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Assignment (MAVEN & JenKINS)

Problem Statement: Automated Deployment of 3-Tier Web application

Q2) Design and develop tasks required to build CI/CD pipeline using learned technologies to deploy 2-Tier **application** on cloud platform as a set of microservices on containerized platform such as docker. Deploy a web application on Docker container using MAVEN as build tool to install, test, package application which is fetched from GitHub Repository & deploy through Web Application as TOMCAT. Provision Infrastructure on AWS.

Step 1) Created The Two instances in AWS

i) Master Instance with elastic ip

The screenshot displays the AWS Management Console interface for the EC2 service. The 'Instances' page is active, showing a list of EC2 instances. The 'Jenkins_Master' instance is selected, and its details are shown in the right-hand pane. The instance is running and has an Elastic IP address of 3.139.7.193.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6 Public IP
Staging	i-0b0c7b23006be82d2	t2.micro	us-east-2a	stopped	2/2 checks ...	None	-	-	-
SStaging	i-026348386b77cc6f2	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-3-14-132-138.us-e...	3.14.132.138	-
production	i-02e93e7714cf21e34	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-18-116-45-186.us-...	18.116.45.186	-
NewProd	i-0805a36e0d5d9c4e7	t2.micro	us-east-2a	running	1/2 checks ...	None	ec2-52-14-195-10.us-e...	52.14.195.10	-
NEWMaster	i-04b62e042aac90765	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-3-21-141-167.us-e...	3.21.141.167	-
Mass	i-0e0bce353745be43d	t2.micro	us-east-2a	terminated	2/2 checks ...	None	-	-	-
Jstaging A...	i-02dddfc2d02f1c1c2	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-3-143-254-46.us-e...	3.143.254.46	-
Jenkins_Mas...	i-05dd5a6529fbc4056	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-3-139-7-193.us-ea...	3.139.7.193	-

Instance: **i-05dd5a6529fbc4056 (Jenkins_Master)** Elastic IP: 3.139.7.193

Description

Property	Value
Instance ID	i-05dd5a6529fbc4056
Instance state	running
Instance type	t2.micro
Finding	Opt-in to AWS Compute Optimizer for recommendations. Learn more
Private DNS	ip-172-31-5-47.us-east-2.compute.internal
Private IPs	172.31.5.47
Secondary private IPs	-
VPC ID	vpc-0579ee0749ed22640
Platform	Amazon Linux
Public DNS (IPv4)	ec2-3-139-7-193.us-east-2.compute.amazonaws.com
IPv4 Public IP	3.139.7.193
IPv6 IPs	-
Elastic IPs	3.139.7.193*
Availability zone	us-east-2a
Security groups	all tcp traffic. view inbound rules. view outbound rules
Scheduled events	No scheduled events
AMI ID	amzn2-ami-kernel-5.10-hvm-2.0.20220805.0-x86_64-gp2 (ami-0568773882d492fc8)
Subnet ID	subnet-007c87b20783764a3

ii) Staging Instances

The screenshot shows the AWS Management Console with the 'Instances' page selected. A table lists several EC2 instances. The instance named 'Jstaging' is highlighted in blue. Below the table, the details for the 'Jstaging' instance are displayed.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6 Public IP
Staging	i-0b0c7b23006be82d2	t2.micro	us-east-2a	stopped	2/2 checks ...	None	-	-	-
SStaging	i-026348386b77cc6f2	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-3-14-132-138.us-e...	3.14.132.138	-
production	i-02e93e7714c21e34	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-18-116-45-186.us...	18.116.45.186	-
NewProd	i-0805a36e0d5d9c4e7	t2.micro	us-east-2a	running	1/2 checks ...	None	ec2-52-14-195-10.us-e...	52.14.195.10	-
NEWMaster	i-04b62e042aac90765	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-3-21-141-167.us-e...	3.21.141.167	-
Mass	i-0e0bce353745be43d	t2.micro	us-east-2a	terminated	2/2 checks ...	None	-	-	-
Jstaging A...	i-02dddf6c2d02fc1c2	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-3-143-254-46.us-e...	3.143.254.46	-
Jenkins_Mas...	i-05dd5a6529be4056	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-3-139-7-193.us-ea...	3.139.7.193	-

Instance: i-02dddf6c2d02fc1c2 (Jstaging AmzLinux) Public DNS: ec2-3-143-254-46.us-east-2.compute.amazonaws.com

Description	Status Checks	Monitoring	Tags
Instance ID	i-02dddf6c2d02fc1c2		
Instance state	running		
Instance type	t2.micro		
Finding	Opt-in to AWS Compute Optimizer for recommendations.		
Private DNS	ip-172-31-15-49.us-east-2.compute.internal		
Private IPs	172.31.15.49		
Secondary private IPs			
VPC ID	vpc-0579ee0749ed22640		
Platform	Amazon Linux		
Public DNS (IPv4)	ec2-3-143-254-46.us-east-2.compute.amazonaws.com		
IPv4 Public IP	3.143.254.46		
IPv6 Public IP	-		
Elastic IPs			
Availability zone	us-east-2a		
Security groups	all tcp traffic, view inbound rules, view outbound rules		
Scheduled events	No scheduled events		
AMI ID	amazon2-ami-kernel-5.10-hvm-2.0.20220805.0-x86_64-gp2 (ami-0568773882d492c68)		
Subnet ID	subnet-007c87b20783764a3		

Step 2) Create a created job **Assignment_maven_project**

The screenshot shows the Jenkins Dashboard. The 'Assignment_maven_project' job is listed in the table. The job is in a 'Success' state, with a last success time of 2 min 54 sec and a last failure time of 1 hr 4 min.

S	W	Name	Last Success	Last Failure	Last Duration
✓	⚙	Assignment_maven_project	2 min 54 sec #10	1 hr 4 min #3	17 sec

Icon: S M L

Icon legend: Atom feed for all, Atom feed for failures, Atom feed for just latest builds

Build Queue: No builds in the queue.

Build Executor Status:

- 1 Idle
- 2 Idle
- 11 (offline)

REST API Jenkins 2.365

step 2) Configuring the Project

The screenshot shows the Jenkins Configuration page for the 'Assignment_maven_project'. The left sidebar contains a 'Configuration' menu with options: General, Source Code Management (selected), Build Triggers, Build Environment, Pre Steps, Build, Post Steps, Build Settings, and Post-build Actions. The main content area is titled 'Configuration' and has a 'Git' radio button selected. Under 'Repositories', there is a 'Repository URL' field with the value 'https://github.com/paramsd1997/maven1st.git', a 'Credentials' dropdown set to '- none -', and an 'Add' button. Below this is an 'Add Repository' button. Under 'Branches to build', there is a 'Branch Specifier (blank for \'any\')' field with the value '*/master' and an 'Add Branch' button. At the bottom are 'Save' and 'Apply' buttons.

Configuration

General

Source Code Management

Build Triggers

Build Environment

Pre Steps

Build

Post Steps

Build Settings

Post-build Actions

Git

Repositories

Repository URL

https://github.com/paramsd1997/maven1st.git

Credentials

- none -

Add

Advanced...

Add Repository

Branches to build

Branch Specifier (blank for 'any')

*/master

Add Branch

Save Apply

The screenshot shows the Jenkins Configuration page for the 'Assignment_maven_project', specifically the 'Post-build Actions' section. The left sidebar is the same as the previous screenshot. The main content area is titled 'Configuration' and has the 'Post-build Actions' radio button selected. Under 'SSH Publishers', there is an 'SSH Server Name' dropdown set to 'jenkinsstaging' and an 'Advanced...' button. Under 'Transfers', there is a 'Transfer Set' section with a 'Source files' field containing 'webapp/target/*.war', a 'Remove prefix' field containing 'webapp/target', and a 'Remote directory' field containing '///opt//docker'. Below this is an 'Exec command' field containing a multi-line script: 'docker stop valaxy_demo', 'docker rm -f valaxy_demo', 'docker image rm -f valaxy_demo', 'cd /opt/docker', and 'docker build -t valaxy_demo'. At the bottom are 'Save' and 'Apply' buttons.

Configuration

General

Source Code Management

Build Triggers

Build Environment

Pre Steps

Build

Post Steps

Build Settings

Post-build Actions

SSH Publishers

SSH Server Name

jenkinsstaging

Advanced...

Transfers

Transfer Set

Source files

webapp/target/*.war

Remove prefix

webapp/target

Remote directory

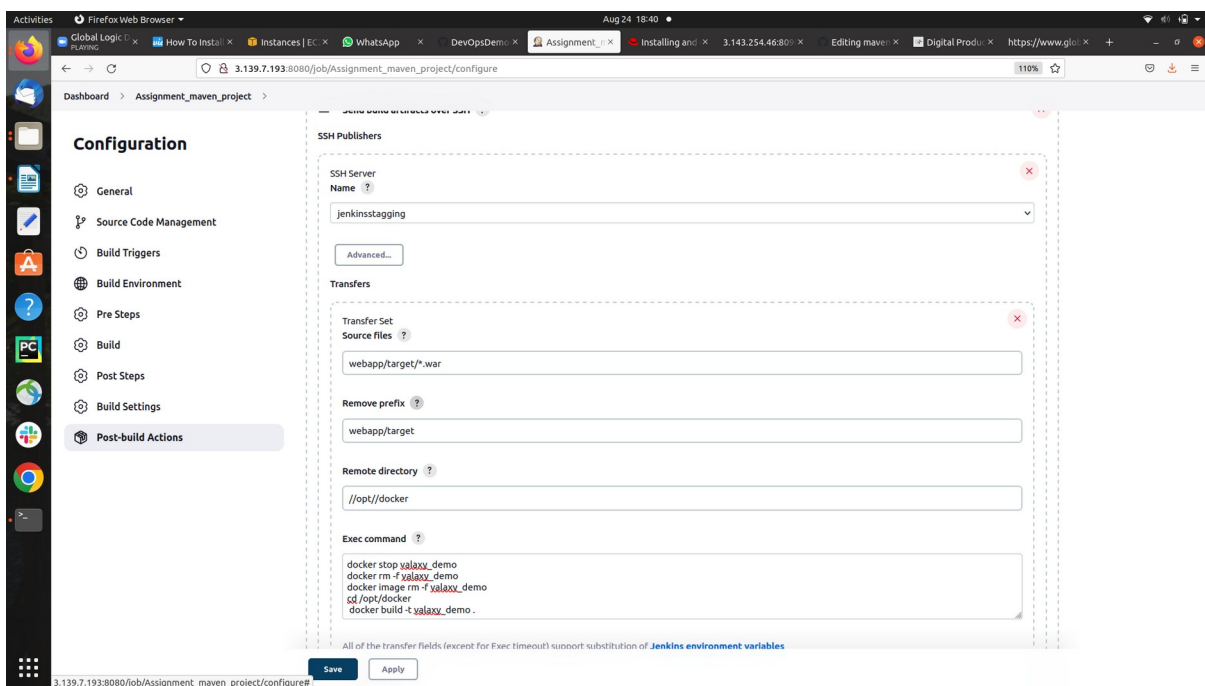
///opt//docker

Exec command

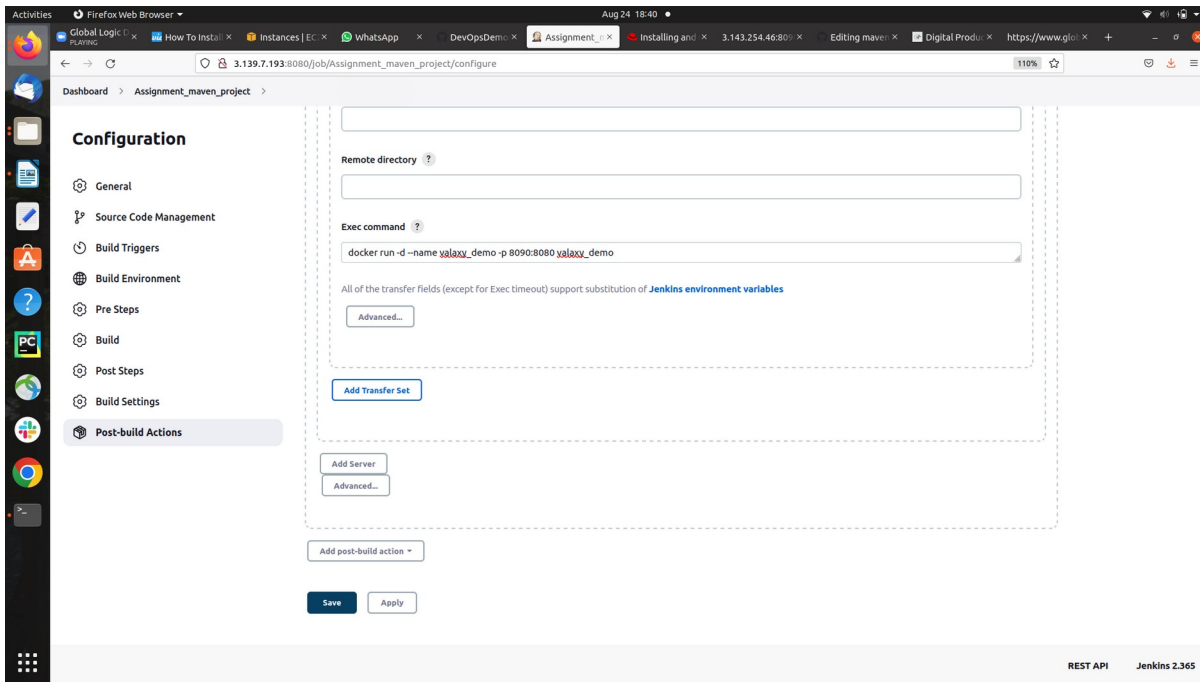
```
docker stop valaxy_demo
docker rm -f valaxy_demo
docker image rm -f valaxy_demo
cd /opt/docker
docker build -t valaxy_demo
```

All of the transfer fields (except for Exec timeout) support substitution of [Jenkins environment variables](#)

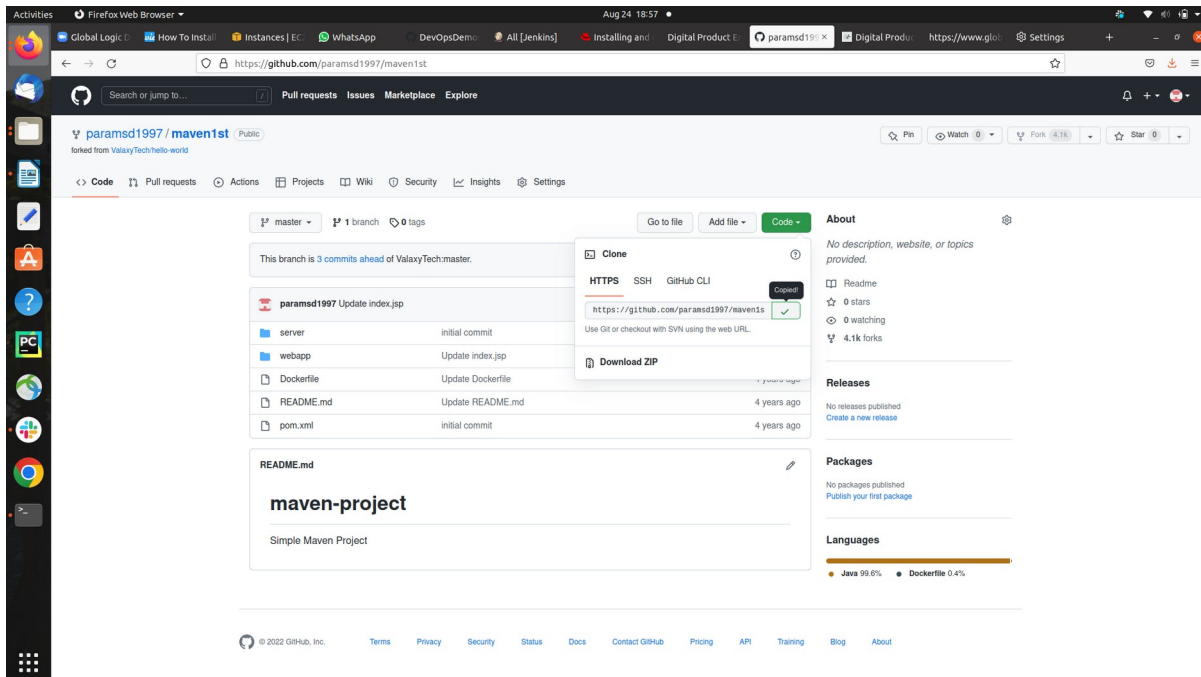
Save Apply



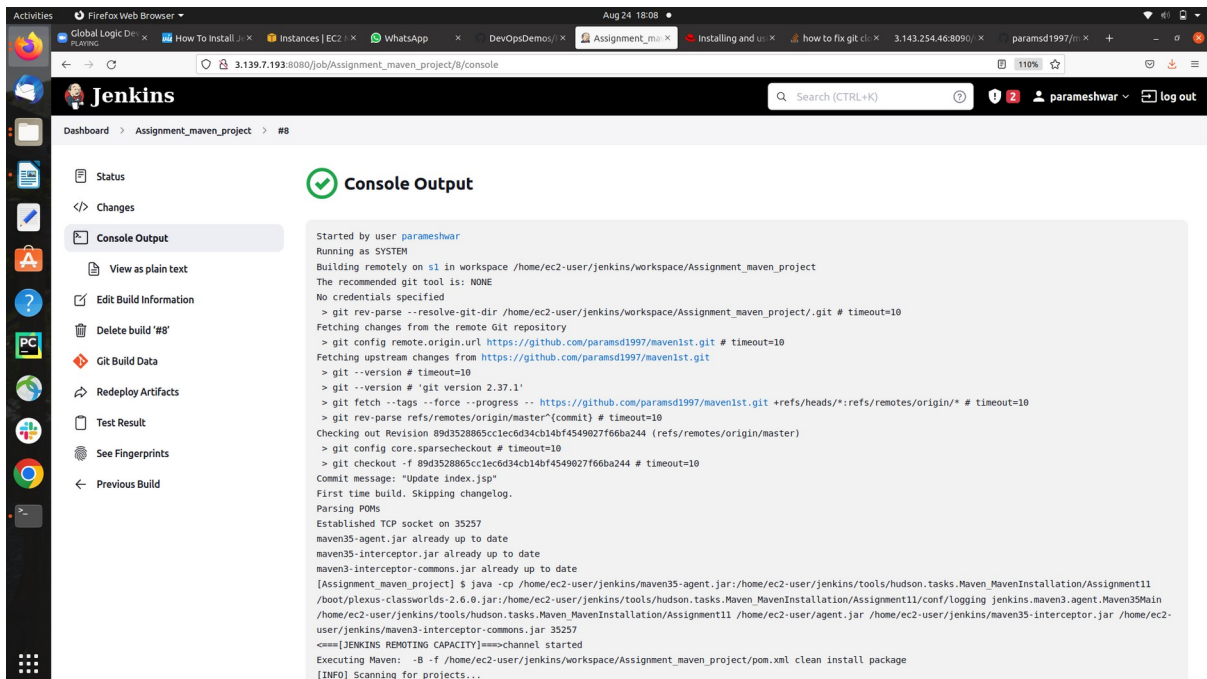
Executing the cmd to Build and run the Container with assigned port



step3) git repository Content



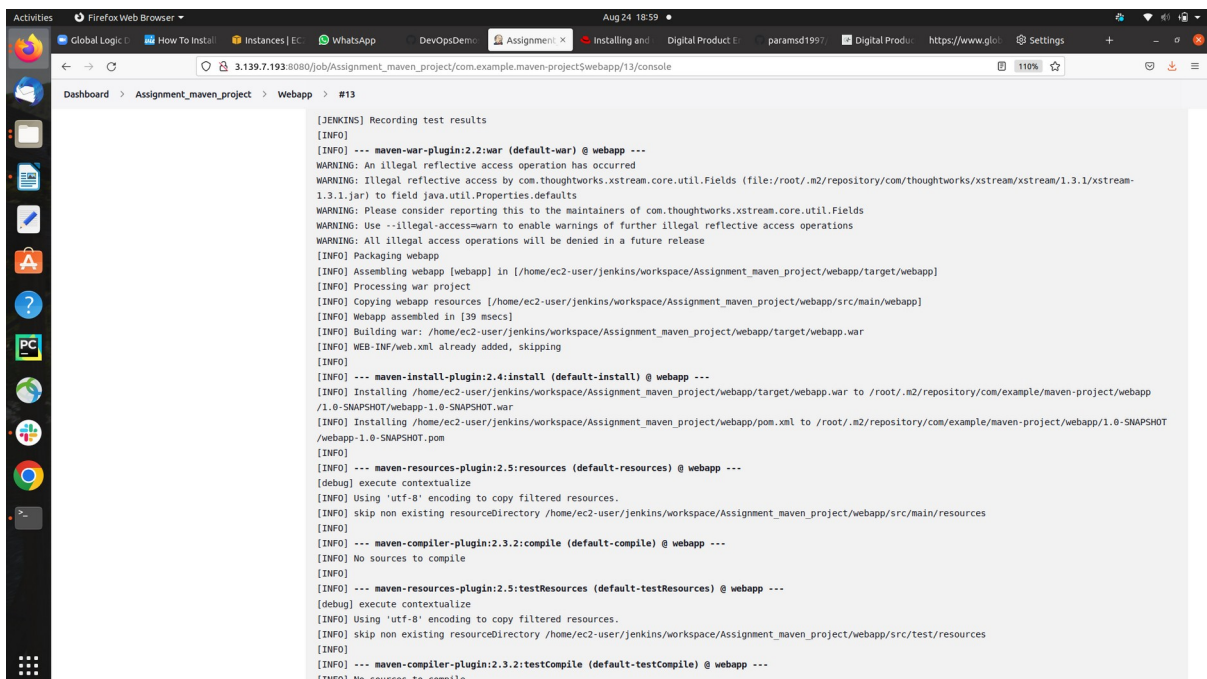
step 4) Build the project



The screenshot shows the Jenkins web interface in a Firefox browser. The page displays the 'Console Output' for the 'Assignment_maven_project' build. The output text is as follows:

```
Started by user parameswar
Running as SYSTEM
Building remotely on sl in workspace /home/ec2-user/jenkins/workspace/Assignment_maven_project
The recommended git tool is: NONE
No credentials specified
> git rev-parse --resolve-git-dir /home/ec2-user/jenkins/workspace/Assignment_maven_project/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/paramsd1997/maven1st.git # timeout=10
Fetching upstream changes from https://github.com/paramsd1997/maven1st.git
> git --version # timeout=10
> git --version # 'git version 2.37.1'
> git fetch --tags --force --progress -- https://github.com/paramsd1997/maven1st.git +refs/heads/*:refs/remotes/origin/* # timeout=10
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
Checking out Revision 89d3528865cc1ec6d34cb14bf4549027f66ba244 (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10
> git checkout -f 89d3528865cc1ec6d34cb14bf4549027f66ba244 # timeout=10
Commit message: "Update index.jsp"
First time build. Skipping changelog.
Parsing POMs
Established TCP socket on 35257
maven35-agent.jar already up to date
maven35-interceptor.jar already up to date
maven3-interceptor-commons.jar already up to date
[Assignment_maven_project] $ java -cp /home/ec2-user/jenkins/maven35-agent.jar:/home/ec2-user/jenkins/tools/hudson.tasks.Maven_MavenInstallation/Assignment11/boot/plexus-classworlds-2.6.0.jar:/home/ec2-user/jenkins/tools/hudson.tasks.Maven_MavenInstallation/Assignment11/conf/logging-jenkins-maven3-agent.Maven35Main:/home/ec2-user/jenkins/tools/hudson.tasks.Maven_MavenInstallation/Assignment11/home/ec2-user/agent.jar /home/ec2-user/jenkins/maven35-interceptor.jar /home/ec2-user/jenkins/maven3-interceptor-commons.jar 35257
====[JENKINS REMOTING CAPACITY]====channel started
Executing Maven: -B -f /home/ec2-user/jenkins/workspace/Assignment_maven_project/pom.xml clean install package
[INFO] Scanning for projects...
```

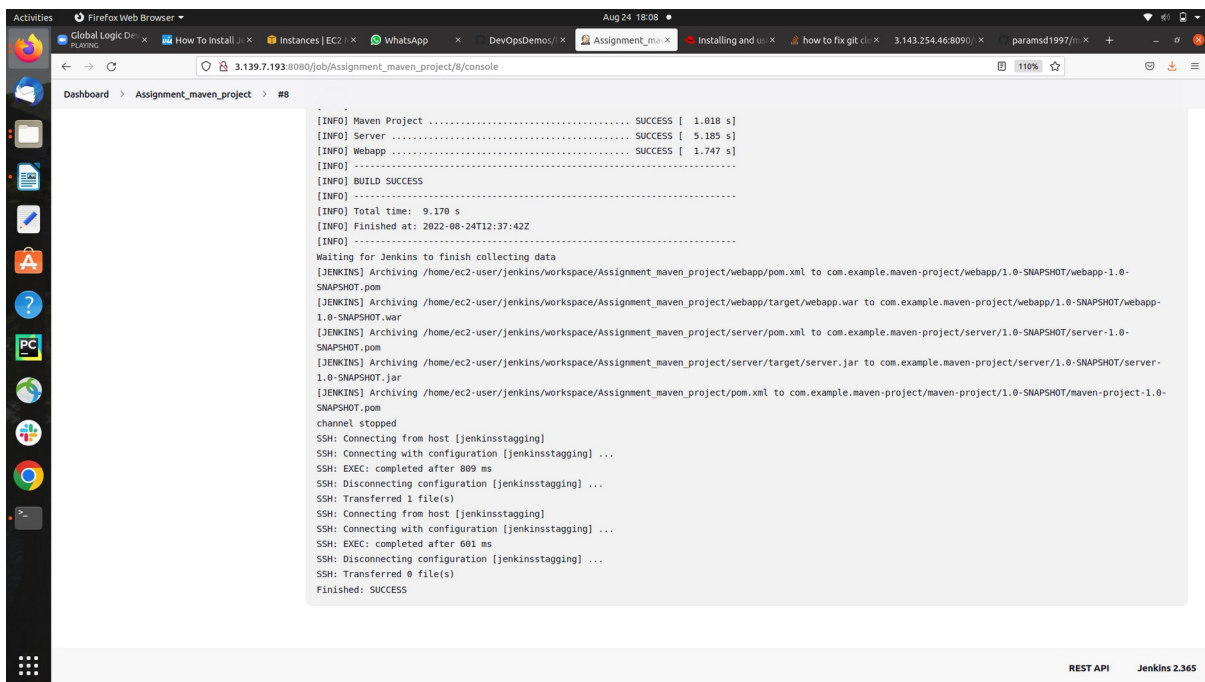
Building the .war file



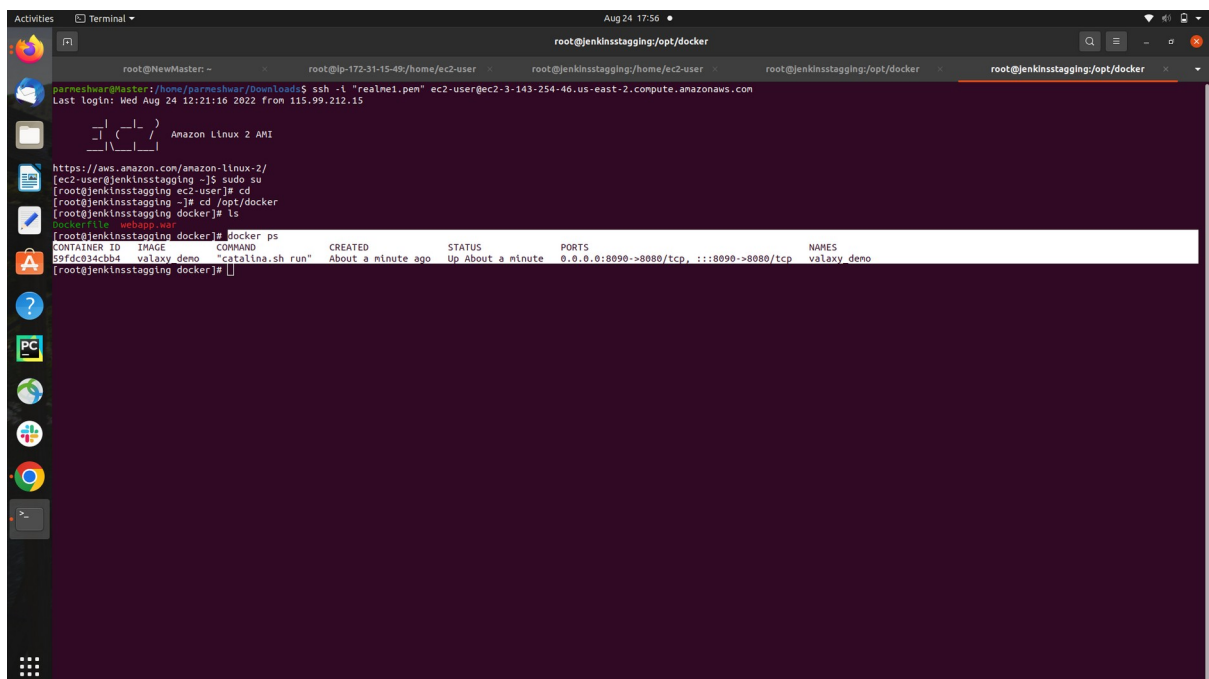
The screenshot shows the Jenkins web interface in a Firefox browser. The page displays the 'Console Output' for the 'webapp' build. The output text is as follows:

```
[JENKINS] Recording test results
[INFO]
[INFO] --- maven-war-plugin:2.2:war (default-war) @ webapp ---
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by com.thoughtworks.xstream.core.util.Fields (file:/root/.m2/repository/com/thoughtworks/xstream/xstream/1.3.1/xstream-1.3.1.jar) to field java.util.Properties.defaults
WARNING: Please consider reporting this to the maintainers of com.thoughtworks.xstream.core.util.Fields
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release
[INFO] Packaging webapp
[INFO] Assembling webapp [webapp] in [/home/ec2-user/jenkins/workspace/Assignment_maven_project/webapp/target/webapp]
[INFO] Processing war project
[INFO] Copying webapp resources [/home/ec2-user/jenkins/workspace/Assignment_maven_project/webapp/src/main/webapp]
[INFO] Webapp assembled in [39 msecs]
[INFO] Building war: /home/ec2-user/jenkins/workspace/Assignment_maven_project/webapp/target/webapp.war
[INFO] WEB-INF/web.xml already added, skipping
[INFO]
[INFO] --- maven-install-plugin:2.4:install (default-install) @ webapp ---
[INFO] Installing /home/ec2-user/jenkins/workspace/Assignment_maven_project/webapp/target/webapp.war to /root/.m2/repository/com/example/maven-project/webapp/1.0-SNAPSHOT/webapp-1.0-SNAPSHOT.war
[INFO] Installing /home/ec2-user/jenkins/workspace/Assignment_maven_project/webapp/pom.xml to /root/.m2/repository/com/example/maven-project/webapp/1.0-SNAPSHOT/webapp-1.0-SNAPSHOT.pom
[INFO]
[INFO] --- maven-resources-plugin:2.5:resources (default-resources) @ webapp ---
[debug] execute contextualize
[INFO] Using 'utf-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory /home/ec2-user/jenkins/workspace/Assignment_maven_project/webapp/src/main/resources
[INFO]
[INFO] --- maven-compiler-plugin:2.3.2:compile (default-compile) @ webapp ---
[INFO] No sources to compile
[INFO]
[INFO] --- maven-resources-plugin:2.5:testResources (default-testResources) @ webapp ---
[debug] execute contextualize
[INFO] Using 'utf-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory /home/ec2-user/jenkins/workspace/Assignment_maven_project/webapp/src/test/resources
[INFO]
[INFO] --- maven-compiler-plugin:2.3.2:testCompile (default-testCompile) @ webapp ---
[INFO] No sources to compile
```

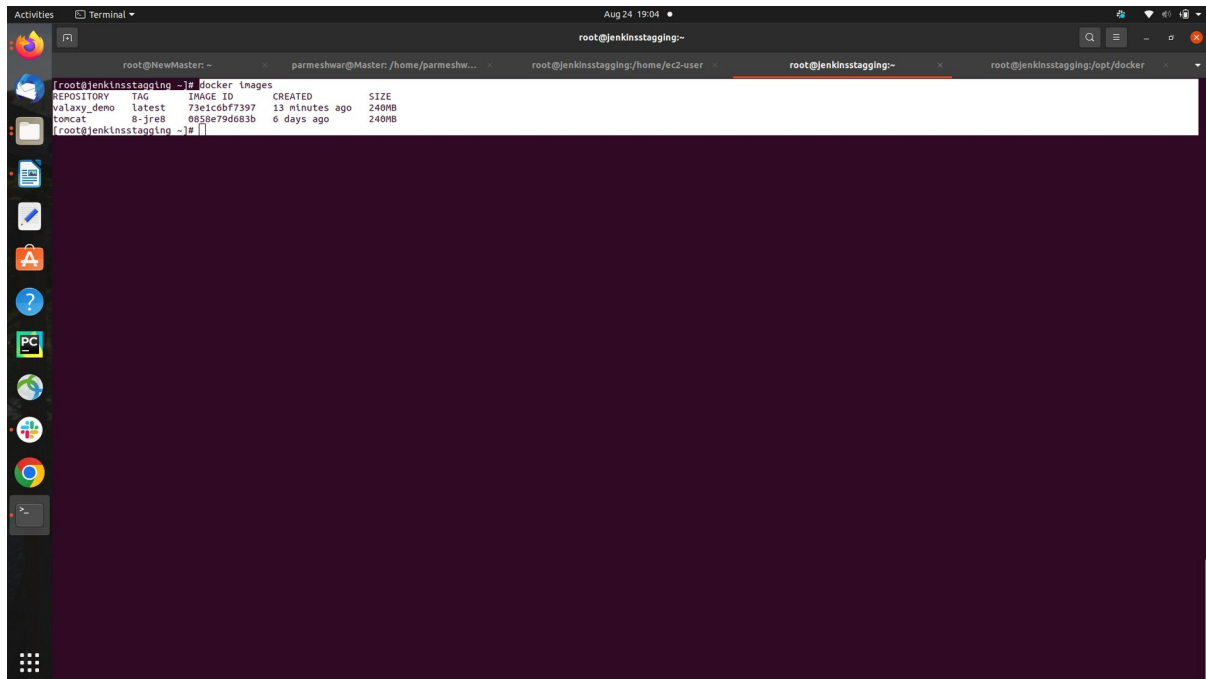

project Build Successfully



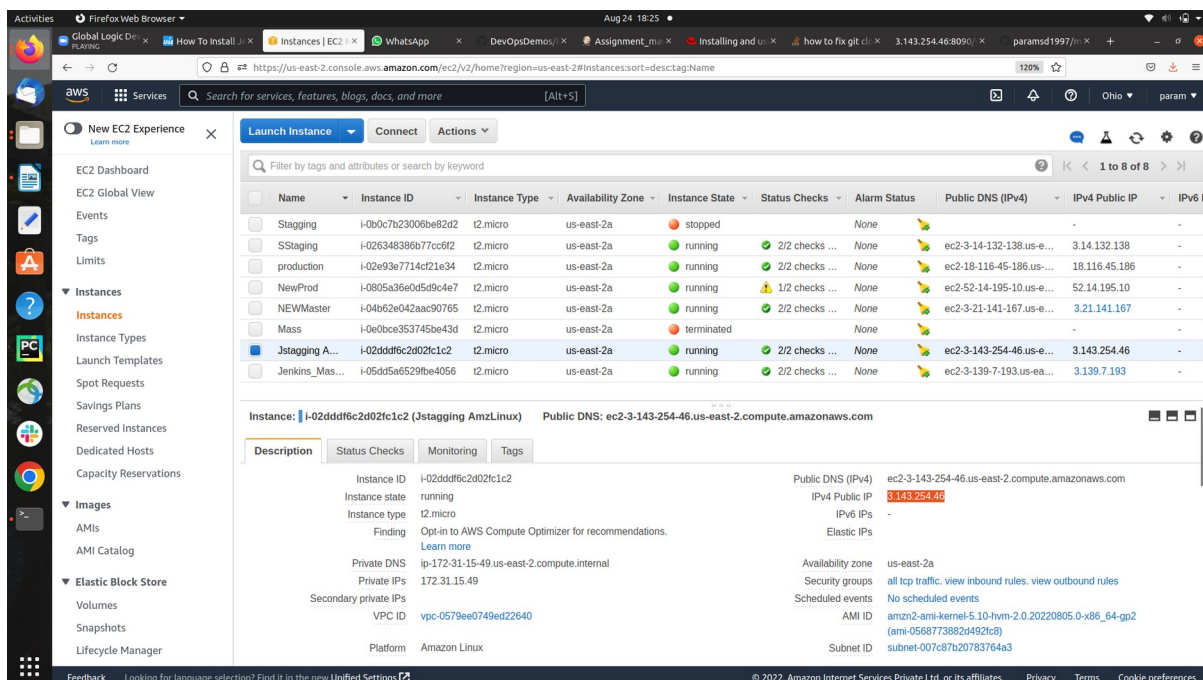
step 5) Docker Container created Successfully

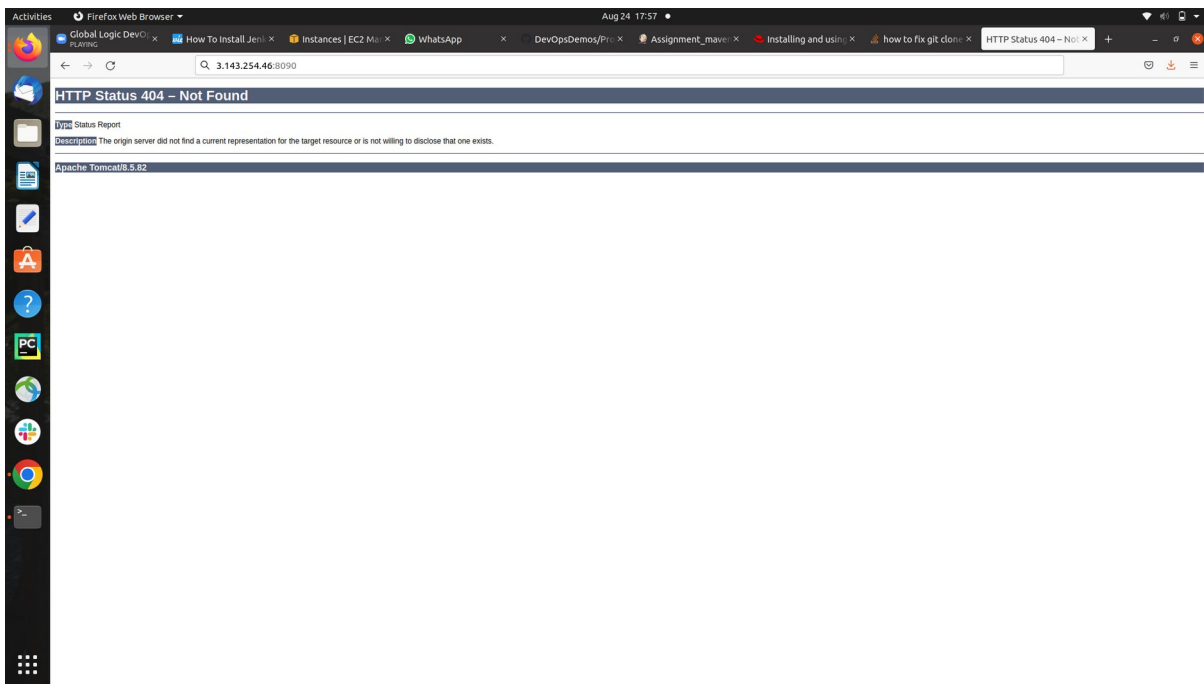


step 5) Docker images of Tomcat created Successfully

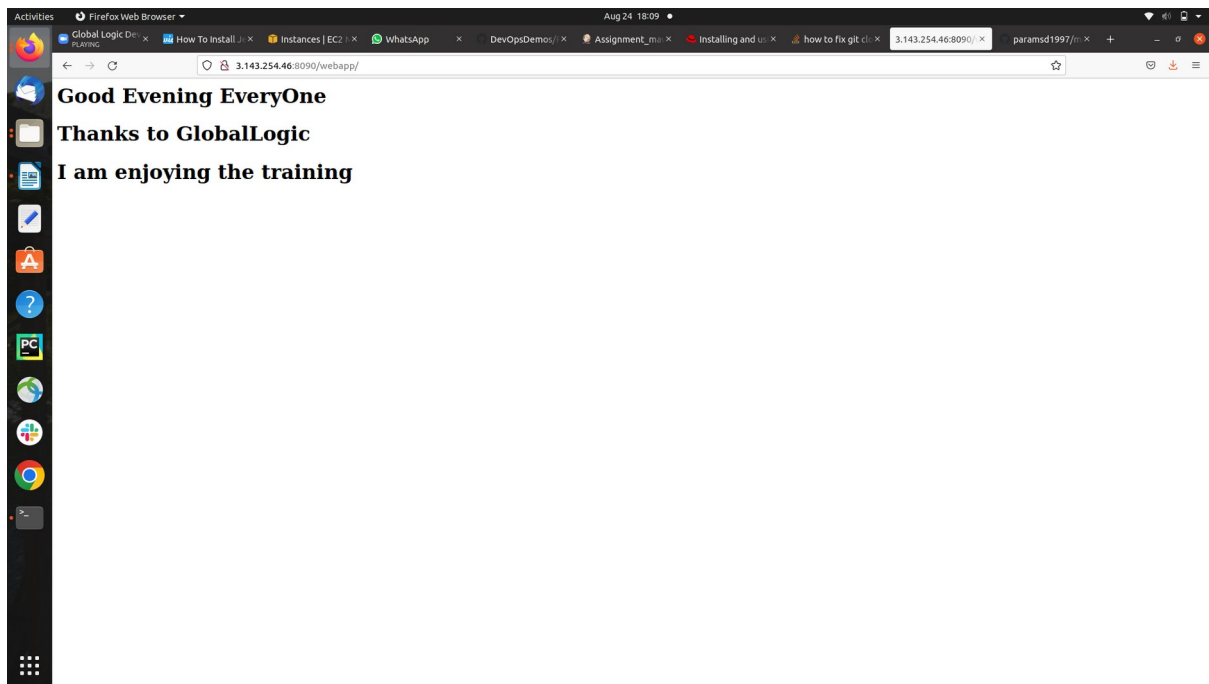


step 6) Accessing the default webpage of **tomcat** using the Staging m/c public ip and port no. Of tomcat 8080





step 6) Accessing the webpage of using the Staggering m/c public ip and Assigned port no.



Changes did in the wepage that output Committed again

