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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 displayed below the list. 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-05dd5a6529f0e4056	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-3-139-7-193.us-ea...	3.139.7.193	-

Instance: **i-05dd5a6529f0e4056 (Jenkins_Master)** Elastic IP: 3.139.7.193

Description	Status Checks	Monitoring	Tags
Instance ID	i-05dd5a6529f0e4056		
Instance state	running		
Instance type	t2.micro		
Finding	Opt-in to AWS Compute Optimizer for recommendations.		
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) Stagging Intnances

The screenshot shows the AWS Management Console with the 'Instances' page selected. A table lists several EC2 instances. The instance 'Jstaging A...' is highlighted, and its details are shown below the table.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6
Staging	i-0b0c7b23006be82d2	t2.micro	us-east-2a	stopped		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-0e0b0c353745be43d	t2.micro	us-east-2a	terminated		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.		
Learn more			
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 IPs	-		
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	amzn2-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 below.

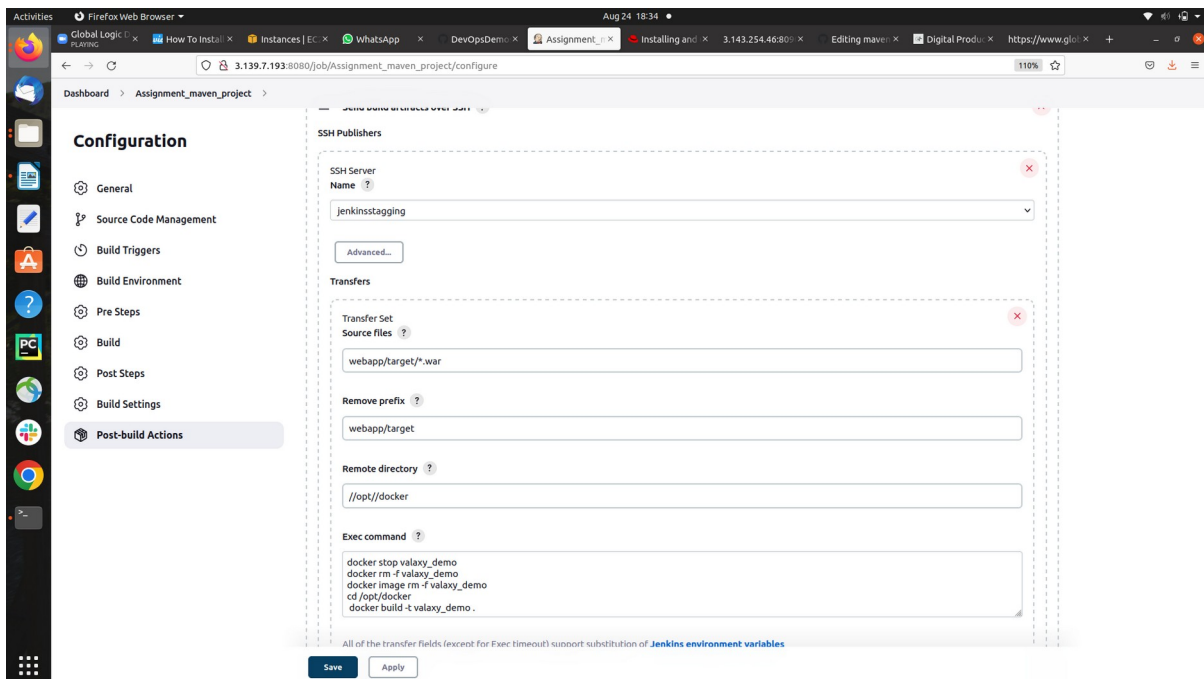
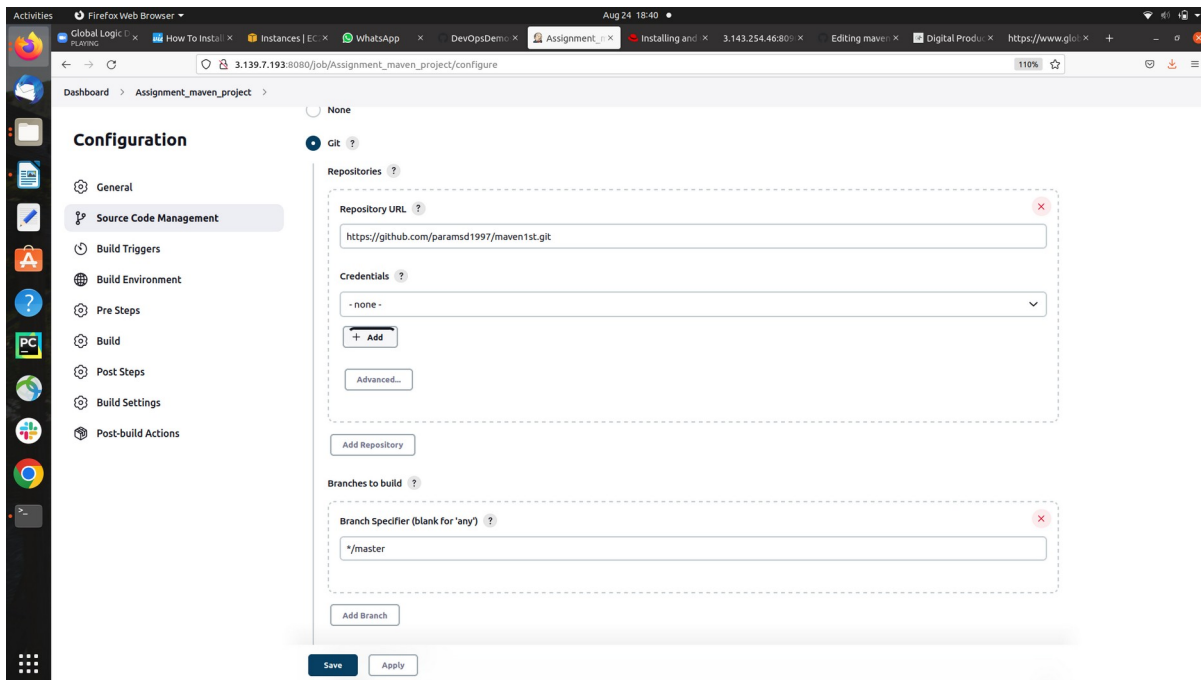
S	W	Name	Last Success	Last Failure	Last Duration
✓	⚙	Assignment_maven_project	2 min 54 sec #10	1 hr 4 min #3	17 sec

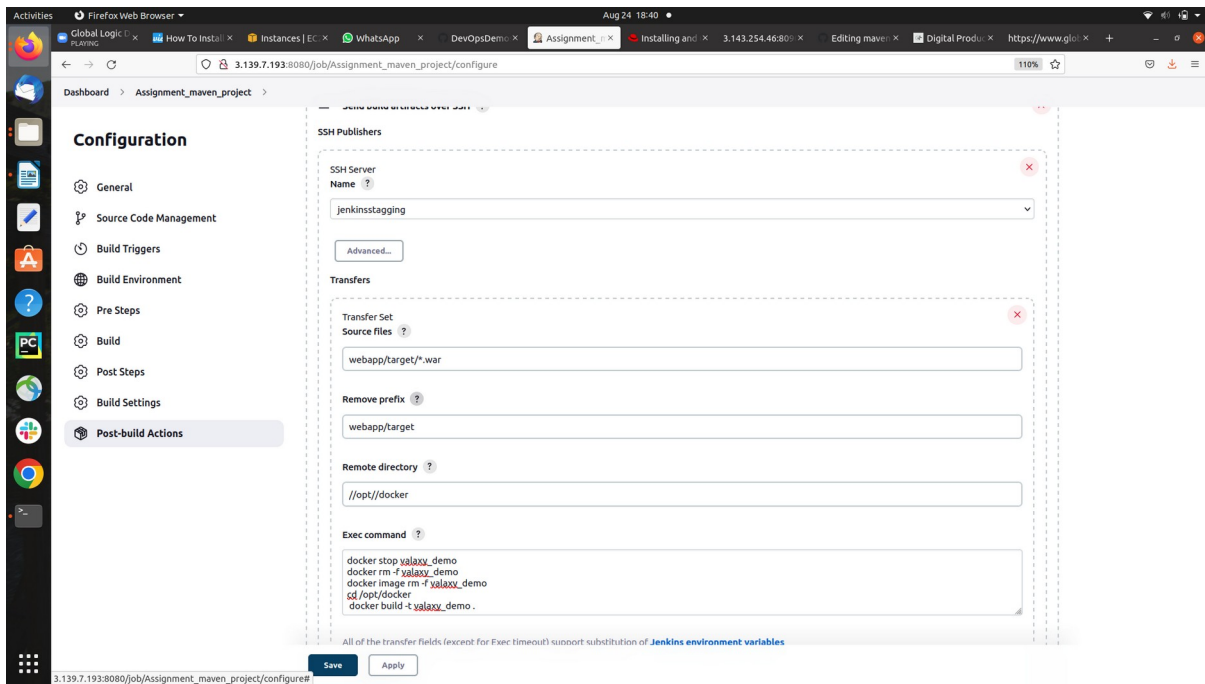
Icon: S M L

Atom feed for all Atom feed for failures Atom feed for just latest builds

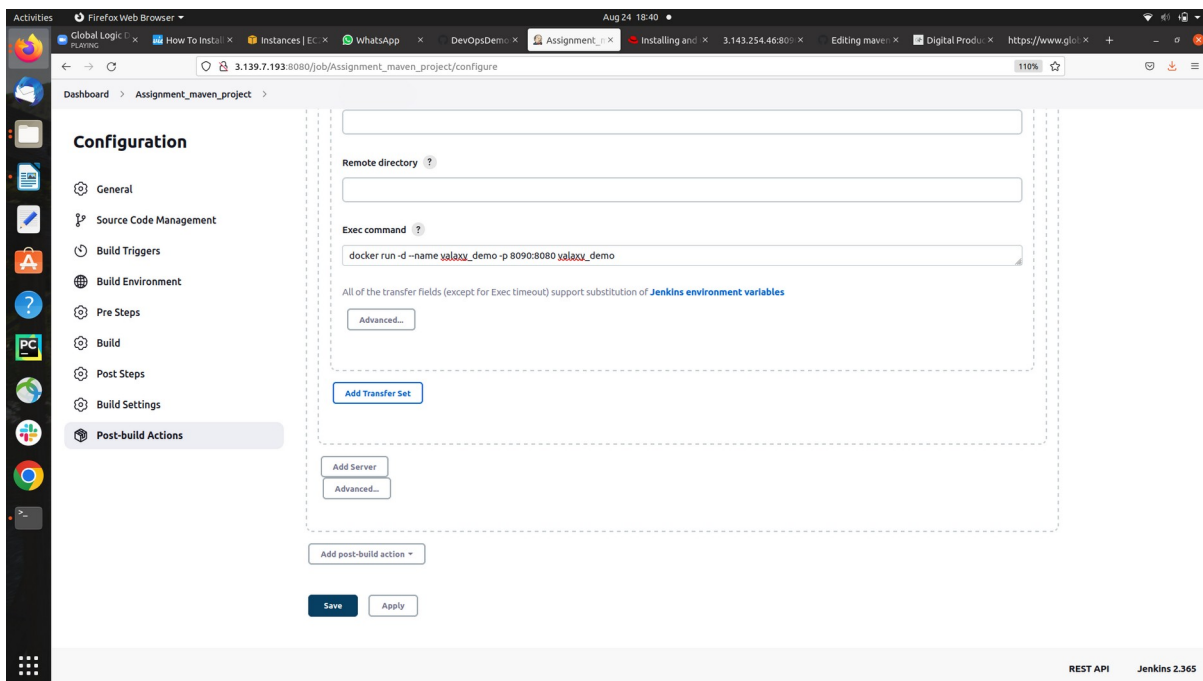
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step 2) Configuring the Project

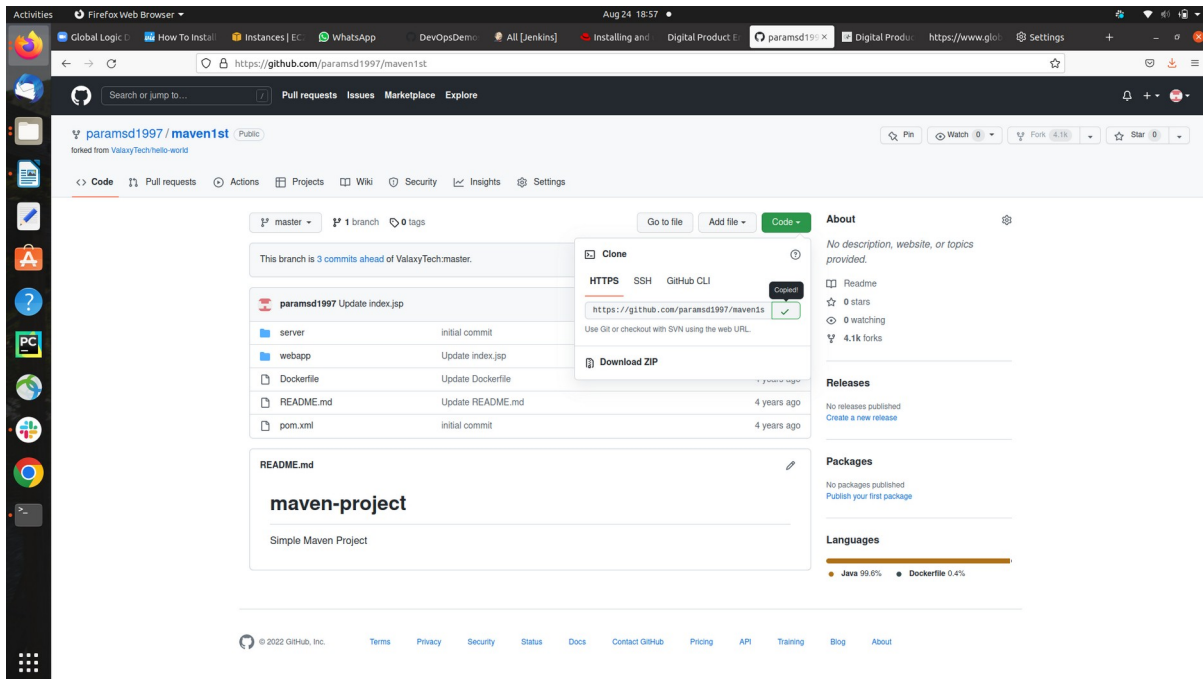




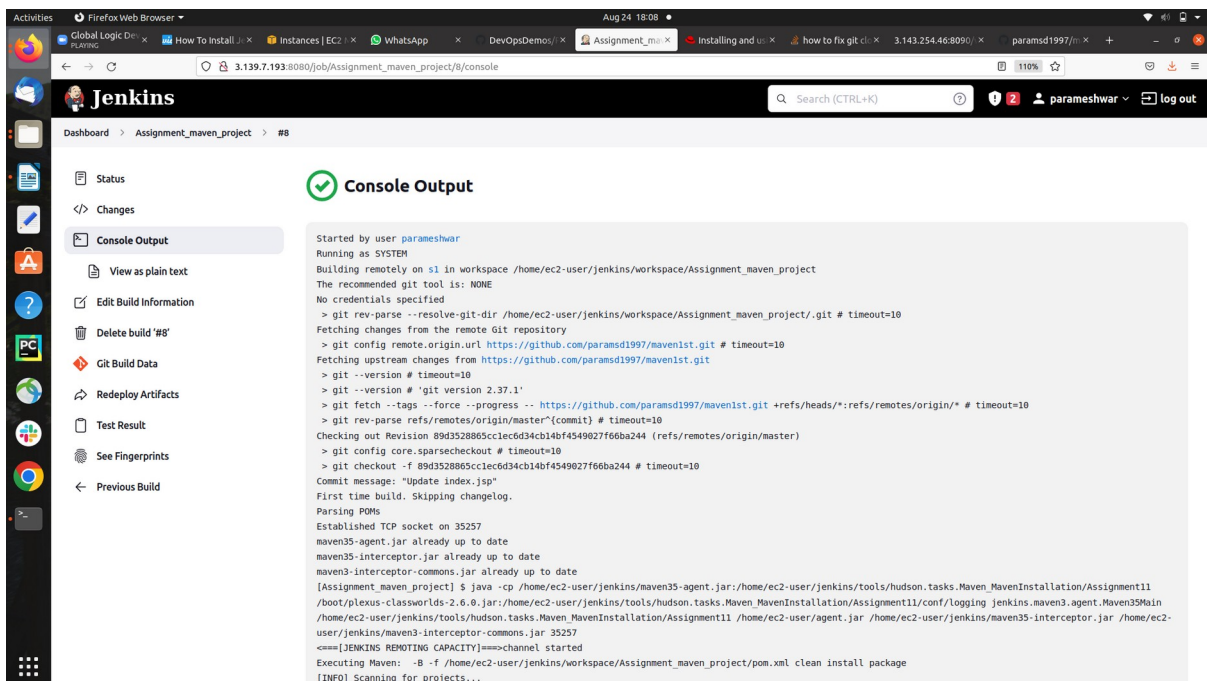
Executing the cmd to Build and run the Container with assigned port



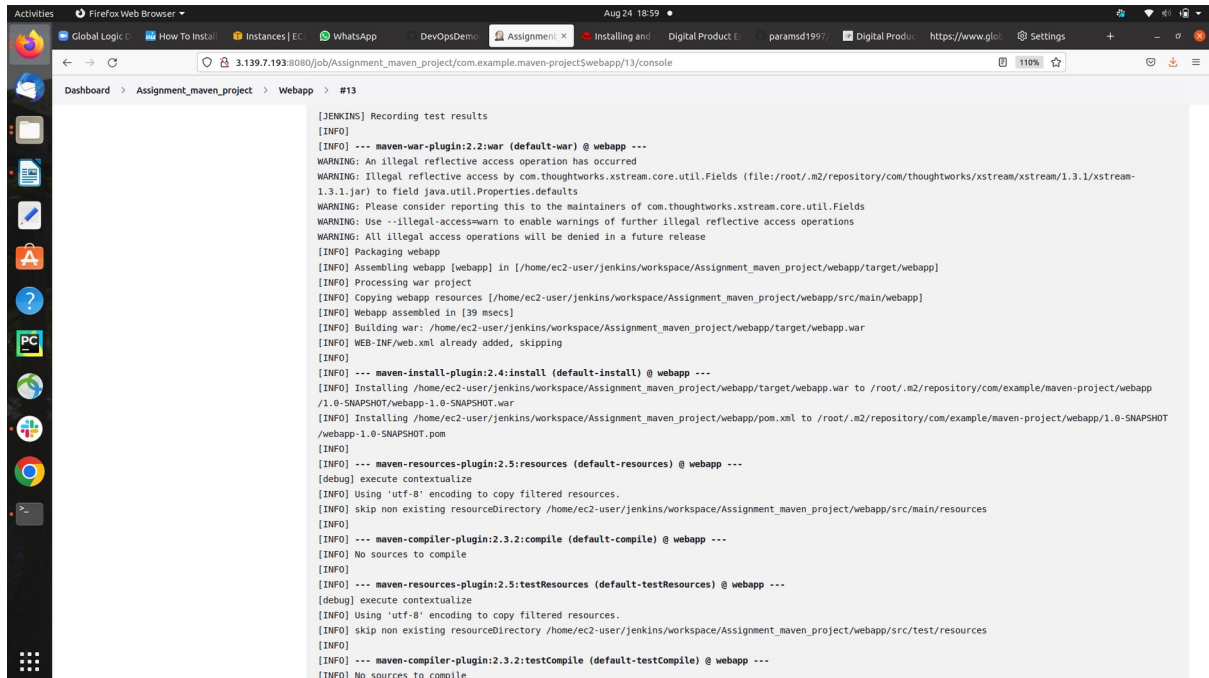
step3) git repository Content



step 4) Build the project output



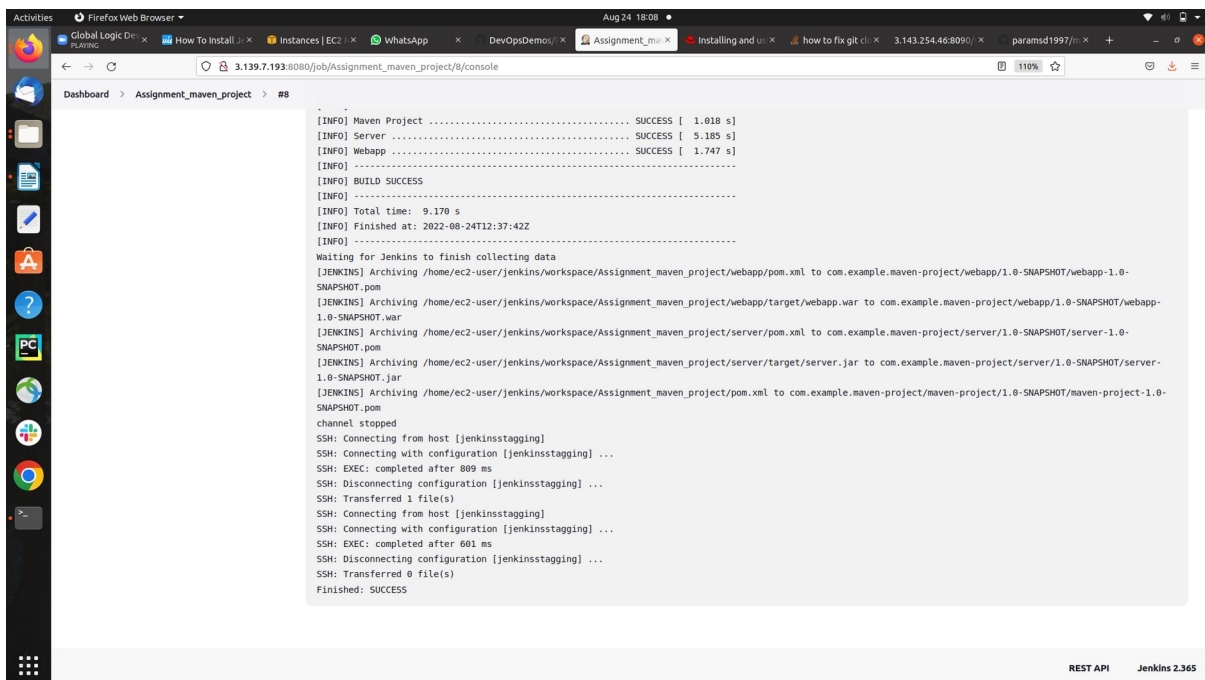
Building the .war file



The screenshot shows the Jenkins console output for a Maven project build. The output 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
[INFO]
```

project Build Successfully

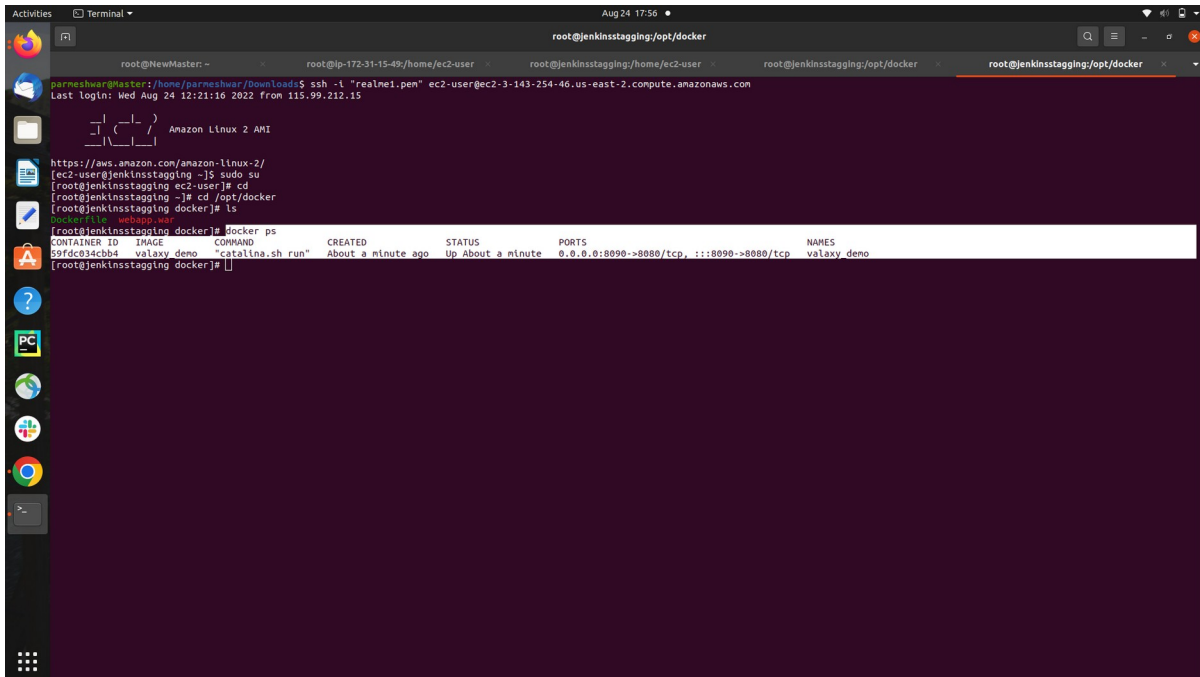


The screenshot shows the Jenkins console output for the final build. The output is as follows:

```
[INFO] Maven Project ..... SUCCESS [ 1.018 s]
[INFO] Server ..... SUCCESS [ 5.185 s]
[INFO] Webapp ..... SUCCESS [ 1.747 s]
[INFO] .....
[INFO] BUILD SUCCESS
[INFO] .....
[INFO] Total time: 9.170 s
[INFO] Finished at: 2022-08-24T12:37:42Z
[INFO] .....
Waiting for Jenkins to finish collecting data
[JENKINS] Archiving /home/ec2-user/jenkins/workspace/Assignment_maven_project/webapp/pom.xml to com.example.maven-project/webapp/1.0-SNAPSHOT/webapp-1.0-SNAPSHOT.pom
[JENKINS] Archiving /home/ec2-user/jenkins/workspace/Assignment_maven_project/webapp/target/webapp.war to com.example.maven-project/webapp/1.0-SNAPSHOT/webapp-1.0-SNAPSHOT.war
[JENKINS] Archiving /home/ec2-user/jenkins/workspace/Assignment_maven_project/server/pom.xml to com.example.maven-project/server/1.0-SNAPSHOT/server-1.0-SNAPSHOT.pom
[JENKINS] Archiving /home/ec2-user/jenkins/workspace/Assignment_maven_project/server/target/server.jar to com.example.maven-project/server/1.0-SNAPSHOT/server-1.0-SNAPSHOT.jar
[JENKINS] Archiving /home/ec2-user/jenkins/workspace/Assignment_maven_project/pom.xml to com.example.maven-project/maven-project/1.0-SNAPSHOT/maven-project-1.0-SNAPSHOT.pom
channel stopped
SSH: Connecting from host [jenkinsstaging]
SSH: Connecting with configuration [jenkinsstaging] ...
SSH: EXEC: completed after 809 ms
SSH: Disconnecting configuration [jenkinsstaging] ...
SSH: Transferred 1 file(s)
SSH: Connecting from host [jenkinsstaging]
SSH: Connecting with configuration [jenkinsstaging] ...
SSH: EXEC: completed after 601 ms
SSH: Disconnecting configuration [jenkinsstaging] ...
SSH: Transferred 0 file(s)
Finished: SUCCESS
```

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step 5) Docker Container created Successfully



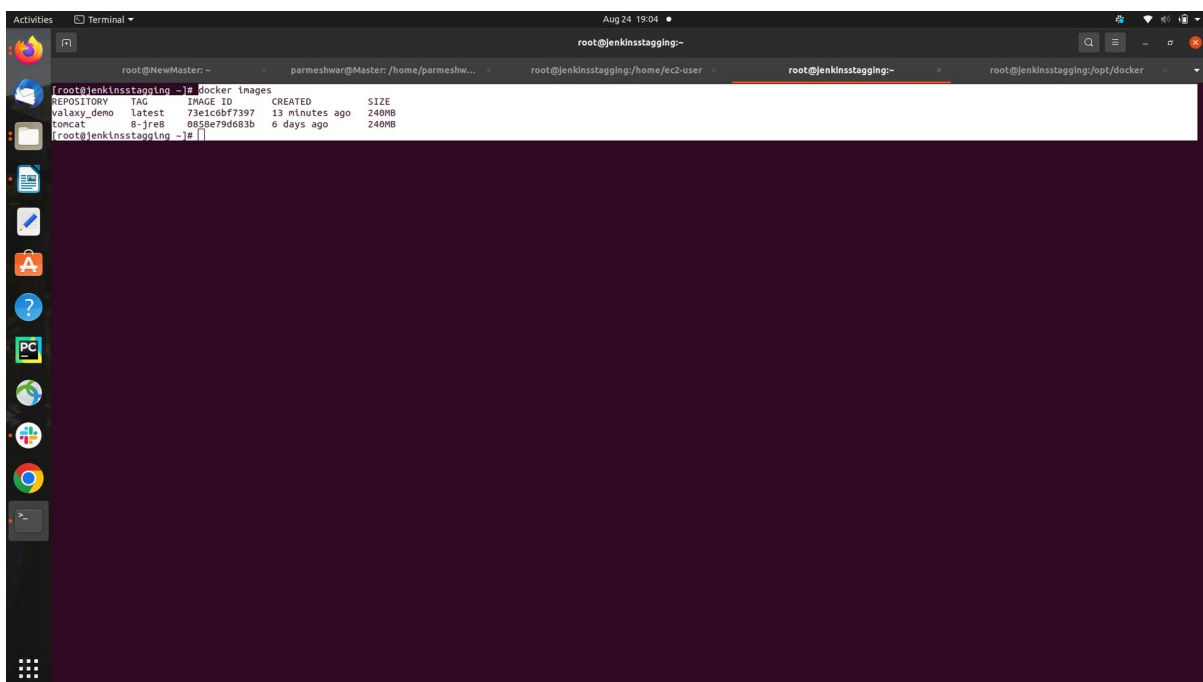
A terminal window showing the process of creating a Docker container. The user is logged into an Amazon Linux 2 AMI. The terminal shows the user navigating to the /opt/docker directory and running the command `docker ps`. The output of the command is displayed in a table format.

```
root@NewMaster: ~
parmeshwar@Master: /home/parmeshwar/Downloads$ ssh -i "realme1.pem" ec2-user@ec2-3-143-254-46.us-east-2.compute.amazonaws.com
Last login: Wed Aug 24 12:21:16 2022 from 115.99.212.15

_ _ _ _ _
| | | | |
_ _ _ _ _ Amazon Linux 2 AMI

https://aws.amazon.com/amazon-linux-2/
[ec2-user@jenkinsstaging ~]$ sudo su
[root@jenkinsstaging ec2-user]# cd
[root@jenkinsstaging ~]# cd /opt/docker
[root@jenkinsstaging docker]# ls
dockerfiles
[root@jenkinsstaging docker]# docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS                               NAMES
59fdc834cbb4   valaxy_demo   "catalina.sh run"        About a minute ago   Up About a minute   0.0.0.0:8090->8080/tcp, :::8090->8080/tcp   valaxy_deno
[root@jenkinsstaging docker]#
```

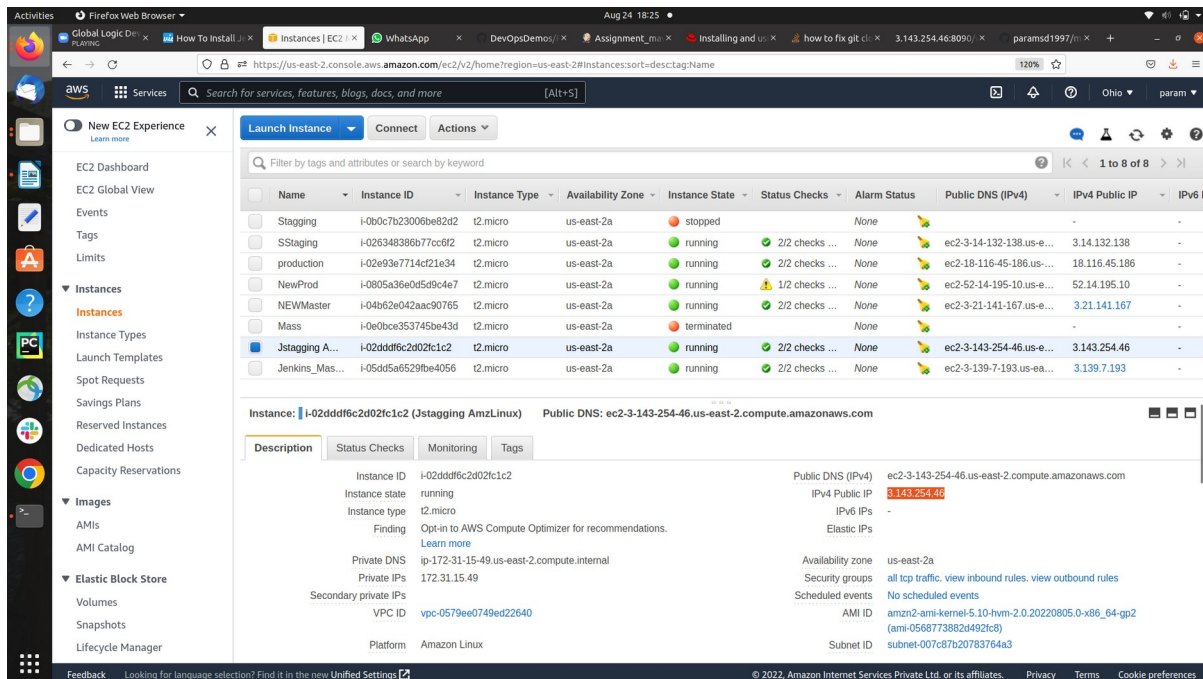
step 5) Docker images of Tomcat created Successfully



A terminal window showing the output of the `docker images` command. The output is displayed in a table format.

```
root@jenkinsstaging ~
[root@jenkinsstaging ~]# docker images
REPOSITORY    TAG       IMAGE ID       CREATED        SIZE
valaxy_demo   latest    73e1c6b77397   13 minutes ago   240MB
tomcat        8-jre08   0859e79d683b   6 days ago       240MB
[root@jenkinsstaging ~]#
```

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

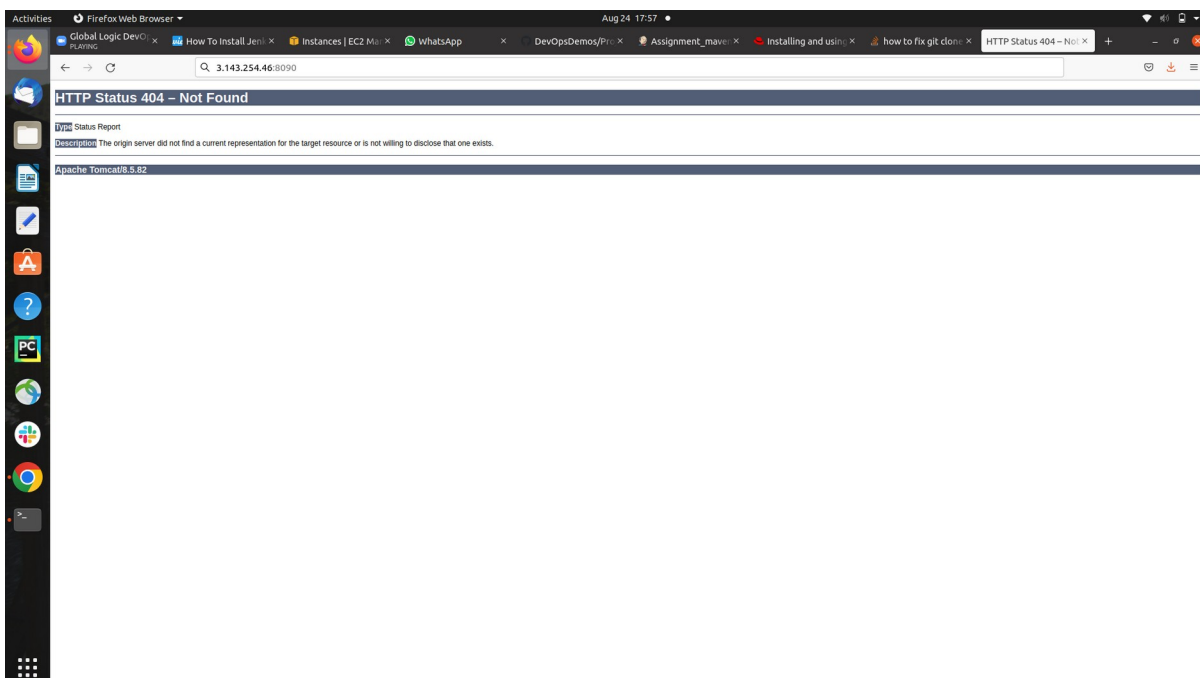


The screenshot shows the AWS Management Console with the EC2 Instances page. The 'Jstaging A...' instance is selected, and its details are displayed. The public IP address is 3.143.254.46.

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)	IPv4 Public IP	IPv6
Staging	i-0b0c7b23006be82d2	t2.micro	us-east-2a	stopped		None		-	-
SStaging	i-026348386b77cc6f2	t2.micro	us-east-2a	running	2/2 checks ...	None	ec2-3-143-132-138.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		None		-	-
Jstaging A...	i-02ddd6c2d02fc1c2	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	-

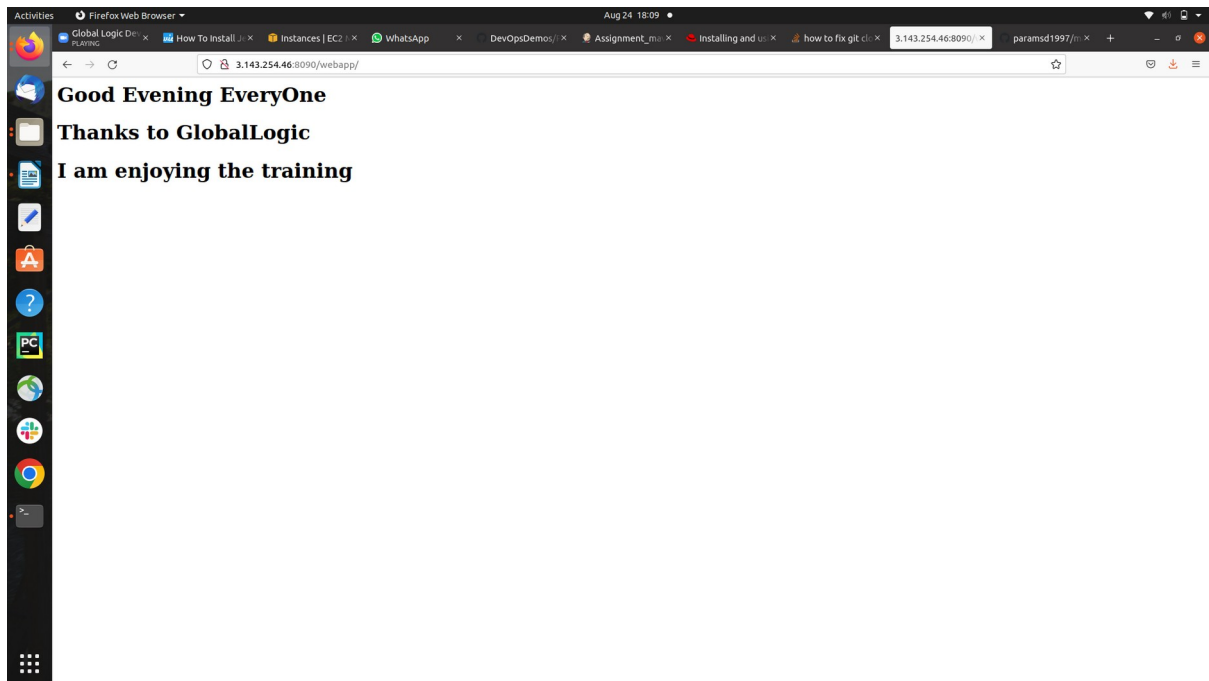
Instance: **i-02ddd6c2d02fc1c2 (Jstaging AmzLinux)** Public DNS: ec2-3-143-254-46.us-east-2.compute.amazonaws.com

Description	Status Checks	Monitoring	Tags
Instance ID	i-02ddd6c2d02fc1c2		
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 IPs	-		
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	amzn2-ami-kernel-5.10-hvm-2.0.20220805.0-x86_64-gp2 (ami-0568773882d492fc8)		
Subnet ID	subnet-007c87b20783764a3		



The screenshot shows a web browser displaying an HTTP 404 - Not Found error. The error message states: "The origin server did not find a current representation for the target resource or is not willing to disclose that one exists." The browser address bar shows the URL: <http://3.143.254.46:8080>.

step 7) Accessing the webpage of using the Staggering m/c public ip and Assigned port no.



Changes did in the webpage that output Committed again

