap-06705e15d64acb59a	30	General Purpose SSD (gp2)	100 / 3000	N/A	☑	Not Encrypte

Add New Volume

Ensure that you have configure Security group so that we are able to do the inbounds and outbounds rules to access our spring boot application using the public IP address as in the below image:

1. Choose AMI | 2. Choose Instance Type | 3. Configure Instance | 4. Add Storage | 5. Add Tags | 6. Configure Security Group | 7. Review

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. Learn more about Amazon EC2 security groups.

Assign a security group: ◉ Create a **new** security group

○ Select an **existing** security group

Security group name: launch-wizard-1

Description: launch-wizard-1 created 2022-01-26T11:31:51.654+05:30

Type	Protocol	Port Range	Source		Description
SSH	TCP	22	Custom	0.0.0.0/0	e.g. SSH for Admin Desktop
All traffic	All	0 - 65535	Anywhere	0.0.0.0/0, ::/0	e.g. SSH for Admin Desktop

Add Rule

Once done with the configuration review and launch the instance

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-1, 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

Amazon Linux 2 AMI (HVM) - Kernel 4.14, SSD Volume Type - ami-083602cee93914c0c

Free tier eligible

Amazon Linux 2 comes with five years support. It provides Linux kernel 4.14 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras. This AMI is the successor of the Amazon Linux AMI that is n...

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

Instances (1/1) Info

Connect | Instance state ▼ | Actions ▼ | Launch instances ▼

Search

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
–	i-0543bccd23b851484	Running	t2.micro	Initializing	No alarms +	us-east-1c

Instance: i-0543bccd23b851484

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

▼ Instance summary Info

Public IPv4 address copied

Instance ID
i-0543bccd23b851484

3.91.182.20 | open address

Private IPv4 addresses
172.31.84.149

IPv6 address
–

Instance state
Running

Public IPv4 DNS
ec2-3-91-182-20.compute-1.amazonaws.com | open address

Connect to instance Info

Connect to your instance i-0543bccd23b851484 using any of these options

EC2 Instance Connect | Session Manager | SSH client | EC2 Serial Console

Instance ID
i-0543bccd23b851484

Public IP address
3.91.182.20

User name
ec2-user

Connect using a custom user name, or use the default user name ec2-user for the AMI used to launch the instance.

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

Cancel | Connect

- It will Open the AWS instance as in the below image:

```
       __|  __|_  )
       _|  (     /   Amazon Linux 2 AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-2/
11 package(s) needed for security, out of 15 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-84-149 ~]$ sudo i
sudo: i: command not found
[ec2-user@ip-172-31-84-149 ~]$ sudo -i
[root@ip-172-31-84-149 ~]# yum install docker
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core
Resolving Dependencies
--> Running transaction check
---> Package docker.x86_64 0:20.10.7-5.amzn2 will be installed
--> Processing Dependency: runc >= 1.0.0 for package: docker-20.10.7-5.amzn2.x86_64
--> Processing Dependency: libcgroup >= 0.40.rc1-5.15 for package: docker-20.10.7-5.amzn2.x86_64
--> Processing Dependency: containerd >= 1.3.2 for package: docker-20.10.7-5.amzn2.x86_64
--> Processing Dependency: pigz for package: docker-20.10.7-5.amzn2.x86_64
--> Running transaction check
---> Package containerd.x86_64 0:1.4.6-7.amzn2 will be installed
---> Package libcgroup.x86_64 0:0.41-21.amzn2 will be installed
---> Package pigz.x86_64 0:2.3.4-1.amzn2.0.1 will be installed
---> Package runc.x86_64 0:1.0.0-2.amzn2 will be installed
--> Finished Dependency Resolution

Dependencies Resolved
```

Here we have gone through the flow by the following steps:

- Programming Spring boot application with a docker file.
- Pushing the project into the GitHub.
- Configure Jenkins to have GitHub project as input and Docker Hub as output and by building the WAR file and converting it into the Docker image and pushing into the Docker Hub.
- Configure the AWS ECS and connecting it through Putty.
- Deploying and hosting the docker file on the AWS EC2 instance using the demon command.
- We can access our Spring boot application from anywhere using he Public Ip address in my case which is: http://3.91.182.20:7000/