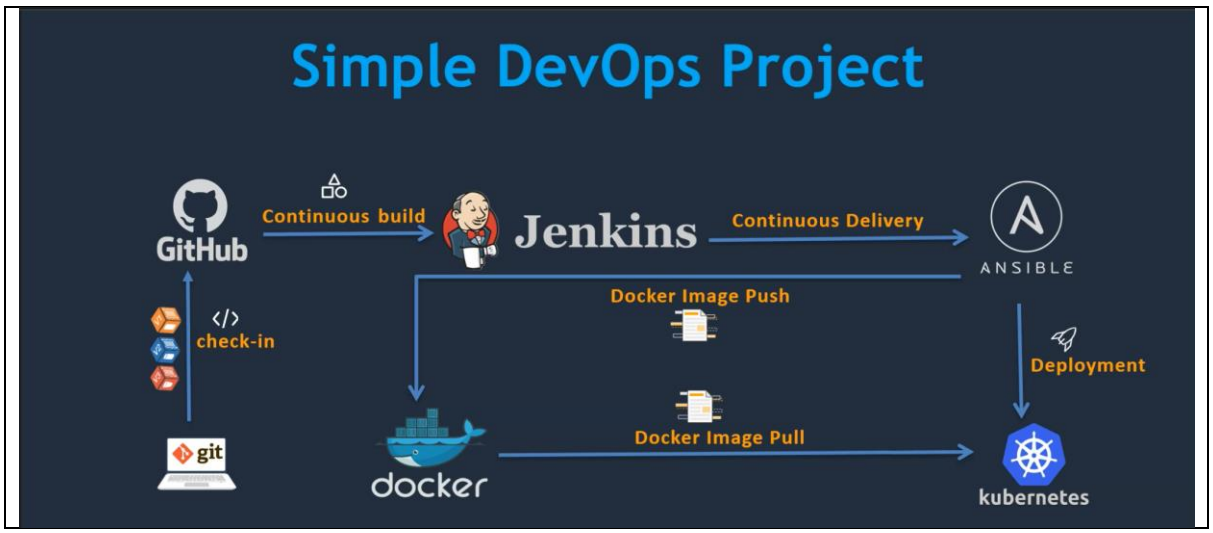
Simple Devops Projects

<u>Requiremts :</u> CI/CD pipeline System

- Git - local version control system.
- GitHub - As Distributed version control system.
- Jenkins - Continous Integration tool.
- Maven - As a Build Tool.
- Anisible - Configuration Management & Deployment tool.
- docker -Containerization
- Kubernetes - As Container Management Tool.

Flow Diagram : -



What Do we Cover?

Build and Deploy on Tomcat Server.

Setup CI/CD with GitHub, Jenkins, Maven & Tomcat.

- Setup Jenkins
- Setup & Configure Maven , Git.
- Setup Tomcat Server.
- Integrating GitHub,Maven ,Tomcat Server with Jenkins
- Create a CI and CD Job.
- Test the Deployment.

1. **Deploy Artifacts on a Tomcat Server**

Fig. Deploy Artifacts on a Tomcat Server

Build and Deploy on Container.

Setup CI/CD with GitHub, Jenkins, Maven & Docker.

- Setting up the docker Environment.
- Write DockerFile.
- Create an Image and Container on Docker Host.
- Integrate Docker Host with Jenkins.
- Create CI/CD Job on Jenkins to build and deploy on container.

2. **Deploy Artifacts on a Container**

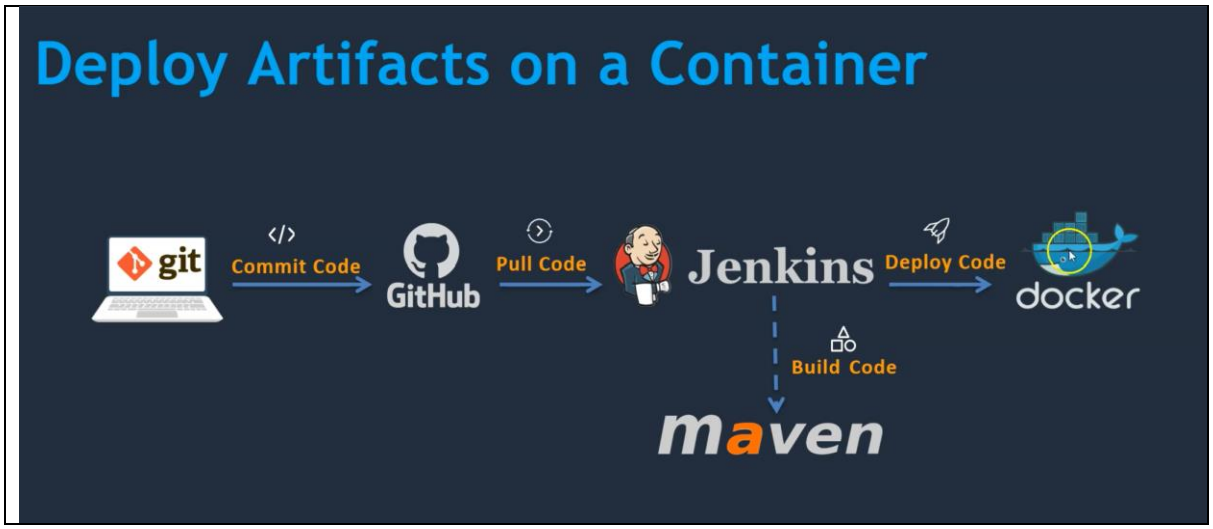


Fig. Deploy Artifacts on a Docker Container

Build and Deploy on Container.

CI/CD with GitHub, Jenkins, Maven, Ansible & Docker.

- Setting up the Ansible Server

- Integrate Docker Host with Ansible.
- Ansible playbook to create Image.
- Ansible playbook to create Container.
- Integrate Ansible with Jenkins.
- CI/CD Job to build code on Ansible & Deploy it on docker container.

3. Deploy Artifacts on a Container

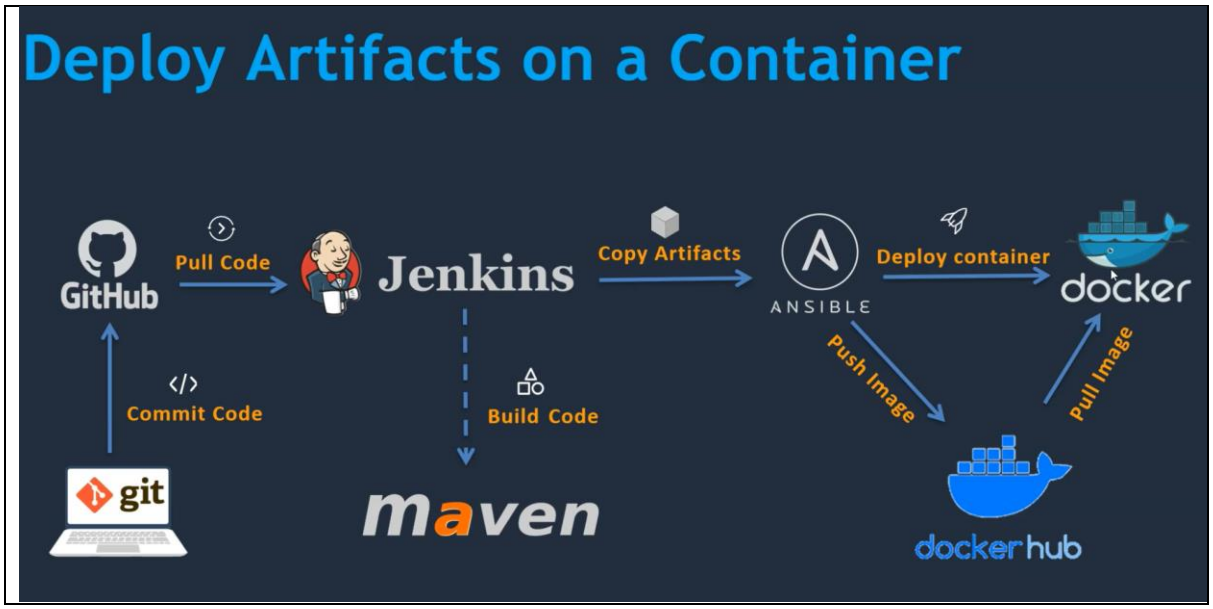


Fig. Deploy Artifacts on a Ansible Container.

Build and Deploy on Container.

CI/CD with GitHub, Jenkins, Maven, Ansible & Kubernetes.

- Setting up the Kubernetes (EKS).

- Write pod service and deployment manifest file.
- Integrate Kubernetes with Ansible.
- Ansible playbook to create deployment & service.
- CI/CD Job to build code on Ansible & Deploy it on Kubernetes.

4. Deploy Artifacts on a Kubernetes.

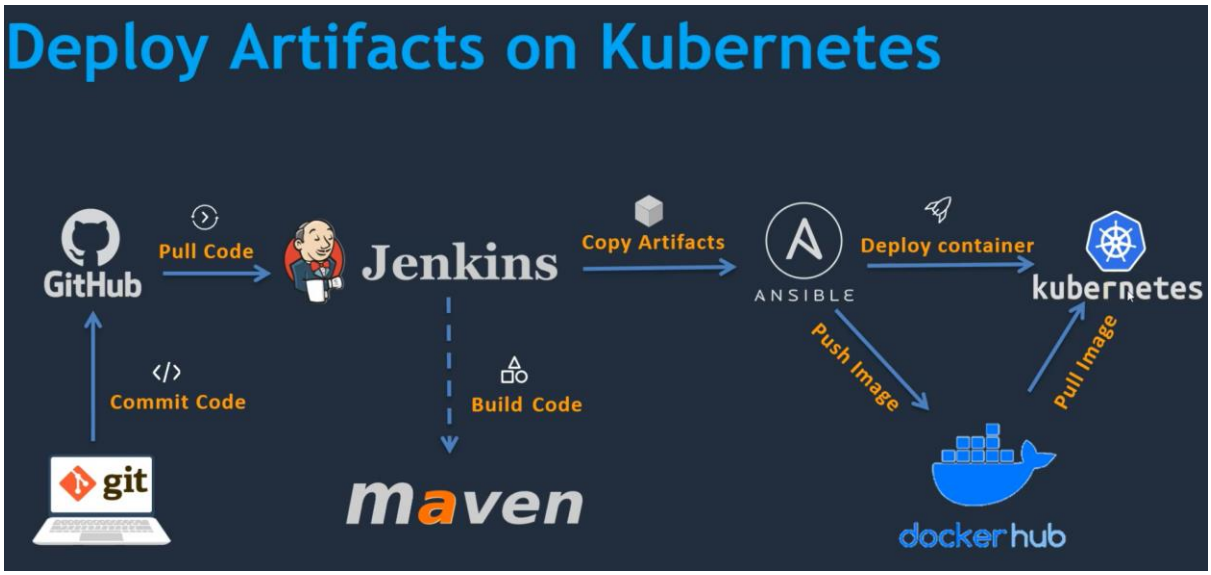


Fig. Deploy Artifacts on Kubernetes.

What is CI and CD

- **Continuous Integration.**
- **Continuous Delivery.**
- **Continuous Deployment.**

How Does CI and CD Works on AWS?

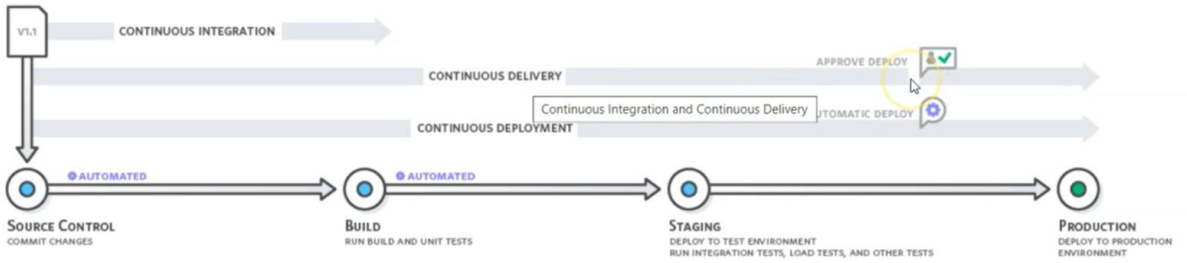


Fig. CI and CD Works on AWS.

How Does CI and CD Working on Devops?

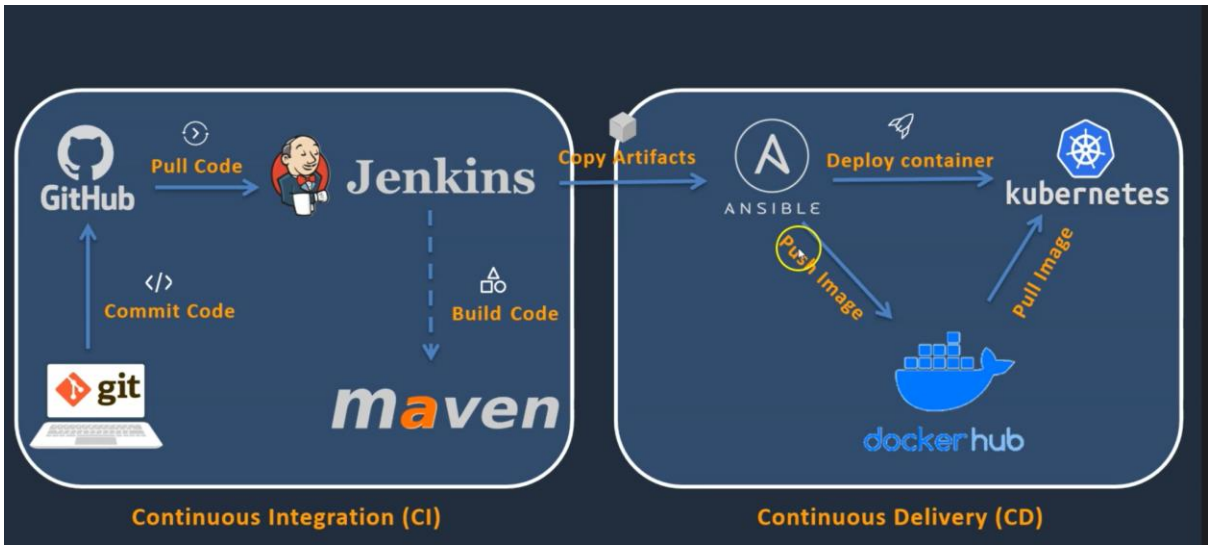


Fig. CI and CD Works on Devops.

<u>Note:</u> For Continuous Deployment we need multiple environments (With Manual Interventions).

Resources to Setup CI and CD pipeline.

- Free Tier AWS account.
- GitHub account (for source code and documentation).
- MobaXterm – enhanced terminal for windows with X11 Server tabbed SSH clients, network tool and much more.
- Git – local version control system.

CI and CD pipeline using Git, Jenkins & Maven.

Fig. Build Code Jenkins on Maven

Setup Jenkins Server

- Setup a Linux EC2 instance
- Install Java
- Install Jenkins

- Start Jenkins
- Access Web UI on port 8080

Setup a Linux EC2 instance

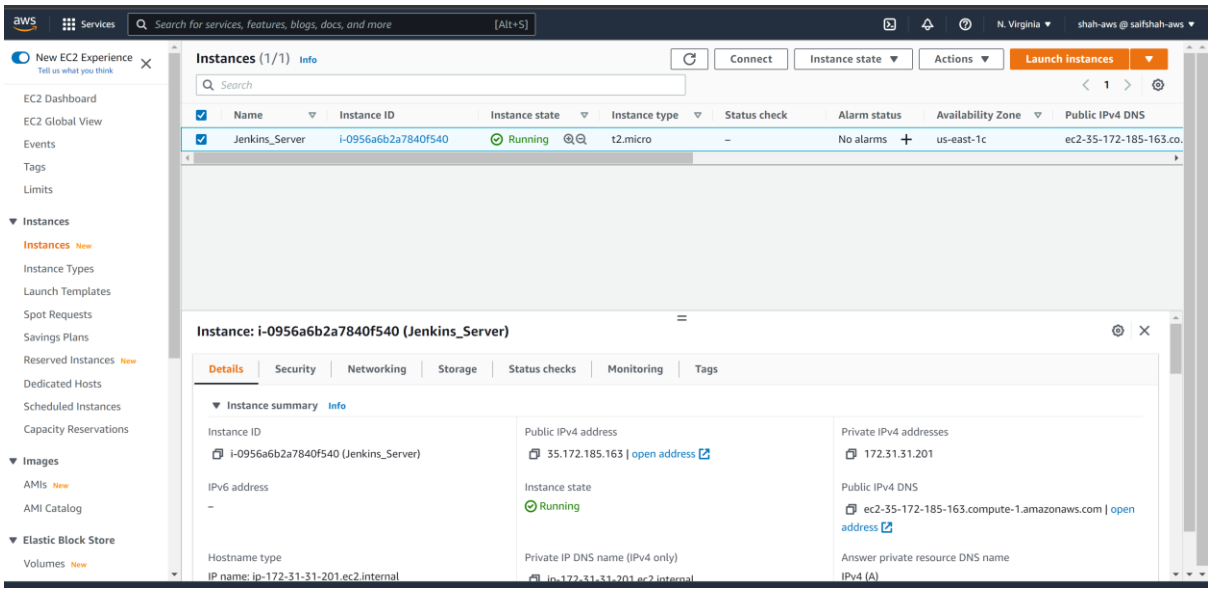


Fig.EC2 Instance for Jenkins Server

Installation of Jenkins

First Step:

Connecting MobaXterm

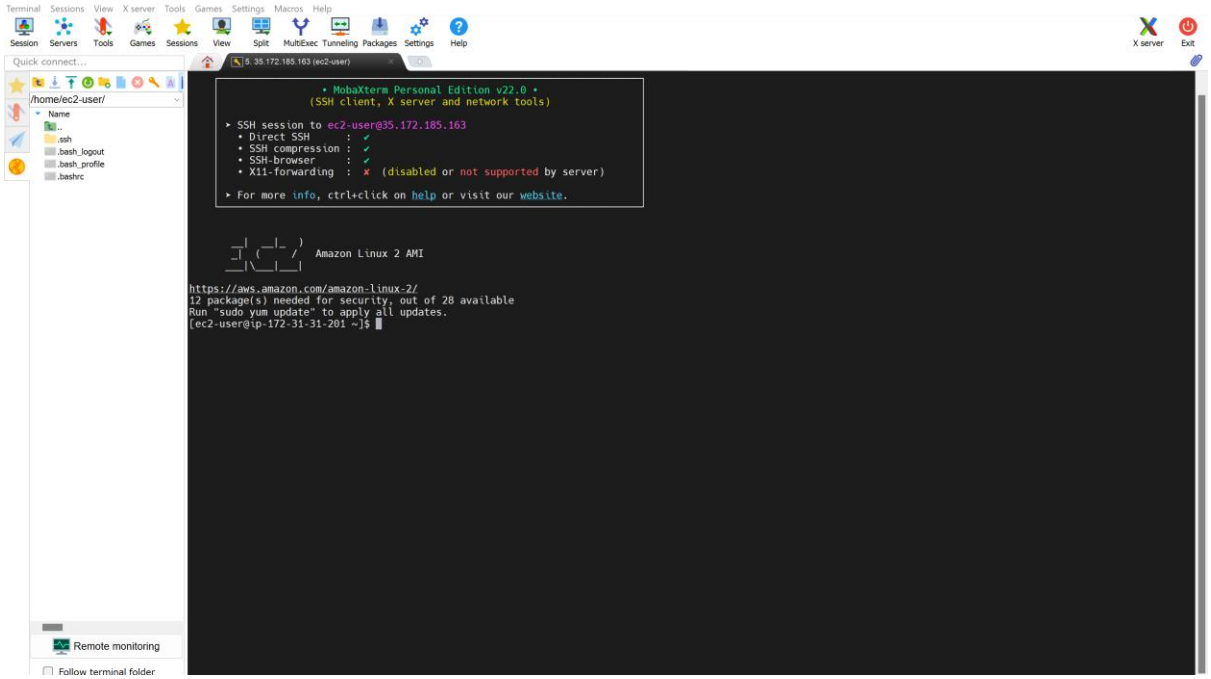


Fig. MobaXterm

Second Step:

Official website: - https://pkg.jenkins.io/redhat-stable/

```
sudo wget -O /etc/yum.repos.d/jenkins.repo https://pkg.jenkins.io/redhat-stable/jenkins.repo
  sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io.key
```

```
yum install epel-release //fails
sudo amazon-linux-extras install epel
sudo amazon-linux-extras install java-openjdk11
yum install jenkins
```

Installation of Java

[root@ip-172-31-31-201 ~]# java --version

openjdk 11.0.13 2021-10-19 LTS

OpenJDK Runtime Environment 18.9 (build 11.0.13+8-LTS)

OpenJDK 64-Bit Server VM 18.9 (build 11.0.13+8-LTS, mixed mode, sharing)

Jenkins Start

[root@ip-172-31-31-201 ~]# service jenkins status

● jenkins.service - Jenkins Continuous Integration Server

Loaded: loaded (/usr/lib/systemd/system/jenkins.service; disabled; vendor preset: disabled)

Active: inactive (dead)

[root@ip-172-31-31-201 ~]# service Jenkins start

Starting jenkins (via systemctl): [OK]

[root@ip-172-31-31-201 ~]# service jenkins status

● jenkins.service - Jenkins Continuous Integration Server

Loaded: loaded (/usr/lib/systemd/system/jenkins.service; disabled; vendor preset: disabled)

Active: active (running) since Sun 2022-05-01 19:02:31 UTC; 2min 3s ago

Main PID: 6549 (java)

CGroup: /system.slice/jenkins.service

└─6549 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=%C/jenkins/war --httpPort=8080

May 01 19:02:02 ip-172-31-31-201.ec2.internal jenkins[6549]: This may also be found at: /var/lib/jenkins/secrets/initialAdminPassword

**May 01 19:02:02 ip-172-31-31-201.ec2.internal jenkins[6549]: **

**May 01 19:02:02 ip-172-31-31-201.ec2.internal jenkins[6549]: **

**May 01 19:02:02 ip-172-31-31-201.ec2.internal jenkins[6549]: **

May 01 19:02:31 ip-172-31-31-201.ec2.internal jenkins[6549]: 2022-05-01 19:02:31.729+0000 [id=30] INFO jenkins.InitReactorRunner$1#onAttained...lization

May 01 19:02:31 ip-172-31-31-201.ec2.internal jenkins[6549]: 2022-05-01 19:02:31.755+0000 [id=23] INFO hudson.lifecycle.Lifecycle#onReady: Je... running

May 01 19:02:31 ip-172-31-31-201.ec2.internal systemd[1]: Started Jenkins Continuous Integration Server.

May 01 19:02:31 ip-172-31-31-201.ec2.internal jenkins[6549]: 2022-05-01 19:02:31.868+0000 [id=45] INFO h.m.DownloadService$Downloadable#load:...nstaller

May 01 19:02:31 ip-172-31-31-201.ec2.internal jenkins[6549]: 2022-05-01 19:02:31.869+0000 [id=45] INFO hudson.util.Retrier#start: Performed t...tempt #1

May 01 19:02:31 ip-172-31-31-201.ec2.internal jenkins[6549]: 2022-05-01 19:02:31.878+0000 [id=45] INFO hudson.model.AsyncPeriodicWork#lambda$...0,935 ms

Hint: Some lines were ellipsized, use -l to show in full.

Access Web UI on port 8080:

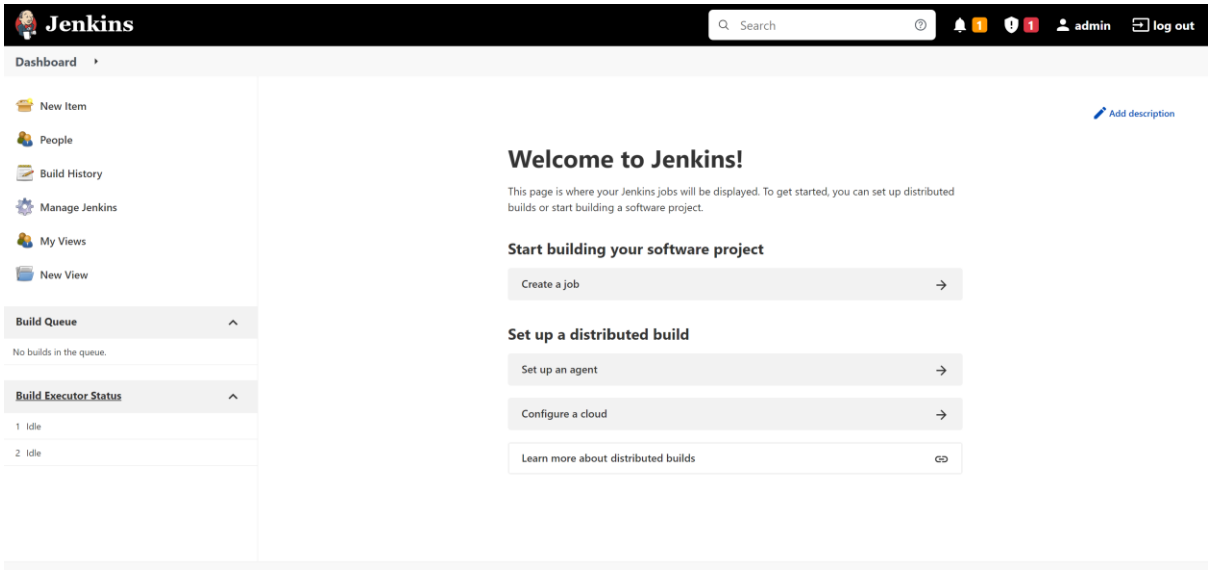


Fig. Access Web UI on port 8080

Run First Jenkins Job:

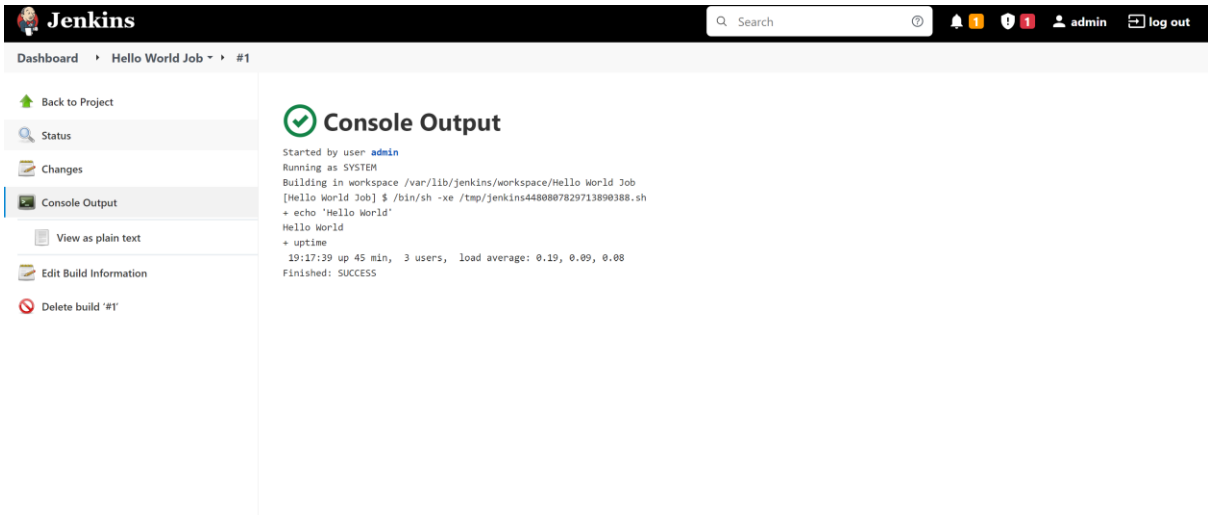


Fig. Run First Jenkins Job

Integrate Git with Jenkins

- Install Git on Jenkins Instances
- Install GitHub plug in on Jenkins GUI
- Configure Git on Jenkins GUI

Install Git on Jenkins Instances:

```
yum install git
```

[root@Jenkins_Server ~]# git --version

git version 2.32.0

Install GitHub plug in on Jenkins GUI

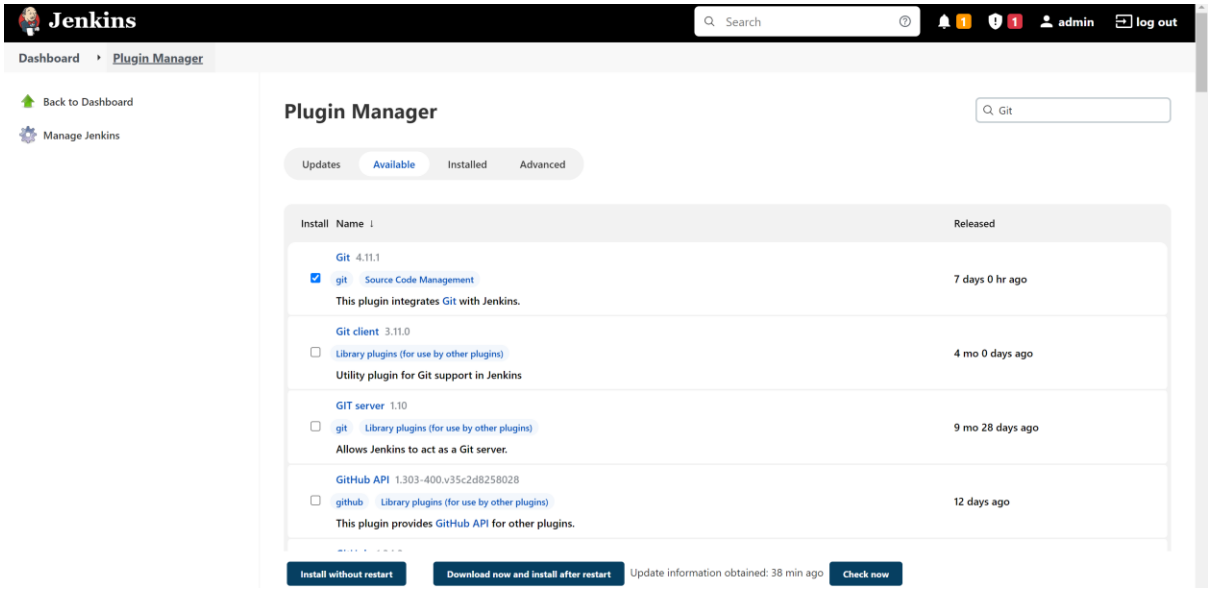


Fig. Plugin Integrates git with Jenkins.

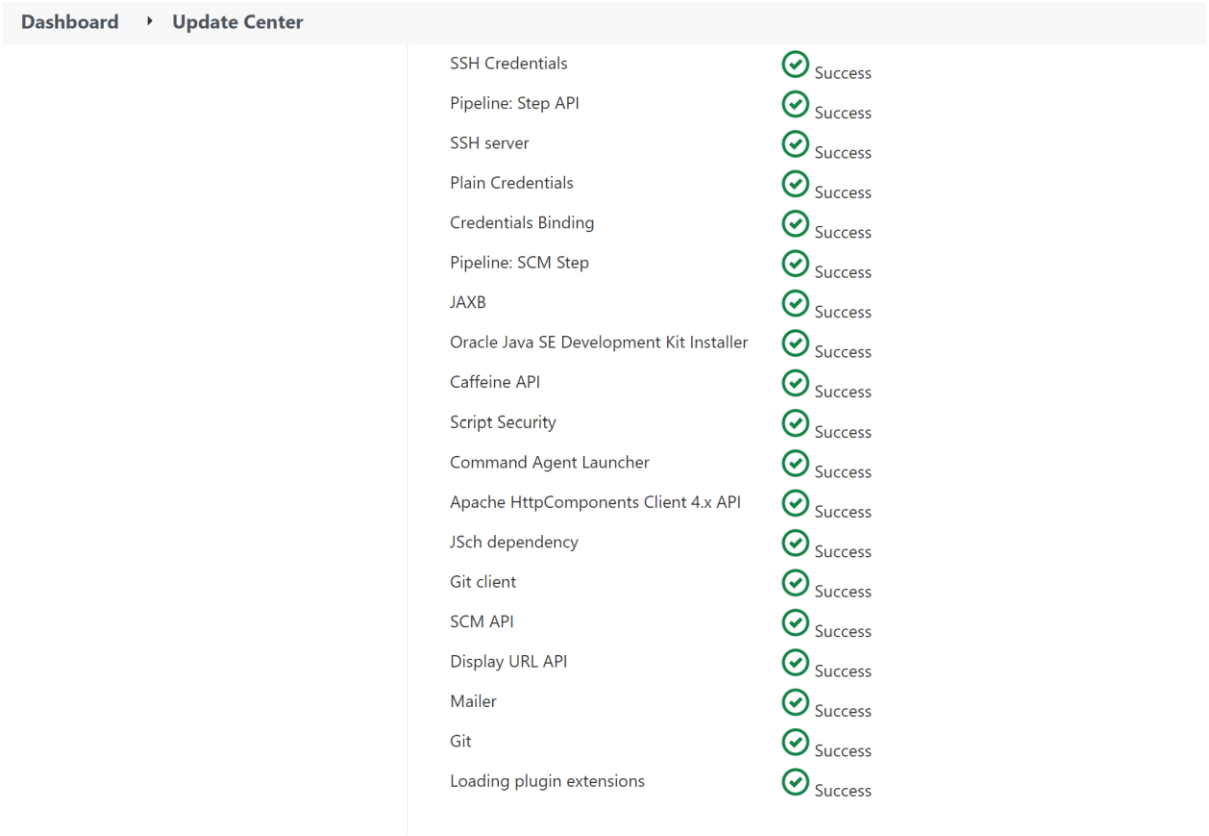


Fig. Success Plugin Integrates git with Jenkins.

Configure Git on Jenkins GUI

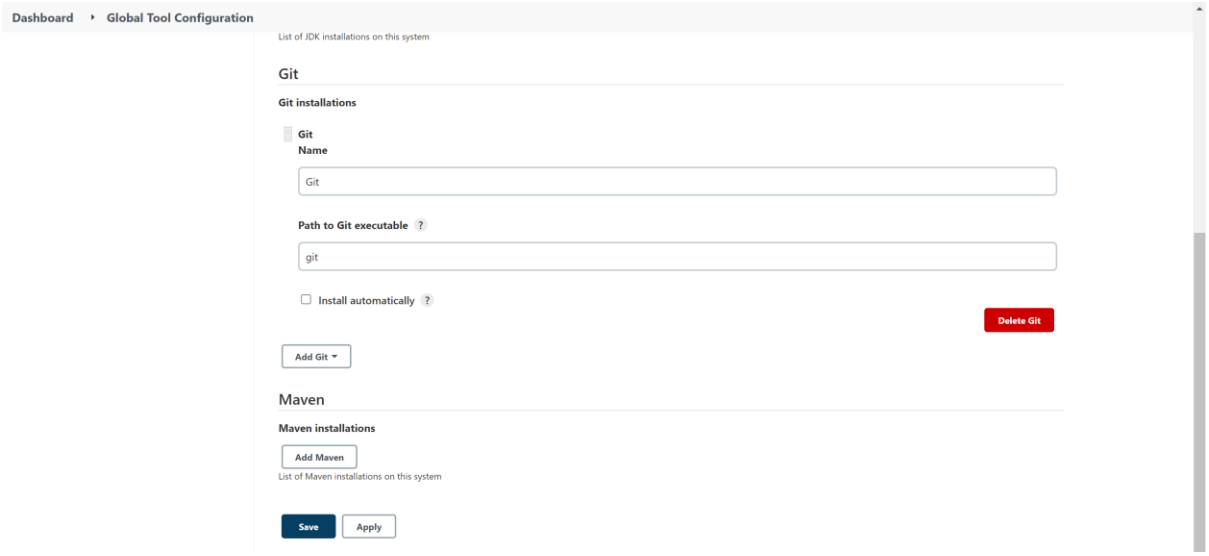


Fig. Configure Git on Jenkins GUI

Run Jenkins Job to pull code from GitHub

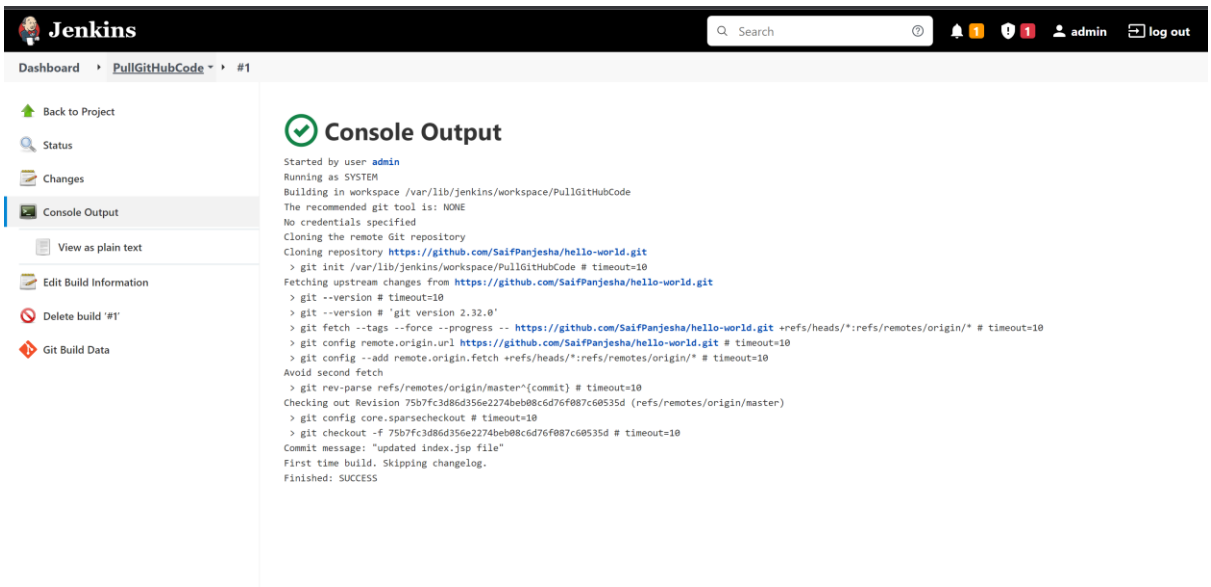


Fig **Run** Jenkins Job to pull code from GitHub

[root@Jenkins_Server ~]# cd /var/lib/jenkins/workspace/PullGitHubCode

[root@Jenkins_Server PullGitHubCode]# ll

total 24

-rw-r--r-- 1 jenkins jenkins 130 May 1 20:20 Dockerfile

-rw-r--r-- 1 jenkins jenkins 5970 May 1 20:20 pom.xml

-rw-r--r-- 1 jenkins jenkins 271 May 1 20:20 README.md

-rw-r--r-- 1 jenkins jenkins 479 May 1 20:20 regapp-deploy.yml

-rw-r--r-- 1 jenkins jenkins 195 May 1 20:20 regapp-service.yml

drwxr-xr-x 3 jenkins jenkins   32 May 1 20:20 server

drwxr-xr-x 3 jenkins jenkins   32 May 1 20:20 webapp

[root@Jenkins_Server PullGitHubCode]#

Integrate Maven with Jenkins

- Setup Maven on Jenkins Server
- Setup Environment Variables
    - JAVA_HOME, M2, M2_HOME
- Install Maven Plugin
- Configure Maven and Java

Setup Maven on Jenkins Server

[root@Jenkins_Server opt]# wget https://dlcdn.apache.org/maven/maven-3/3.8.5/binaries/apache-maven-3.8.5-bin.tar.gz

[root@Jenkins_Server opt]# ll

[root@Jenkins_Server opt]# mv apache-maven-3.8.5 maven

[root@Jenkins_Server opt]# cd maven

[root@Jenkins_Server ~]# cd /opt

[root@Jenkins_Server opt]# ll

[root@Jenkins_Server maven]# cd bin

[root@Jenkins_Server bin]# ll

[root@Jenkins_Server bin]# ./mvn -v

Apache Maven 3.8.5 (3599d3414f046de2324203b78ddcf9b5e4388aa0)

Maven home: /opt/maven

Java version: 11.0.13, vendor: Red Hat, Inc., runtime: /usr/lib/jvm/java-11-openjdk-11.0.13.0.8-1.amzn2.0.3.x86_64

Default locale: en_US, platform encoding: UTF-8

OS name: "linux", version: "4.14.275-207.503.amzn2.x86_64", arch: "amd64", family: "unix"

[root@Jenkins_Server bin]# cd ..

[root@Jenkins_Server maven]# cd bin

[root@Jenkins_Server bin]# mvn -v

[root@Jenkins_Server bin]# cd ~

[root@Jenkins_Server ~]# ll -a

Setup Environment Variables

JAVA_HOME, M2, M2_HOME

[root@Jenkins_Server ~]# vi .bash_profile

```
# .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
        . ~/.bashrc
fi
M2_HOME=/opt/maven
M2=/opt/maven/bin
JAVA_HOME=/usr/lib/jvm/java-11-openjdk-11.0.13.0.8-1.amzn2.0.3.x86_64

# User specific environment and startup programs

PATH=$PATH:$HOME/bin:$JAVA_HOME:$M2_HOME:$M2

export PATH
```

[root@Jenkins_Server ~]# echo $Path

[root@Jenkins_Server ~]# source .bash_profile

[root@Jenkins_Server ~]# echo $Path

[root@Jenkins_Server ~]# vi .bash_profile

[root@Jenkins_Server ~]# echo $Path

[root@Jenkins_Server ~]# logout

[root@Jenkins_Server /]# cd ~

[root@Jenkins_Server ~]# echo $path

[root@Jenkins_Server ~]# echo $PATH

/sbin:/bin:/usr/sbin:/usr/bin

[root@Jenkins_Server ~]# vi .bash_profile

[root@Jenkins_Server ~]# echo $PATH

/sbin:/bin:/usr/sbin:/usr/bin

[root@Jenkins_Server ~]# source .bash_profile

[root@Jenkins_Server ~]# echo $PATH

/sbin:/bin:/usr/sbin:/usr/bin:/root/bin:/usr/lib/jvm/java-11-openjdk-11.0.13.0.8-1.amzn2.0.3.x86_64:/opt/maven:/opt/maven/bin

[root@Jenkins_Server ~]# mvn -v

Apache Maven 3.8.5 (3599d3414f046de2324203b78ddcf9b5e4388aa0)

Maven home: /opt/maven

Java version: 11.0.13, vendor: Red Hat, Inc., runtime: /usr/lib/jvm/java-11-openjdk-11.0.13.0.8-1.amzn2.0.3.x86_64

Default locale: en_US, platform encoding: UTF-8

OS name: "linux", version: "4.14.275-207.503.amzn2.x86_64", arch: "amd64", family: "unix"

Install Maven Plugin

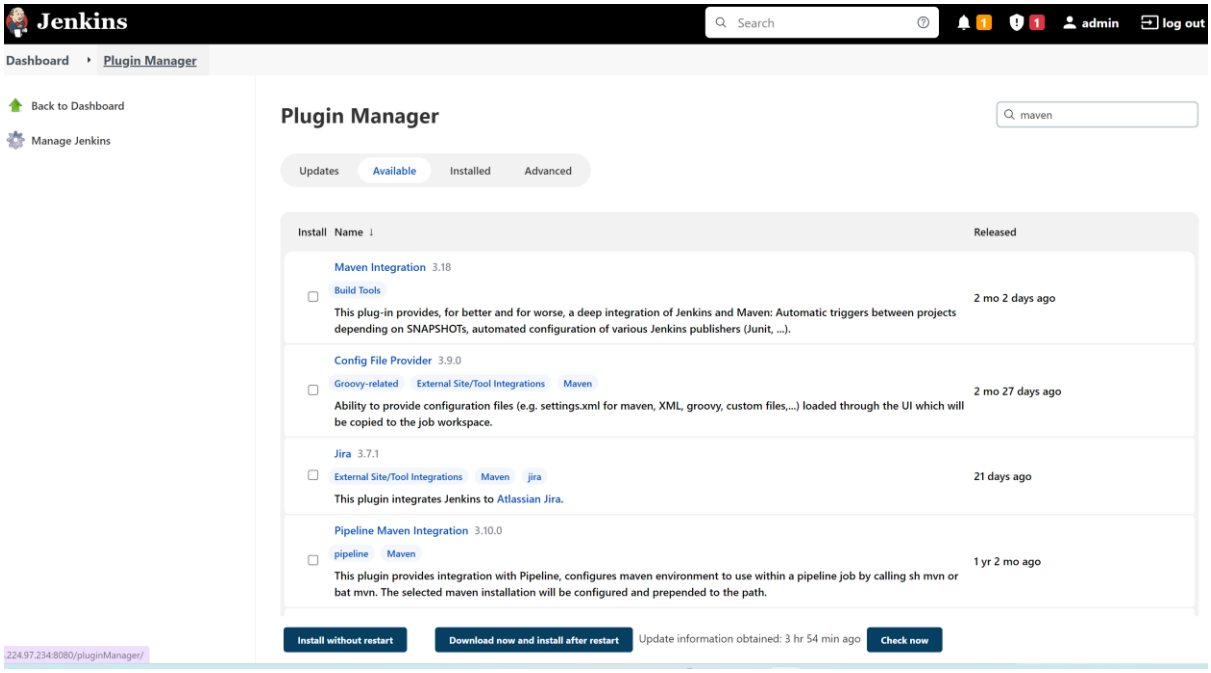


Fig Maven Plugin

Configure Maven and Java

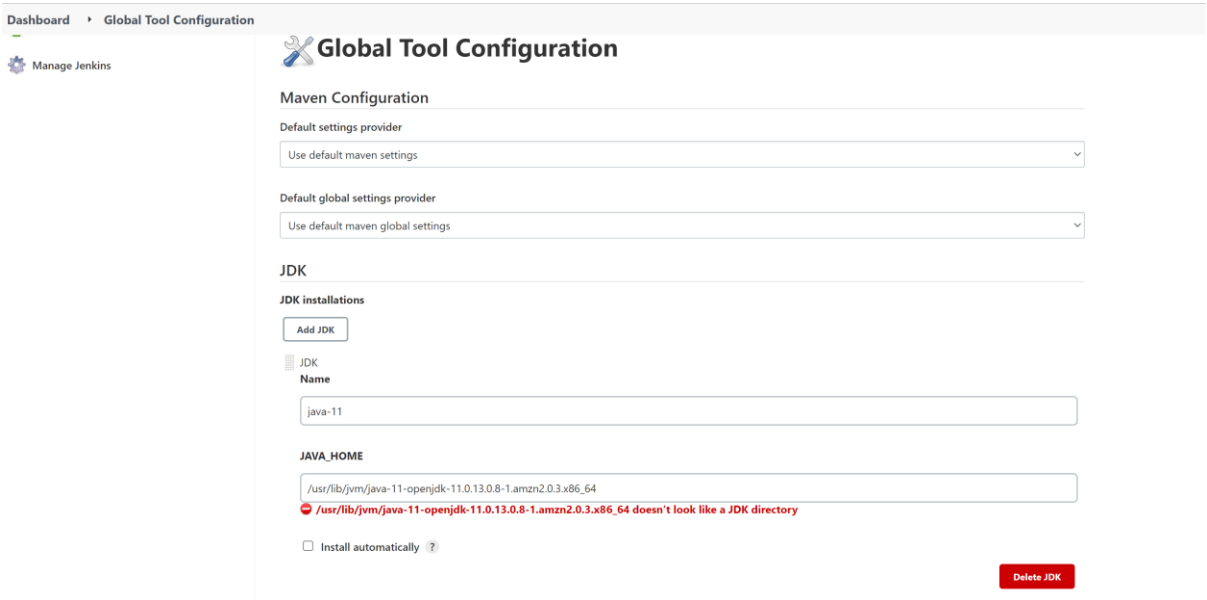


Fig. Java Global Tool Configuration.

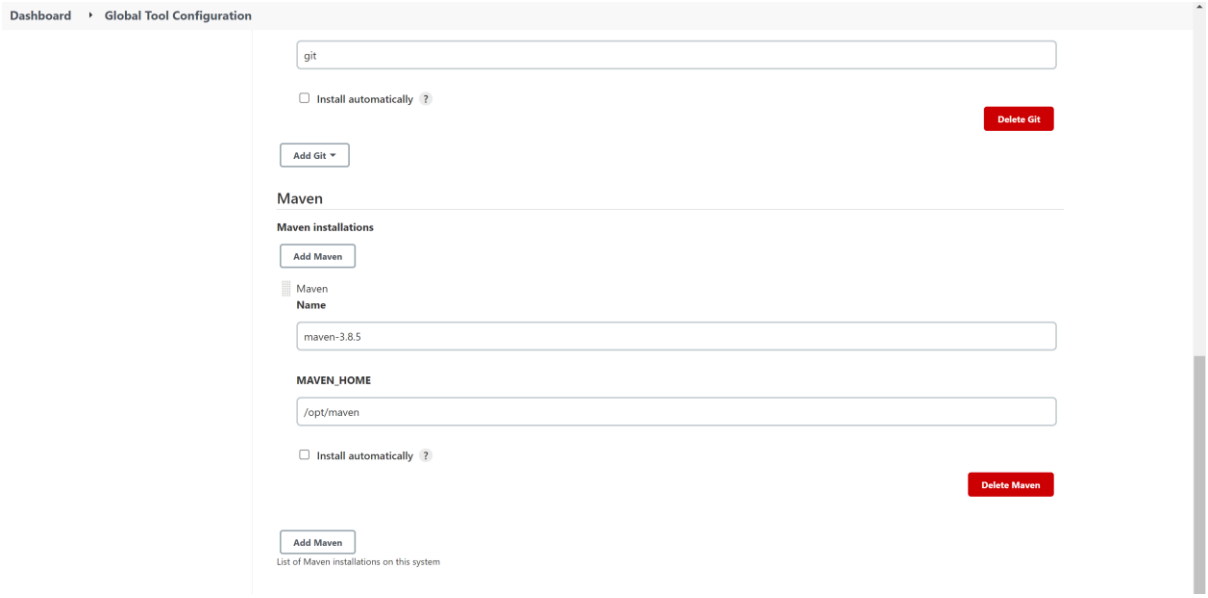


Fig. Maven Global Tool Configuration

Build a Java project using Jenkins and generate artifacts.

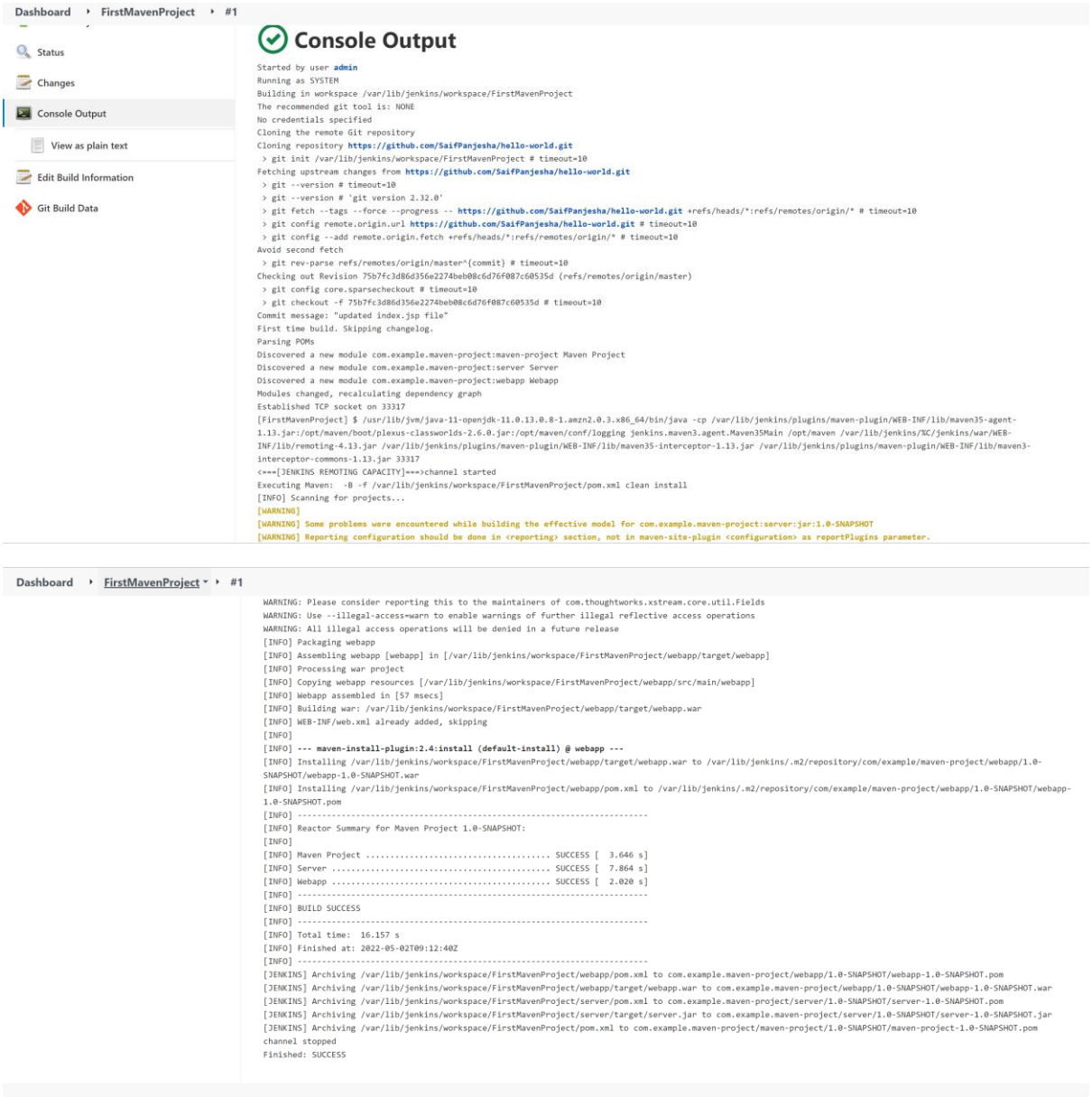


Fig. Build a Java project using Jenkins

Generate Artifacts

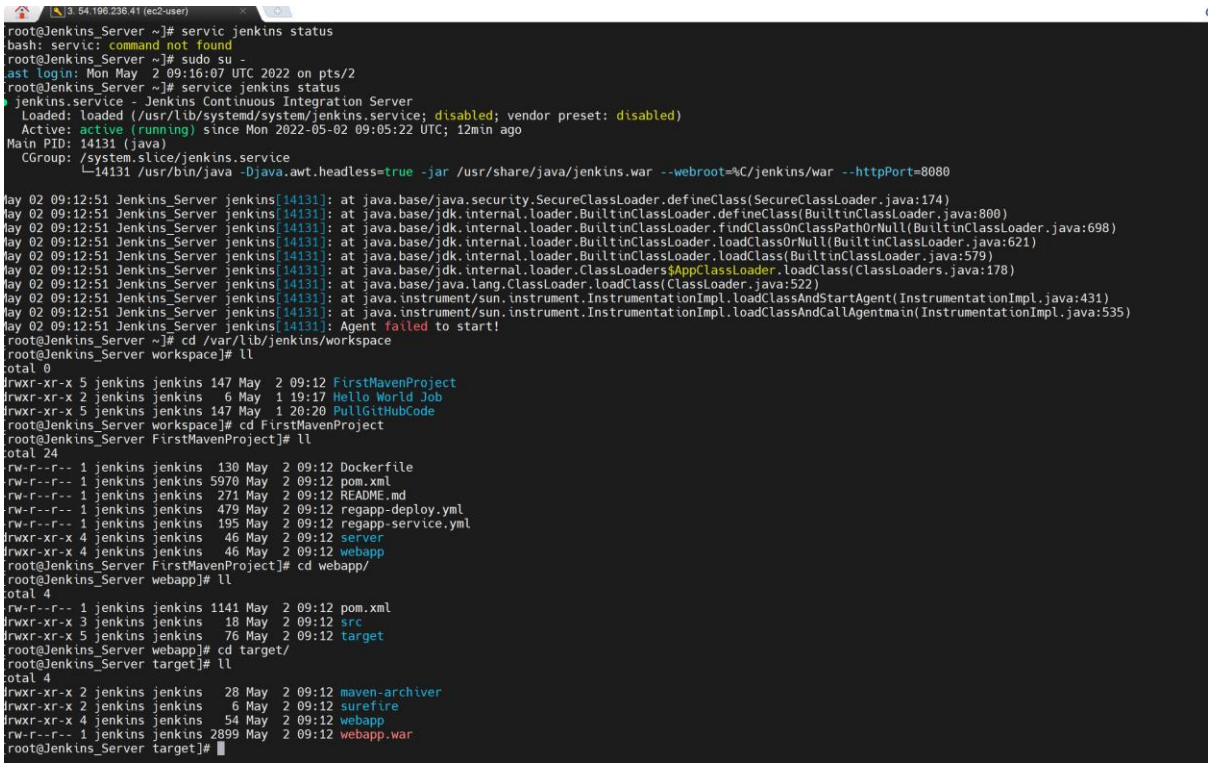


Fig. Artifacts Generated

Integrate Tomcat in CI/CD pipeline:

- **Setup Tomcat Server**
- Setup a Linux EC2 Instance
- Install Java
- Configure Tomcat
- Start Tomcat Server
- Access Web UI on port 8080

Setup a Linux EC2 Instance

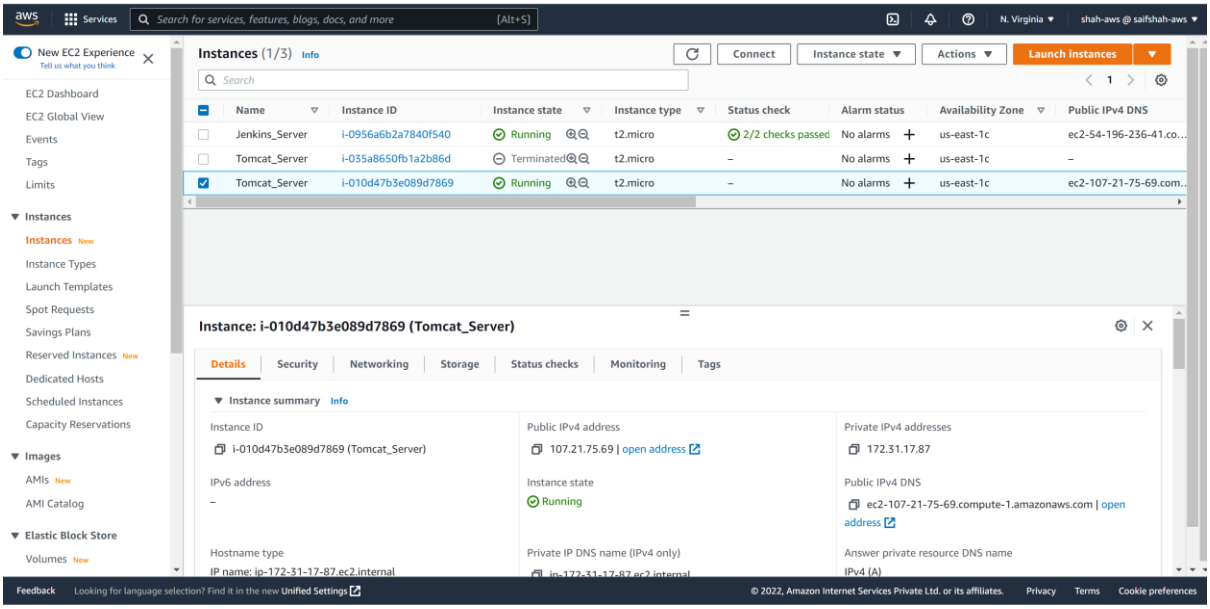


Fig. EC2 Instance for Tomcat Server

Install Java

```
 61  dnsmasq2.85              available    [ =stable ]
[root@ip-172-31-17-87 ~]# java --version
openjdk 11.0.13 2021-10-19 LTS
OpenJDK Runtime Environment 18.9 (build 11.0.13+8-LTS)
OpenJDK 64-Bit Server VM 18.9 (build 11.0.13+8-LTS, mixed mode, sharing)
[root@ip-172-31-17-87 ~]#
```

Fig. Installation of Java

Configure Tomcat

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

https://aws.amazon.com/amazon-linux-2/
12 package(s) needed for security, out of 28 available
Run "sudo yum update" to apply all updates.
[ec2-user@tomcat_server ~]$ sudo su -
Last login: Mon May  2 09:57:58 UTC 2022 on pts/0
[root@tomcat_server ~]# clear
[root@tomcat_server ~]# java --versiob
Unrecognized option: --versiob
Error: Could not create the Java Virtual Machine.
Error: A fatal exception has occurred. Program will exit.
[root@tomcat_server ~]# java --version
openjdk 11.0.13 2021-10-19 LTS
OpenJDK Runtime Environment 18.9 (build 11.0.13+8-LTS)
OpenJDK 64-Bit Server VM 18.9 (build 11.0.13+8-LTS, mixed mode, sharing)
[root@tomcat_server ~]# wget https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.62/bin/apache-tomcat-9.0.62.tar.gz
--2022-05-02 10:42:15--  https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.62/bin/apache-tomcat-9.0.62.tar.gz
Resolving dlcdn.apache.org (dlcdn.apache.org)... 151.101.2.132, 2a04:4e42::644
Connecting to dlcdn.apache.org (dlcdn.apache.org)|151.101.2.132|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11560971 (11M) [application/x-gzip]
Saving to: 'apache-tomcat-9.0.62.tar.gz'

100%[=========================================================================================================================>] 11,560,971  --.-K/s   in 0.05s

2022-05-02 10:42:15 (226 MB/s) - 'apache-tomcat-9.0.62.tar.gz' saved [11560971/11560971]

[root@tomcat_server ~]# ll
total 11296
-rw-r--r-- 1 root root       13 May  2 09:58 ;
-rw-r--r-- 1 root root 11560971 Mar 31 14:40 apache-tomcat-9.0.62.tar.gz
[root@tomcat_server ~]# tar -xvzf apache-tomcat-9.0.62.tar.gz
apache-tomcat-9.0.62/conf/
apache-tomcat-9.0.62/conf/catalina.policy
apache-tomcat-9.0.62/conf/catalina.properties
apache-tomcat-9.0.62/conf/context.xml
apache-tomcat-9.0.62/conf/jaspic-providers.xml
apache-tomcat-9.0.62/conf/jaspic-providers.xsd
apache-tomcat-9.0.62/conf/logging.properties
apache-tomcat-9.0.62/conf/server.xml
apache-tomcat-9.0.62/conf/tomcat-users.xml
apache-tomcat-9.0.62/conf/tomcat-users.xsd
apache-tomcat-9.0.62/conf/web.xml
apache-tomcat-9.0.62/bin/
apache-tomcat-9.0.62/lib/
apache-tomcat-9.0.62/logs/
apache-tomcat-9.0.62/temp/
apache-tomcat-9.0.62/webapps/
apache-tomcat-9.0.62/webapps/ROOT/
```

Fig .Tomcat Configuration

Start Tomcat Server

```
-rw-r----- 1 root root 18980 Mar 31 14:34 BUILDING.txt
drwx------ 2 root root   238 Mar 31 14:34 conf
-rw-r----- 1 root root  6210 Mar 31 14:34 CONTRIBUTING.md
drwxr-x--- 2 root root  4096 May  2 10:42 lib
-rw-r----- 1 root root 57092 Mar 31 14:34 LICENSE
drwxr-x--- 2 root root     6 Mar 31 14:34 logs
-rw-r----- 1 root root  2333 Mar 31 14:34 NOTICE
-rw-r----- 1 root root  3378 Mar 31 14:34 README.md
-rw-r----- 1 root root  6898 Mar 31 14:34 RELEASE-NOTES
-rw-r----- 1 root root 16497 Mar 31 14:34 RUNNING.txt
drwxr-x--- 2 root root    30 May  2 10:42 temp
drwxr-x--- 7 root root    81 Mar 31 14:34 webapps
drwxr-x--- 2 root root     6 Mar 31 14:34 work
[root@tomcat_server tomcat]# cd bin
[root@tomcat_server bin]# ll
total 884
-rw-r----- 1 root root  34699 Mar 31 14:34 bootstrap.jar
-rw-r----- 1 root root  16840 Mar 31 14:34 catalina.bat
-rwxr-x--- 1 root root  25294 Mar 31 14:34 catalina.sh
-rw-r----- 1 root root   1664 Mar 31 14:34 catalina-tasks.xml
-rw-r----- 1 root root   2123 Mar 31 14:34 ciphers.bat
-rwxr-x--- 1 root root   1997 Mar 31 14:34 ciphers.sh
-rw-r----- 1 root root  25308 Mar 31 14:34 commons-daemon.jar
-rw-r----- 1 root root 210038 Mar 31 14:34 commons-daemon-native.tar.gz
-rw-r----- 1 root root   2040 Mar 31 14:34 configtest.bat
-rwxr-x--- 1 root root   1922 Mar 31 14:34 configtest.sh
-rwxr-x--- 1 root root   9100 Mar 31 14:34 daemon.sh
-rw-r----- 1 root root   2091 Mar 31 14:34 digest.bat
-rwxr-x--- 1 root root   1965 Mar 31 14:34 digest.sh
-rw-r----- 1 root root   3606 Mar 31 14:34 makebase.bat
-rwxr-x--- 1 root root   3382 Mar 31 14:34 makebase.sh
-rw-r----- 1 root root   3460 Mar 31 14:34 setclasspath.bat
-rwxr-x--- 1 root root   3708 Mar 31 14:34 setclasspath.sh
-rw-r----- 1 root root   2020 Mar 31 14:34 shutdown.bat
-rwxr-x--- 1 root root   1902 Mar 31 14:34 shutdown.sh
-rw-r----- 1 root root   2022 Mar 31 14:34 startup.bat
-rwxr-x--- 1 root root   1904 Mar 31 14:34 startup.sh
-rw-r----- 1 root root  46897 Mar 31 14:34 tomcat-juli.jar
-rw-r----- 1 root root 429747 Mar 31 14:34 tomcat-native.tar.gz
-rw-r----- 1 root root   4574 Mar 31 14:34 tool-wrapper.bat
-rwxr-x--- 1 root root   5540 Mar 31 14:34 tool-wrapper.sh
-rw-r----- 1 root root   2026 Mar 31 14:34 version.bat
-rwxr-x--- 1 root root   1908 Mar 31 14:34 version.sh
[root@tomcat_server bin]# ./startup.sh
Using CATALINA_BASE:   /root/tomcat
Using CATALINA_HOME:   /root/tomcat
Using CATALINA_TMPDIR: /root/tomcat/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /root/tomcat/bin/bootstrap.jar:/root/tomcat/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
```

Fig Tomcat Server Started

Access Web UI on port 8080

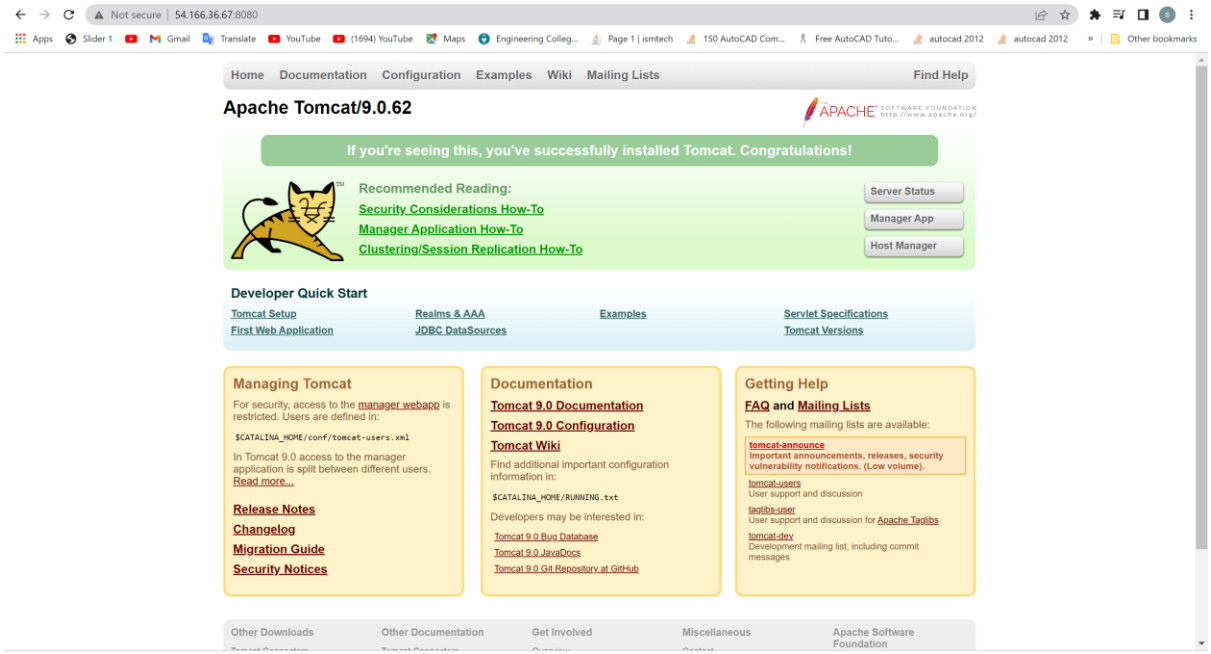
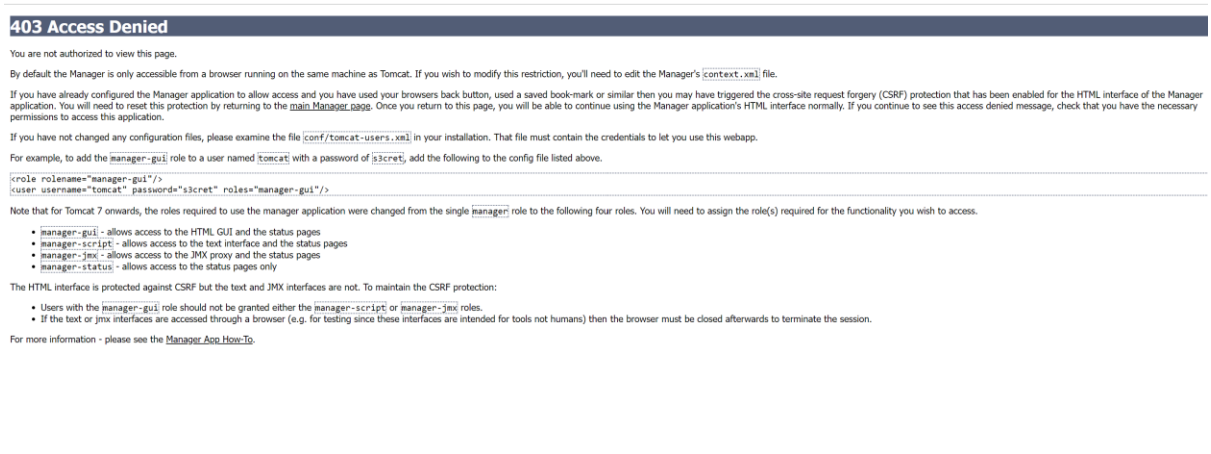


Fig. Access Web UI on port 8080

Edit Manage App Error




```
oot@tomcat_server tomcat]# find -name context.xml
/conf/context.xml
/webapps/examples/META-INF/context.xml
/webapps/host-manager/META-INF/context.xml
/webapps/manager/META-INF/context.xml
oot@tomcat_server tomcat]#
```

Fig. Manage App Error

vi ./webapps/host-manager/META-INF/context.xml

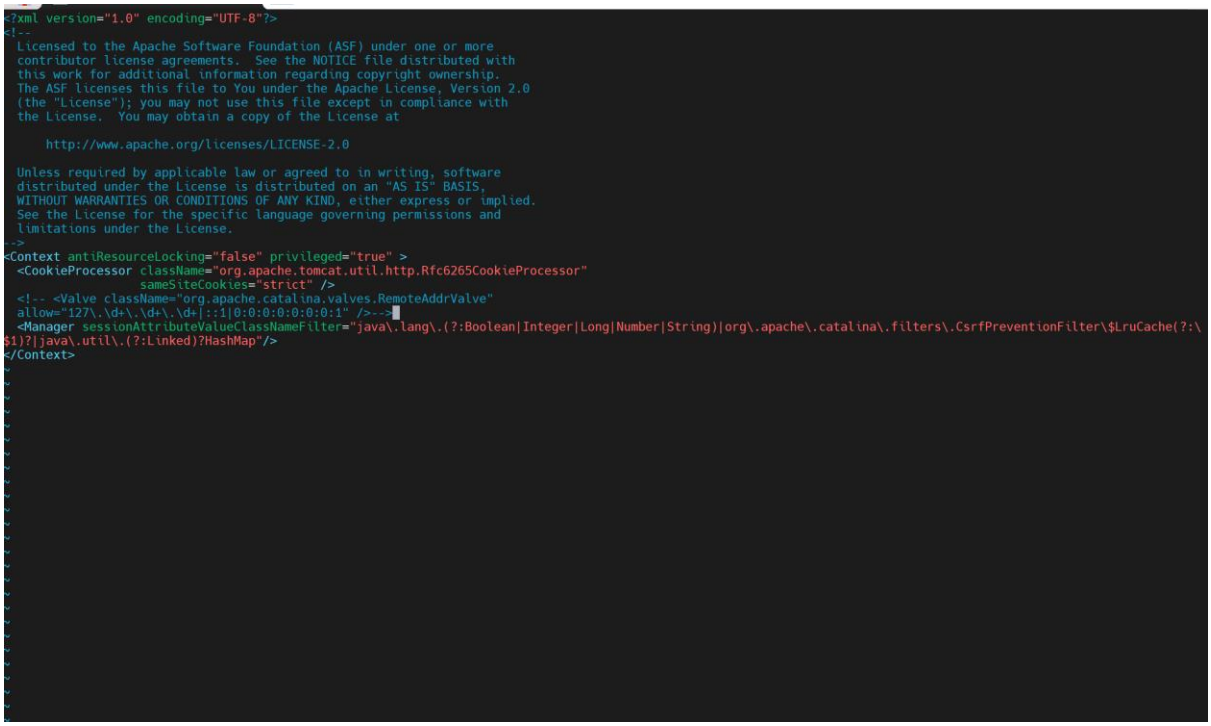


Fig. allow access host manager in context file

vi ./webapps/manager/META-INF/context.xml

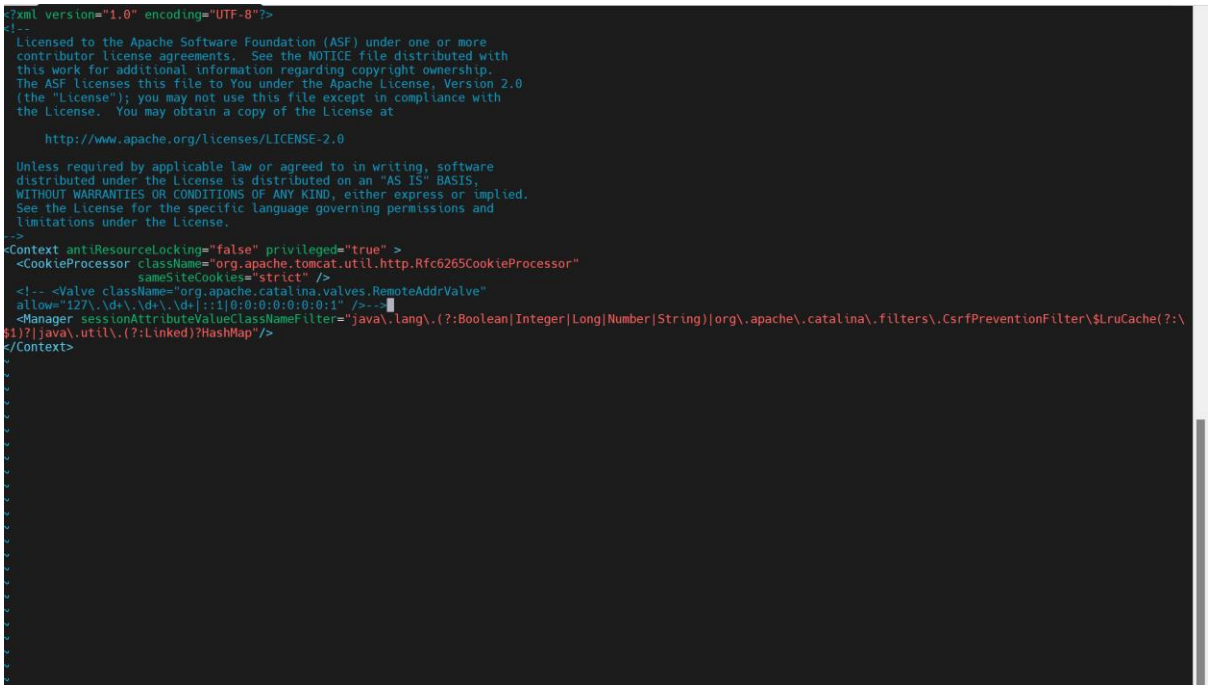


Fig. allow access manager in context file

Create Tomcat Users

Configure tomcat user's xml file

```
[root@tomcat_server bin]# cd ..
[root@tomcat_server tomcat]# cd conf
[root@tomcat_server conf]# ll
total 232
drwxr-x--- 3 root root     23 May  2 10:44 Catalina
-rw------- 1 root root  12953 Mar 31 14:34 catalina.policy
-rw------- 1 root root   7308 Mar 31 14:34 catalina.properties
-rw------- 1 root root   1400 Mar 31 14:34 context.xml
-rw------- 1 root root   1149 Mar 31 14:34 jaspic-providers.xml
-rw------- 1 root root   2313 Mar 31 14:34 jaspic-providers.xsd
-rw------- 1 root root   4144 Mar 31 14:34 logging.properties
-rw------- 1 root root   7580 Mar 31 14:34 server.xml
-rw------- 1 root root   2756 Mar 31 14:34 tomcat-users.xml
-rw------- 1 root root   2558 Mar 31 14:34 tomcat-users.xsd
-rw------- 1 root root 172359 Mar 31 14:34 web.xml
[root@tomcat_server conf]#
```

Fig. Configure tomcat user's xml file

#.vi tomcat-users.xml

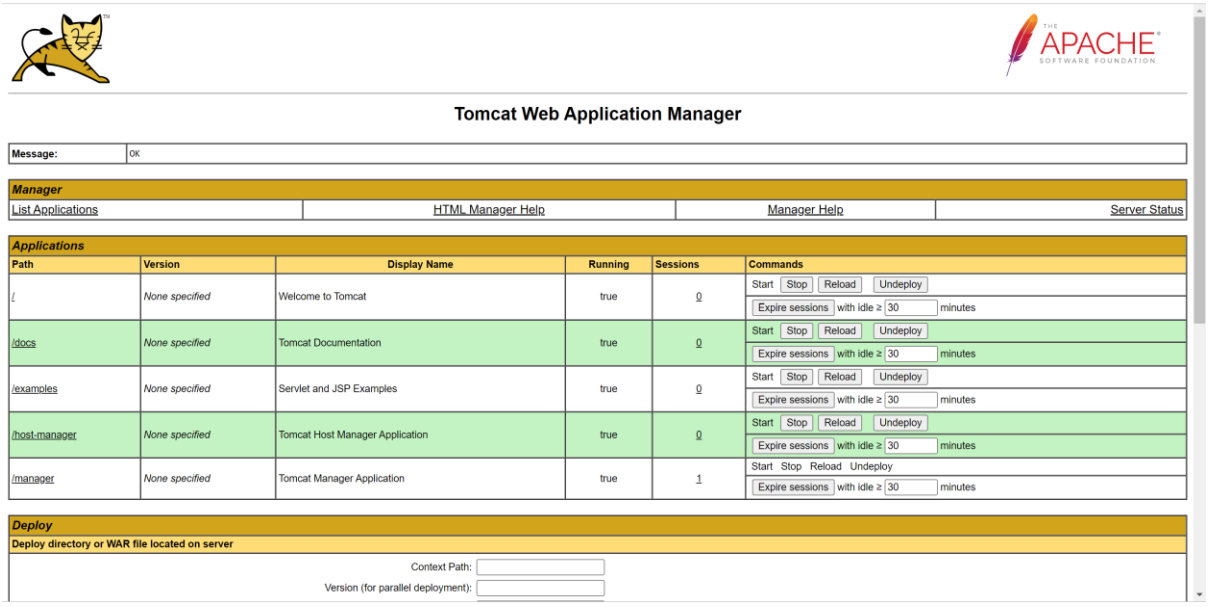
```
 distributed under the License is distributed on an "AS IS" BASIS,
 WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
 See the License for the specific language governing permissions and
 limitations under the License.
-->
<tomcat-users xmlns="http://tomcat.apache.org/xml"
              xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
              xsi:schemaLocation="http://tomcat.apache.org/xml tomcat-users.xsd"
              version="1.0">
<!--
 By default, no user is included in the "manager-gui" role required
 to operate the "/manager/html" web application.  If you wish to use this app,
 you must define such a user - the username and password are arbitrary.

 Built-in Tomcat manager roles:
   - manager-gui    - allows access to the HTML GUI and the status pages
   - manager-script - allows access to the HTTP API and the status pages
   - manager-jmx    - allows access to the JMX proxy and the status pages
   - manager-status - allows access to the status pages only

 The users below are wrapped in a comment and are therefore ignored. If you
 wish to configure one or more of these users for use with the manager web
 application, do not forget to remove the <!.. ..> that surrounds them. You
 will also need to set the passwords to something appropriate.
-->
<!--
 <user username="admin" password="<must-be-changed>" roles="manager-gui"/>
 <user username="robot" password="<must-be-changed>" roles="manager-script"/>
-->
<!--
 The sample user and role entries below are intended for use with the
 examples web application. They are wrapped in a comment and thus are ignored
 when reading this file. If you wish to configure these users for use with the
 examples web application, do not forget to remove the <!.. ..> that surrounds
 them. You will also need to set the passwords to something appropriate.
-->
<!--
 <role rolename="tomcat"/>
 <role rolename="role1"/>
 <user username="tomcat" password="<must-be-changed>" roles="tomcat"/>
 <user username="both" password="<must-be-changed>" roles="tomcat,role1"/>
 <user username="role1" password="<must-be-changed>" roles="role1"/>
-->
<role rolename="manager-gui"/>
<role rolename="manager-script"/>
<role rolename="manager-jmx"/>
<role rolename="manager-status"/>
<user username="admin" password="admin" roles="manager-gui, manager-script, manager-jmx, manager-status"/>
<user username="deployer" password="deployer" roles="manager-script"/>
<user username="tomcat" password="s3cret" roles="manager-gui"/>
</tomcat-users>
```

Fig. Adding Tomcat roles

Tomcat Start and Shutdown

ln -s /opt/apache-tomcat/bin/startup.sh /usr/local/bin/tomcatup

ln -s /opt/apache-tomcat-<version>/bin/shutdown.sh /usr/local/bin/tomcatdown



Tomcat Web Application Manager

Message: OK

Manager

List Applications | HTML Manager Help | Manager Help | Server Status

Applications

Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/docs	None specified	Tomcat Documentation	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/examples	None specified	Servlet and JSP Examples	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/host-manager	None specified	Tomcat Host Manager Application	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/manager	None specified	Tomcat Manager Application	true	1	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

Deploy

Deploy directory or WAR file located on server

Context Path:

Version (for parallel deployment):

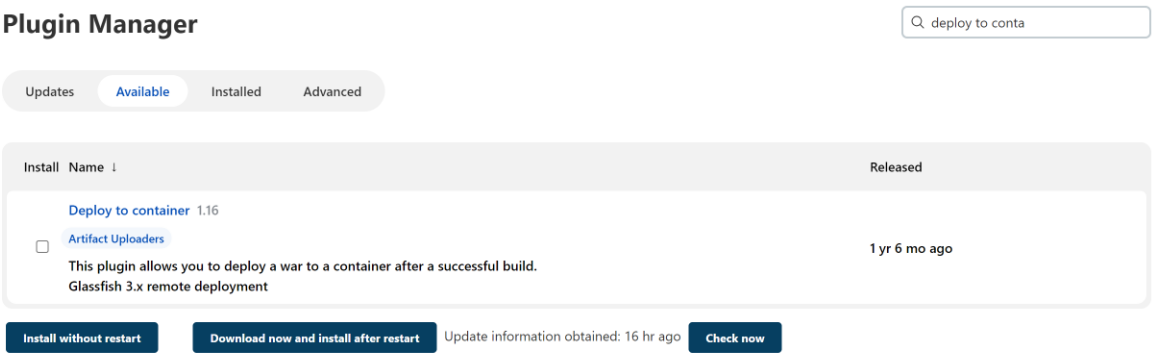
Fig. Tomcat Web Application Manager

Install Tomcat with Jenkins

Install plug- in “deploy -to -container”

Configure Tomcat Server with Credentials.

Install plug- in “deploy to container”



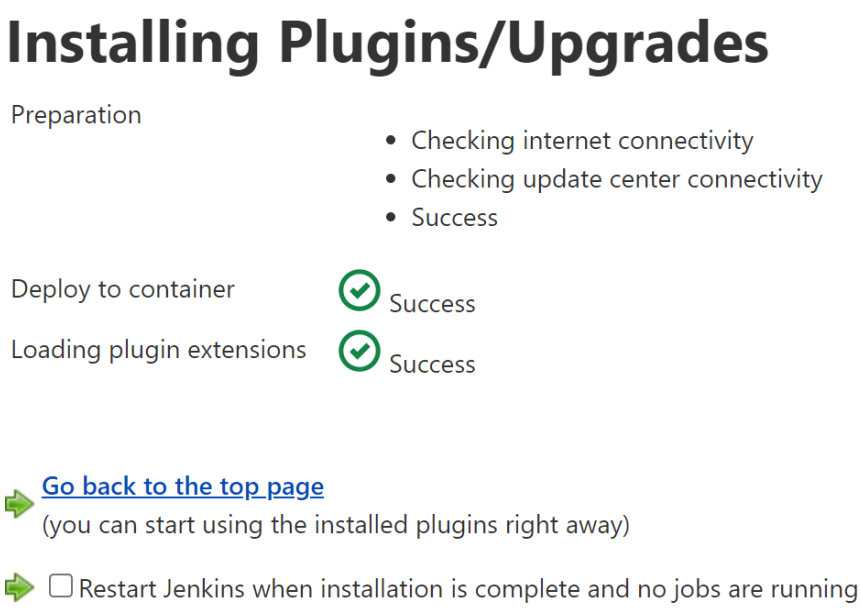


Fig. Plug In deploy to container

Build Maven and Deploy to Tomcat Server

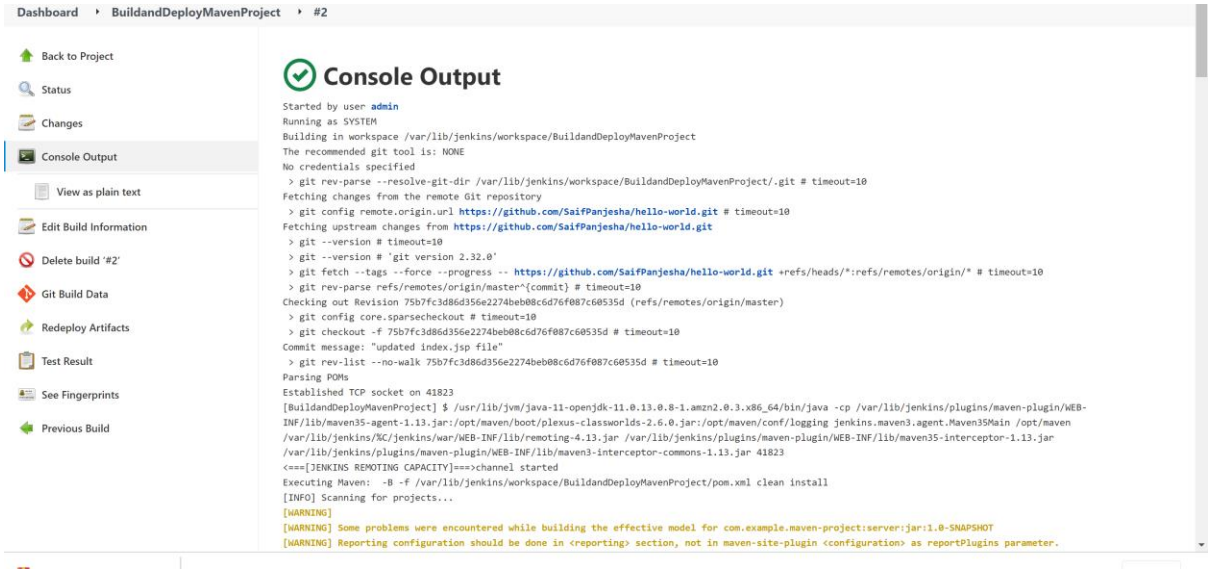


Fig. Build Maven

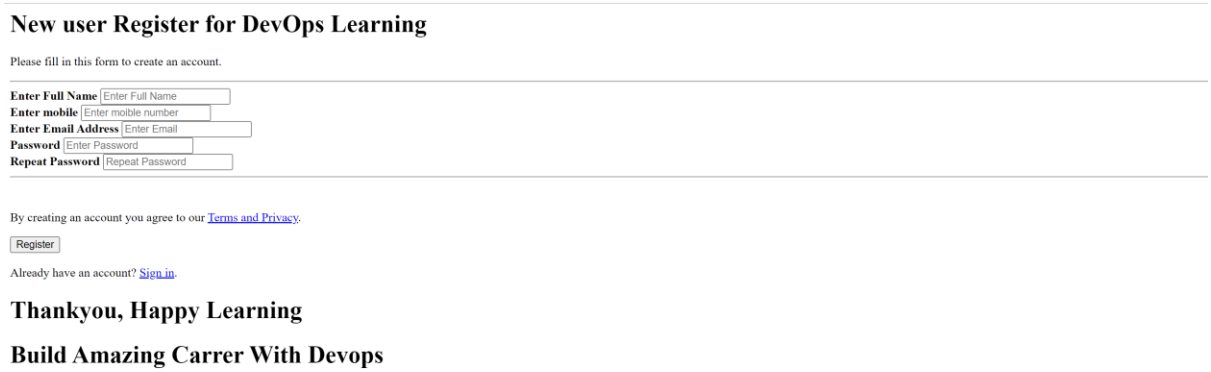


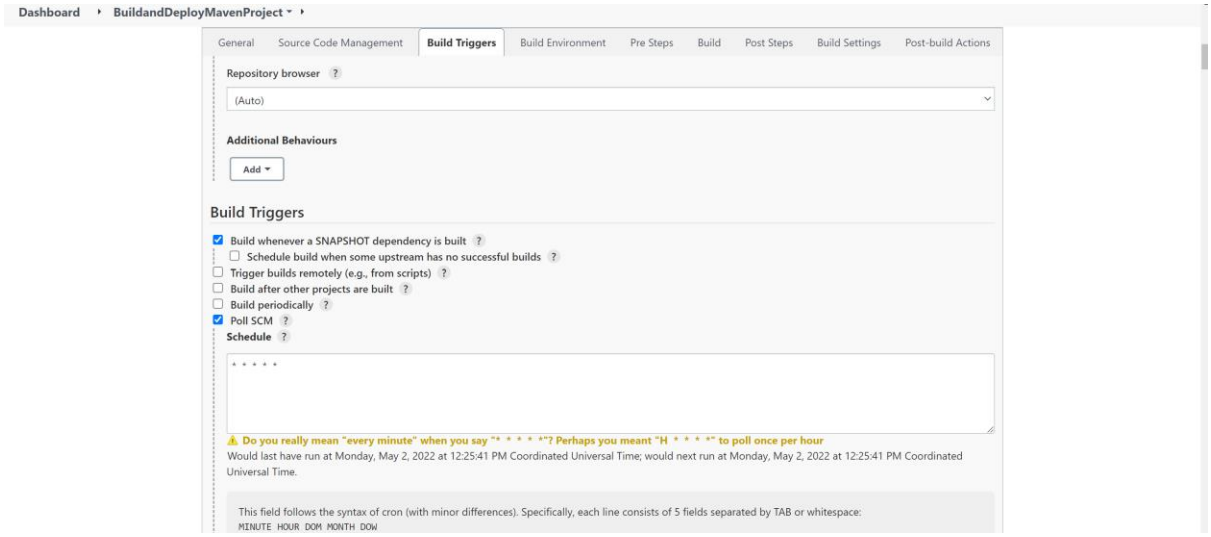
Fig. Deploy to tomcat server

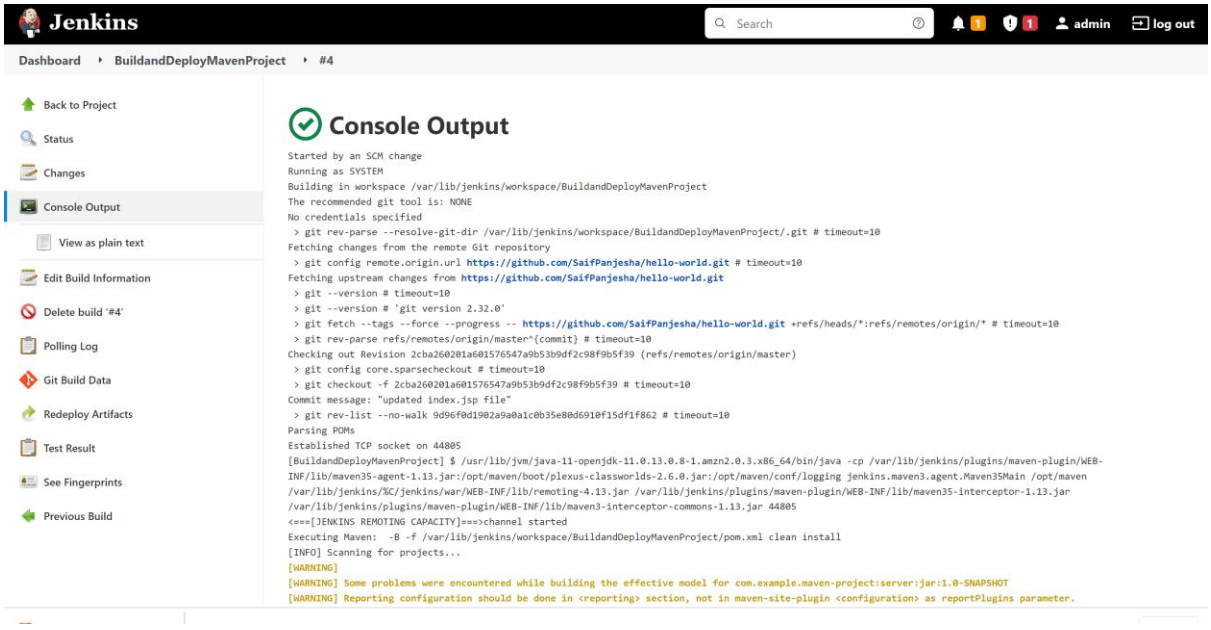
Deploy Artifacts on Tomcat Server -Using Git Bash

```
saiff@LAPTOP-H8UBOVRR MINGW64 ~
$ cd D:/Devops

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops
$ pwd
/d/Devops

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops
$ git clone https://github.com/SaifPanjesha/hello-world.git
Cloning into 'hello-world'...
remote: Enumerating objects: 403, done.
remote: Total 403 (delta 0), reused 0 (delta 0), pack-reused 403
Receiving objects: 100% (403/403), 45.79 KiB | 558.00 KiB/s, done.
Resolving deltas: 100% (90/90), done.

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops
$ ll
total 4
drwxr-xr-x 1 saiff 197609 0 May  2 17:35  hello-world/
drwxr-xr-x 1 saiff 197609 0 May  2 00:39 'saiffaizalpanjesha -aws'/

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops
$ cd hello-world

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world (master)
$ ll
total 12
-rw-r--r-- 1 saiff 197609  134 May  2 17:35 Dockerfile
-rw-r--r-- 1 saiff 197609  274 May  2 17:35 README.md
-rw-r--r-- 1 saiff 197609 6190 May  2 17:35 pom.xml
-rw-r--r-- 1 saiff 197609  507 May  2 17:35 regapp-deploy.yml
-rw-r--r-- 1 saiff 197609  209 May  2 17:35 regapp-service.yml
drwxr-xr-x 1 saiff 197609    0 May  2 17:35 server/
drwxr-xr-x 1 saiff 197609    0 May  2 17:35 webapp/

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world (master)
$ cd webapps/
bash: cd: webapps/: No such file or directory

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world (master)
$ cd webapp

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp (master)
$ ll
total 4
-rw-r--r-- 1 saiff 197609 1185 May  2 17:35 pom.xml
drwxr-xr-x 1 saiff 197609    0 May  2 17:35 src/

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp (master)
$ cd src/main

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main (master)
$ ll
total 0
drwxr-xr-x 1 saiff 197609 0 May  2 17:35 webapp/

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main (master)
$ cd webapp

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main/webapp (master)
$ ll
total 4
drwxr-xr-x 1 saiff 197609    0 May  2 17:35 WEB-INF/
-rw-r--r-- 1 saiff 197609 1354 May  2 17:35 index.jsp

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main/webapp (master)
$ vi index.jsp

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main/webapp (master)
$ git status
On branch master
Your branch is up to date with 'origin/master'.

Changes not staged for commit:
```

```
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   index.jsp

no changes added to commit (use "git add" and/or "git commit -a")

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main/webapp (master)
$ add .
bash: add: command not found

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main/webapp (master)
$ git add .

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main/webapp (master)
$ git status
On branch master
Your branch is up to date with 'origin/master'.

Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        modified:   index.jsp


saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main/webapp (master)
$ commit -m "updated index.jsp"
bash: commit: command not found

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main/webapp (master)
$ commit -m "updated index.jsp file"
bash: commit: command not found

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main/webapp (master)
$ git commit -m "updated index.jsp file"
[master 9d96f0d] updated index.jsp file
 1 file changed, 1 insertion(+), 1 deletion(-)

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main/webapp (master)
$ git push origin master
Enumerating objects: 13, done.
Counting objects: 100% (13/13), done.
Delta compression using up to 8 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (7/7), 560 bytes | 560.00 KiB/s, done.
Total 7 (delta 2), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To https://github.com/SaifPanjesha/hello-world.git
   75b7fc3..9d96f0d  master -> master

saiff@LAPTOP-H8UBOVRR MINGW64 /d/Devops/hello-world/webapp/src/main/webapp (master)
$
```

Automate Build and Deploy using poll SCM





Thankyou, Happy Learning

Build Amazing Carrer With Devops

I appreciate

Fig. Automate Build and Deploy using poll SCM

Integrating Docker in CI/CD pipeline

Setup a Docker Environment

Setup Docker Host

- Setup a Linux EC2 Instance
- Install Docker
- Start docker services
- Basic docker commands

Setup a Linux EC2 Instance

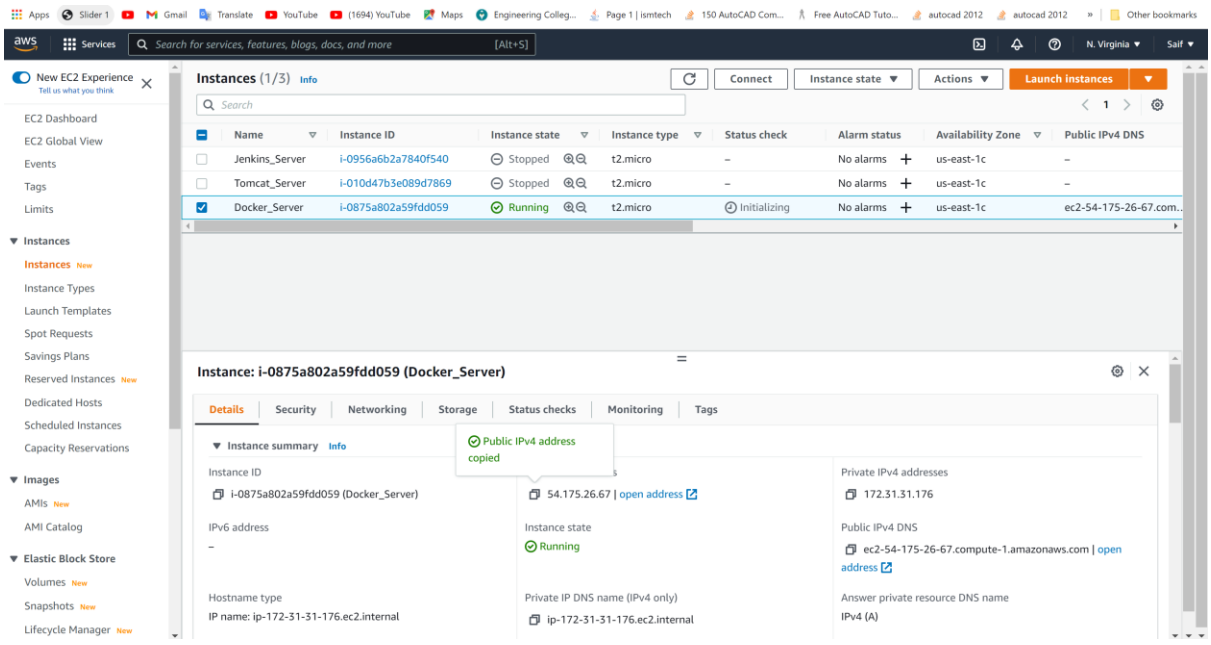


Fig. Docker Server EC2 Instance

Install Docker

[root@ip-172-31-31-176 ~]# yum install docker -y

Start docker services

[root@ip-172-31-31-176 ~]# service docker start

Basic docker commands

[root@ip-172-31-31-176 ~]# docker images

[root@ip-172-31-31-176 ~]# docker ps //running container

[root@ip-172-31-31-176 ~]# docker ps -a // all container

[root@ip-172-31-31-176 ~]# docker - -version

[root@ip-172-31-31-176 ~]# docker - - help

Create a Tomcat Container

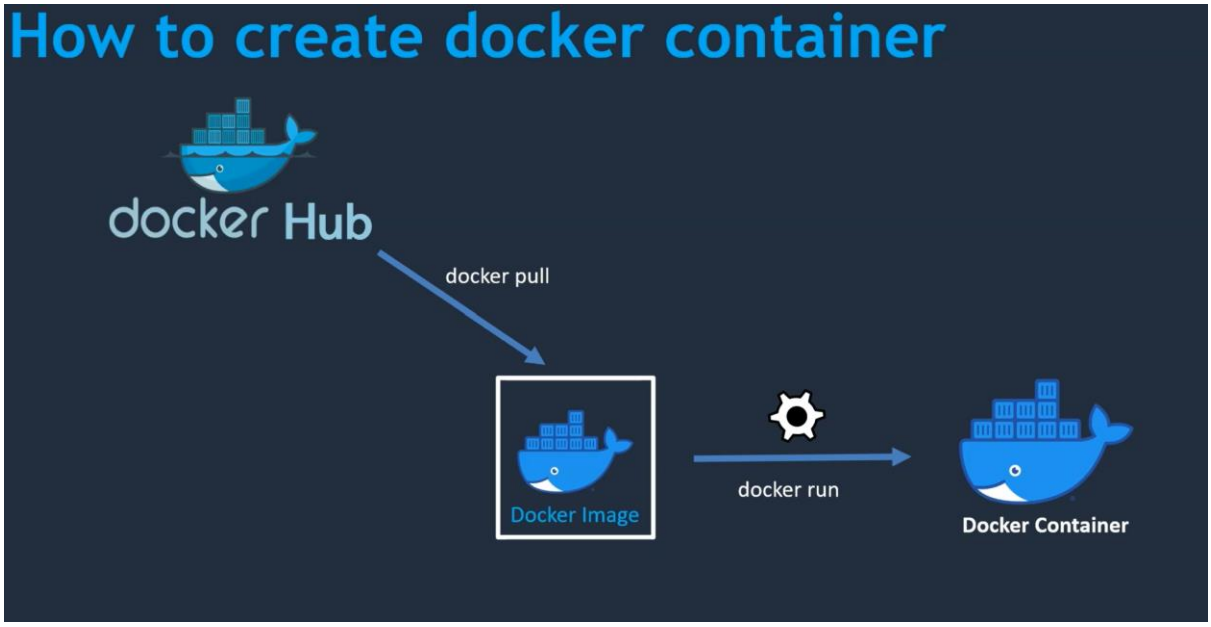


Fig. Creating Docker Container(https://hub.docker.com/)

- **Creating Images**

[root@dockerhost ~]# docker pull tomcat

[root@dockerhost ~]# docker images

REPOSITORY TAG IMAGE ID CREATED SIZE

tomcat latest 0183eb12bb0c 6 days ago 680MB

- Creating Container

[root@dockerhost ~]# docker ps

CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES

[root@dockerhost ~]# docker run -d --name tomcat-container -p 8081:8080 tomcat

78e9303c67b9f67ca161776a1321da5cb8bad4b85e64c9753a84bf91359ace21

[root@dockerhost ~]# docker ps

CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES

78e9303c67b9 tomcat "catalina.sh run" 14 seconds ago Up 13 seconds 0.0.0.0:8081->8080/tcp, :::8081->8080/tcp tomcat-container

[root@dockerhost ~]#

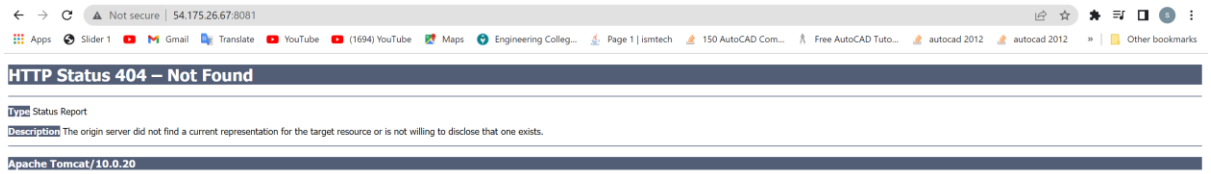


Fig. Tomcat Container

Fixing Tomcat Container Issue

```
[root@dockerhost ~]# docker exec -it tomcat-container /bin/bash
root@78e9303c67b9:/usr/local/tomcat# ls
BUILDING.txt  CONTRIBUTING.md  LICENSE  NOTICE  README.md  RELEASE-NOTES  RUNNING.txt  bin  conf  lib  logs  native-jni-lib  temp  webapps  webapps.dist  work
root@78e9303c67b9:/usr/local/tomcat# cd webapps
root@78e9303c67b9:/usr/local/tomcat/webapps# ls
root@78e9303c67b9:/usr/local/tomcat/webapps# cd .
root@78e9303c67b9:/usr/local/tomcat/webapps# cd ..
root@78e9303c67b9:/usr/local/tomcat# cd webapp.dist
bash: cd: webapp.dist: No such file or directory
root@78e9303c67b9:/usr/local/tomcat# cd webapps.dist
root@78e9303c67b9:/usr/local/tomcat/webapps.dist# ls
ROOT  docs  examples  host-manager  manager
root@78e9303c67b9:/usr/local/tomcat/webapps.dist# cp -R * ../webapps
root@78e9303c67b9:/usr/local/tomcat/webapps.dist# cd ..
root@78e9303c67b9:/usr/local/tomcat# cd webapps
root@78e9303c67b9:/usr/local/tomcat/webapps# ls
```

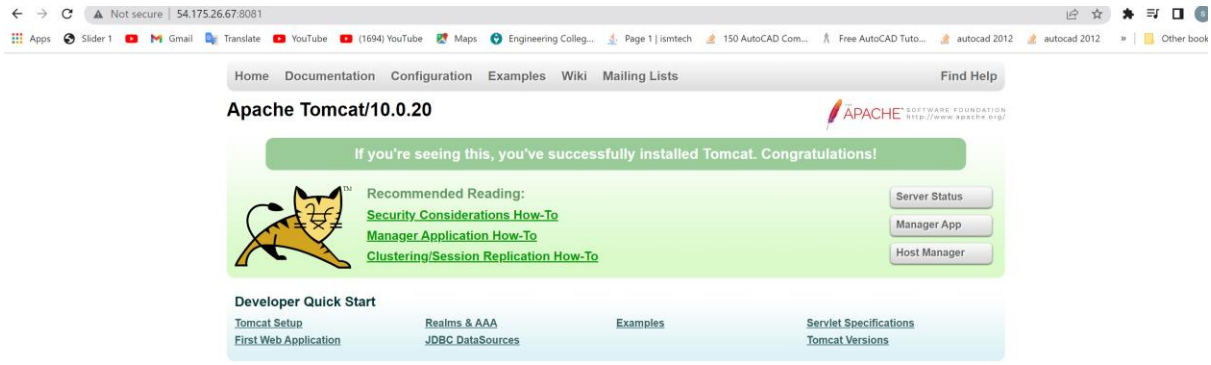


Fig. Fixing Tomcat Container Issue

[root@dockerhost ~]# docker ps -a

CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES

78e9303c67b9 tomcat "catalina.sh run" 21 minutes ago Up 21 minutes 0.0.0.0:8081->8080/tcp, :::8081->8080/tcp tomcat-container

[root@dockerhost ~]# docker stop tomcat-container

tomcat-container

[root@dockerhost ~]# docker ps -a

CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES

78e9303c67b9 tomcat "catalina.sh run" 22 minutes ago Exited (143) 7 seconds ago tomcat-container

[root@dockerhost ~]# docker ps

CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES

[root@dockerhost ~]# docker run -d --name tomca2 -p 8082:8080 tomcat:latest

d4c7db9d910fdceeef014d3e3fc685e9ef04305627373c5e2df1db43c75c03fb

[root@dockerhost ~]# docker exec -it tomca2 /bin/bash

root@d4c7db9d910f:/usr/local/tomcat#

Fig. refuse to connect

Create a Docker File

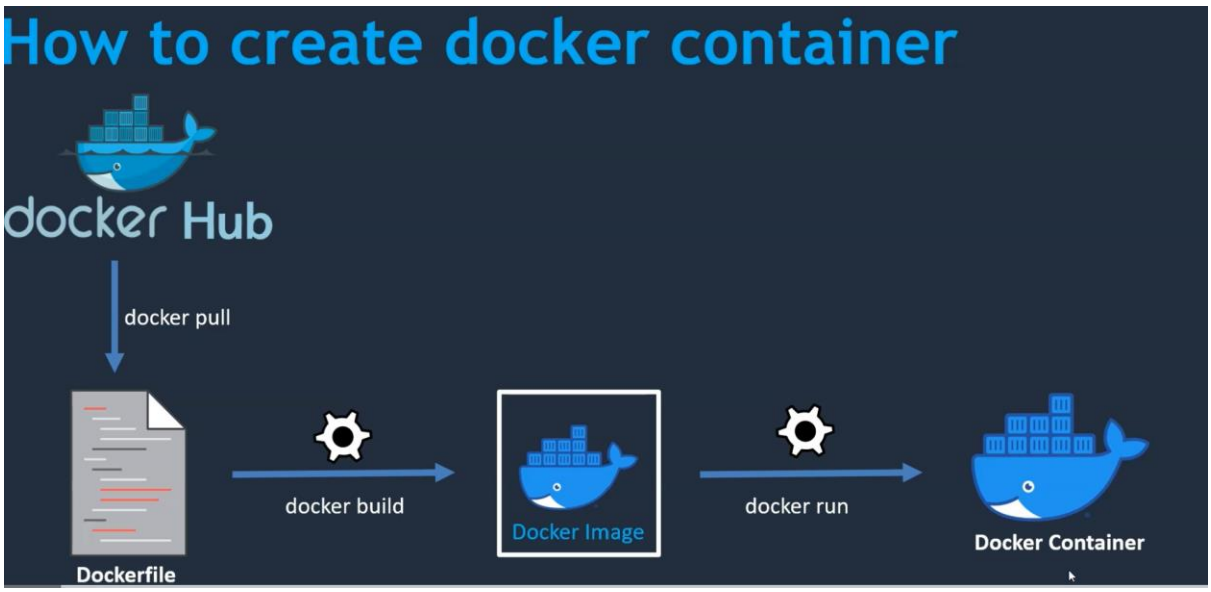


Fig. Create Docker File

Docker File

vi DockerFile

```
FROM centos
RUN mkdir /opt/tomcat/
WORKDIR /opt/tomcat
RUN curl -O https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.62/bin/apache-tomcat-9.0.62.tar.gz
RUN tar -xvzf apache-tomcat-9.0.62.tar.gz
RUN mv apache-tomcat-9.0.62/* /opt/tomcat
RUN cd /etc/yum.repos.d/
RUN sed -i 's/mirrorlist/#mirrorlist/g' /etc/yum.repos.d/CentOS-*
RUN sed -i 's|#baseurl=http://mirror.centos.org|baseurl=http://vault.centos.org|g' /etc/yum.repos.d/CentOS-*
RUN yum -y install java
CMD /bin/bash
EXPOSE 8080

CMD ["/opt/tomcat/bin/catalina.sh", "run"]
```

Run:

```
docker build -t mytomcat .
```

Resolving Error for port 8082 Tomcat Container

Fig. refuse to connect

[root@dockerhost ~]# vi DockerFile

FROM tomcat:latest

RUN cp -R /usr/local/tomcat webpp.dist/* /usr/local/tomcatwebapps

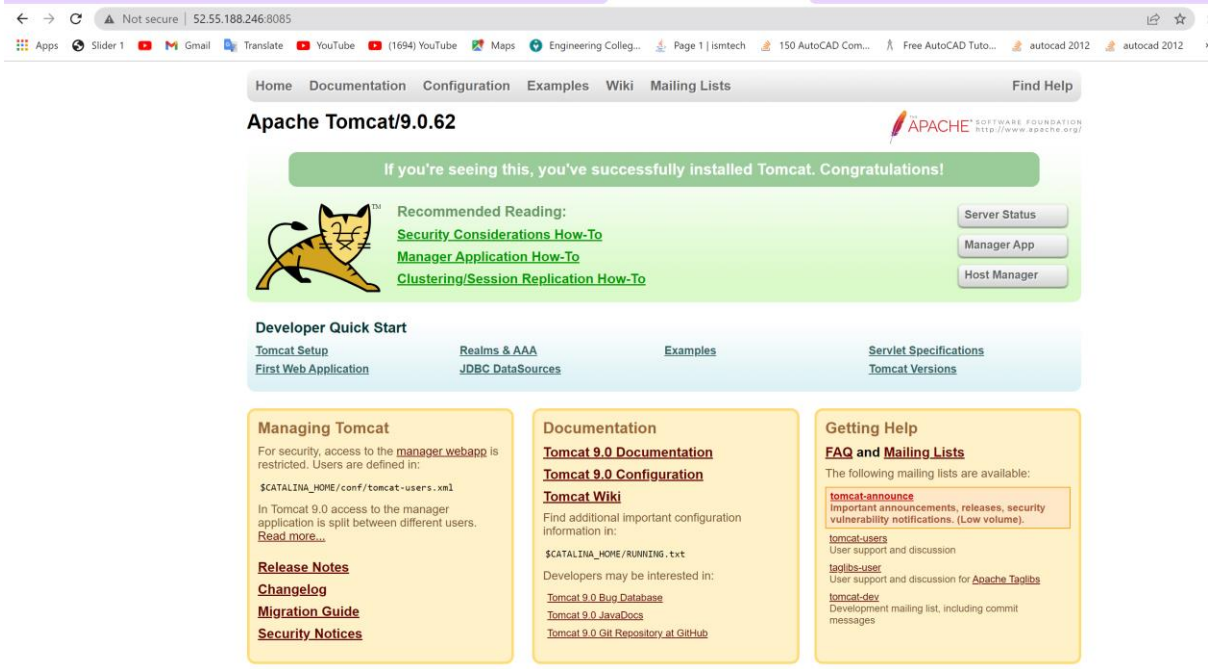


Fig. resolving error for port 8085 Apache Tomcat container

Integrate Docker with Jenkins

Create a docker admin user

Install “Publish Over SSH “plugin

Add Docker Host to Jenkins “configure systems”

[**root@dockerhost ~]# cat /etc/passwd //User**

[root@dockerhost ~]# cat /etc/group //Groups

[root@dockerhost ~]# useradd dockeradmin // Creating Users

[root@dockerhost ~]# passwd dockeradmin // Creating Password

Changing password for user dockeradmin.

New password:

BAD PASSWORD: The password contains the user name in some form

Retype new password:

passwd: all authentication tokens updated successfully.

[root@dockerhost ~]#

[root@dockerhost ~]# usermod -aG docker dockeradmin

// Modifying Docker Group

[root@dockerhost ~]# id dockeradmin

uid=1001(dockeradmin) gid=1001(dockeradmin)
groups=1001(dockeradmin),992(docker)

[root@dockerhost ~]#

[root@dockerhost ~]# vi /etc/ssh/sshd_config // Configure path password yes

[root@dockerhost ~]# vi /etc/ssh/sshd_config

[root@dockerhost ~]# service sshd reload

Redirecting to /bin/systemctl reload sshd.service

[root@dockerhost ~]#

__|___|

https://aws.amazon.com/amazon-linux-2/

[dockeradmin@dockerhost ~]$

Install “Publish Over SSH “plugin

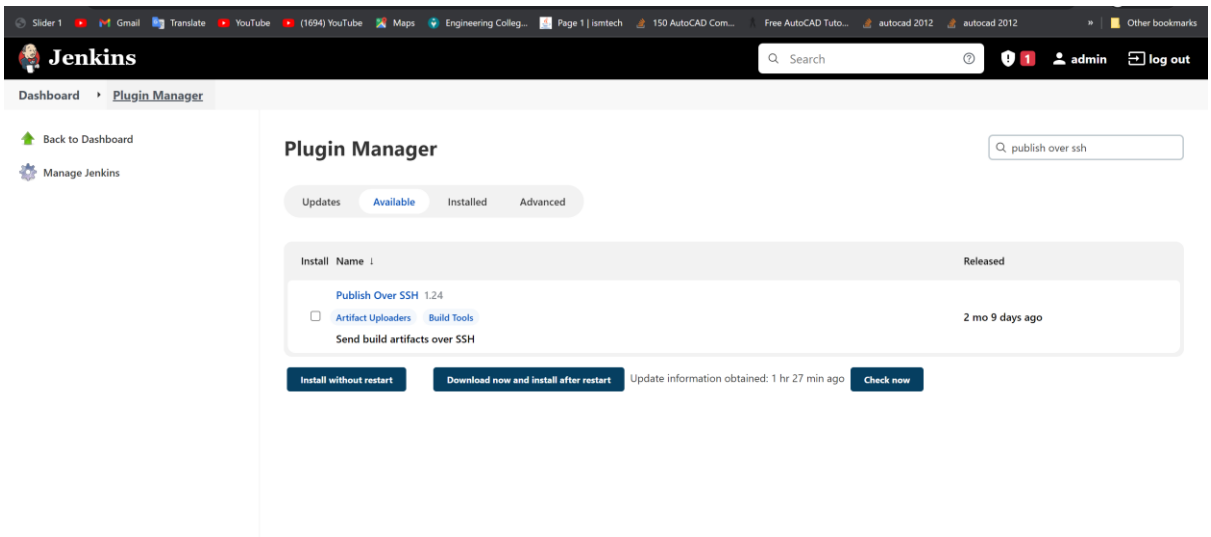


Fig. Publish Over SSH plugin

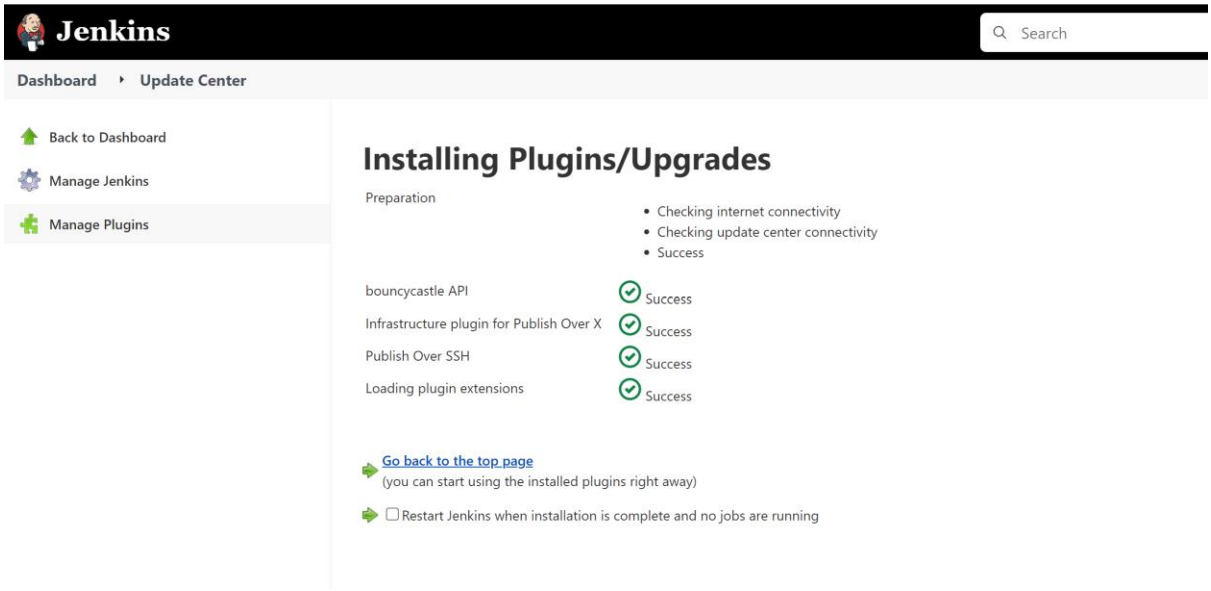


Fig. Publish Over SSH plugin Success

Add Docker Host to Jenkins “configure systems”

Fig. Configure System Success

Steps to configure systems:

Login as: dockeradmin

Server refused our key

dockeradmin@54.227.61.230's password:

```
┌──────────────────────────────────────────────────────────────────────┐
│                • MobaXterm Personal Edition v22.0 •                  │
│            (SSH client, X server and network tools)                  │
│                                                                      │
│ ➤ SSH session to dockeradmin@54.227.61.230                           │
│   • Direct SSH      :  ✓                                             │
│   • SSH compression :  ✓                                             │
│   • SSH-browser     :  ✓                                             │
│   • X11-forwarding  :  ✗  (disabled or not supported by server)      │
│                                                                      │
│ ➤ For more info, ctrl+click on help or visit our website.            │
└──────────────────────────────────────────────────────────────────────┘
```

Last login: Wed May 11 11:24:01 2022 from 152.57.203.204

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

https://aws.amazon.com/amazon-linux-2/

4 package(s) needed for security, out of 4 available

Run "sudo yum update" to apply all updates.

[dockeradmin@dockerhost ~]$ ssh-keygen

Generating public/private rsa key pair.

Enter file in which to save the key (/home/dockeradmin/.ssh/id_rsa):

/home/dockeradmin/.ssh/id_rsa already exists.

Overwrite (y/n)? y

Enter passphrase (empty for no passphrase):

Enter same passphrase again:

Your identification has been saved in /home/dockeradmin/.ssh/id_rsa.

Your public key has been saved in /home/dockeradmin/.ssh/id_rsa.pub.

The key fingerprint is:

SHA256:3NHEC/uXpcApxGxmukI0Ca3VwRMTOnyww48ZF+eyQZs dockeradmin@dockerhost

The key's randomart image is:

+---[RSA 2048]----+

| .o.+B*... |

| o*=+BOo. |

| +O.EBo+.o |

| . .@.=o.= .|

| .o S..o . + |

| . . . + |

```
|     .   .  |
|            |
|            |
```

```
+----[SHA256]-----+
[dockeradmin@dockerhost ~]$ cd  /home/dockeradmin
[dockeradmin@dockerhost ~]$ ll
total 0

[dockeradmin@dockerhost ~]$ cd /.ssh
-bash: cd: /.ssh: No such file or directory

[dockeradmin@dockerhost ~]$ cd /home/dockeradmin/.ssh
[dockeradmin@dockerhost .ssh]$ ll
total 8

-rw------- 1 dockeradmin dockeradmin 1679 May 11 11:35 id_rsa
-rw-r--r-- 1 dockeradmin dockeradmin  404 May 11 11:35 id_rsa.pub

[dockeradmin@dockerhost .ssh]$
```

Jenkins Job to build and copy the artifacts on to docker host

Creating a new Job item:

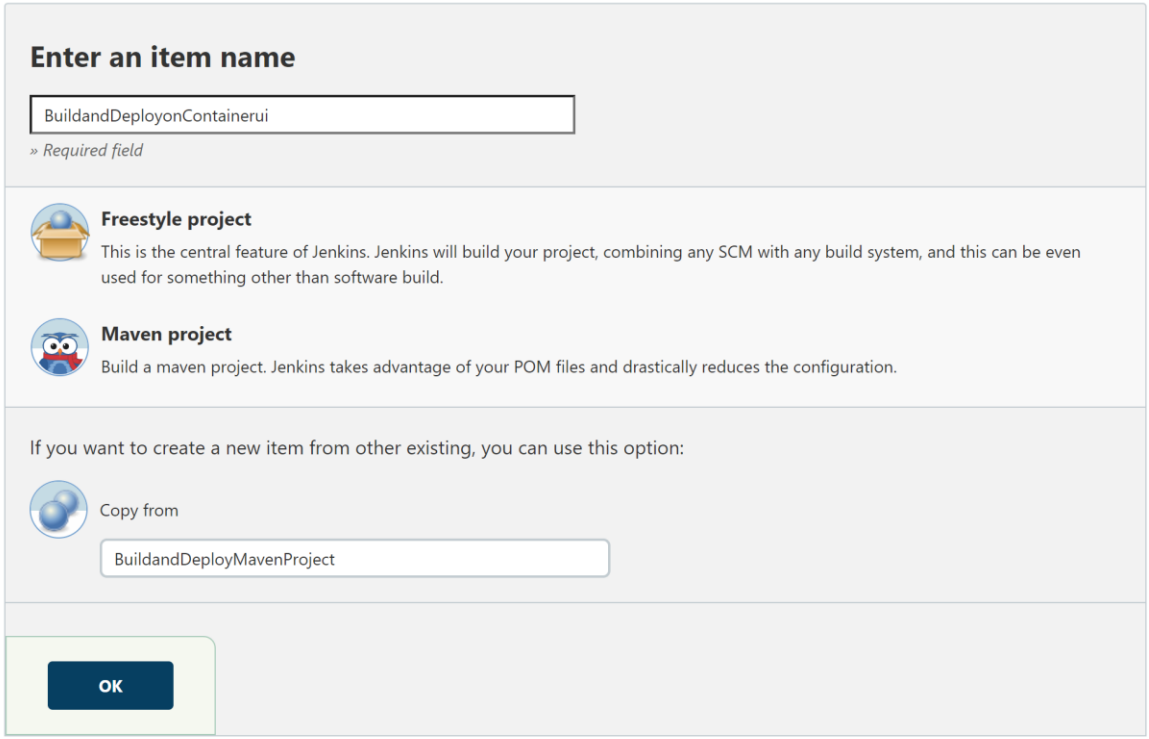


Fig. BuildandDeployonContainer item Created

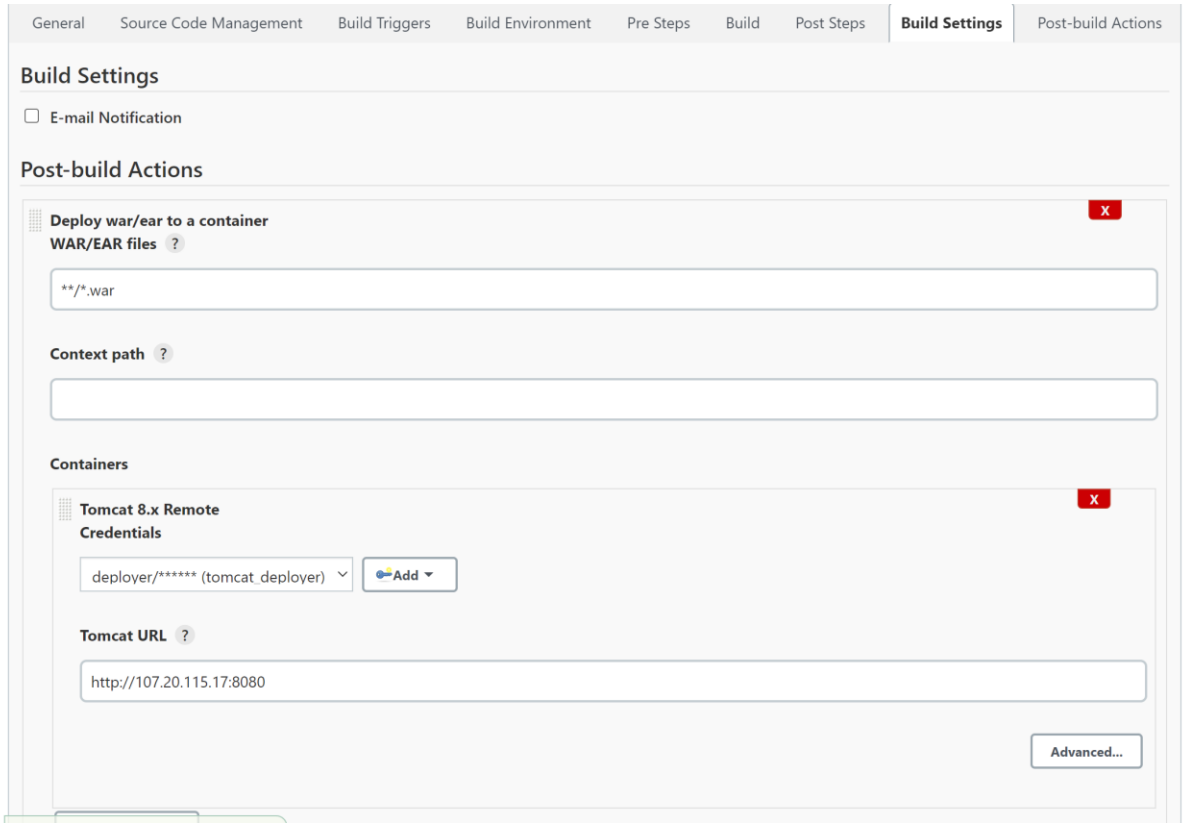


Fig. deleting Deploy war/ear on Container item.

Build Artifacts over SSH:

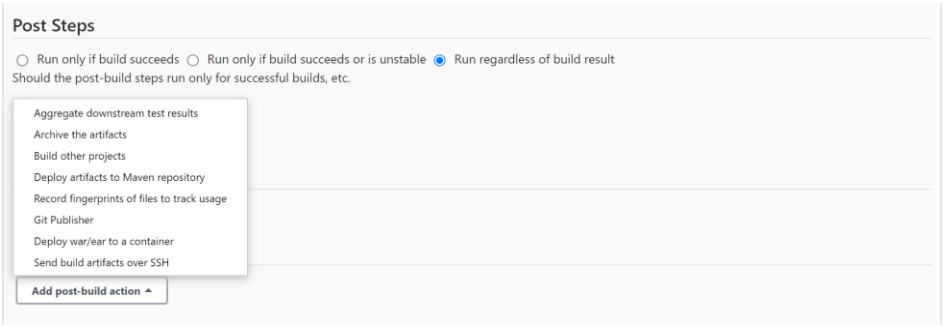


Fig. send build artifacts over SSH

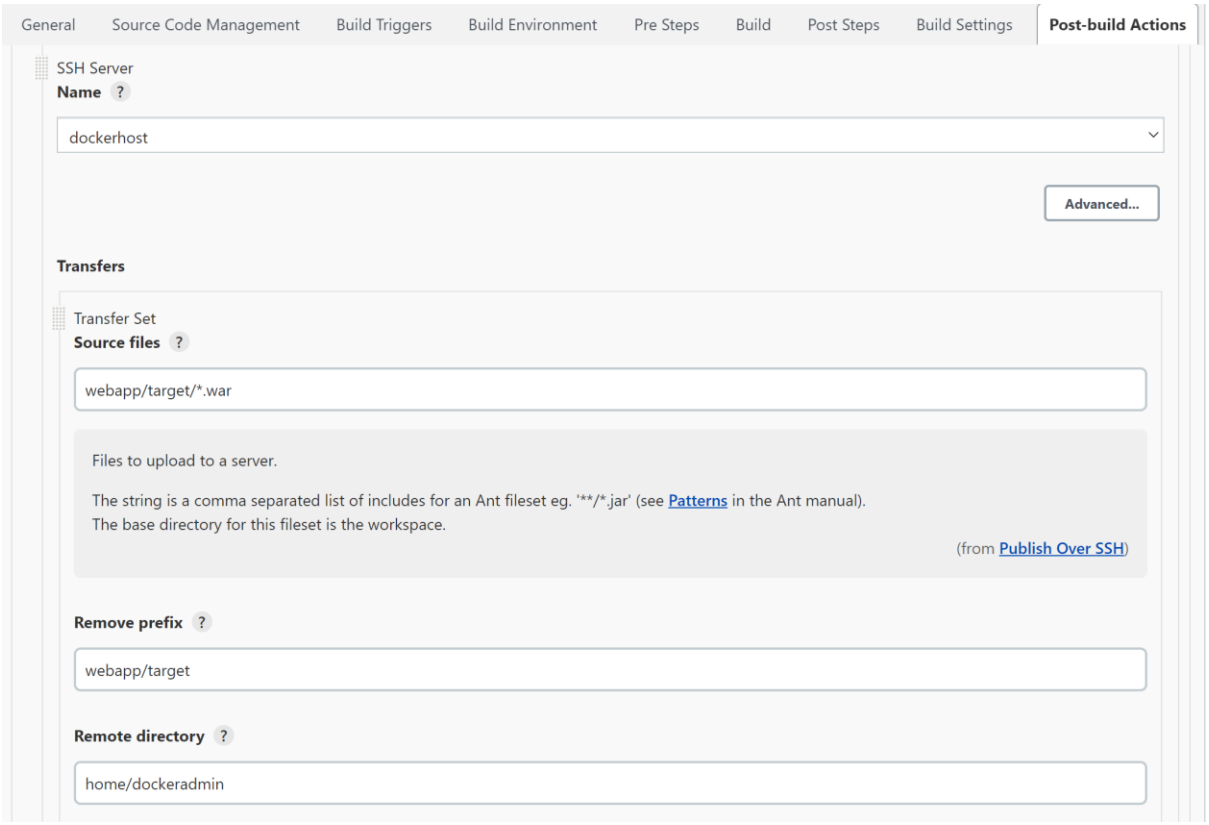


Fig. Configuring SSH Server

Test Case Success:

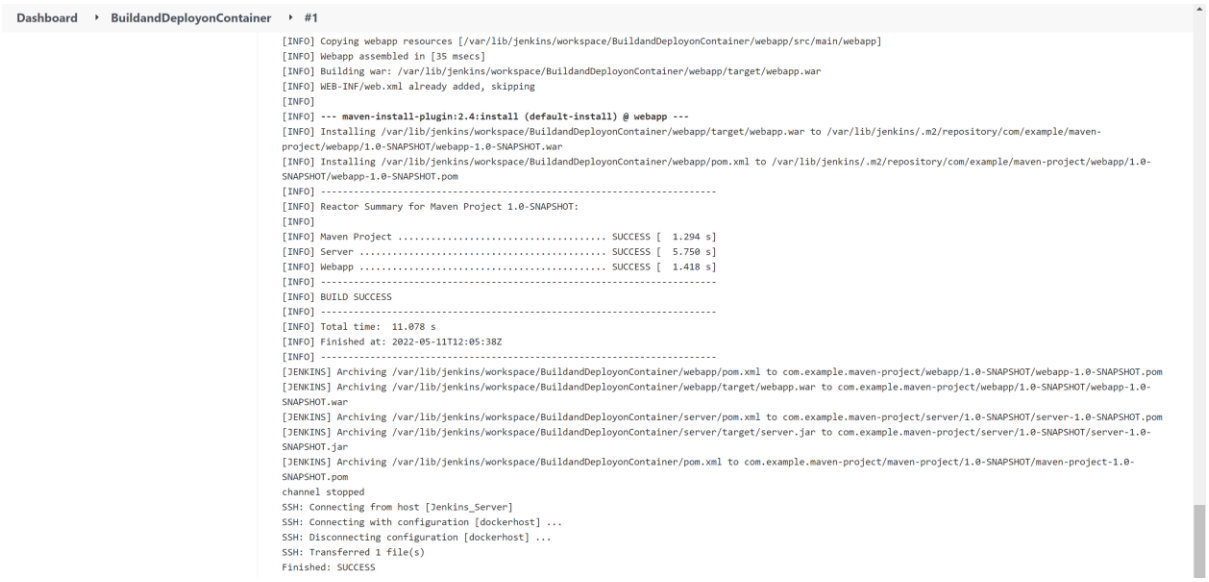


Fig. Success

[dockeradmin@dockerhost ~]$ ll

total 0

[dockeradmin@dockerhost ~]$ ll

total 0

drwxrwxr-x 3 dockeradmin dockeradmin 25 May 11 12:05 home

[dockeradmin@dockerhost ~]$ ll

total 4

drwxrwxr-x 3 dockeradmin dockeradmin 25 May 11 12:05 home

-rw-rw-r-- 1 dockeradmin dockeradmin 2912 May 11 12:07 webapp.war

[dockeradmin@dockerhost ~]$ rm -rf /home

rm: cannot remove '/home/ec2-user': Permission denied

rm: cannot remove '/home/dockeradmin': Permission denied

[dockeradmin@dockerhost ~]$ rm -rf home/

[dockeradmin@dockerhost ~]$ ll

total 0

[dockeradmin@dockerhost ~]$ ls

[dockeradmin@dockerhost ~]$ ll

total 0

[dockeradmin@dockerhost ~]$ cd ..

[dockeradmin@dockerhost home]$ ll

total 0

drwx------ 2 dockeradmin dockeradmin 6 May 11 12:08 dockeradmin

drwx------ 4 ec2-user ec2-user 125 May 2 21:42 ec2-user

[dockeradmin@dockerhost home]$ cd dockeradmin

[dockeradmin@dockerhost ~]$ ll

total 0

[dockeradmin@dockerhost ~]$ ll

total 4

-rw-r--r-- 1 dockeradmin dockeradmin 2912 May 11 12:09 webapp.war

Update Tomcat Docker File to automate deployment process

[root@dockerhost ~]# cd /opt

[root@dockerhost opt]# ll

total 0

drwxr-xr-x 4 root root 33 Apr 19 16:16 aws

drwx--x--x 4 root root 28 May 2 19:54 containerd

drwxr-xr-x 2 root root 6 Aug 16 2018 rh

[root@dockerhost opt]# mkdir docker

[root@dockerhost opt]# ll

total 0

drwxr-xr-x 4 root root 33 Apr 19 16:16 aws

drwx--x--x 4 root root 28 May 2 19:54 containerd

drwxr-xr-x 2 root root 6 May 11 14:14 docker

drwxr-xr-x 2 root root 6 Aug 16 2018 rh

Permission Given to docker admin :

[root@dockerhost opt]# chmod -R dockeradmin:dockeradmin docker

chmod: invalid mode: ‘dockeradmin:dockeradmin’

Try 'chmod --help' for more information.

[root@dockerhost opt]# chown -R dockeradmin:dockeradmin docker

[root@dockerhost opt]# ll

total 0

drwxr-xr-x 4 root root 33 Apr 19 16:16 aws

drwx--x--x 4 root root 28 May 2 19:54 containerd

drwxr-xr-x 2 dockeradmin dockeradmin 6 May 11 14:14 docker

drwxr-xr-x 2 root root 6 Aug 16 2018 rh

[root@dockerhost opt]# ls -ld //Given Execution Permission

drwxr-xr-x 6 root root 59 May 11 14:14 .

Searching and moving Dockerfile in docker folder

[root@dockerhost opt]# cd root/

-bash: cd: root/: No such file or directory

[root@dockerhost opt]# cd /root

[root@dockerhost ~]# ll

total 8

-rw-r--r-- 1 root root 527 May 2 21:59 Dockerfile

-rw-r--r-- 1 root root 86 May 3 07:34 DockerFile

[root@dockerhost ~]# vi DockerFile

[root@dockerhost ~]# mv Dockerfile /opt/docker

[root@dockerhost ~]# cd /opt/docker

[root@dockerhost docker]# ll

total 4

-rw-r--r-- 1 root root 527 May 2 21:59 Dockerfile

[root@dockerhost docker]# chown -R dockeradmin:dockeradmin Dockerfile

[root@dockerhost docker]# ll

total 4

-rw-r--r-- 1 dockeradmin dockeradmin 527 May 2 21:59 Dockerfile

[root@dockerhost docker]#

Configuring path to copy in cd/opt :

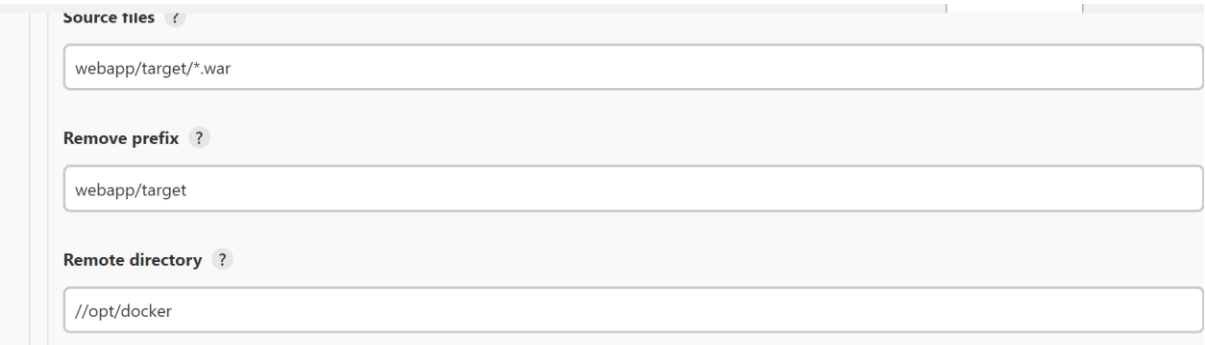


Fig. Remote Directory Path added

[root@dockerhost docker]# ll

total 8

-rw-r--r-- 1 dockeradmin dockeradmin 527 May 2 21:59 Dockerfile

-rw-r--r-- 1 dockeradmin dockeradmin 2912 May 11 14:31 webapp.war

[root@dockerhost docker]#

[root@dockerhost docker]# date

Wed May 11 14:34:06 UTC 2022

FROM tomcat:latest

RUN cp -R /usr/local/tomcat webpp.dist/* /usr/local/tomcatwebapps

COPY ./*.war /usr/local/tomcatwebapps

[root@dockerhost docker]# ll

total 12

-rw-r--r-- 1 dockeradmin dockeradmin 527 May 2 21:59 Dockerfile

-rw-r--r-- 1 dockeradmin dockeradmin   86 May 3 07:34 DockerFile

-rw-r--r-- 1 dockeradmin dockeradmin 2912 May 11 14:31 webapp.war

[root@dockerhost docker]# date

Wed May 11 14:38:20 UTC 2022

[root@dockerhost docker]# vi DockerFile

[root@dockerhost docker]# vi DockerFile

[root@dockerhost docker]# docker build -t tomcat:v1 .

Cannot connect to the Docker daemon at unix:///var/run/docker.sock. Is the docker daemon running?

[root@dockerhost docker]# cat DockerFile

FROM tomcat:latest

RUN cp -R /usr/local/tomcat webpp.dist/* /usr/local/tomcatwebapps

COPY ./*.war /usr/local/tomcatwebapps

[root@dockerhost docker]# service docker status

Redirecting to /bin/systemctl status docker.service

● docker.service - Docker Application Container Engine

Loaded: loaded (/usr/lib/systemd/system/docker.service; disabled; vendor preset: disabled)

Active: inactive (dead)

Docs: https://docs.docker.com

[root@dockerhost docker]# service docker start

Redirecting to /bin/systemctl start docker.service

[root@dockerhost docker]# docker build -t tomcat:v1 .

Sending build context to Docker daemon 7.168kB

Step 1/13 : FROM centos

---> 5d0da3dc9764

Step 2/13 : RUN mkdir /opt/tomcat/

---> Using cache

---> 29c2831a4695

Step 3/13 : WORKDIR /opt/tomcat

---> Using cache

---> ecea7cd5c77e

Step 4/13 : RUN curl -O https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.62/bin/apache-tomcat-9.0.62.tar.gz

---> Using cache

---> 5123cdc2263f

Step 5/13 : RUN tar -xvzf apache-tomcat-9.0.62.tar.gz

---> Using cache

---> 4776da674d01

Step 6/13 : RUN mv apache-tomcat-9.0.62/* /opt/tomcat

---> Using cache

---> fce4b9b7e164

Step 7/13 : RUN cd /etc/yum.repos.d/

---> Using cache

---> f7a2265a5410

Step 8/13 : RUN sed -i 's/mirrorlist/#mirrorlist/g' /etc/yum.repos.d/CentOS-*

---> Using cache

---> 2e2e2d5d8a29

Step 9/13 : RUN sed -i 's|#baseurl=http://mirror.centos.org|baseurl=http://vault.centos.org|g' /etc/yum.repos.d/CentOS-*

---> Using cache

---> abdcb8de2b2b

Step 10/13 : RUN yum -y install java

---> Using cache

---> 10ce50067582

Step 11/13 : CMD /bin/bash

---> Using cache

---> 4561a92d2242

Step 12/13 : EXPOSE 8080

---> Using cache

---> 95f4005d94f7

Step 13/13 : CMD ["/opt/tomcat/bin/catalina.sh", "run"]

---> Using cache

---> 9c295cdb7c8c

Successfully built 9c295cdb7c8c

Successfully tagged tomcat:v1

Checks Images:

[root@dockerhost docker]# docker images

REPOSITORY TAG IMAGE ID CREATED SIZE

demotomcat latest 9c295cdb7c8c 8 days ago 510MB

mytomcat latest 9c295cdb7c8c 8 days ago 510MB

tomcat v1 9c295cdb7c8c 8 days ago 510MB

tomcat latest 0183eb12bb0c 2 weeks ago 680MB

centos latest 5d0da3dc9764 7 months ago 231MB

Running Container :

[root@dockerhost docker]# docker run -d --name tomcatv1 -p 8086:8080 tomcat:v1

edef49a560653ec2a7d2c3cb260abdafaacea025654b5bf91e4124a61c18f0e5

[root@dockerhost docker]# docker ps

CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES

edef49a56065 tomcat:v1 "/opt/tomcat/bin/cat…" 7 seconds ago Up 6 seconds 0.0.0.0:8086->8080/tcp, :::8086->8080/tcp tomcatv1

[root@dockerhost docker]#

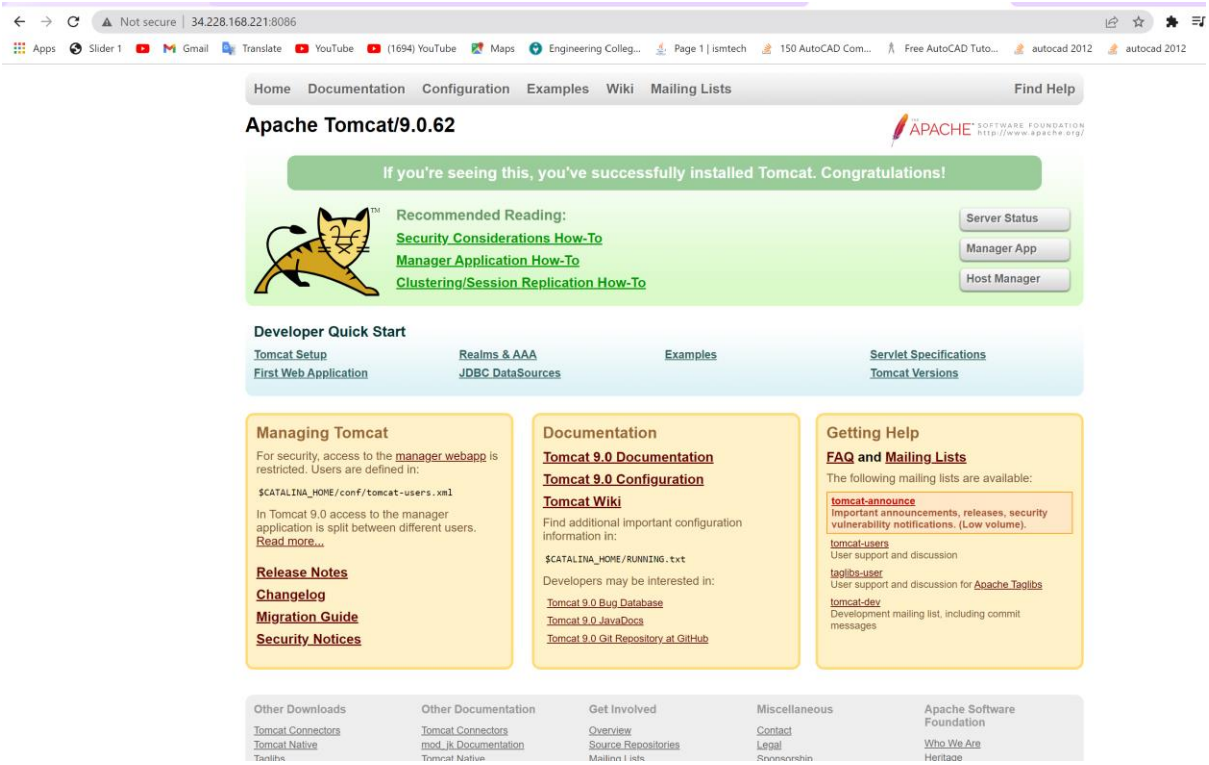


Fig. Tomcat Started

Automate Build and Deployment on Docker Container :

cd /opt/docker;

docker build -t regapp:v1 .;

docker run -d --name regapp:v1 -p 8087:8080 regapp:v1

Fig. Configuration on Jenkins Server

```
[root@dockerhost ~]# service docker start
Redirecting to /bin/systemctl start docker.service
[root@dockerhost ~]# docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED          STATUS                      PORTS                                       NAMES
edef49a56065   tomcat:v1      "/opt/tomcat/bin/cat…"   24 minutes ago   Up 24 minutes               0.0.0.0:8086->8080/tcp, :::8086->8080/tcp   tomcatv1
5251e0ac3ad9   demotomcat     "/opt/tomcat/bin/cat…"   8 days ago       Exited (143) 8 days ago                                                 mydemotomcat-container
183307c95d1b   mytomcat       "/opt/tomcat/bin/cat…"   8 days ago       Exited (143) 8 days ago                                                 mytomcat-server
13967cbc8a35   5d0da3dc9764   "/bin/sh -c 'sudo am…"   8 days ago       Exited (127) 8 days ago                                                 charming_chatterjee
36d65ecb9a6e   5d0da3dc9764   "/bin/sh -c 'amazon-…"   8 days ago       Exited (127) 8 days ago                                                 nifty_bell
c6093995c672   5d0da3dc9764   "/bin/sh -c 'yum ins…"   8 days ago       Exited (1) 8 days ago                                                   inspiring_franklin
74fcd8513fff   5d0da3dc9764   "/bin/sh -c 'yum ins…"   8 days ago       Exited (1) 8 days ago                                                   stoic_rhodes
89d40f0ec25e   5d0da3dc9764   "/bin/sh -c 'yum ins…"   8 days ago       Exited (1) 8 days ago                                                   loving_heyrovsky
9ac2c0b28c45   5d0da3dc9764   "/bin/sh -c 'yum ins…"   8 days ago       Exited (1) 8 days ago                                                   nifty_thompson
d4c7db9d910f   tomcat:latest  "catalina.sh run"        8 days ago       Exited (143) 8 days ago                                                 tomca2
78e9303c67b9   tomcat         "catalina.sh run"        8 days ago       Exited (143) 8 days ago                                                 tomcat-container
[root@dockerhost ~]# docker stop
"docker stop" requires at least 1 argument.
See 'docker stop --help'.

Usage:  docker stop [OPTIONS] CONTAINER [CONTAINER...]

Stop one or more running containers
[root@dockerhost ~]# docker stop edef49a56065
edef49a56065
[root@dockerhost ~]# docker ps -a
CONTAINER ID   IMAGE          COMMAND                  CREATED          STATUS                      PORTS     NAMES
edef49a56065   tomcat:v1      "/opt/tomcat/bin/cat…"   25 minutes ago   Exited (143) 5 seconds ago            tomcatv1
5251e0ac3ad9   demotomcat     "/opt/tomcat/bin/cat…"   8 days ago       Exited (143) 8 days ago               mydemotomcat-container
183307c95d1b   mytomcat       "/opt/tomcat/bin/cat…"   8 days ago       Exited (143) 8 days ago               mytomcat-server
13967cbc8a35   5d0da3dc9764   "/bin/sh -c 'sudo am…"   8 days ago       Exited (127) 8 days ago               charming_chatterjee
36d65ecb9a6e   5d0da3dc9764   "/bin/sh -c 'amazon-…"   8 days ago       Exited (127) 8 days ago               nifty_bell
c6093995c672   5d0da3dc9764   "/bin/sh -c 'yum ins…"   8 days ago       Exited (1) 8 days ago                 inspiring_franklin
74fcd8513fff   5d0da3dc9764   "/bin/sh -c 'yum ins…"   8 days ago       Exited (1) 8 days ago                 stoic_rhodes
89d40f0ec25e   5d0da3dc9764   "/bin/sh -c 'yum ins…"   8 days ago       Exited (1) 8 days ago                 loving_heyrovsky
9ac2c0b28c45   5d0da3dc9764   "/bin/sh -c 'yum ins…"   8 days ago       Exited (1) 8 days ago                 nifty_thompson
d4c7db9d910f   tomcat:latest  "catalina.sh run"        8 days ago       Exited (143) 8 days ago               tomca2
78e9303c67b9   tomcat         "catalina.sh run"        8 days ago       Exited (143) 8 days ago               tomcat-container
[root@dockerhost ~]# docker container prune
WARNING! This will remove all stopped containers.
Are you sure you want to continue? [y/N] y
Deleted Containers:
edef49a560653ec2a7d2c3cb260abdafaacea025654b5bf91e4124a61c18f0e5
5251e0ac3ad991f75f289e597f245643e124693162ffa58b542685b4ea64129d
183307c95d1b6c91603de52e753f9a0d16f8cee32fe7300b129b4c5c9e3486a4
13967cbc8a35d2df2c49041dfad83781246f33973dc1ad7c9f315f9e00096122
36d65ecb9a6ead4c6ca2cf7601cf26994fb0484eec5e8eaf380f4b21397a032a
c6093995c672959c270618124a4022c7a395e0927951b695109f916265ada3c1
74fcd8513fffd43605cc9a945ebc235af74f20eb4d1bbb524ff00ad5fe699866
89d40f0ec25eb5ee062f477a7ea33e6af614d70eafc30def7eaea509498b9a0c
9ac2c0b28c452a9b3fa50fd5023f14e7e1c34cea57e0a618d97655617733a250
d4c7db9d910fdceeef014d3e3fc685e9ef04305627373c5e2df1db43c75c03fb
78e9303c67b9f67ca161776a1321da5cb8bad4b85e64c9753a84bf91359ace21
```

Fig. Removing all running container

docker images prune -a // remove images

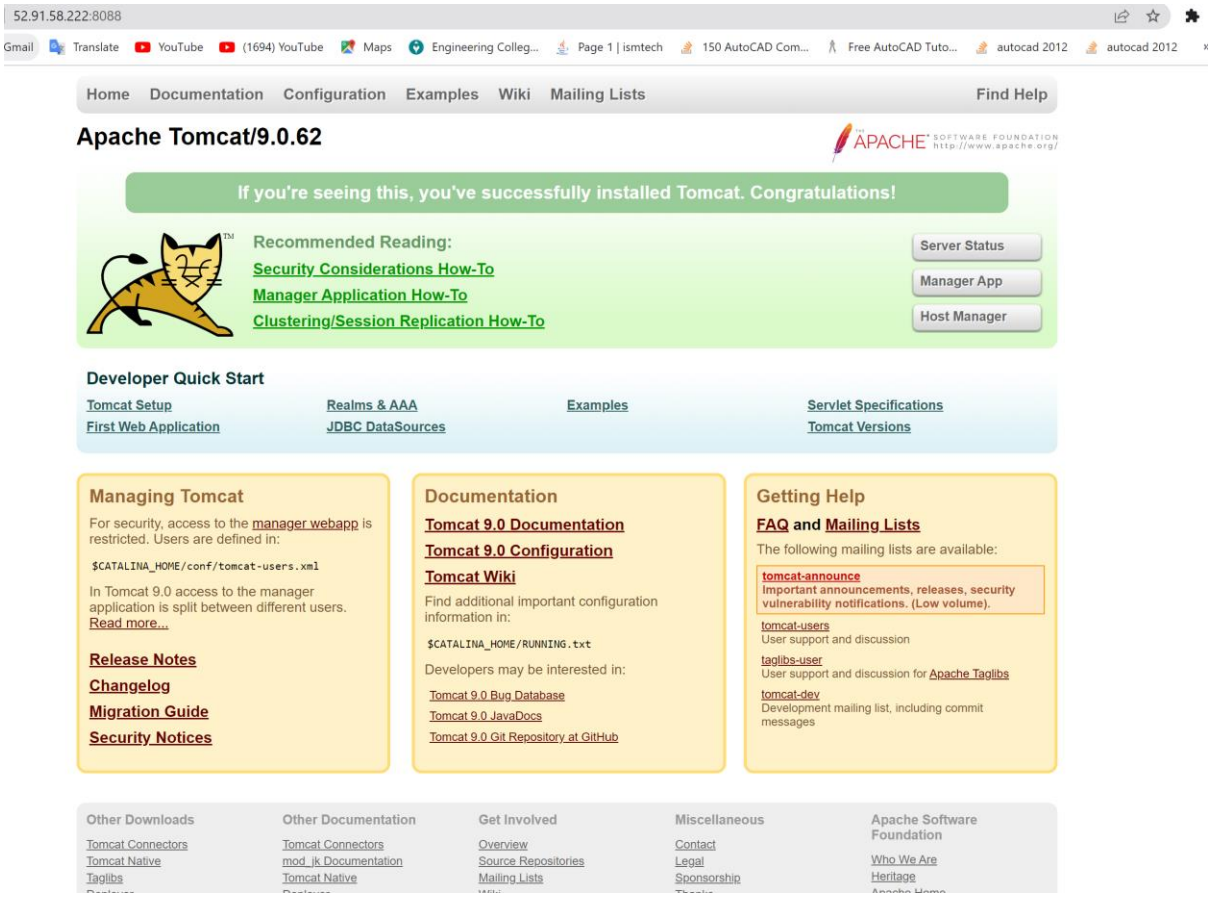


Fig . Tomcat Started on port 8088

Integrate Ansible in CI/CD Pipeline:

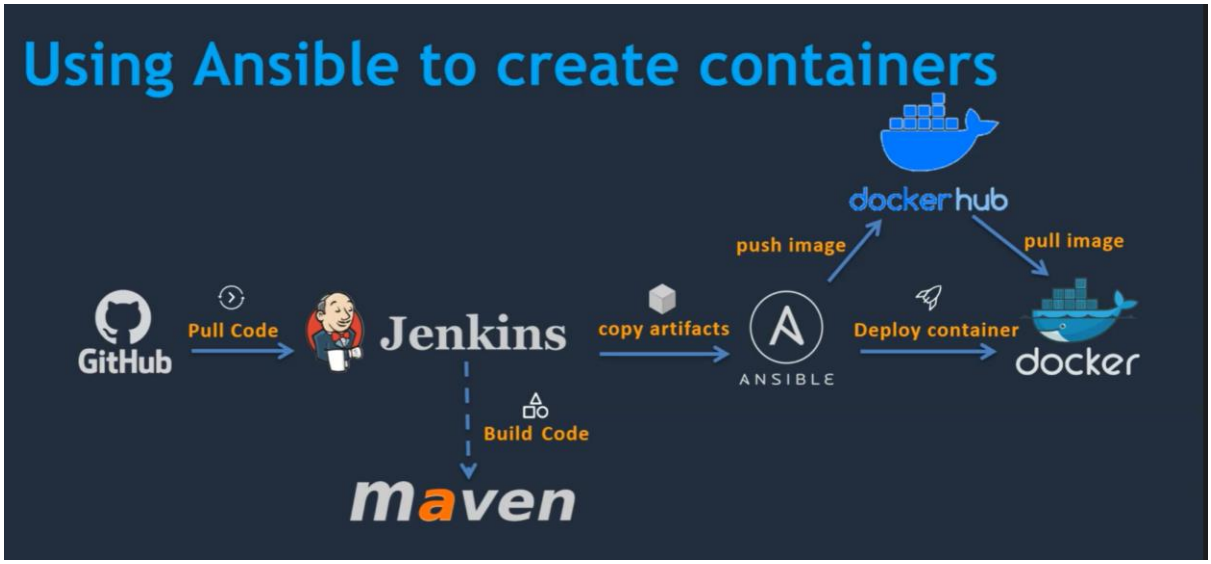


Fig. Using Ansible to create containers

Prepare Ansible Server:

- Setup EC2 Instance
- Setup hostname
- Create ansadmin users
- Add Users to sudoers file
- Generate ssh keys
- Enable Password Based Login
- Install Ansible

Setup EC2 Instance

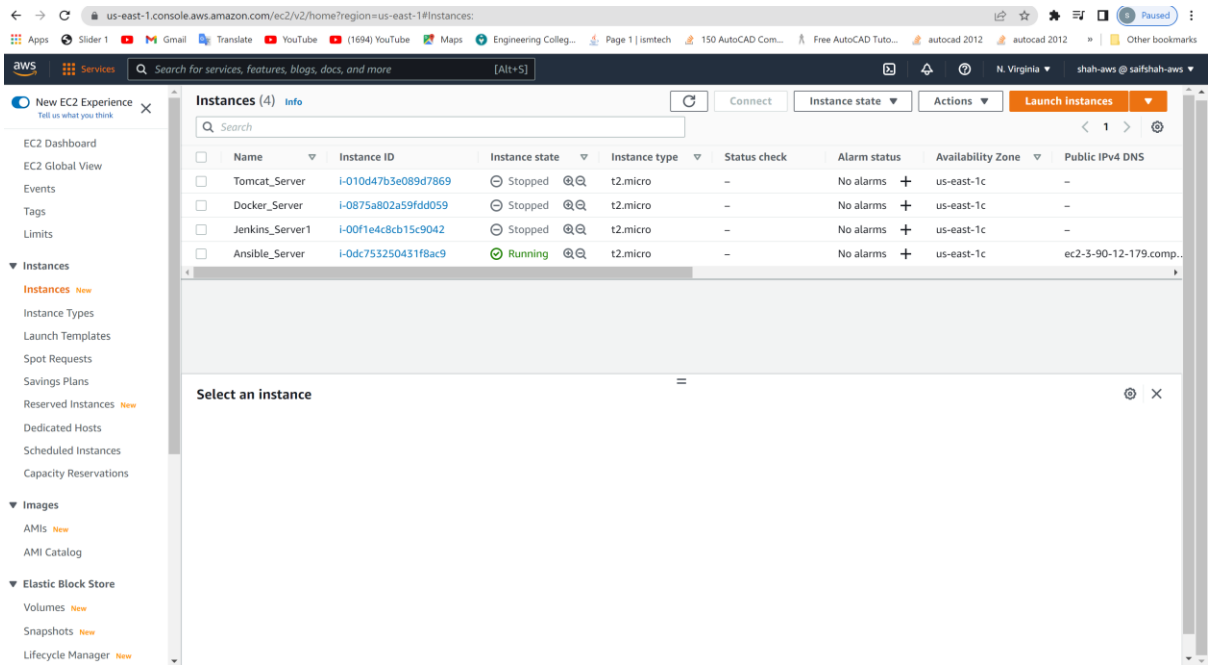


Fig.EC2 Instance Setup For Ansible

Setup hostname

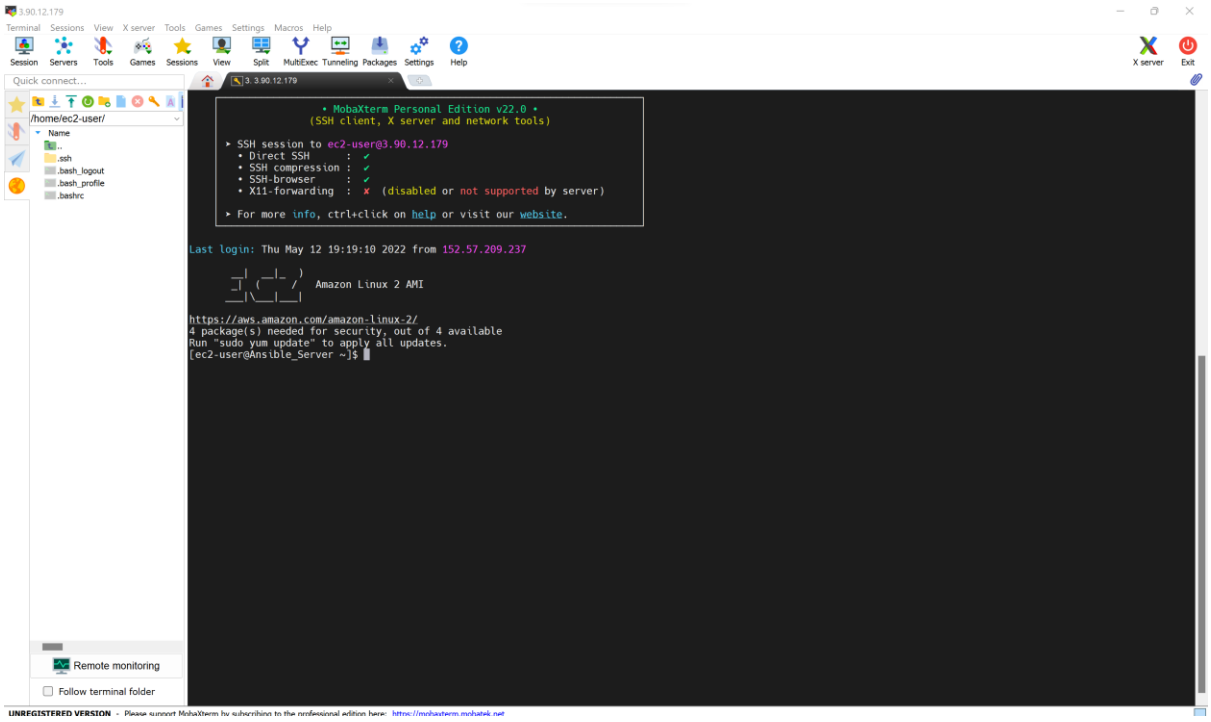


Fig.EC2 Setup hostname For Ansible

Create ansadmin users

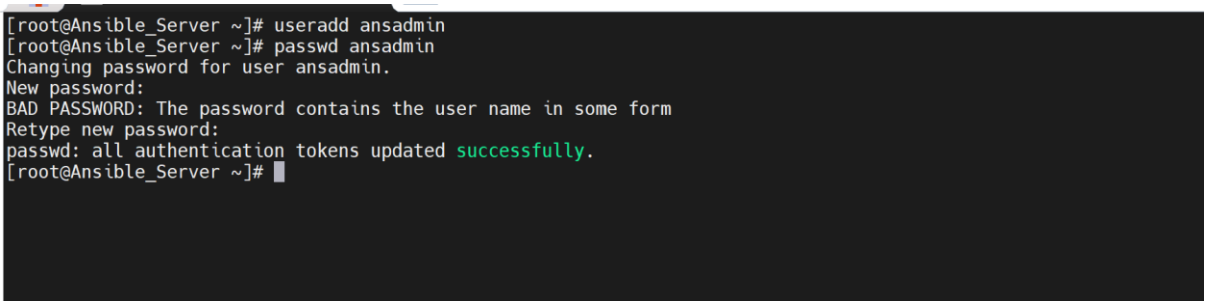


Fig. ansadmin users is created

Add Users to sudoers file

The **sudoers file** is a file Linux and Unix administrators use to allocate system rights to system users.

Command to enter **visudo**

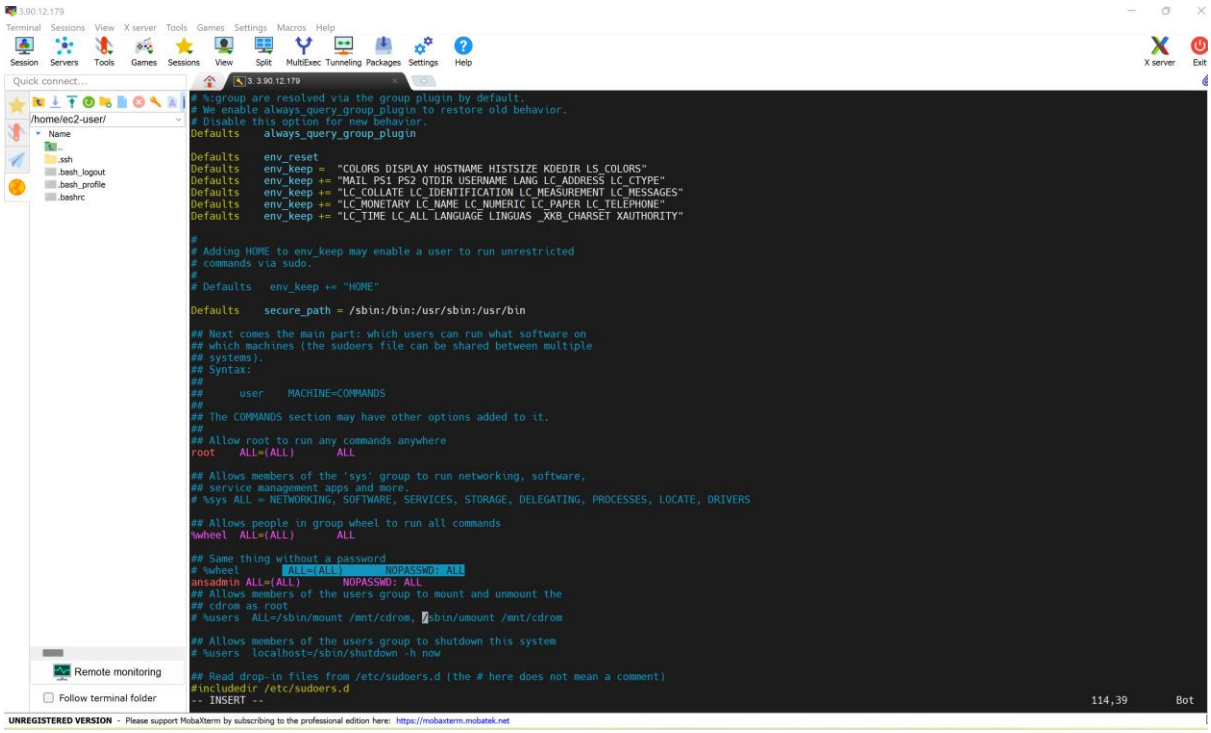


Fig. Add Users to sudoers file

- Note: Shift +g to end of line

Configuring SSH

[root@Ansible_Server ~]# vi /etc/ssh/sshd_config

[root@Ansible_Server ~]# service sshd reload

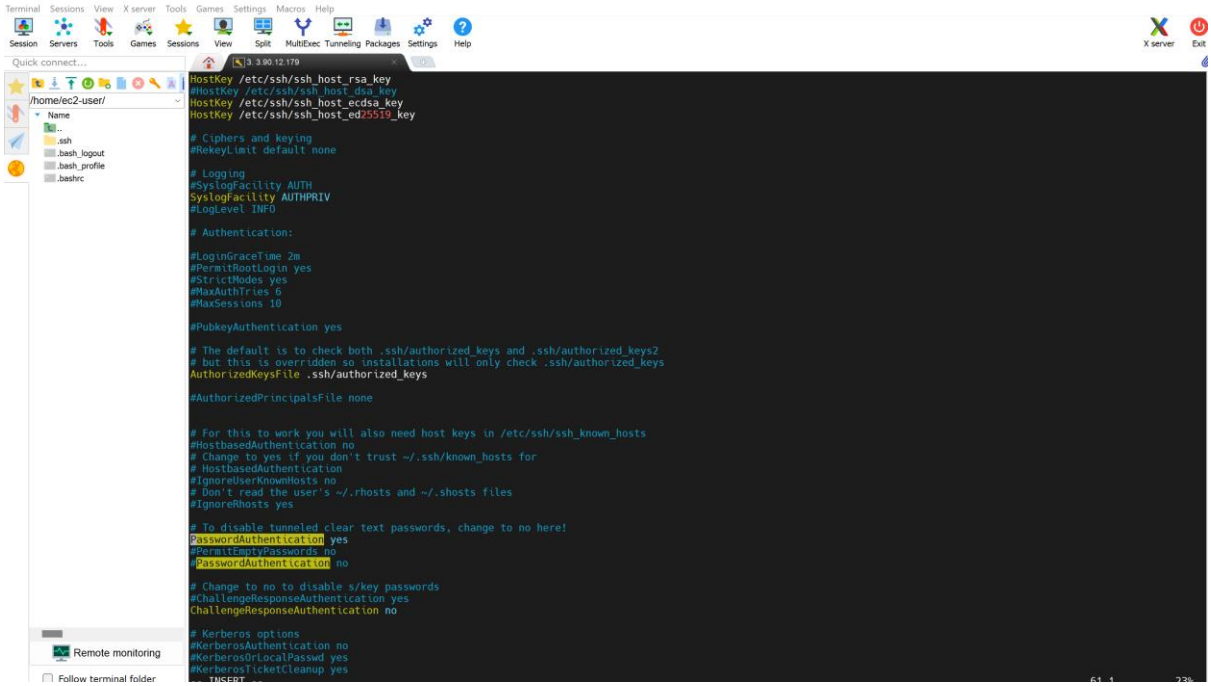


Fig. Configuring Passwd

Enable Password Based Login

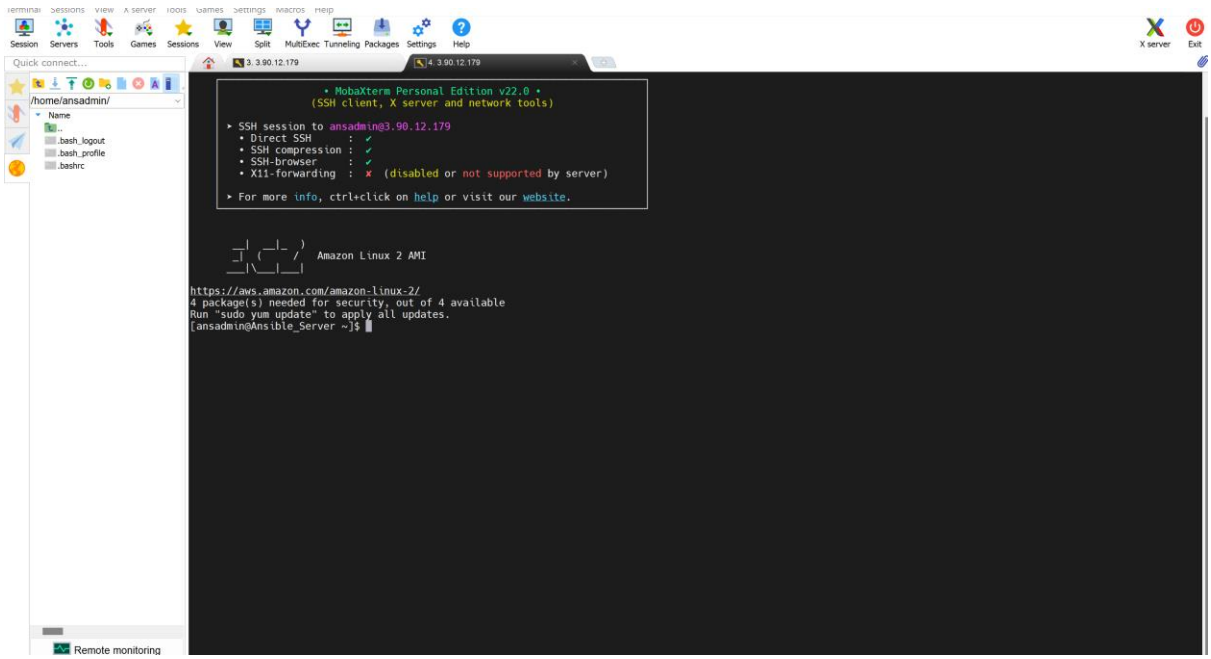


Fig. Login as ansadmin

Generated SSH Keys:

[ansadmin@Ansible_Server ~]$ ssh-keygen

Generating public/private rsa key pair.

Enter file in which to save the key (/home/ansadmin/.ssh/id_rsa):

Created directory '/home/ansadmin/.ssh'.

Enter passphrase (empty for no passphrase):

Enter same passphrase again:

Your identification has been saved in /home/ansadmin/.ssh/id_rsa.

Your public key has been saved in /home/ansadmin/.ssh/id_rsa.pub.

The key fingerprint is:

SHA256:+4bEKmcZCo4uVhQ8BYqwqn/bZwLbV+Cl30l0dUDJMlE ansadmin@Ansible_Server

The key's randomart image is:

+---[RSA 2048]----+

|. ..o. .=Eo |

|o..+ o o o|

|o. o o ..|

|. . . . . . |

|. . oS+ . . |

|. ... . =.. . |

|.o.. = =.+ o . |

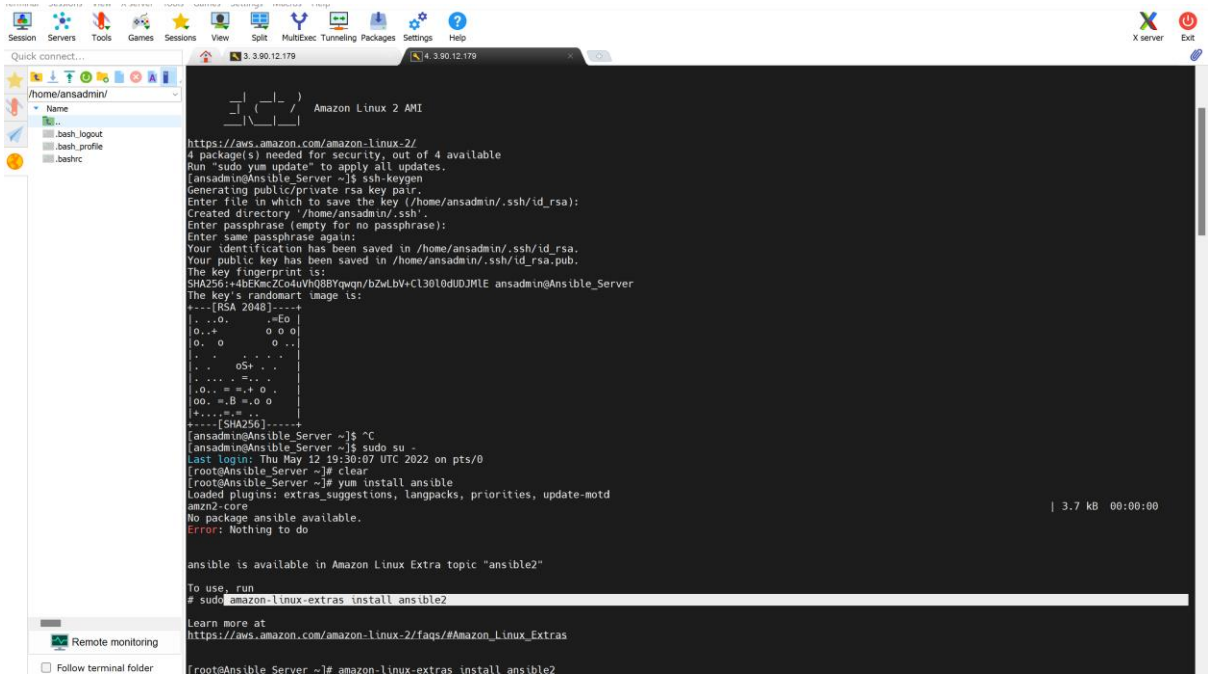
|oo. =.B =.o o |

|+....=.= .. |

+----[SHA256]-----+

[ansadmin@Ansible_Server ~]$

Install Ansible



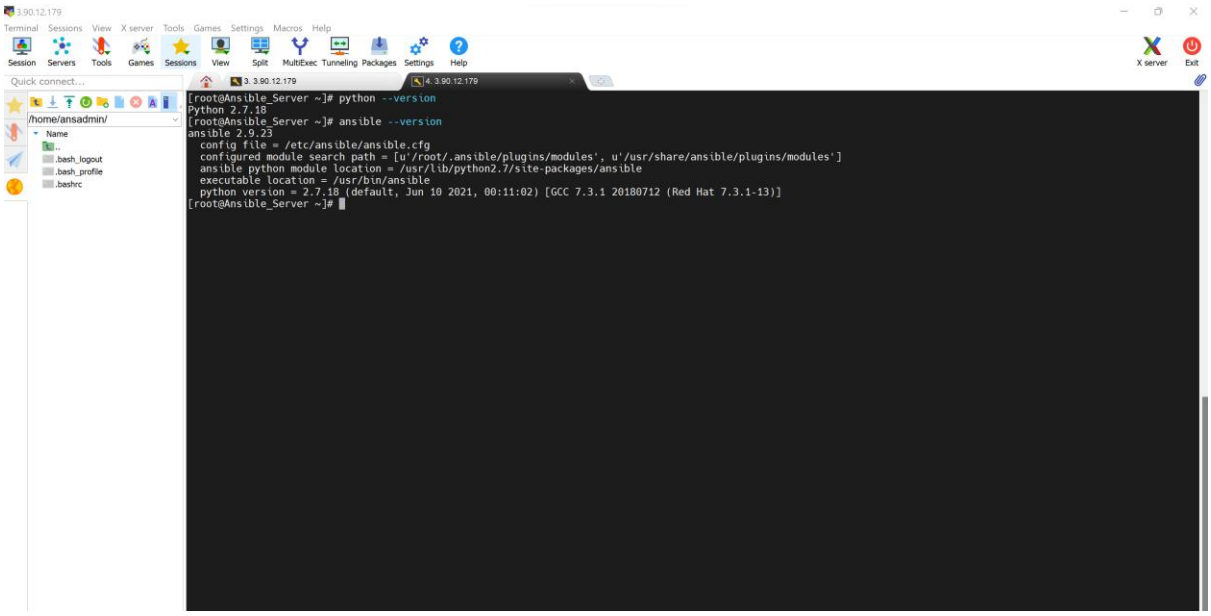


Fig. Installing Ansible

Note: For Installing Ansible required python which inbuilt comes amazon ec2 service.

Integrate Docker with Ansible:

- **On Docker Host**

- Create ansadmin
- Add ansadmin to sudoers file
- Enable Password Based Login

- **On Ansible Node**

- Add to host file
- Copy ssh keys
- Test the Connection

Create ansadmin

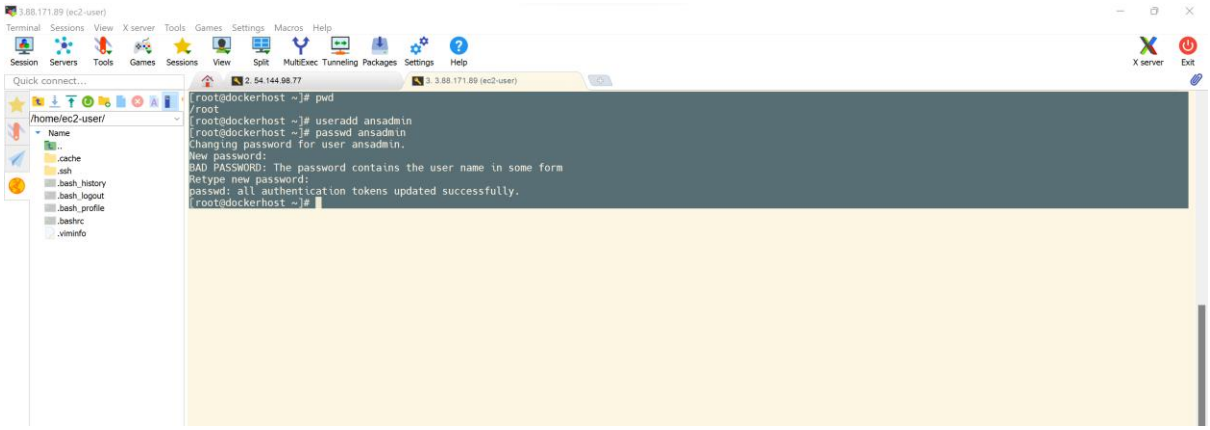


Fig. Created ansadmin for docker

Add ansadmin to sudoers file

The **sudoers file** is a file Linux and Unix administrators use to allocate system rights to system users.

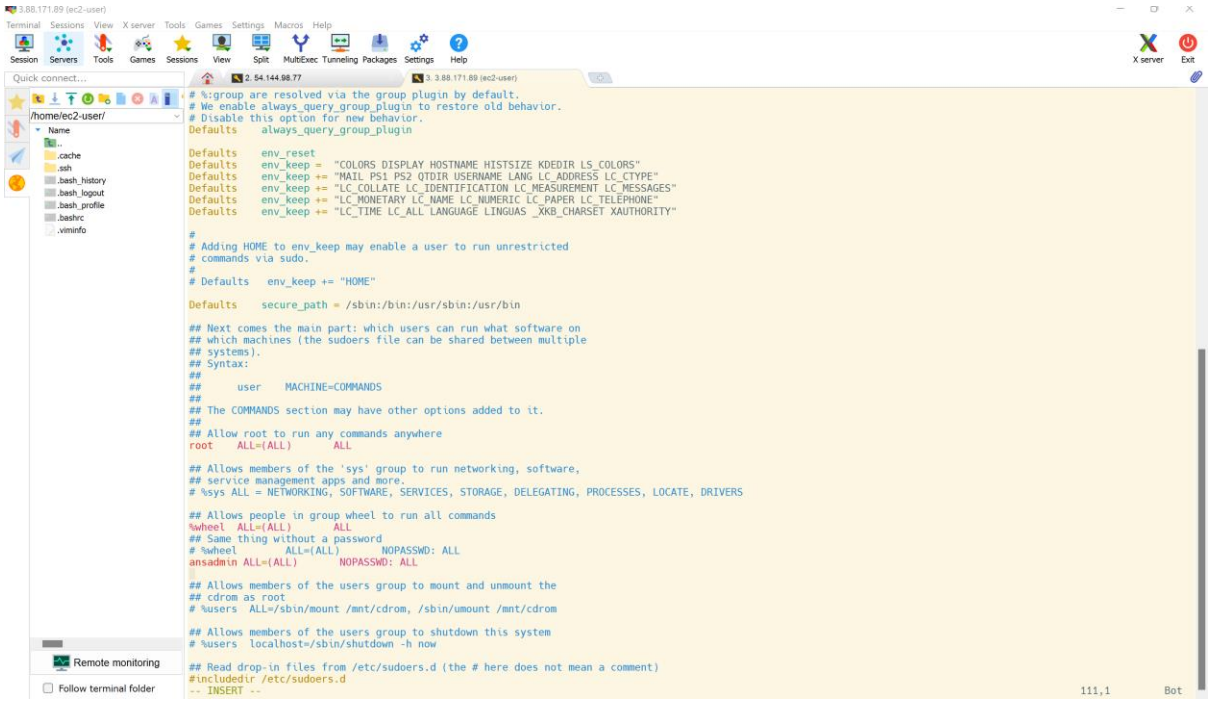


Fig. Created ansadmin added to sudoers file

Enable Password Based Login

Fig. Enable Password Based Login

----------On Ansible Node----------

Add to host file

[root@Ansible_Server ~]# vi /etc/ansible/hosts

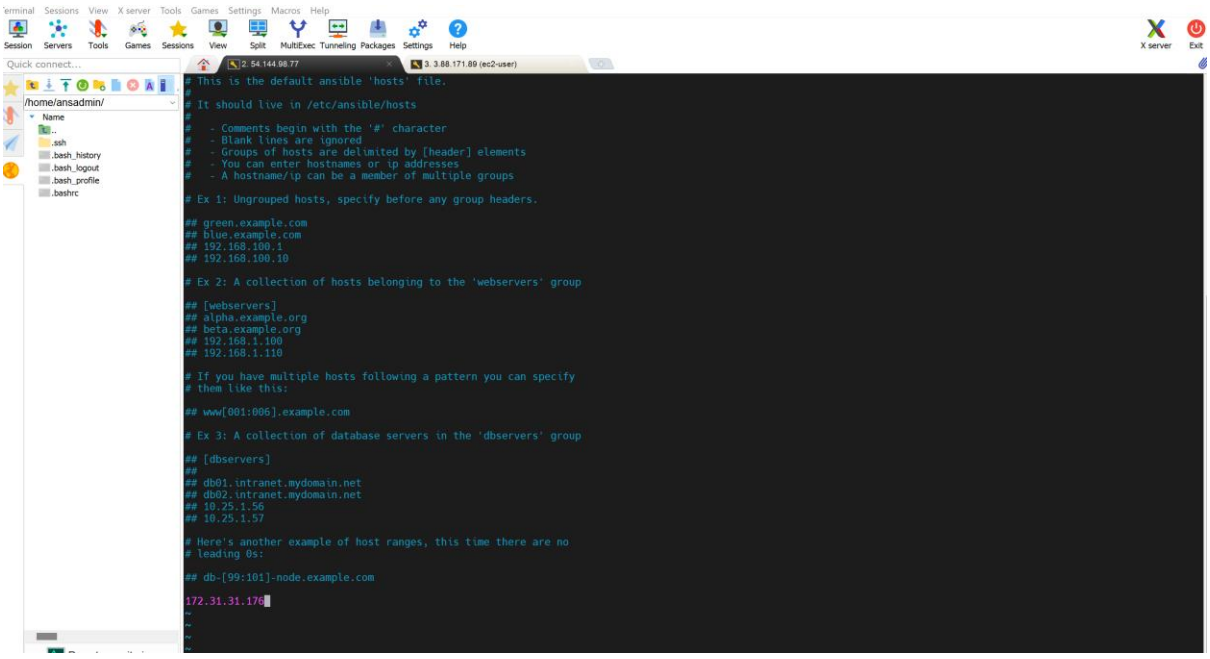
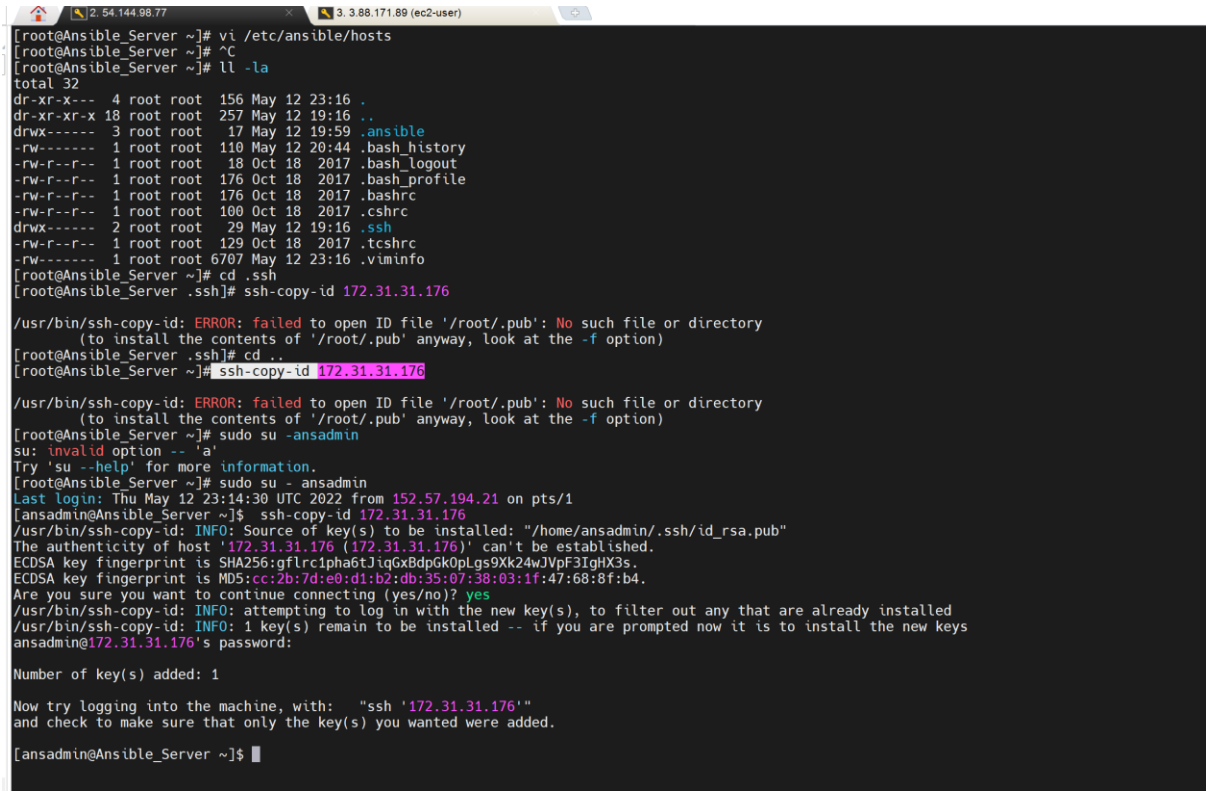


Fig. Added host ipconfig address from docker host

Copy ssh keys



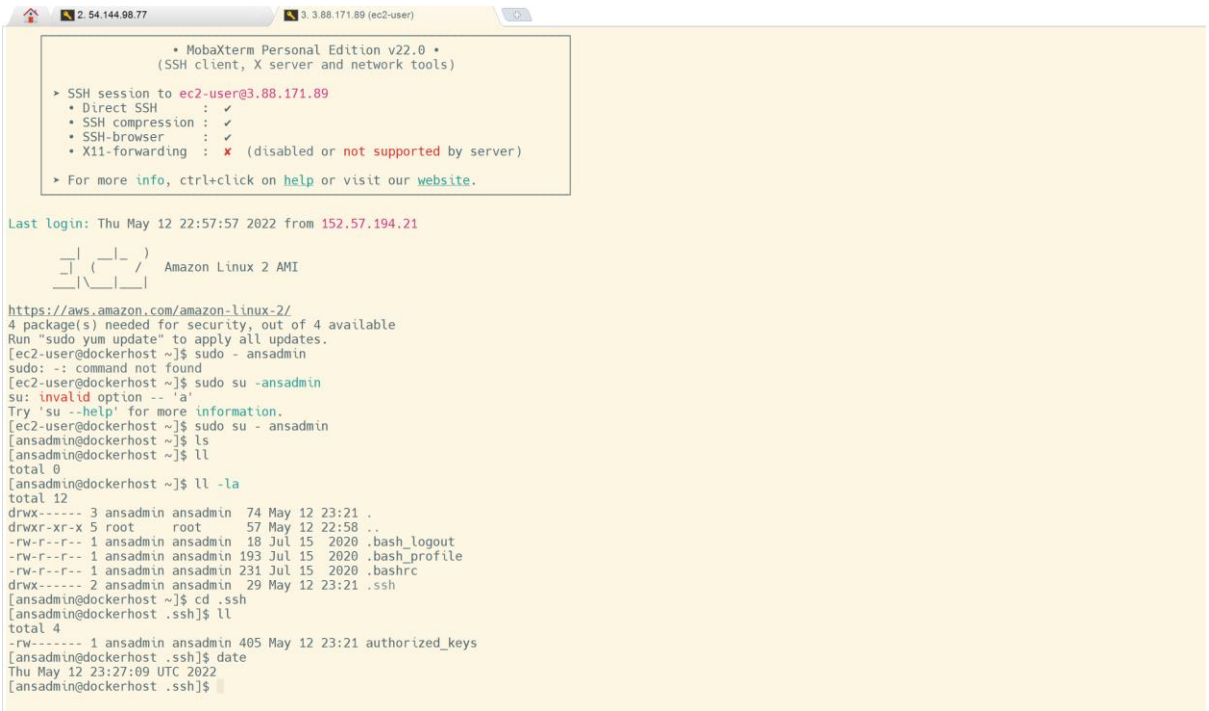


Fig. Copying sshkey to docker host.

[ansadmin@Ansible_Server ~]$ cat .ssh/id_rsa.pub

ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCtCHrU93Nngsu3VtGfMvQktI1pktg
GWyd9z8iyiak0Dizs8AiIPGEEwoP4ihhsx8l9loSU5i1D9/rGG2KtpQh95SXUzgfvu
tnA/UEuEiPV1oTYpeteltG868/qsCLUME8b9nJU57g782QvnNBS4OBmNUHTQ6
egxxpwtOzl/O1Oq8eNe84QODGyuOk7EJqjLxOh17B/BeRG07sKLvA/n183pep6
dM+5OwdTe+c1wuoJ2V9mdD/fbIfKkC789LofxNuZPuvOF5sn9KeuJ65pOuUn6t
/L6Ev2vUw2YXe8FCQrBgY6Ab02RIc2VufjfJ+nUXwaGoV67p/2VGcyQwXdvdcb
ansadmin@Ansible_Server

[ansadmin@Ansible_Server ~]$

[ansadmin@dockerhost .ssh]$ cat authorized_keys

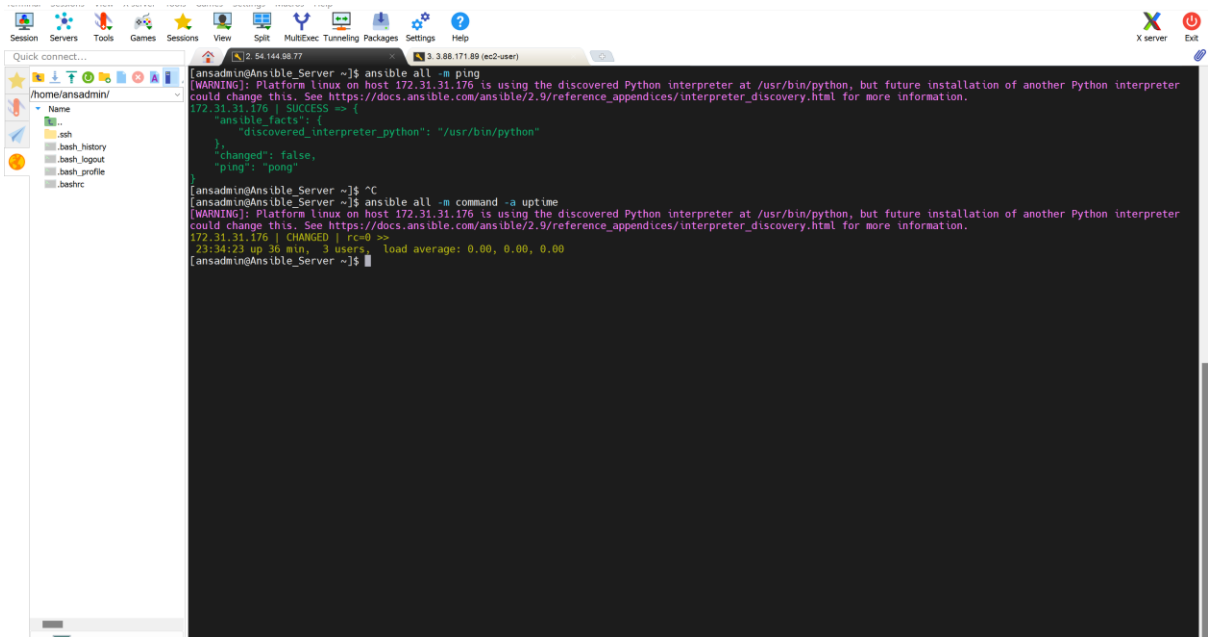
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQCtCHrU93Nngsu3VtGfMvQktI1pktg
GWyd9z8iyiak0Dizs8AiIPGEEwoP4ihhsx8l9loSU5i1D9/rGG2KtpQh95SXUzgfvu
tnA/UEuEiPV1oTYpeteltG868/qsCLUME8b9nJU57g782QvnNBS4OBmNUHTQ6
egxxpwtOzl/O1Oq8eNe84QODGyuOk7EJqjLxOh17B/BeRG07sKLvA/n183pep6
dM+5OwdTe+c1wuoJ2V9mdD/fbIfKkC789LofxNuZPuvOF5sn9KeuJ65pOuUn6t
/L6Ev2vUw2YXe8FCQrBgY6Ab02RIc2VufjfJ+nUXwaGoV67p/2VGcyQwXdvdcb
ansadmin@Ansible_Server

[ansadmin@dockerhost .ssh]$

Test the Connection

[ansadmin@Ansible_Server ~]$ ansible all -m ping

[ansadmin@Ansible_Server ~]$ ansible all -m command -a uptime



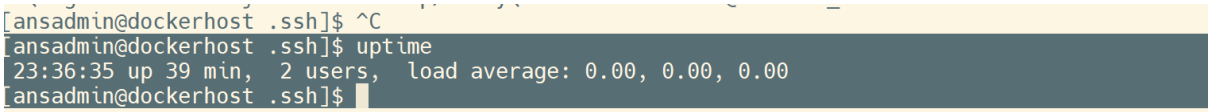


Fig. Connection Success

Integrate Ansible with Jenkins:

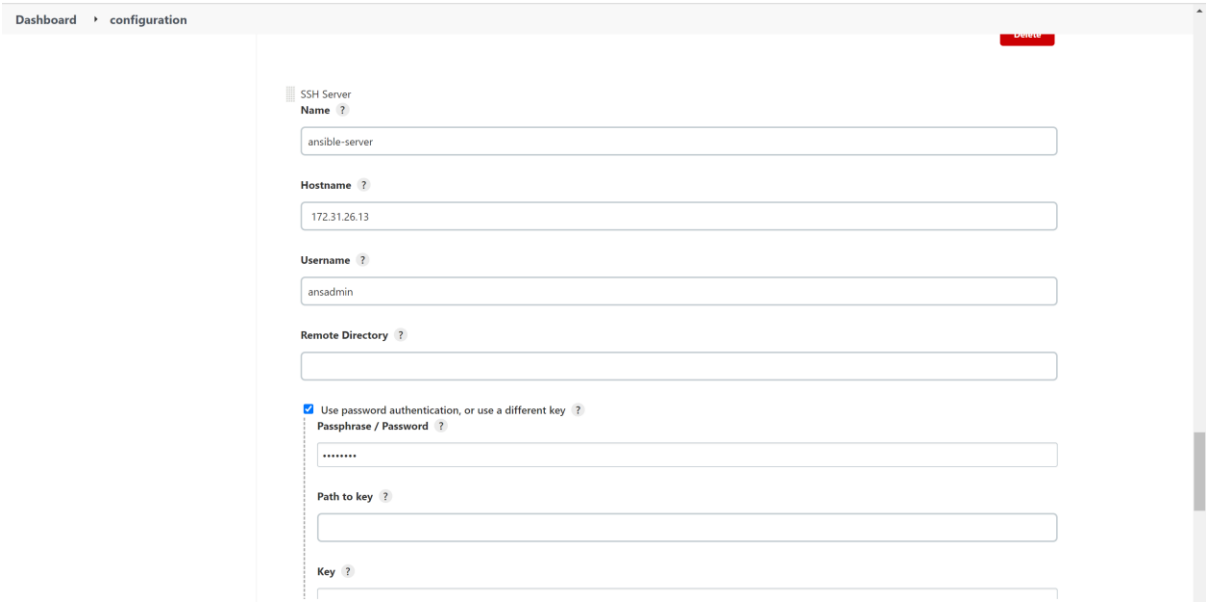


Fig. Configuring Ansible with Jenkins

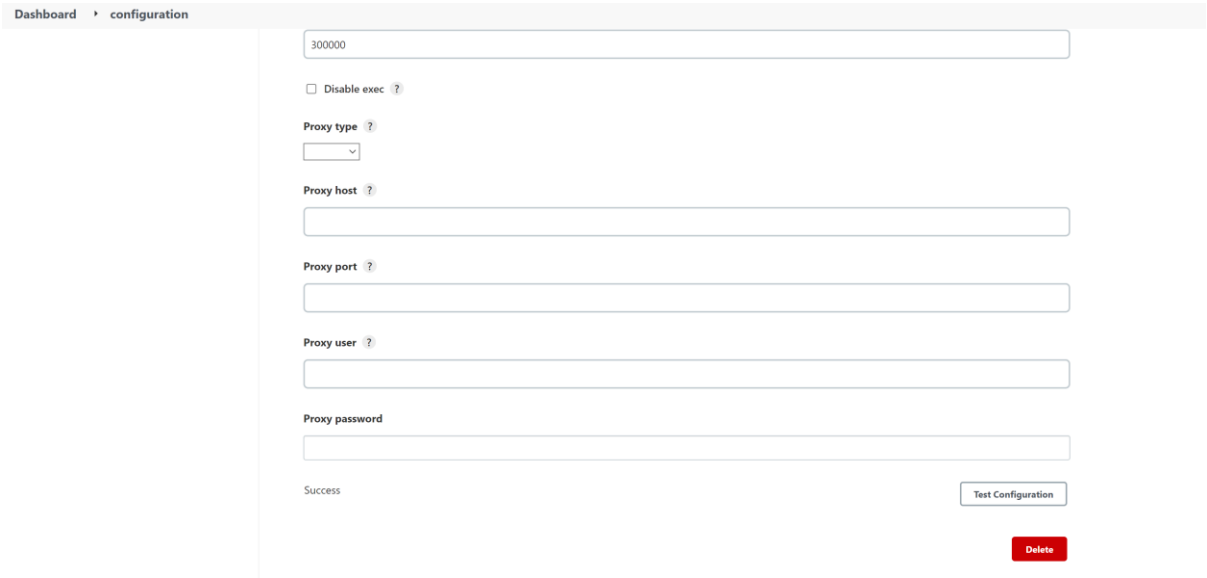


Fig. Testing Success and save it.

Creating Item:

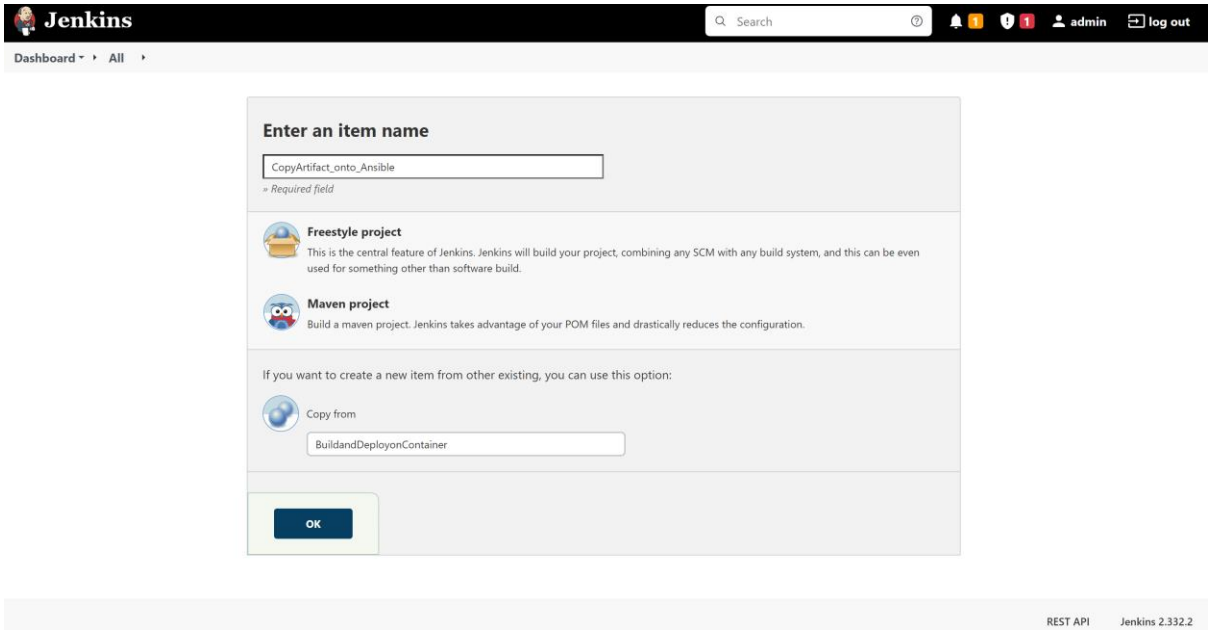


Fig. CopyArtifact_onto_Ansible

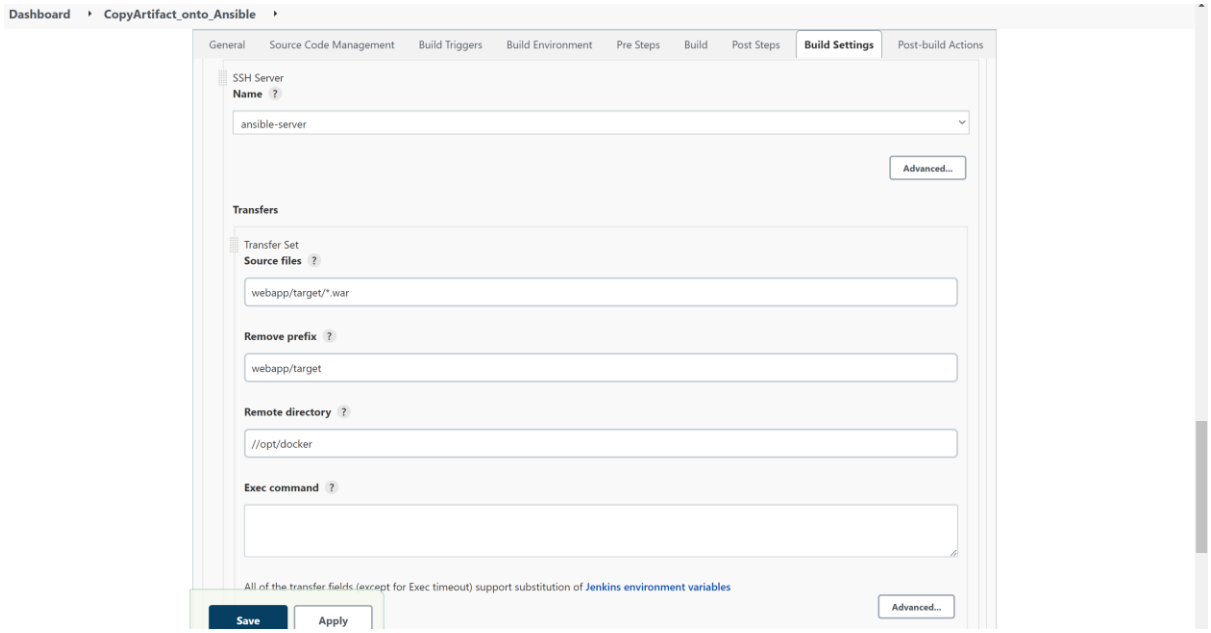


Fig. Configuring SSH Server with ansible-server

Creating docker directory on Ansible Server:

```
[root@Ansible_Server ~]# cd /opt
[root@Ansible_Server opt]# ll
total 0
drwxr-xr-x 4 root root 33 Apr 28 19:54 aws
drwxr-xr-x 2 root root  6 Aug 16  2018 rh
[root@Ansible_Server opt]# mkdir docker
[root@Ansible_Server opt]# ll
total 0
drwxr-xr-x 4 root root 33 Apr 28 19:54 aws
drwxr-xr-x 2 root root  6 May 13 09:36 docker
drwxr-xr-x 2 root root  6 Aug 16  2018 rh
[root@Ansible_Server opt]# chown ansadmin:ansadmin docker
[root@Ansible_Server opt]# ll
total 0
drwxr-xr-x 4 root     root     33 Apr 28 19:54 aws
drwxr-xr-x 2 ansadmin ansadmin  6 May 13 09:36 docker
drwxr-xr-x 2 root     root      6 Aug 16  2018 rh
[root@Ansible_Server opt]#
```

Console Output:

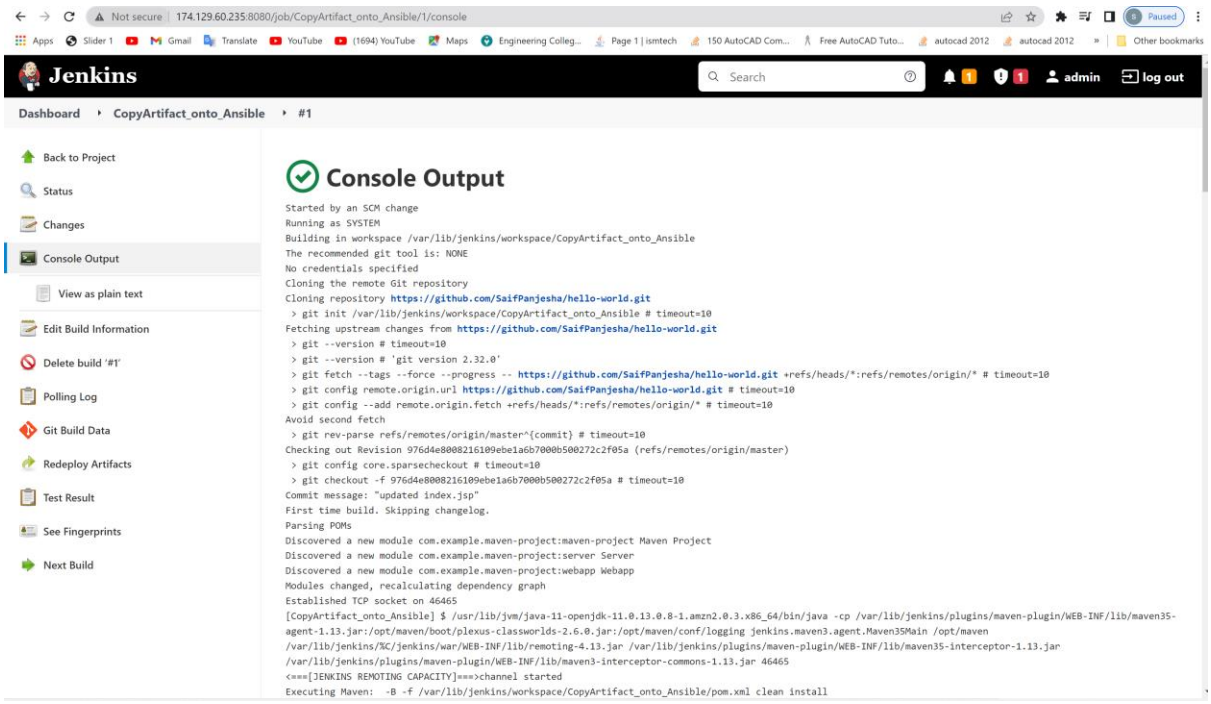


Fig. Success Build on Jenkins

[root@Ansible_Server opt]# cd docker

[root@Ansible_Server docker]# ll

total 4

-rw-rw-r-- 1 ansadmin ansadmin 2907 May 13 09:41 webapp.war

[root@Ansible_Server docker]# date

Fri May 13 09:42:51 UTC 2022

[root@Ansible_Server docker]#

Build an Image and create Container on Ansible

Step 1: Installing docker

[root@Ansible_Server docker] # yum install docker

[root@Ansible_Server docker]# cat /etc/group

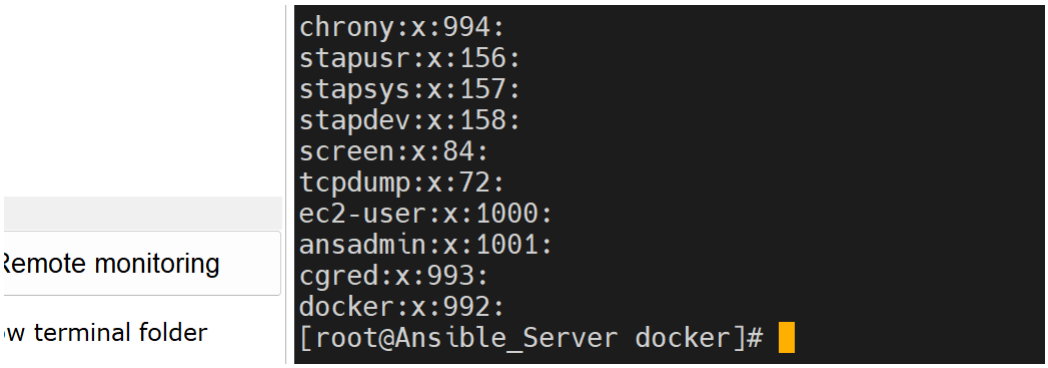


Fig. Docker Successful Installed on Ansible

[root@Ansible_Server docker]# usermod -aG docker ansadmin

[root@Ansible_Server docker]# id ansadmin

uid=1001(ansadmin) gid=1001(ansadmin) groups=1001(ansadmin),992(docker)

[root@Ansible_Server docker]# service docker start

Redirecting to /bin/systemctl start docker.service

[root@Ansible_Server docker]# service docker status

Redirecting to /bin/systemctl status docker.service

● docker.service - Docker Application Container Engine

Loaded: loaded (/usr/lib/systemd/system/docker.service; disabled; vendor preset: disabled)

Active: active (running) since Fri 2022-05-13 11:51:21 UTC; 25s ago

Docs: https://docs.docker.com

Process: 3450 ExecStartPre=/usr/libexec/docker/docker-setup-runtimes.sh (code=exited, status=0/SUCCESS)

Process: 3440 ExecStartPre=/bin/mkdir -p /run/docker (code=exited, status=0/SUCCESS)

Main PID: 3458 (dockerd)

Tasks: 7

Memory: 27.4M

CGroup: /system.slice/docker.service

└─3458 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/containerd.sock --default-ulimit nofile=32768:65536

May 13 11:51:21 Ansible_Server dockerd[3458]: time="2022-05-13T11:51:21.544859745Z" level=info msg="scheme \"unix\" not registered, fallback to default sc...dule=grpc

May 13 11:51:21 Ansible_Server dockerd[3458]: time="2022-05-13T11:51:21.545114355Z" level=info msg="ccResolverWrapper: sending update to cc: {[{unix:///ru...dule=grpc

May 13 11:51:21 Ansible_Server dockerd[3458]: time="2022-05-13T11:51:21.545391892Z" level=info msg="ClientConn switching balancer to \"pick_first\"" module=grpc

May 13 11:51:21 Ansible_Server dockerd[3458]: time="2022-05-13T11:51:21.584329972Z" level=info msg="Loading containers: start."

May 13 11:51:21 Ansible_Server dockerd[3458]: time="2022-05-13T11:51:21.798738326Z" level=info msg="Default bridge (docker0) is assigned with an IP addres... address"

May 13 11:51:21 Ansible_Server dockerd[3458]: time="2022-05-13T11:51:21.858803093Z" level=info msg="Loading containers: done."

May 13 11:51:21 Ansible_Server dockerd[3458]: time="2022-05-13T11:51:21.872257256Z" level=info msg="Docker daemon" commit=906f57f graphdriver(s)=overlay2 ...=20.10.13

May 13 11:51:21 Ansible_Server dockerd[3458]: time="2022-05-13T11:51:21.872693304Z" level=info msg="Daemon has completed initialization"

May 13 11:51:21 Ansible_Server systemd[1]: Started Docker Application Container Engine.

May 13 11:51:21 Ansible_Server dockerd[3458]: time="2022-05-13T11:51:21.898522550Z" level=info msg="API listen on /run/docker.sock"

Hint: Some lines were ellipsized, use -l to show in full.

[root@Ansible_Server docker]# ^C

Creating Docker File:

[ansadmin@Ansible_Server docker]$ vi Dockerfile

FROM tomcat:latest

RUN cp -R /usr/local/tomcat webpp.dist/* /usr/local/tomcatwebapps

COPY ./*.war /usr/local/tomcatwebapps

Build The File:

docker build -t regapp:v1 .

Docker Images

[ansadmin@Ansible_Server docker]$ docker images

REPOSITORY TAG IMAGE ID CREATED SIZE

regapp v1 15574dfecf93 About a minute ago 510MB

tomcat latest 6a1271dfce51 36 hours ago 680MB

centos latest 5d0da3dc9764 7 months ago 231MB

Create a Container out of it :

[ansadmin@Ansible_Server docker]$ docker build -t regapp:v1 .

Output Console:

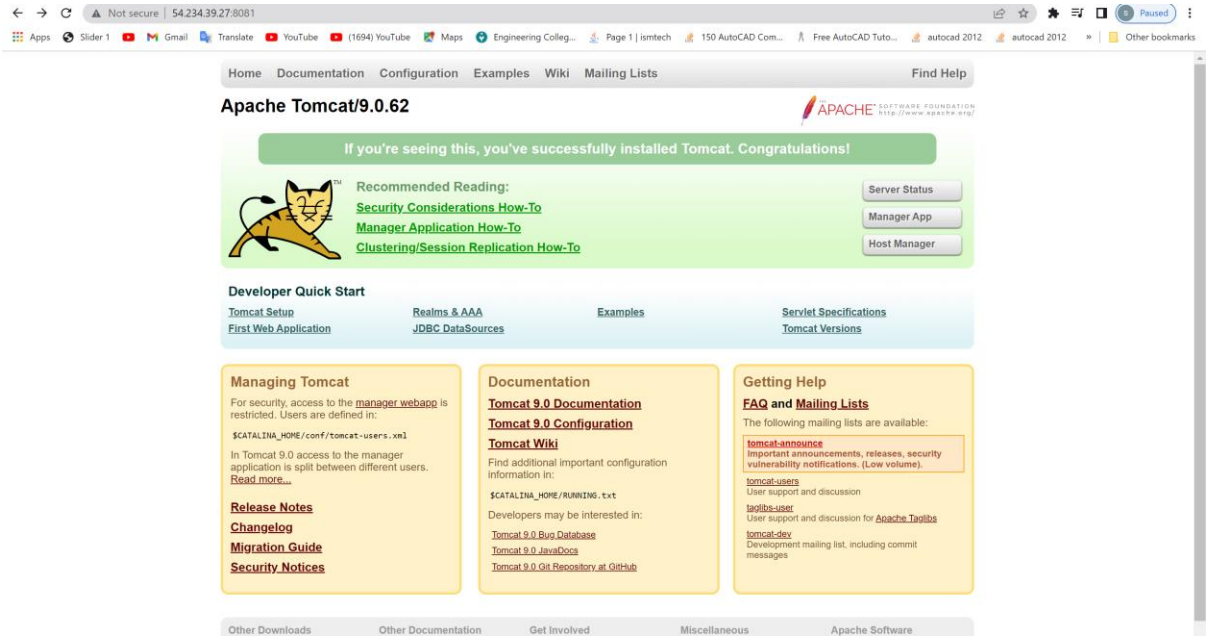


Fig.Tomcat Started

Ansible Playbook to create image and container

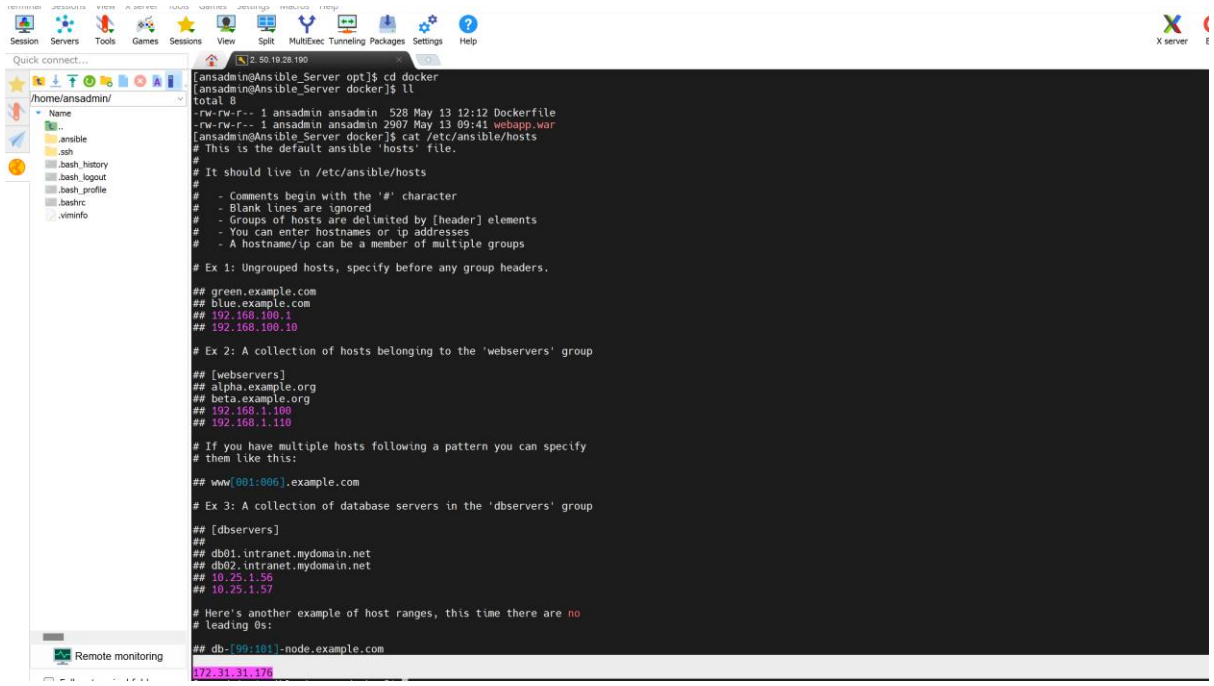


Fig.Default ansible-playbook hosts

[ansadmin@Ansible_Server docker]$ sudo vi /etc/ansible/hosts

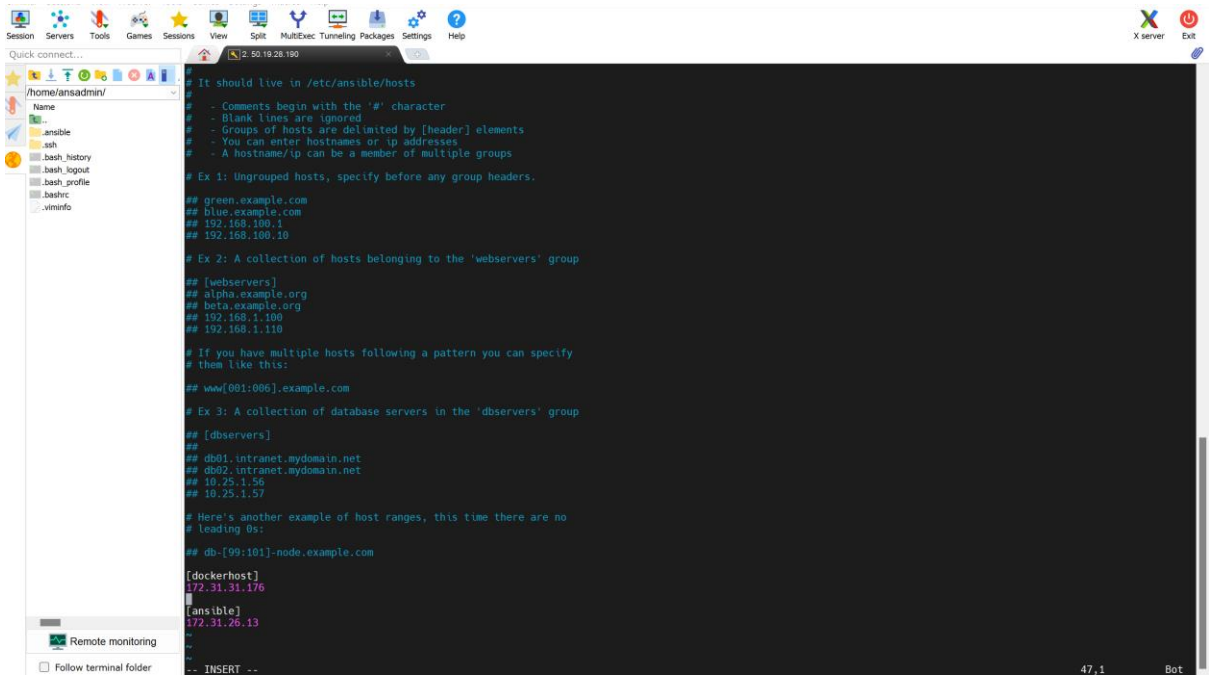


Fig. Adding address for host

[ansadmin@Ansible_Server docker]$ sudo vi /etc/ansible/hosts

[ansadmin@Ansible_Server docker]$ ansible all -a uptime

[WARNING]: Platform linux on host 172.31.31.176 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter

could change this. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.

172.31.31.176 | CHANGED | rc=0 >>

16:35:26 up 3 min, 2 users, load average: 0.01, 0.01, 0.00

[WARNING]: Platform linux on host 172.31.26.13 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter

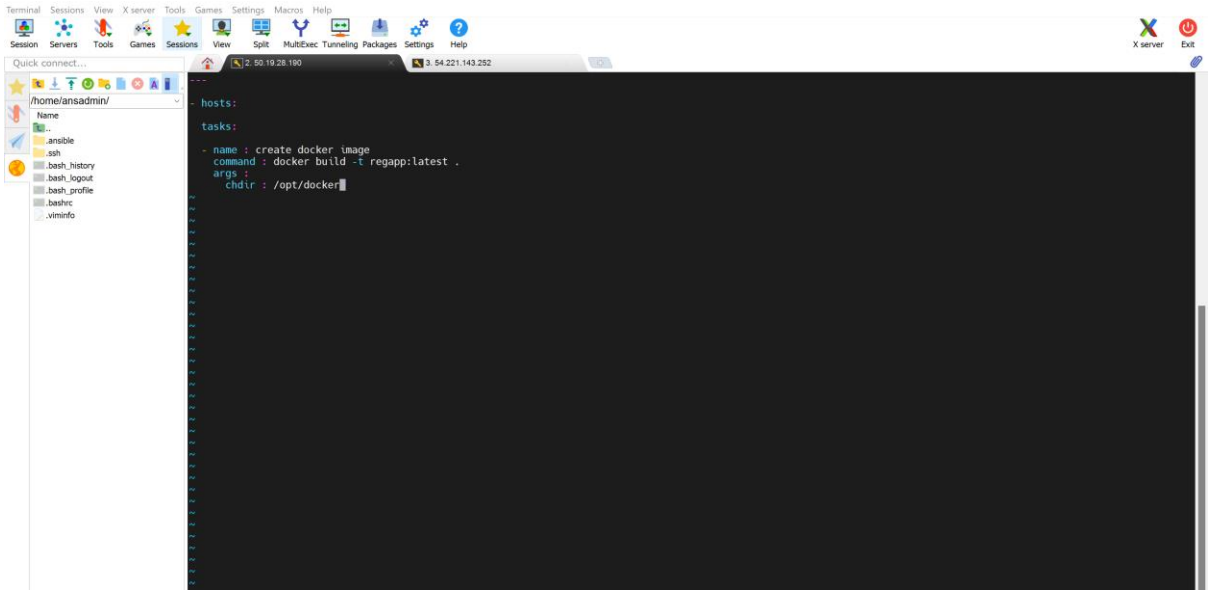
could change this. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.

172.31.26.13 | CHANGED | rc=0 >>

16:35:26 up 32 min, 2 users, load average: 0.08, 0.02, 0.01

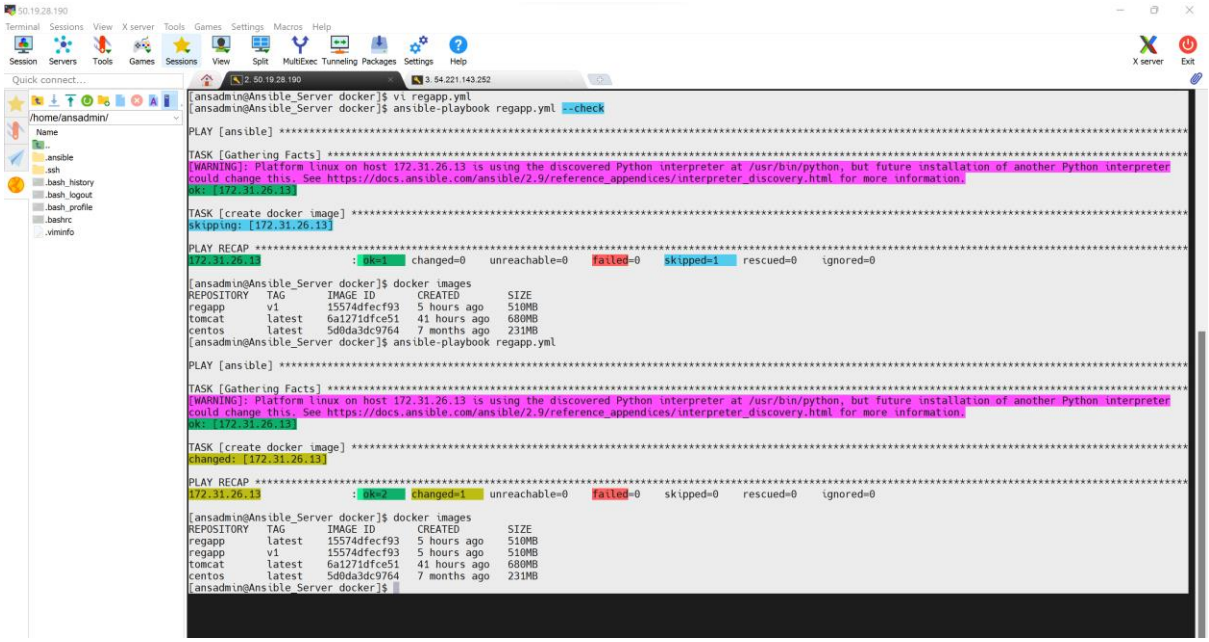
[ansadmin@Ansible_Server docker]$

Creating playbook:



```
---
- hosts:

  tasks:

  - name : create docker image
    command : docker build -t regapp:latest .
    args :
      chdir : /opt/docker
```

Fig. regapp.yml is created for ansible playbook



```
[ansadmin@Ansible_Server docker]$ vi regapp.yml
[ansadmin@Ansible_Server docker]$ ansible-playbook regapp.yml --check

PLAY [ansible] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host 172.31.26.13 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter
could change this. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.
ok: [172.31.26.13]

TASK [create docker image] *****
skipping: [172.31.26.13]

PLAY RECAP *****
172.31.26.13               : ok=1    changed=0    unreachable=0    failed=0    skipped=1    rescued=0    ignored=0

[ansadmin@Ansible_Server docker]$ docker images
REPOSITORY   TAG       IMAGE ID       CREATED        SIZE
regapp       v1        15574dfecf93   5 hours ago    510MB
tomcat       latest    6a1271dfce51   41 hours ago   680MB
centos       latest    5d0da3dc9764   7 months ago   231MB
[ansadmin@Ansible_Server docker]$ ansible-playbook regapp.yml

PLAY [ansible] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host 172.31.26.13 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter
could change this. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.
ok: [172.31.26.13]

TASK [create docker image] *****
changed: [172.31.26.13]

PLAY RECAP *****
172.31.26.13               : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[ansadmin@Ansible_Server docker]$ docker images
REPOSITORY   TAG       IMAGE ID       CREATED        SIZE
regapp       latest    15574dfecf93   5 hours ago    510MB
regapp       v1        15574dfecf93   5 hours ago    510MB
tomcat       latest    6a1271dfce51   41 hours ago   680MB
centos       latest    5d0da3dc9764   7 months ago   231MB
[ansadmin@Ansible_Server docker]$
```

Fig. Successful docker Image is Created

Copying Images on dockerhub:

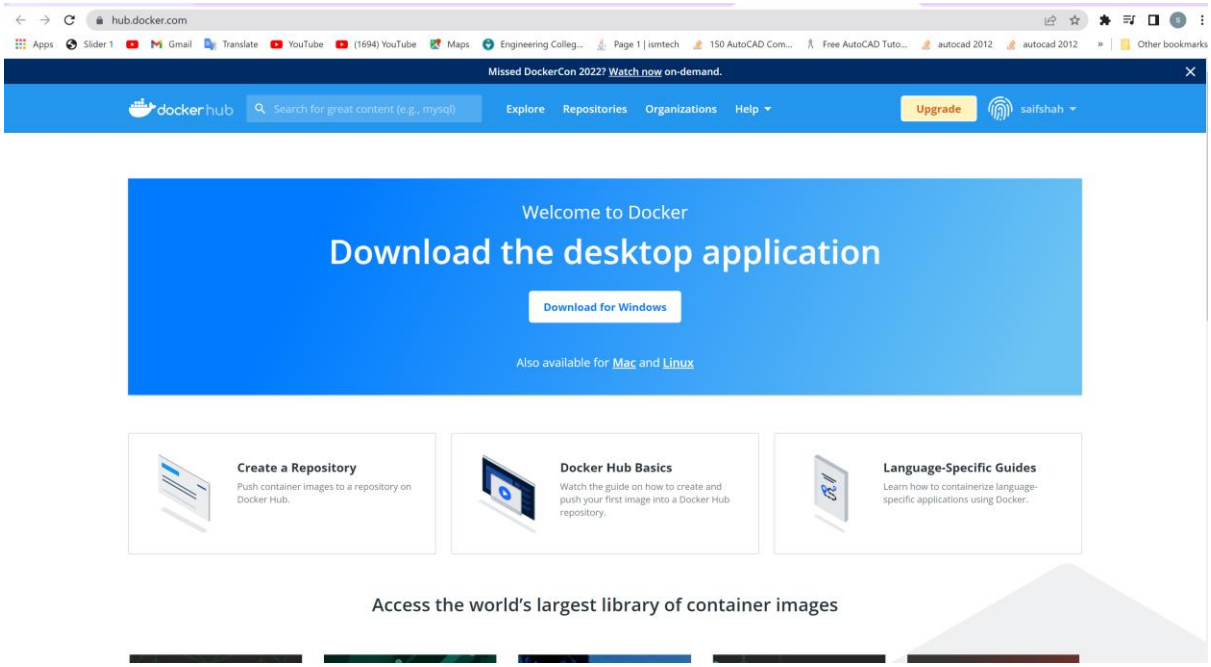


Fig .Dockerhub account

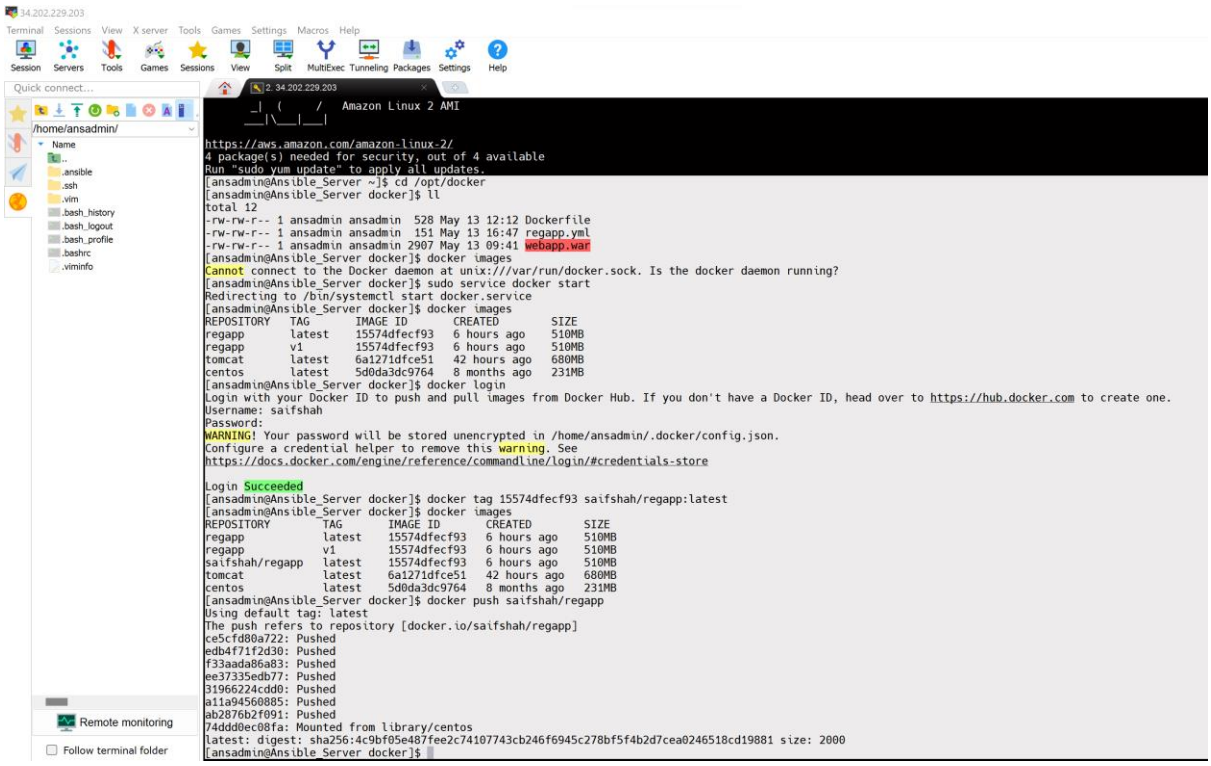


Fig. Added Images to Docker Hub

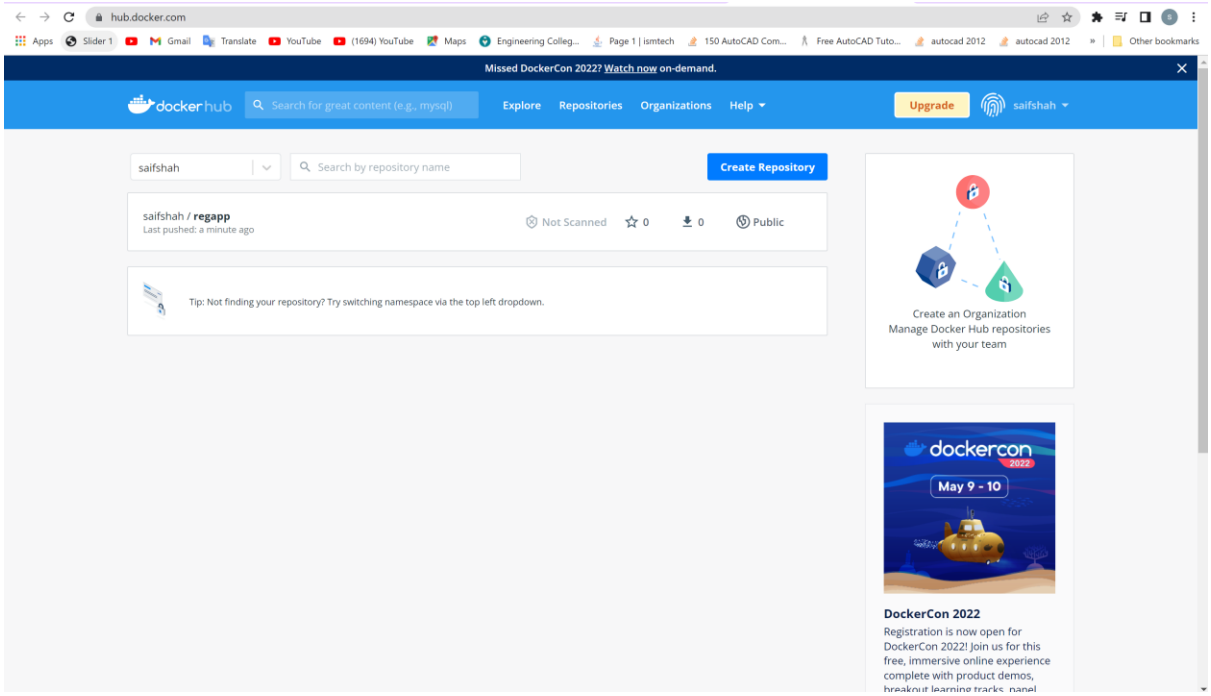


Fig. Successful Copying Images on Docker Hub

Jenkins Job to build an image on ansible:

[ansadmin@Ansible_Server docker]$ vi regapp.yml

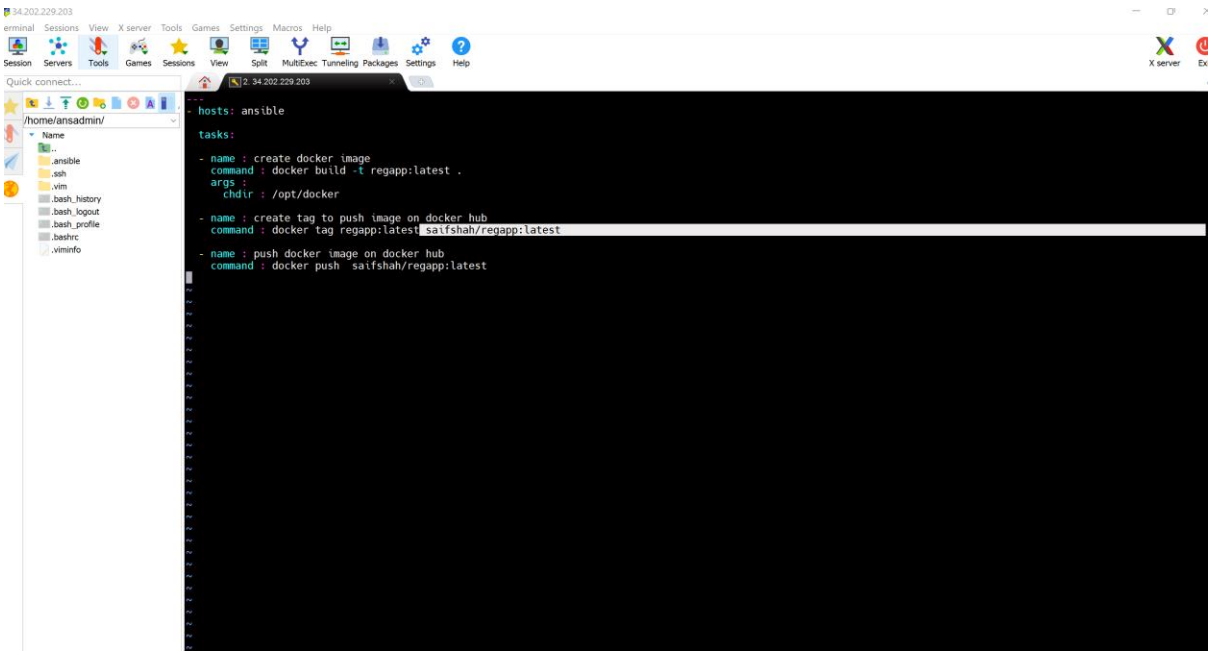


Fig. Created Ansible playbook

[ansadmin@Ansible_Server docker]$ vi regapp.yml

[ansadmin@Ansible_Server docker]$ ^C

[ansadmin@Ansible_Server docker]$ ansible-playbook regapp.yml --check

PLAY [ansible]
****
****
****

TASK [Gathering Facts]
****
****
****

[WARNING]: Platform linux on host 172.31.26.13 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter

could change this. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.

ok: [172.31.26.13]

TASK [create docker image]
****
****
****

skipping: [172.31.26.13]

TASK [create tag to push image on docker hub]
****
****

skipping: [172.31.26.13]

TASK [push docker image on docker hub]
****
****

skipping: [172.31.26.13]

PLAY RECAP
****
****
****

172.31.26.13 : ok=1 changed=0 unreachable=0 failed=0 skipped=3 rescued=0 ignored=0

[ansadmin@Ansible_Server docker]$

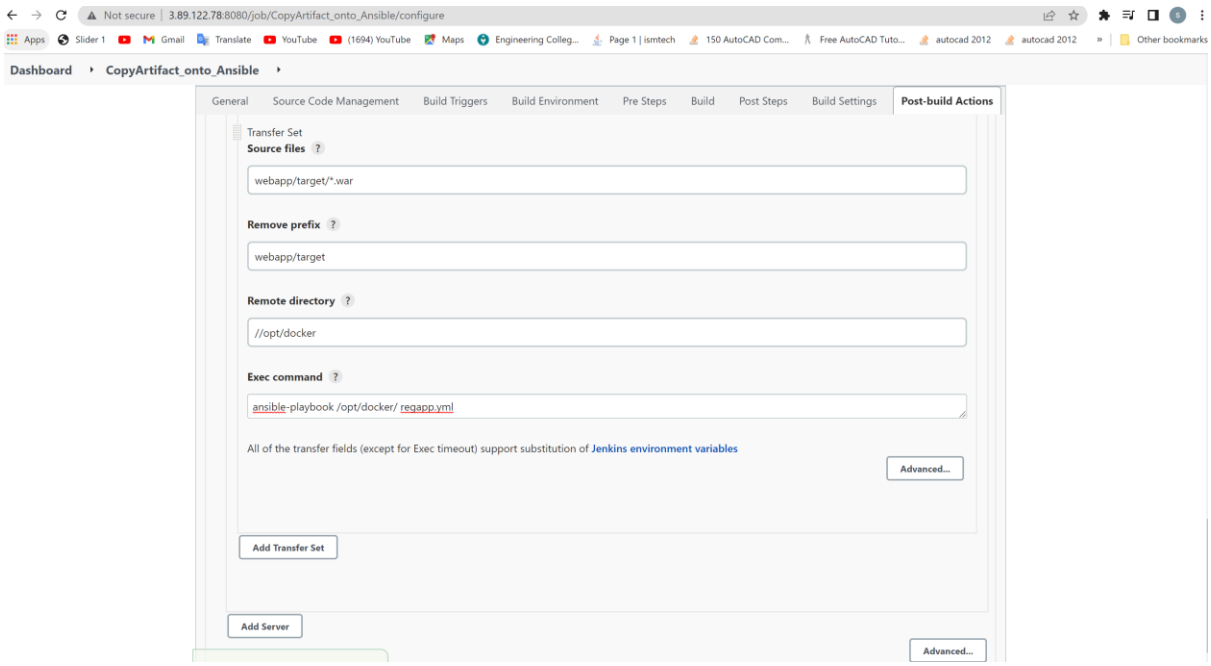


Fig. Configuring Artifact onto Ansible

ansible-playbook /opt/docker/regapp.yml

MINGW64:/c/Users/saiff/hello-world/webapp/src/main/webapp

```
form action="action_page.php">
 <div class="container">
   <h1> New User Register for DevOps Learning</h1>
   <p>Please fill in this form to create an account.</p>
   <hr>

   <label for="Name"><b>Enter Full Name</b></label>
   <input type="text" placeholder="Enter Full Name" name="Name" id="Name" required>
   <br>

   <label for="mobile"><b>Enter mobile</b></label>
   <input type="text" placeholder="Enter moible number" name="mobile" id="mobile" required>
   <br>

   <label for="email"><b>Enter Email Address</b></label>
   <input type="text" placeholder="Enter Email Address" name="email" id="email" required>
   <br>

   <label for="psw"><b>Password</b></label>
   <input type="password" placeholder="Enter Password" name="psw" id="psw" required>
   <br>

   <label for="psw-repeat"><b>Repeat Password</b></label>
   <input type="password" placeholder="Repeat Password" name="psw-repeat" id="psw-repeat" required>
   <hr>
   <br>
   <p>By creating an account you agree to our <a href="#">Terms and Privacy</a>.</p>
   <button type="submit" class="registerbtn">Register</button>
 </div>
 <div class="container signin">
   <p>Already have an account? <a href="#">Sign in</a>.</p>
 </div>

  <h1> Thankyou, Happy Learning </h1>
  <h1>Build Amazing Carrer With Devops <h1>
  <b> I appreciate</b>
/form>
```

Fig. Editing index.jsp file

[ansadmin@Ansible_Server docker]$ ll

total 12

-rw-rw-r-- 1 ansadmin ansadmin 528 May 13 12:12 Dockerfile

-rw-rw-r-- 1 ansadmin ansadmin 357 May 13 18:21 regapp.yml

-rw-rw-r-- 1 ansadmin ansadmin 2913 May 13 18:59 webapp.war

[ansadmin@Ansible_Server docker]$ date

Fri May 13 19:00:02 UTC 2022

[ansadmin@Ansible_Server docker]$ docker images

REPOSITORY TAG IMAGE ID CREATED SIZE

regapp latest 15574dfecf93 7 hours ago 510MB

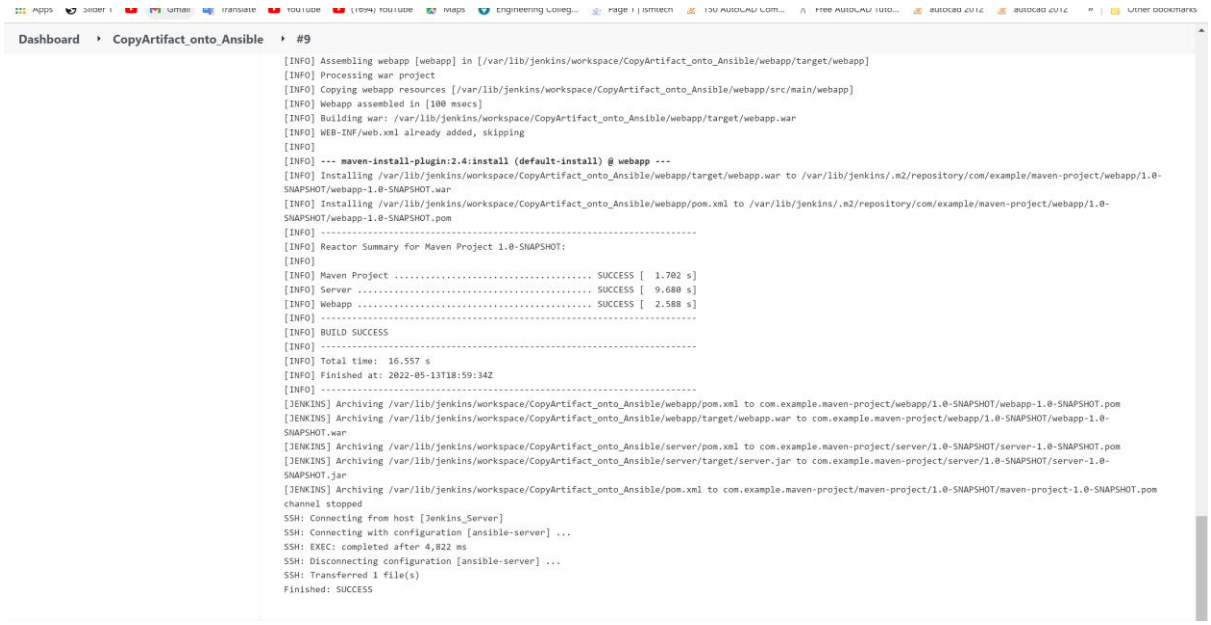
regapp v1 15574dfecf93 7 hours ago 510MB

saifshah/regapp latest 15574dfecf93 7 hours ago 510MB

tomcat latest 6a1271dfce51 43 hours ago 680MB

centos latest 5d0da3dc9764 8 months ago 231MB

[ansadmin@Ansible_Server docker]$



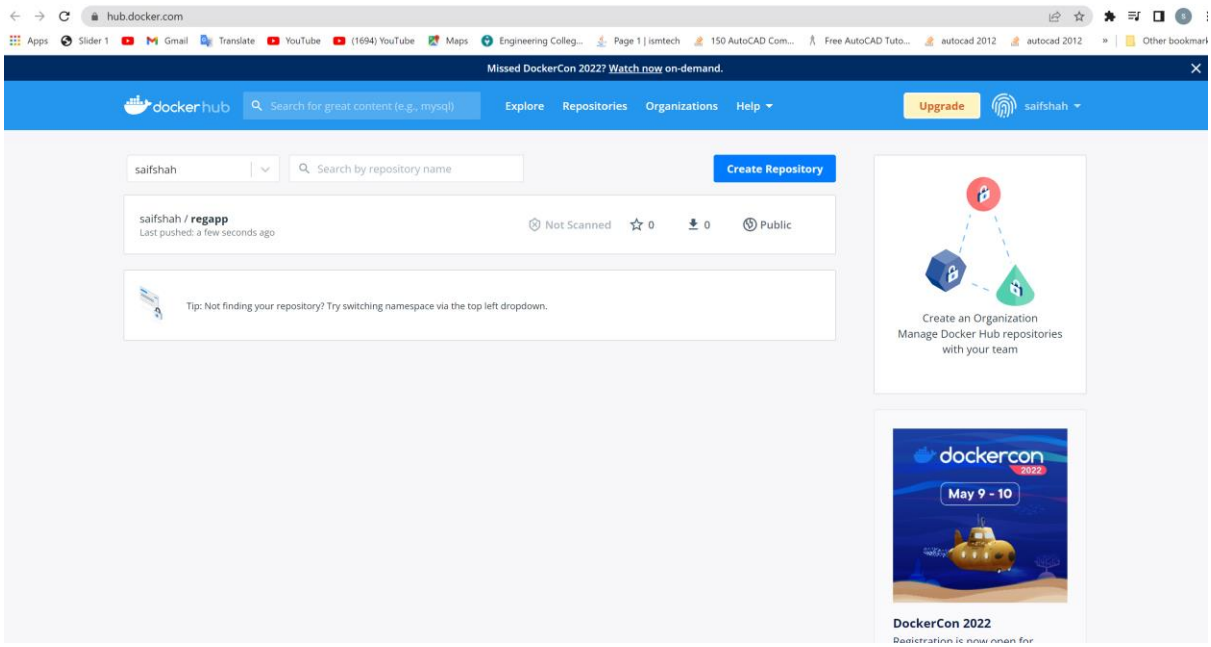


Fig. Success Build an image on ansible

How to create container on dockerhost using ansible playbook -Devops Project:

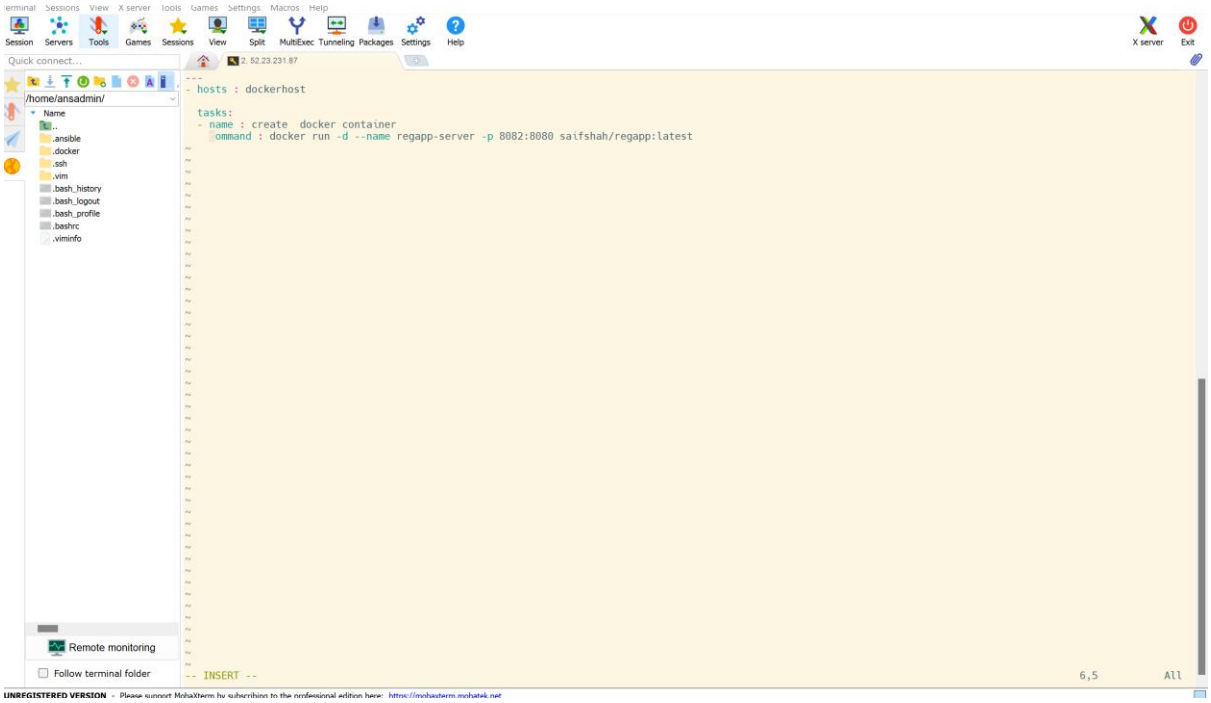


Fig. Create new dockerhosts playbook for ansible

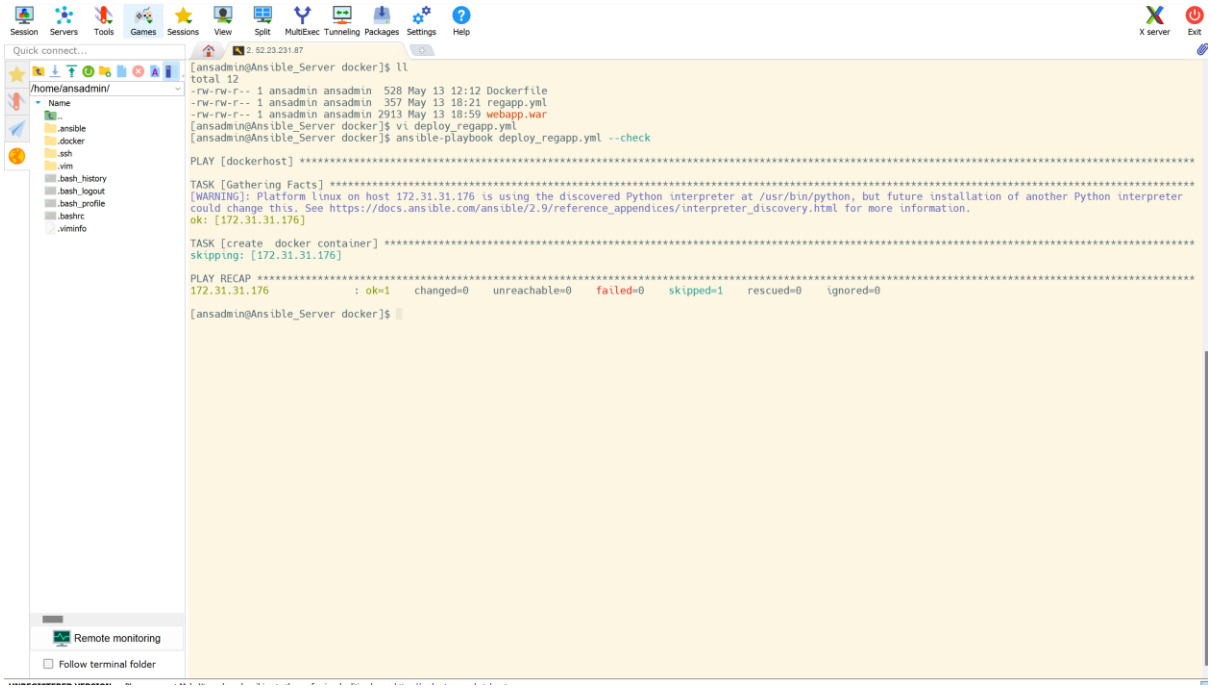


Fig. Successful Check

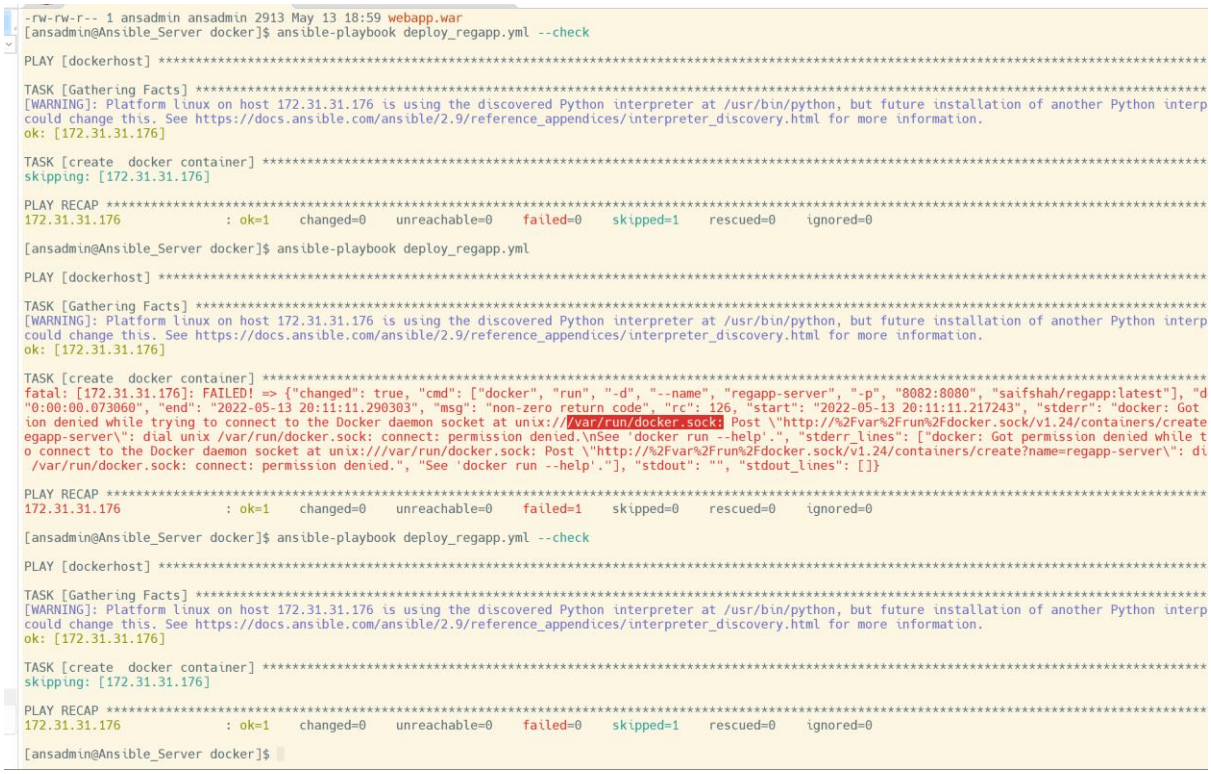


Fig. Error to fix permission

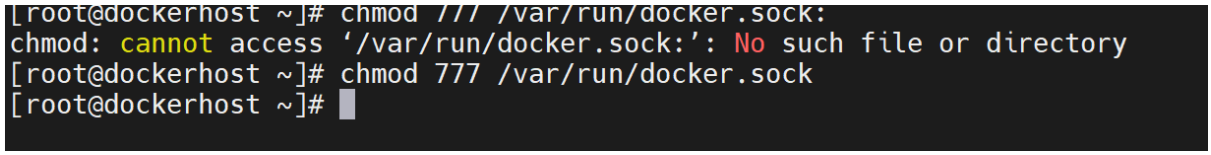


Fig. Fixed Permission Error

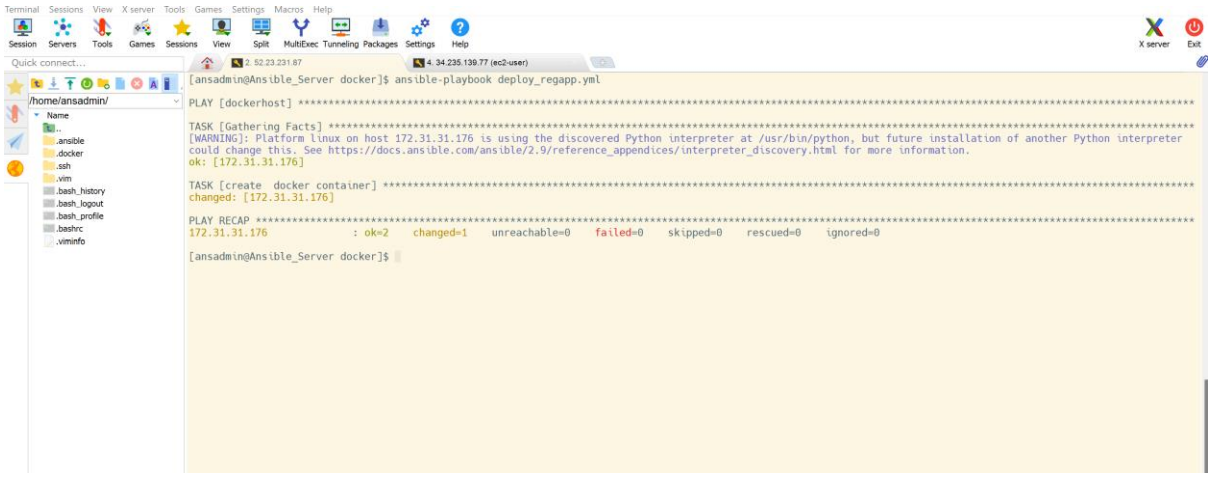


Fig. ansible-playbook deploy-regapp.yml success

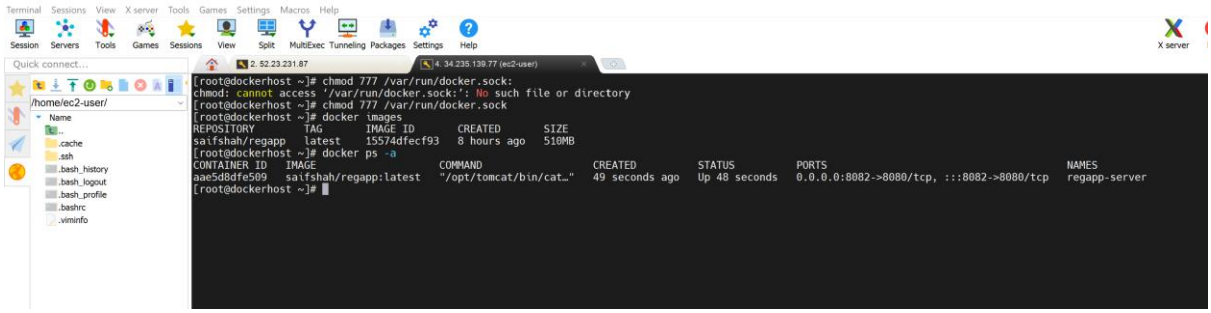


Fig. Images and Container are running

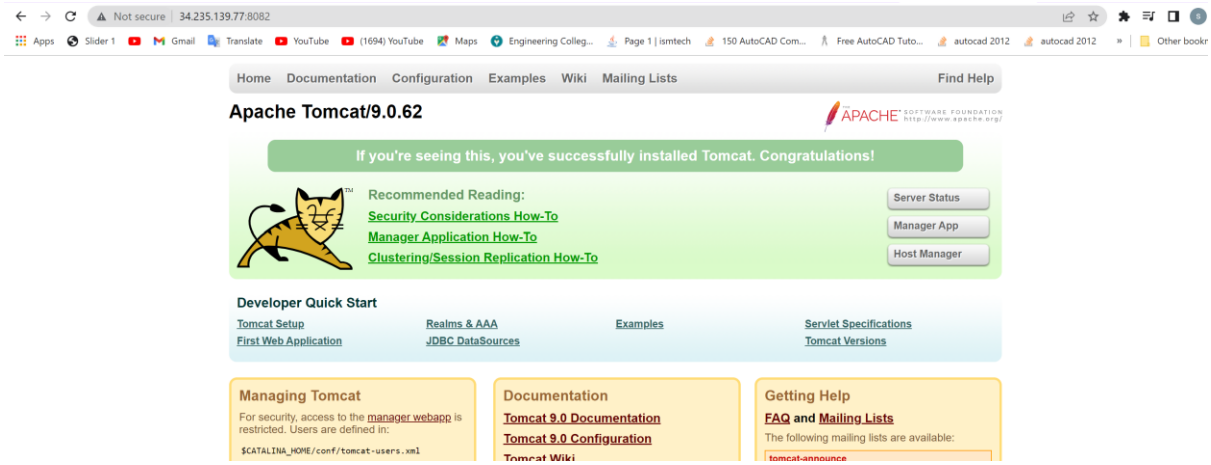


Fig. Access to the port 8082 on server

Continous deployment of docker container using ansible playbook

Deploy ansible playbook

- **Remove existing container**
- **Remove existing image**
- **Create new container**

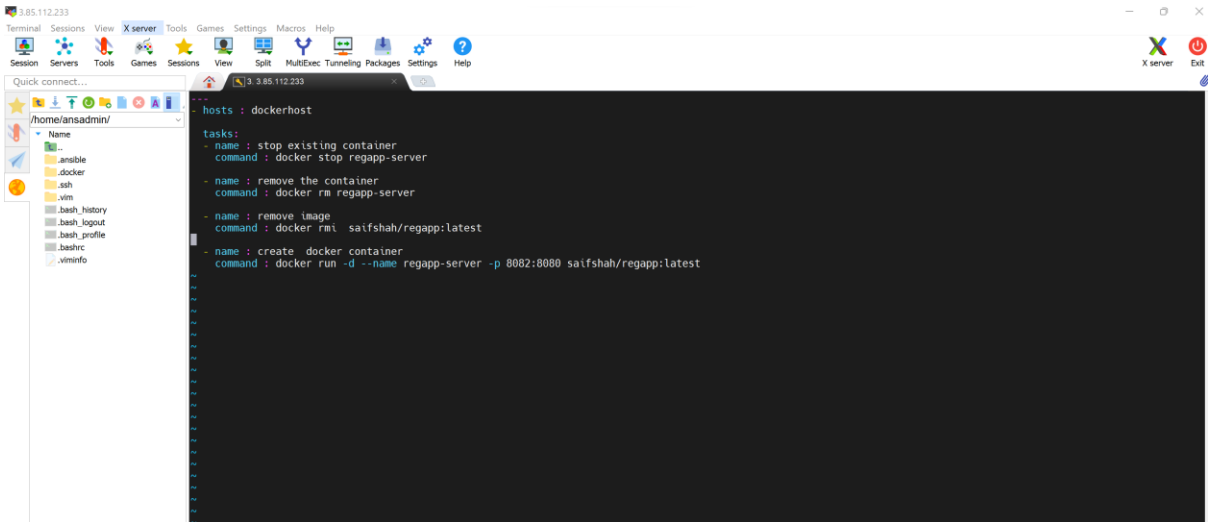


Fig. Creating ansible playbook

Note : ignore_errors : yes // ignoring the tasks

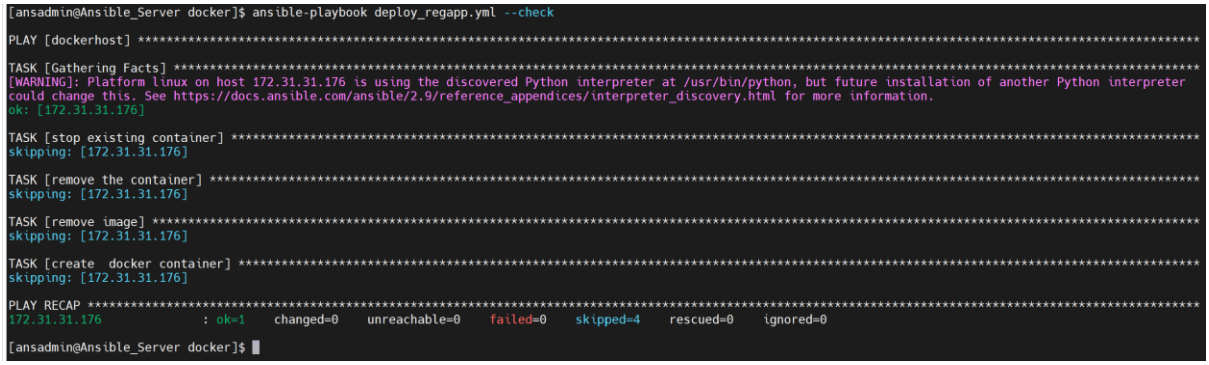


Fig . Check Succesful

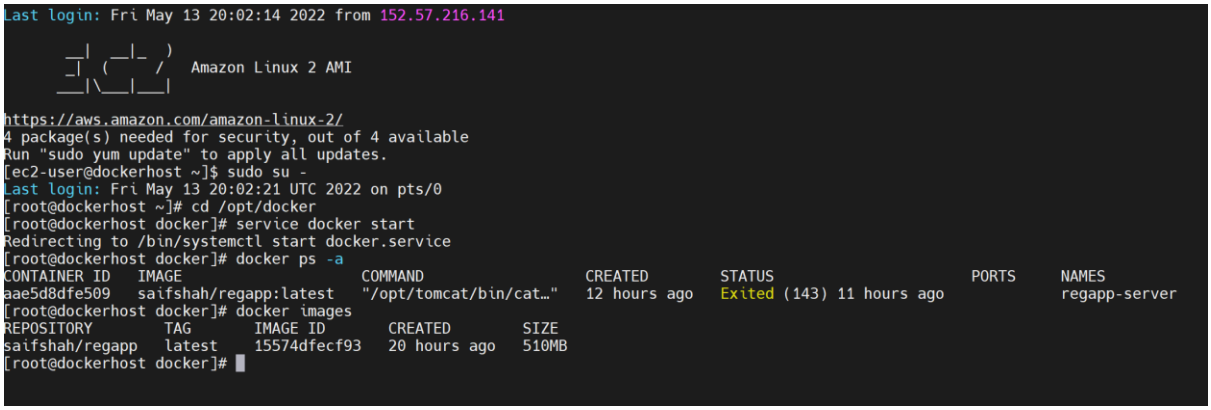


Fig . Docker Images and Container

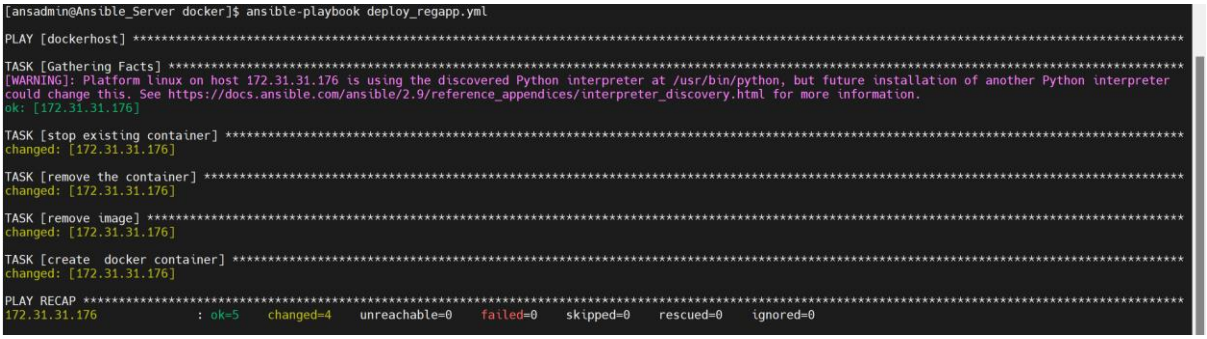


Fig. Succesful ansible playbook created

Fig . Docker images and container output after ansible playbook

Hint: https://docs.ansible.com/ansible/2.4/docker_image_module.html

Jenkins CI/CD to deploy on container using Ansible

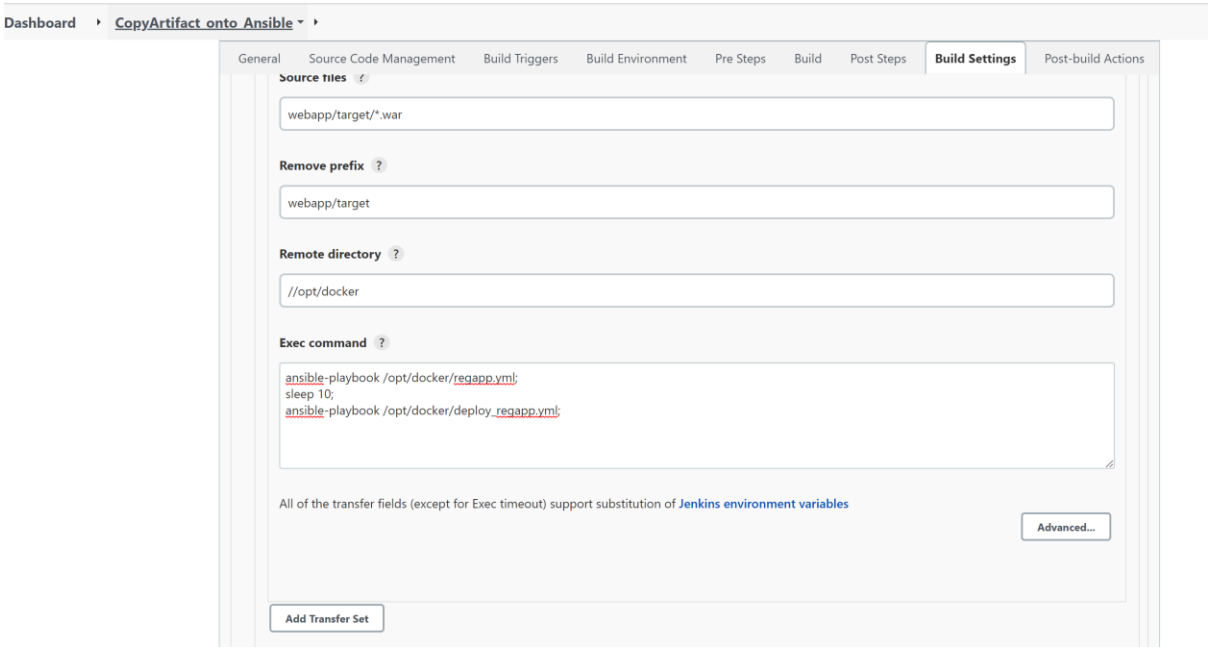


Fig. Configuring deploy_regapp.yml

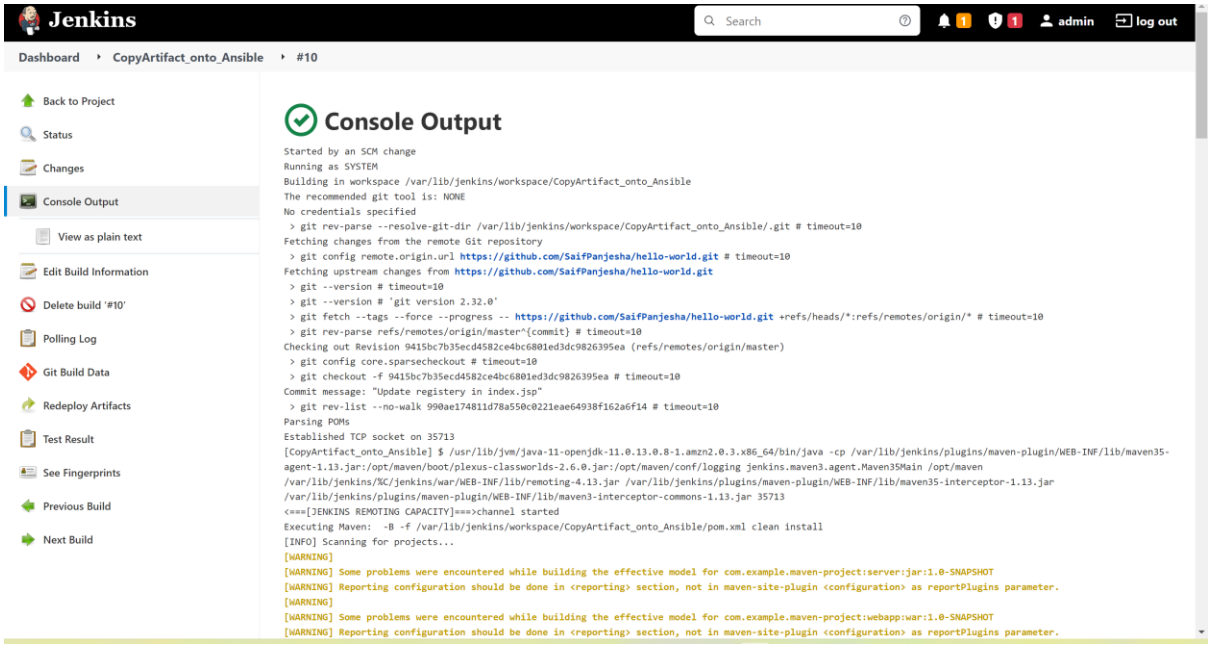


Fig. Build Success

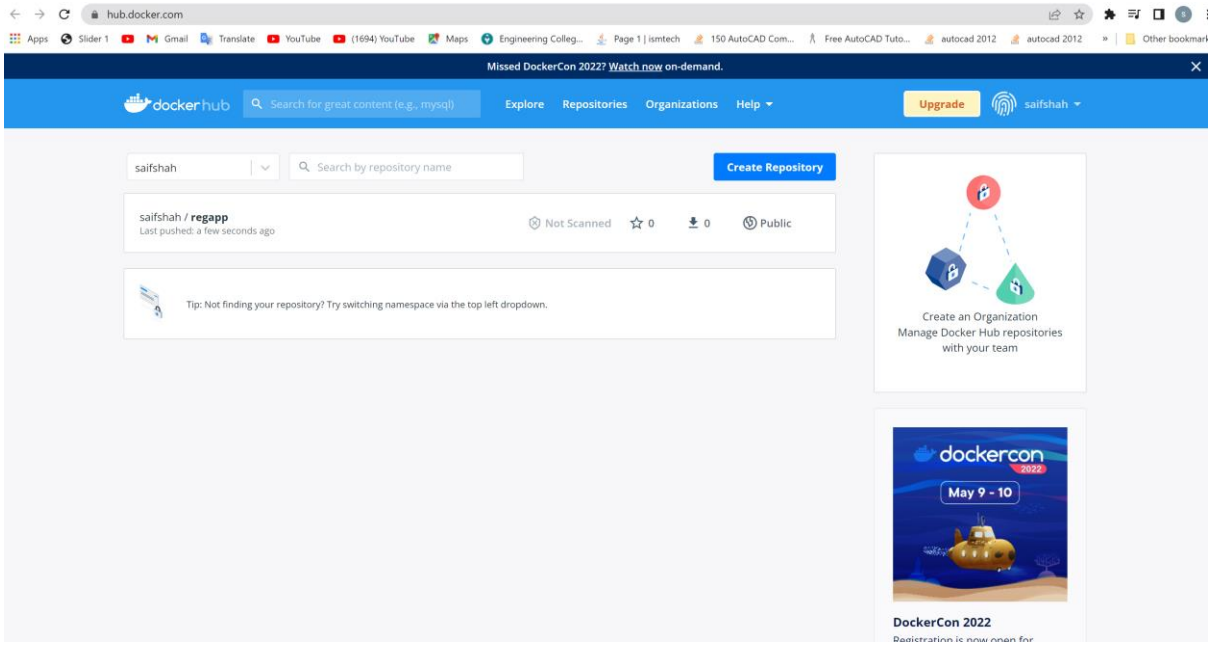


Fig. Success Build an image on ansible

Kubernetes:

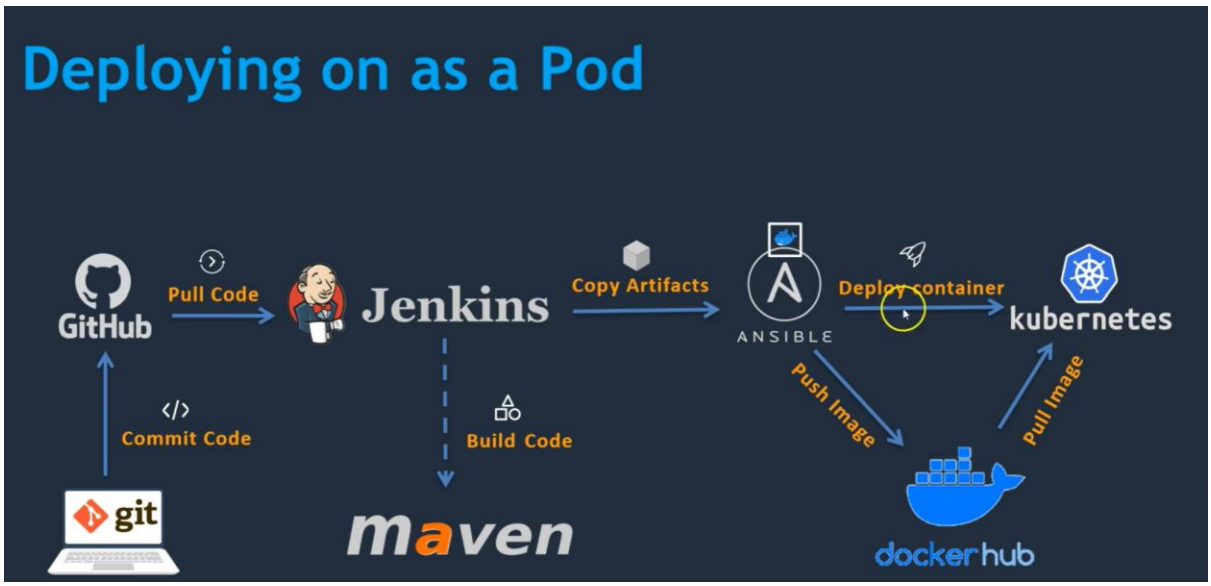


Fig. Kubernetes

Kubernetes installation methods:

Installing Kubernetes with deployment tools

Bootstrapping clusters with kubeadm
Installing Kubernetes with kops
Installing Kubernetes with Kubespray

Turnkey Cloud Solutions

Windows in Kubernetes

Windows containers in Kubernetes

EKS installation procedure

Kubernetes Setup using eksctl

Pre-requisites:

- **an EC2 Instance**

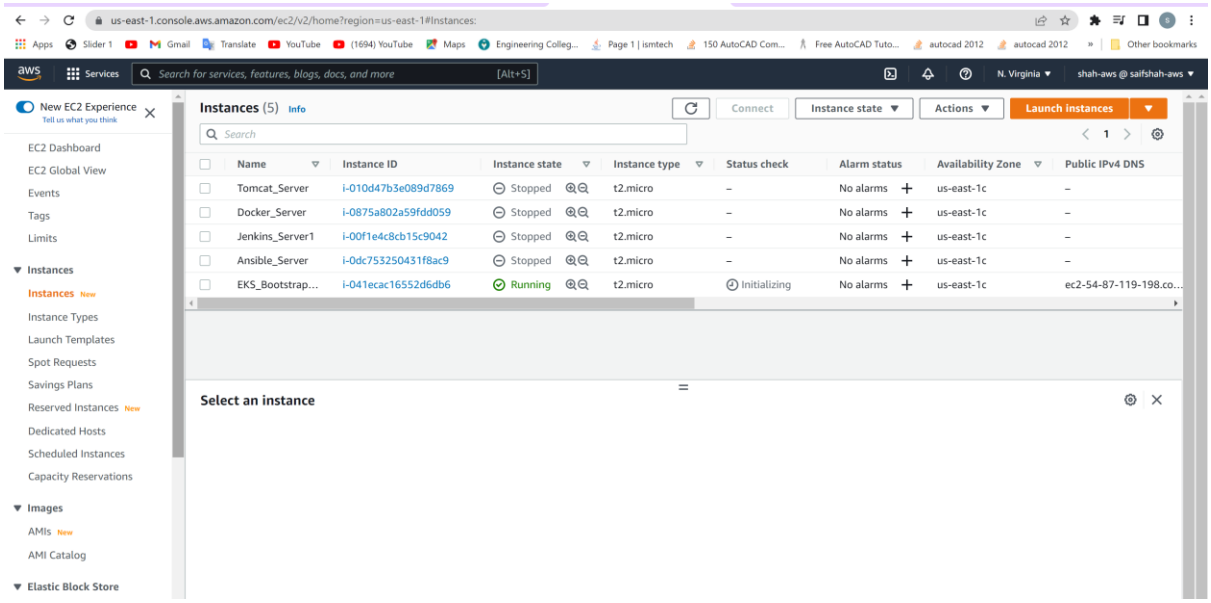


Fig. EKS Bootstrap Server

- Install AWSCLI latest version

  curl "https://awscli.amazonaws.com/awscli-exe-linux-x86_64.zip" -o "awscliv2.zip"

  unzip awscliv2.zip

  sudo ./aws/install

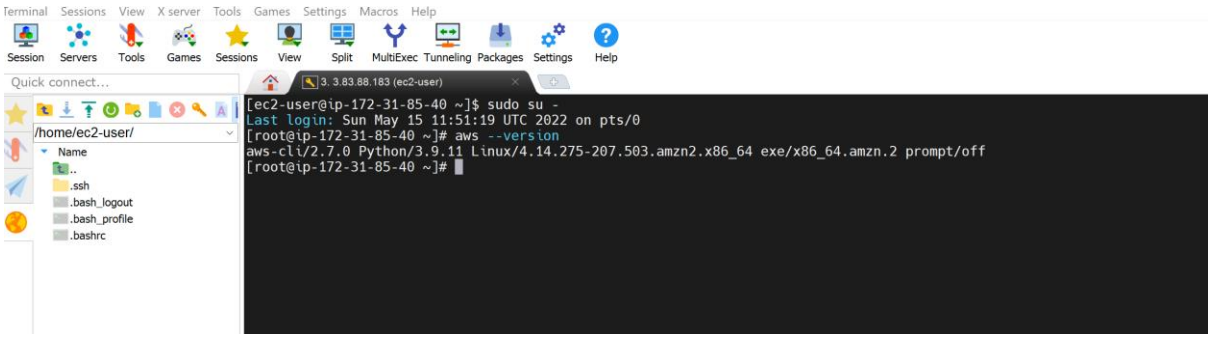


Fig. Successful AWS cli updated

1. Setup kubectl

a. **Download kubectl version 1.22**

curl -o kubectl https://s3.us-west-2.amazonaws.com/amazon-eks/1.22.6/2022-03-09/bin/linux/amd64/kubectl

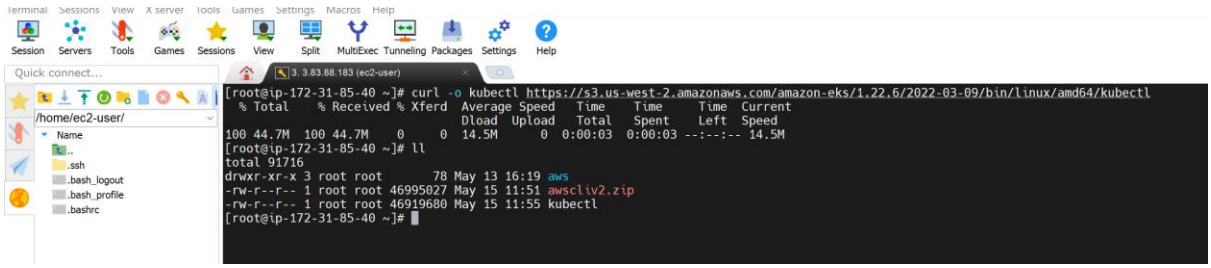


Fig. Kubectl version 1.22

b. Grant execution permissions to kubectl executable

[root@ip-172-31-85-40 ~]# chmod +x kubectl

c. Move kubectl onto /usr/local/bin

[root@ip-172-31-85-40 ~]# mv kubectl /usr/local/bin

d. Test that your kubectl installation was successful

[root@ip-172-31-85-40 ~]# kubectl version

Client Version: version.Info{Major:"1", Minor:"22+", GitVersion:"v1.22.6-eks-7d68063", GitCommit:"f24e667e49fb137336f7b064dba897beed639bad", GitTreeState:"clean", BuildDate:"2022-02-23T19:32:14Z", GoVersion:"go1.16.12", Compiler:"gc", Platform:"linux/amd64"}

The connection to the server localhost:8080 was refused - did you specify the right host or port?

2. Setup eksctl

a. Download and extract the latest release

curl --silent --location "https://github.com/weaveworks/eksctl/releases/latest/download/eksctl_$(uname -s)_amd64.tar.gz" | tar xz -C /tmp

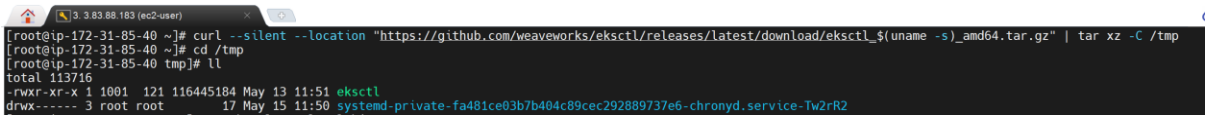


Fig. eksctl download and release

b. Move the extracted binary to /usr/local/bin

[root@ip-172-31-85-40 tmp]# mv eksctl /usr/local/bin

c. Test that your eksctl installation was successful

[root@ip-172-31-85-40 tmp]# eksctl version

0.97.0

3. **Create an IAM Role and attache it to EC2 instance**
   Note: create IAM user with programmatic access if your bootstrap system is outside of AWS
   IAM user should have access to
   IAM
   EC2
   CloudFormation
   Note: Check eksctl documentaiton for [Minimum IAM policies]

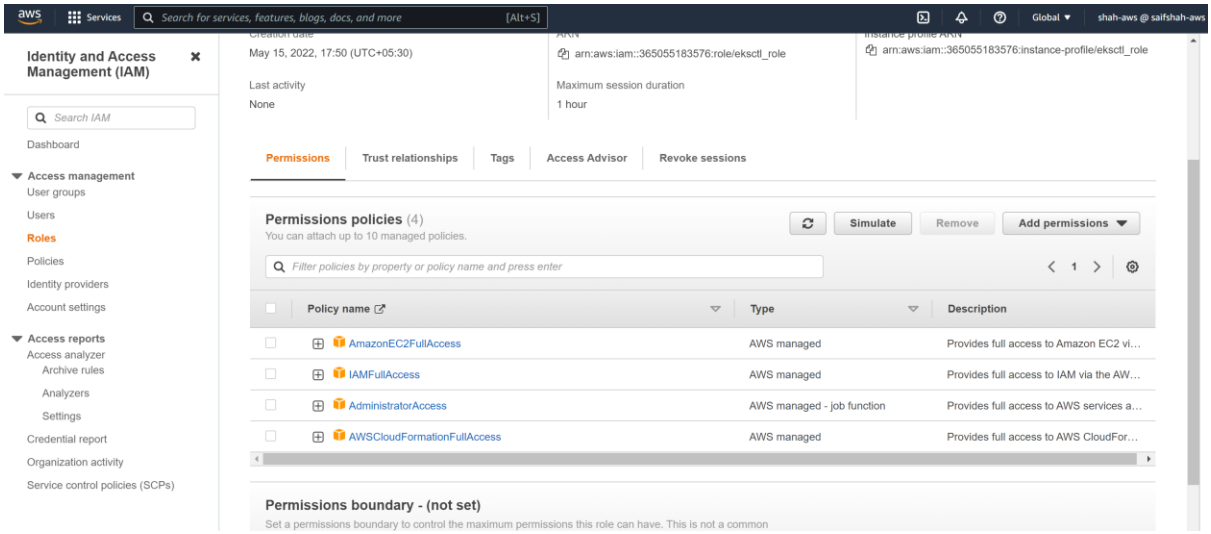


Fig. Created IAM role

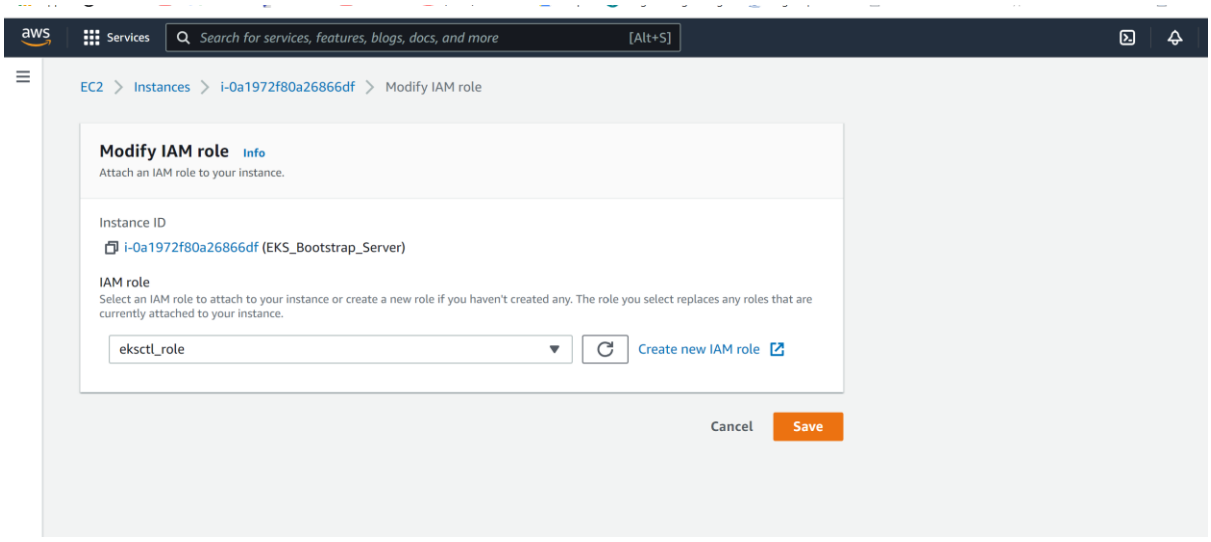


Fig. Role Save to EC2 Instance

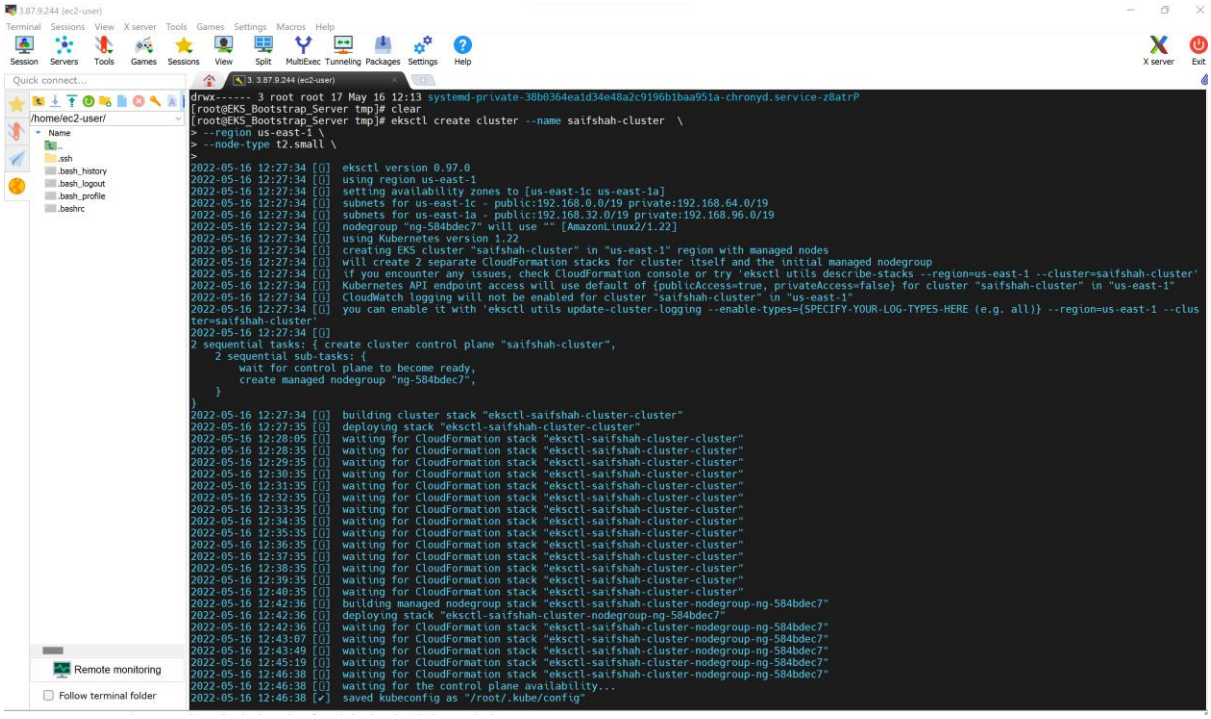
4. Create your cluster and nodes

```
eksctl create cluster --name cluster-name  \
--region region-name \
--node-type instance-type \
--nodes-min 2 \
--nodes-max 2 \
--zones <AZ-1>,<AZ-2>
```

Example :

```
eksctl create cluster --name saifshah-cluster  \
--region us-east-1 \
--node-type t2.small \
```

Output:



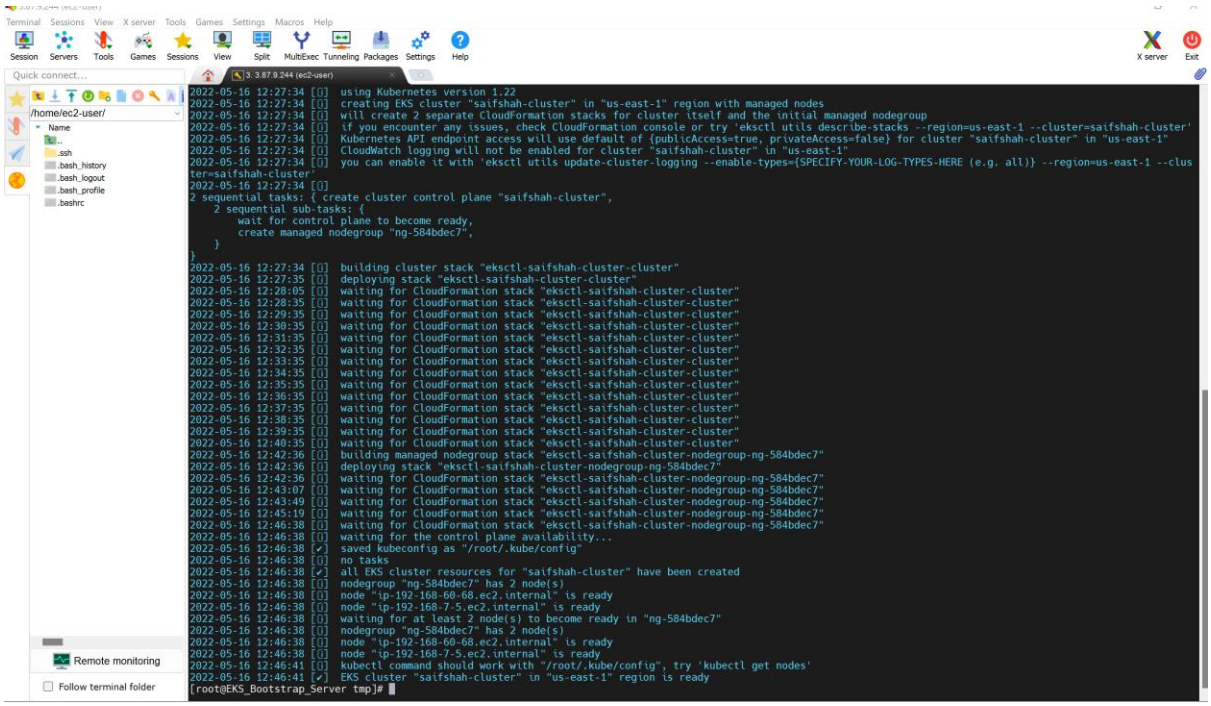


Fig. Cluster Created

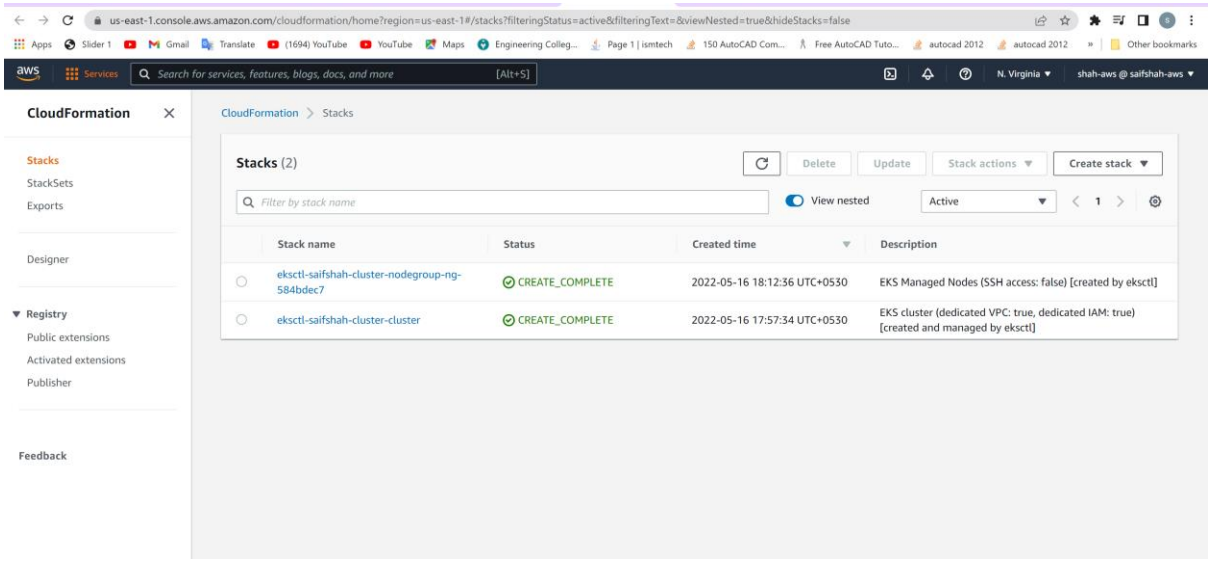


Fig. Stacks in CloudFormation

5. To delete the EKS clsuter

eksctl delete cluster saifshah --region us-east-1

6. **Validate your cluster using by creating by checking nodes and by creating a pod**

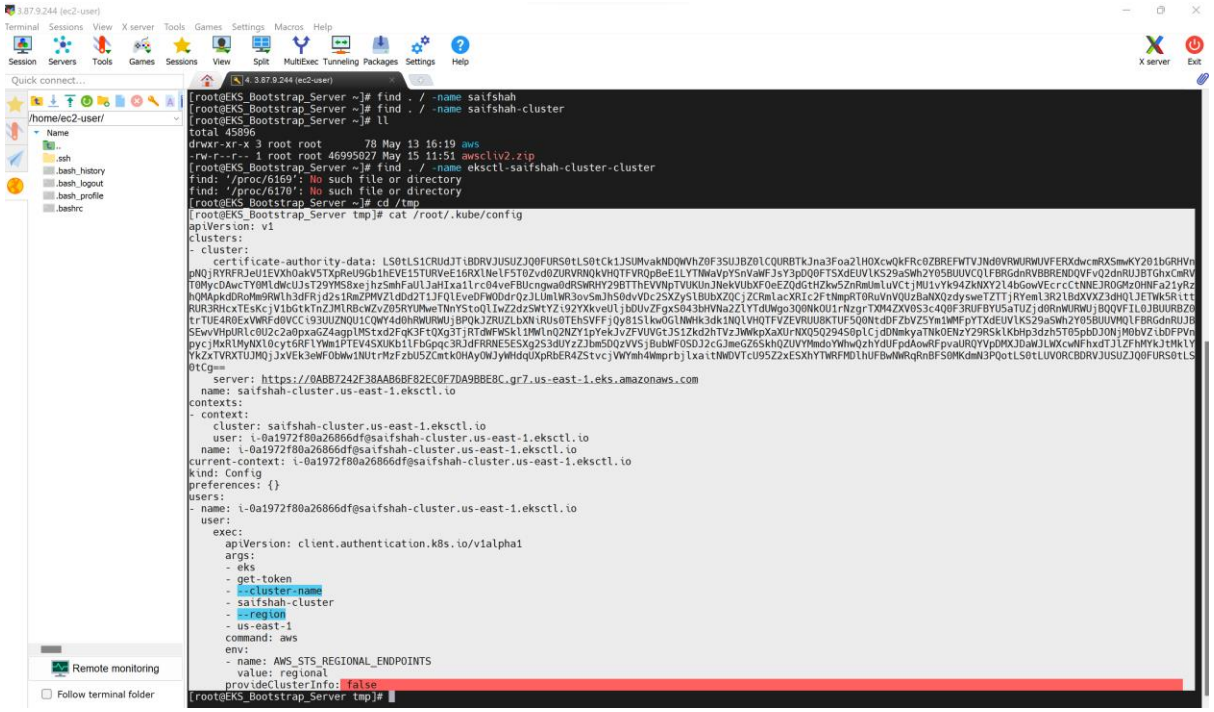


Fig. cat /root/. kube/config

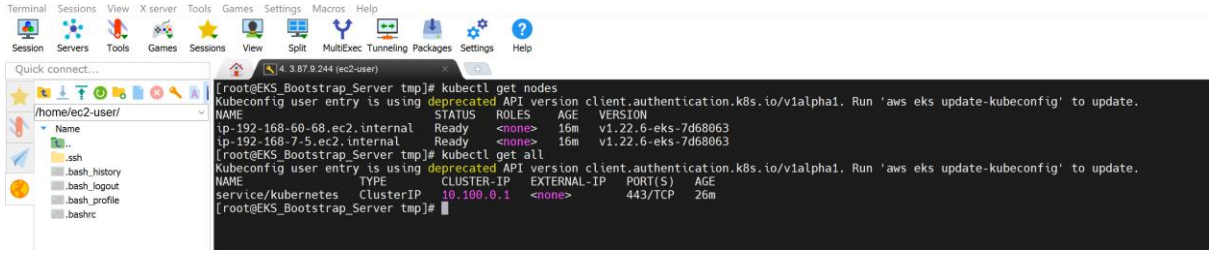


Fig. Created nodes and check all service/Kubernetes

Creating a pod:

```
[root@EKS_Bootstrap_Server tmp]# kubectl run webapp --image=htpod;
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
pod/webapp created
[root@EKS_Bootstrap_Server tmp]# kubectl get all
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
NAME READY STATUS RESTARTS AGE
pod/webapp 0/1 ImagePullBackOff 0 51s

NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
service/kubernetes ClusterIP 10.100.0.1 <none> 443/TCP 36m
```

Fig . Pod Successful created

Command for only showing pod:

[root@EKS_Bootstrap_Server tmp]# kubectl get po

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

NAME READY STATUS RESTARTS AGE

webapp 0/1 ImagePullBackOff 0 2m44s

[root@EKS_Bootstrap_Server tmp]#

Run Kubernetes Basic Commands:

7. **Deploying Nginx Container**

kubectl create deployment demo-nginx --image=nginx --replicas=2 --port=80

 # kubectl deployment regapp --image=saifshah/regapp --replicas=2 --port=8080

kubectl get all

kubectl get pod

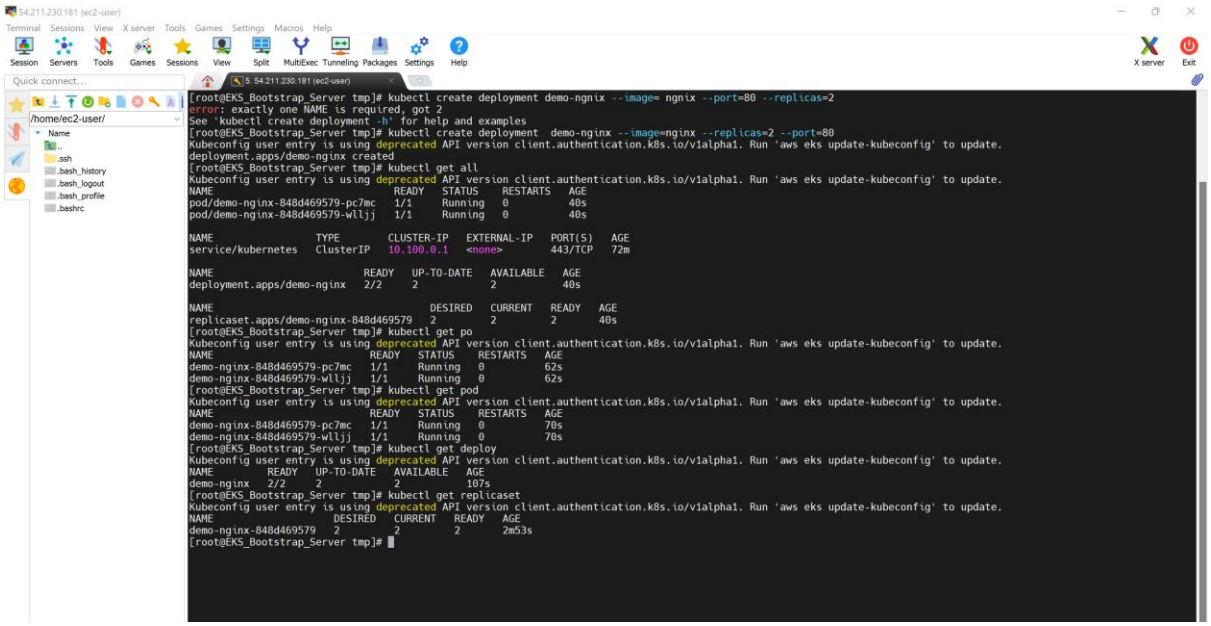


Fig. Deploying Ngnix Container

8. **Expose the deployment as service. This will create an ELB in front of those 2 containers and allow us to publicly access them.**

kubectl expose deployment demo-nginx --port=80 --type=LoadBalancer
 # kubectl expose deployment regapp --port=8080 --type=LoadBalancer
kubectl get services -o wide

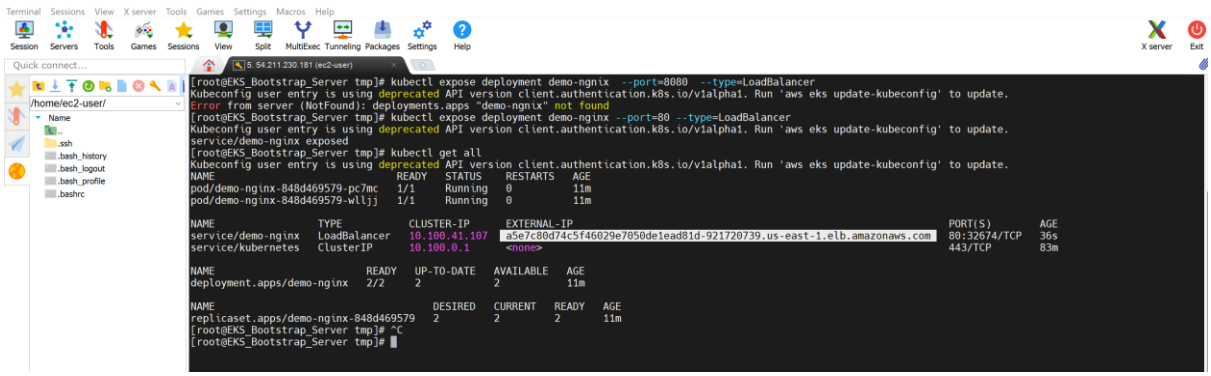


Fig. Deployment as a service

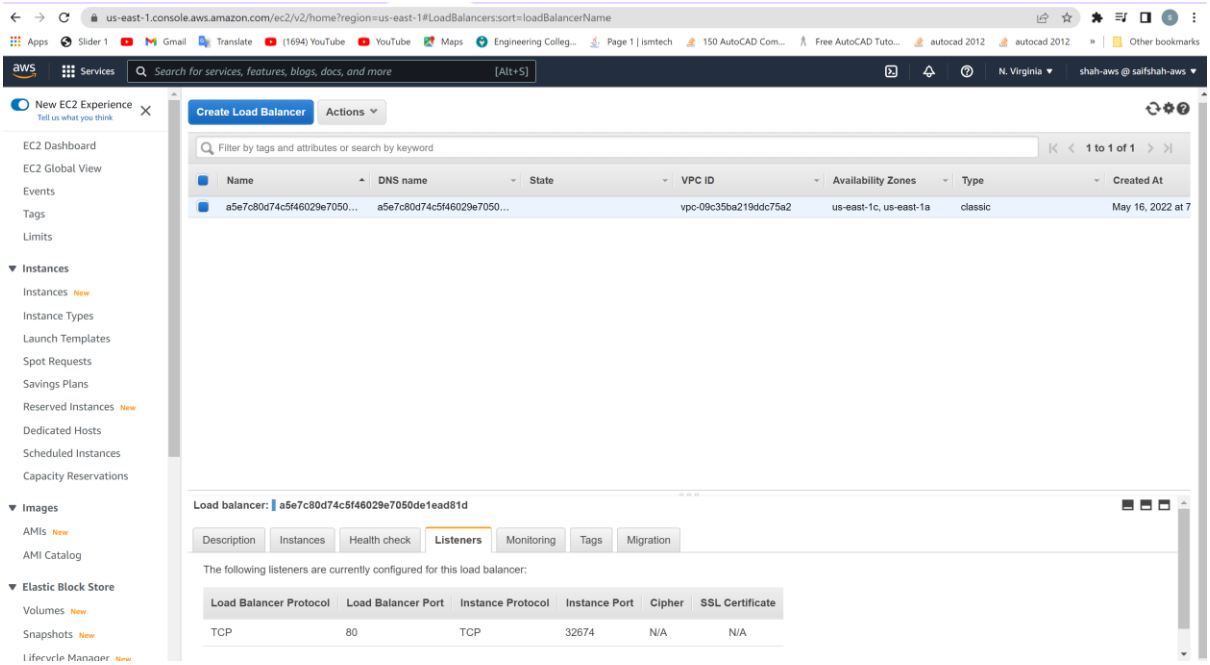


Fig. Created load balancer after deployment.

kubectl get services -o wide

```
root@EKS_Bootstrap_Server tmp]# kubectl get services -o wide
ubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
AME          TYPE           CLUSTER-IP      EXTERNAL-IP                                                               PORT(S)        AGE    SELECTOR
emo-nginx    LoadBalancer   10.100.41.107   a5e7c80d74c5f46029e7050de1ead81d-921720739.us-east-1.elb.amazonaws.com   80:32674/TCP   7m6s   app=demo-nginx
ubernetes    ClusterIP      10.100.0.1      <none>                                                                    443/TCP        90m    <none>
root@EKS_Bootstrap_Server tmp]#
```

Fig. Kubectl services.

Create a Manifest File:

```
[root@EKS_Bootstrap_Server ~]# cd /tmp
[root@EKS_Bootstrap_Server tmp]# kubectl get all
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
NAME                              READY   STATUS    RESTARTS   AGE
pod/demo-nginx-848d469579-pc7mc   1/1     Running   0          32m
pod/demo-nginx-848d469579-wlljj   1/1     Running   0          32m

NAME                 TYPE           CLUSTER-IP      EXTERNAL-IP                                                              PORT(S)        AGE
service/demo-nginx   LoadBalancer   10.100.41.107   a5e7c80d74c5f46029e7050de1ead81d-921720739.us-east-1.elb.amazonaws.com   80:32674/TCP   21m
service/kubernetes   ClusterIP      10.100.0.1      <none>                                                                   443/TCP        104m

NAME                         READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/demo-nginx   2/2     2            2           32m

NAME                                    DESIRED   CURRENT   READY   AGE
replicaset.apps/demo-nginx-848d469579   2         2         2       32m
[root@EKS_Bootstrap_Server tmp]# delete deployment demo-nginx
-bash: delete: command not found
[root@EKS_Bootstrap_Server tmp]# kubectl delete deployment demo-nginx
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
deployment.apps "demo-nginx" deleted
[root@EKS_Bootstrap_Server tmp]# kubectl get all
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
NAME                 TYPE           CLUSTER-IP      EXTERNAL-IP                                                              PORT(S)        AGE
service/demo-nginx   LoadBalancer   10.100.41.107   a5e7c80d74c5f46029e7050de1ead81d-921720739.us-east-1.elb.amazonaws.com   80:32674/TCP   22m
service/kubernetes   ClusterIP      10.100.0.1      <none>                                                                   443/TCP        105m
[root@EKS_Bootstrap_Server tmp]# kubectl delete service/demo-nginx
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
service "demo-nginx" deleted
```

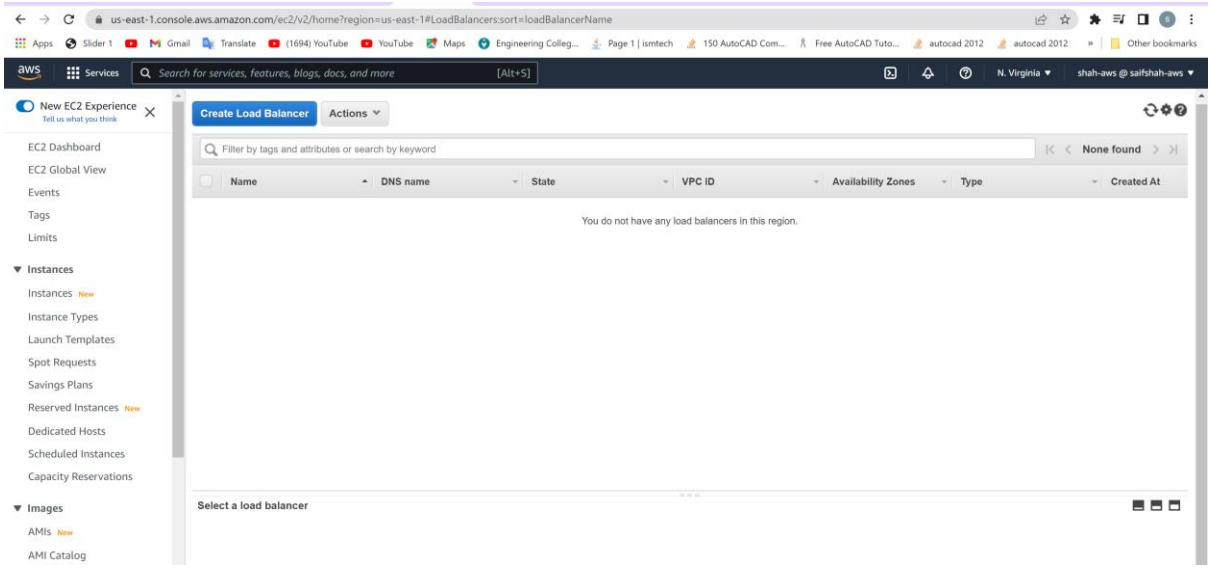


Fig. Deleted earlier configuration

Creating a manifest file:

```
[root@EKS_Bootstrap_Server tmp]# vi pod.yml
```

```
apiVersion v1
kind: pod
metadata:
  name: data-pod
  labels:
    users: my-user
spec:
  containers:
    - name: demo-nginx
      image: ngnix
      ports:
        - name: demo-nginx
          containerPort: 80
```

Creating a service manifest file:

```
[root@EKS_Bootstrap_Server tmp]# vi service.yml
[root@EKS_Bootstrap_Server tmp]# cat service.yml
apiVersion: v1
kind: Service
metadata:
  name: demo-Service
```

```
spec:
  ports:
    - name: ngnix-port
      port: 80
      targetPort: 80

  type: LoadBalancer
```

Output: pod.yml

```
[root@EKS_Bootstrap_Server tmp]# cat pod.yml
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
  labels:
    app: demo-app

spec:
  containers:
  - name: nginx-container
    image: nginx
    ports:
    - name: nginx
```

```
    containerPort: 80
[root@EKS_Bootstrap_Server tmp]# kubectl apply -f pod.yml    //applying
Kubeconfig user entry is using deprecated API version
client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to
update.
pod/nginx-pod created
[root@EKS_Bootstrap_Server tmp]# kubectl get all
Kubeconfig user entry is using deprecated API version
client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to
update.
NAME          READY   STATUS    RESTARTS   AGE
pod/nginx-pod   1/1     Running   0          25s

NAME                 TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
service/kubernetes   ClusterIP   10.100.0.1   <none>        443/TCP   7h37m
[root@EKS_Bootstrap_Server tmp]#
```

Output : service.yml

```
[root@EKS_Bootstrap_Server tmp]# clear
[root@EKS_Bootstrap_Server tmp]# ll
total 8
-rw-r--r-- 1 root root 199 May 16 20:11 pod.yml
-rw-r--r-- 1 root root 160 May 16 20:16 service.yml
drwx------ 3 root root  17 May 16 19:39 systemd-private-
2a2e6e9d1ac347feaab952b1c678ed15-chronyd.service-2einFz
[root@EKS_Bootstrap_Server tmp]# cat service.yml
```

```
apiVersion: v1
kind: Service
metadata:
  name: demo-service

spec:
  ports:
    - name: ngnix-port
      port: 80
      targetPort: 80

  type: LoadBalancer
```

```
[root@EKS_Bootstrap_Server tmp]# kubectl apply -f service.yml
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
service/demo-service created
[root@EKS_Bootstrap_Server tmp]# kubectl get all
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
NAME            READY   STATUS    RESTARTS   AGE
pod/nginx-pod   1/1     Running   0          5m32s

NAME                 TYPE          CLUSTER-IP      EXTERNAL-IP
PORT(S)       AGE
```

service/demo-service LoadBalancer 10.100.56.237 afade1324bbc8455fa7b71537a4bcf6e-1513829373.us-east-1.elb.amazonaws.com 80:31295/TCP 22s

service/kubernetes ClusterIP 10.100.0.1 <none> 443/TCP 7h42m

[root@EKS_Bootstrap_Server tmp]#

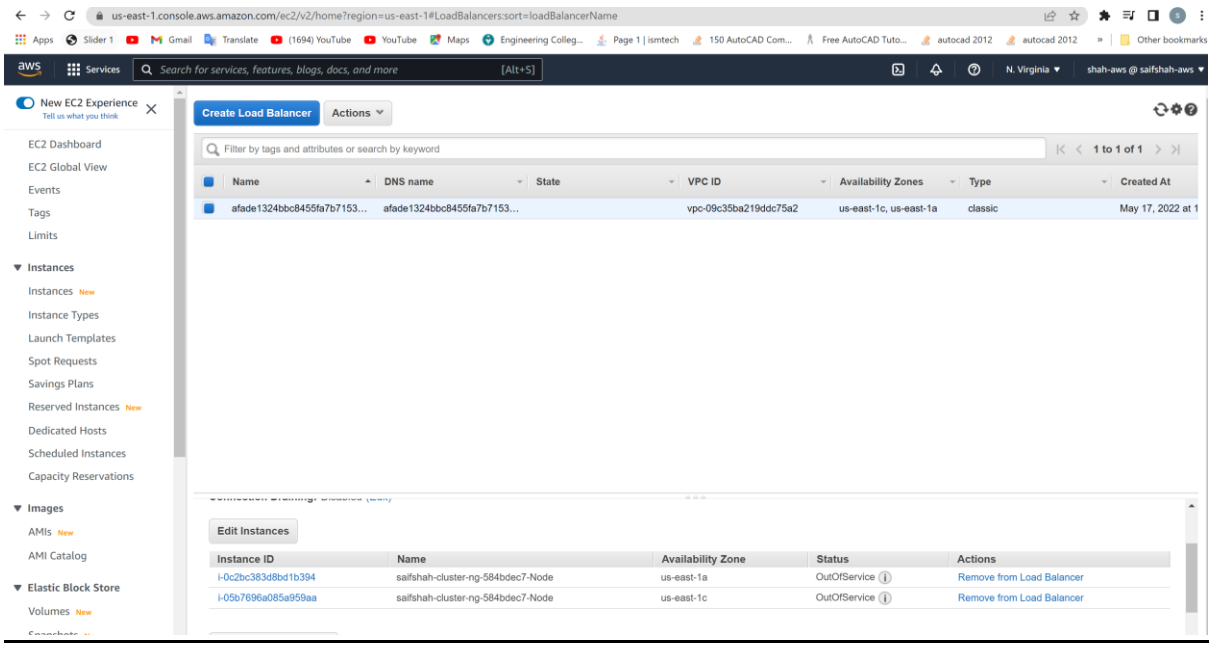
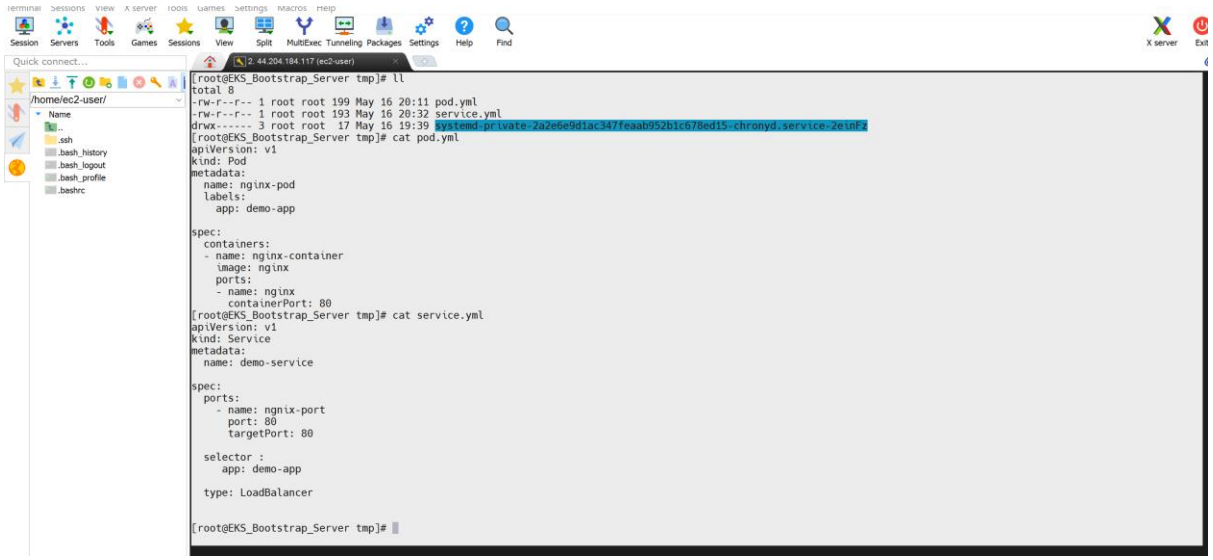


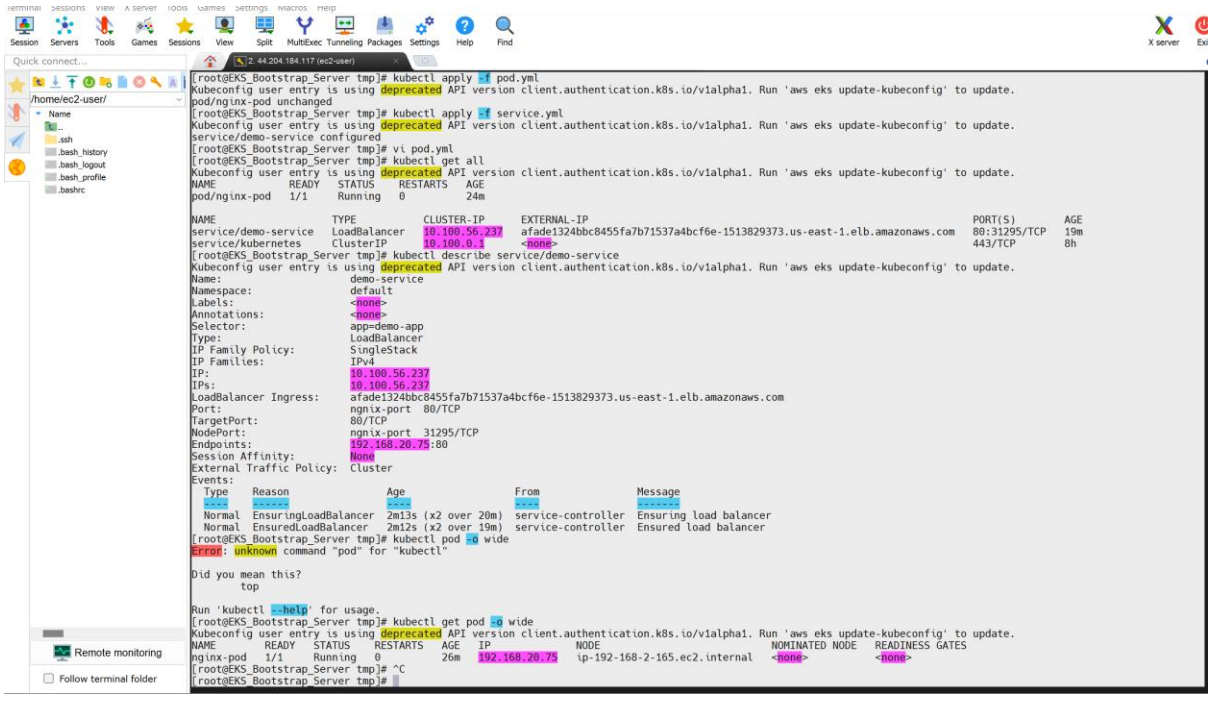
Fig. LoadBalancer is created.

Setup Pod and Service:



```
[root@EKS_Bootstrap_Server tmp]# ll
total 8
-rw-r--r-- 1 root root 199 May 16 20:11 pod.yml
-rw-r--r-- 1 root root 193 May 16 20:32 service.yml
drwx------ 3 root root  17 May 16 19:39 systemd-private-2a2e6e9d1ac347feaab952b1c678ed15-chronyd.service-2einFz
[root@EKS_Bootstrap_Server tmp]# cat pod.yml
apiVersion: v1
kind: Pod
metadata:
  name: nginx-pod
  labels:
    app: demo-app

spec:
  containers:
  - name: nginx-container
    image: nginx
    ports:
    - name: nginx
      containerPort: 80
[root@EKS_Bootstrap_Server tmp]# cat service.yml
apiVersion: v1
kind: Service
metadata:
  name: demo-service

spec:
  ports:
    - name: ngnix-port
      port: 80
      targetPort: 80

  selector :
     app: demo-app

  type: LoadBalancer


[root@EKS_Bootstrap_Server tmp]#
```

Fig. Adding Label as a selector app



```
[root@EKS_Bootstrap_Server tmp]# kubectl apply -f pod.yml
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
pod/nginx-pod unchanged
[root@EKS_Bootstrap_Server tmp]# kubectl apply -f service.yml
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
service/demo-service configured
[root@EKS_Bootstrap_Server tmp]# vi pod.yml
[root@EKS_Bootstrap_Server tmp]# kubectl get all
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
NAME                READY   STATUS    RESTARTS   AGE
pod/nginx-pod   1/1     Running   0          24m

NAME                   TYPE           CLUSTER-IP      EXTERNAL-IP                                                               PORT(S)        AGE
service/demo-service   LoadBalancer   10.100.56.237   afade1324bbc8455fa7b71537a4bcf6e-1513829373.us-east-1.elb.amazonaws.com   80:31295/TCP   19m
service/kubernetes     ClusterIP      10.100.0.1      <none>                                                                    443/TCP        8h
[root@EKS_Bootstrap_Server tmp]# kubectl describe service/demo-service
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
Name:                     demo-service
Namespace:                default
Labels:                   <none>
Annotations:              <none>
Selector:                 app=demo-app
Type:                     LoadBalancer
IP Family Policy:         SingleStack
IP Families:              IPv4
IP:                       10.100.56.237
IPs:                      10.100.56.237
LoadBalancer Ingress:     afade1324bbc8455fa7b71537a4bcf6e-1513829373.us-east-1.elb.amazonaws.com
Port:                     ngnix-port  80/TCP
TargetPort:               80/TCP
NodePort:                 ngnix-port  31295/TCP
Endpoints:                192.168.20.75:80
Session Affinity:         None
External Traffic Policy:  Cluster
Events:
  Type    Reason                Age                From                Message
  ----    ------                ----               ----                -------
  Normal  EnsuringLoadBalancer  2m13s (x2 over 20m)  service-controller  Ensuring load balancer
  Normal  EnsuredLoadBalancer   2m12s (x2 over 19m)  service-controller  Ensured load balancer
[root@EKS_Bootstrap_Server tmp]# kubectl pod -o wide
Error: unknown command "pod" for "kubectl"

Did you mean this?
        top

Run 'kubectl --help' for usage.
[root@EKS_Bootstrap_Server tmp]# kubectl get pod -o wide
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
NAME        READY   STATUS    RESTARTS   AGE   IP              NODE                                        NOMINATED NODE   READINESS GATES
nginx-pod   1/1     Running   0          26m   192.168.20.75   ip-192-168-2-165.ec2.internal   <none>           <none>
[root@EKS_Bootstrap_Server tmp]# ^C
[root@EKS_Bootstrap_Server tmp]#
```

Fig. Using Labels & Selector

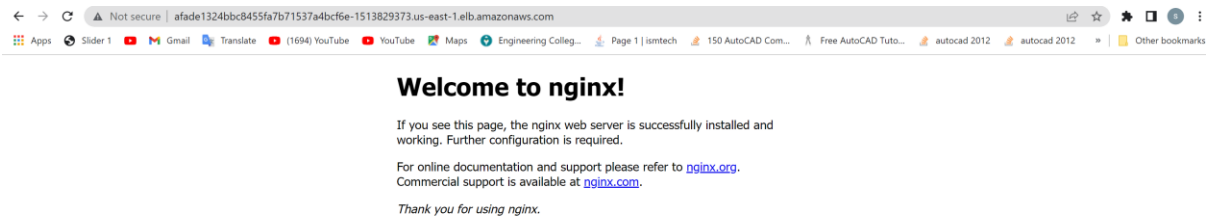


Fig. Output Successful out of Service Load Balancer Working.

Integrating Kubernetes in CI/CD pipeline:

Deleting previous configuration:

[root@EKS_Bootstrap_Server tmp]# kubectl get all

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

NAME READY STATUS RESTARTS AGE

pod/nginx-pod 1/1 Running 0 35m

NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE

service/demo-service LoadBalancer 10.100.56.237 afade1324bbc8455fa7b71537a4bcf6e-1513829373.us-east-1.elb.amazonaws.com 80:31295/TCP 30m

service/kubernetes ClusterIP 10.100.0.1 <none> 443/TCP 8h

[root@EKS_Bootstrap_Server tmp]# kubectl delete pod/nginx-pod

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

pod "nginx-pod" deleted

[root@EKS_Bootstrap_Server tmp]# kubectl get po

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

No resources found in default namespace.

[root@EKS_Bootstrap_Server tmp]# kubectl delete service/demo-service

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

service "demo-service" deleted

[root@EKS_Bootstrap_Server tmp]#

Write a deployment file:

[root@EKS_Bootstrap_Server ~]# cat regapp-deploy.yml

apiVersion: apps/v1

kind: Deployment

metadata:

name: saifshah-regapp

labels:

app: regapp

```
spec:
  replicas: 3
  selector:
    matchLabels:
      app: regapp

  template:
    metadata:
      labels:
        app: regapp
    spec:
      containers:
      - name: regapp
        image: saifshah/regapp
        imagePullPolicy: Always
        ports:
        - containerPort: 8080
  strategy:
    type: RollingUpdate
    rollingUpdate:
      maxSurge: 1
      maxUnavailable: 1

[root@EKS_Bootstrap_Server ~]# cat regapp-service.yml
apiVersion: v1
kind: Service
```

```
metadata:
  name: saifshah-service
  labels:
    app: regapp
spec:
  selector:
    app: regapp

  ports:
    - port: 8080
      targetPort: 8080

  type: LoadBalancer

[root@EKS_Bootstrap_Server ~]#



[root@EKS_Bootstrap_Server ~]# ls
aws  awscliv2.zip  regapp-deploy.yml  regapp-service.yml
[root@EKS_Bootstrap_Server ~]# kubectl apply -f regapp-deploy.yml
Kubeconfig user entry is using deprecated API version
client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to
update.
error: error when retrieving current configuration of:
Resource: "apps/v1, Resource=deployments", GroupVersionKind: "apps/v1,
Kind=Deployment"
Name: "saifshah/regapp", Namespace: "default"
```

from server for: "regapp-deploy.yml": invalid resource name "saifshah/regapp": [may not contain '/']

[root@EKS_Bootstrap_Server ~]# vi regapp-deploy.yml

[root@EKS_Bootstrap_Server ~]# clear

[root@EKS_Bootstrap_Server ~]# ls

aws awscliv2.zip regapp-deploy.yml regapp-service.yml

[root@EKS_Bootstrap_Server ~]# kubectl apply -f regapp-deploy.yml

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

deployment.apps/saifshah-regapp created

[root@EKS_Bootstrap_Server ~]# vi regapp-service.yml

[root@EKS_Bootstrap_Server ~]# kubectl apply -f regapp-service.yml

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

service/saifshah-service created

[root@EKS_Bootstrap_Server ~]# kubectl get all

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

NAME   READY   STATUS   RESTARTS   AGE

pod/saifshah-regapp-67dc7d6554-5gdbh   1/1   Running   0   3m53s

pod/saifshah-regapp-67dc7d6554-n8vfm   1/1   Running   0   3m53s

pod/saifshah-regapp-67dc7d6554-q4bnf   1/1   Running   0   3m53s

NAME   TYPE   CLUSTER-IP   EXTERNAL-IP
PORT(S)   AGE

service/kubernetes ClusterIP 10.100.0.1 <none> 443/TCP 24h

service/saifshah-service LoadBalancer 10.100.223.173 a1968e704ce994e9e8a9832790201698-1437160444.us-east-1.elb.amazonaws.com 8080:32727/TCP 3m4s

NAME READY UP-TO-DATE AVAILABLE AGE

deployment.apps/saifshah-regapp 3/3 3 3 3m53s

NAME DESIRED CURRENT READY AGE

replicaset.apps/saifshah-regapp-67dc7d6554 3 3 3 3m53s

[root@EKS_Bootstrap_Server ~]# kubectl describe

error: You must specify the type of resource to describe. Use "kubectl api-resources" for a complete list of supported resources.

[root@EKS_Bootstrap_Server ~]# kubectl describe service/saifshah-service

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

Name: saifshah-service

Namespace: default

Labels: app=regapp

Annotations: <none>

Selector: app=regapp

Type: LoadBalancer

IP Family Policy: SingleStack

IP Families: IPv4

IP: 10.100.223.173

IPs: 10.100.223.173

LoadBalancer Ingress: a1968e704ce994e9e8a9832790201698-1437160444.us-east-1.elb.amazonaws.com

Port: <unset> 8080/TCP

TargetPort: 8080/TCP

NodePort: <unset> 32727/TCP

Endpoints: 192.168.0.41:8080,192.168.27.33:8080,192.168.33.84:8080

Session Affinity: None

External Traffic Policy: Cluster

Events:

Type Reason Age From Message

---- ------ ---- ---- -------

Normal EnsuringLoadBalancer 3m42s service-controller Ensuring load balancer

Normal EnsuredLoadBalancer 3m37s service-controller Ensured load balancer

[root@EKS_Bootstrap_Server ~]# kubectl get pod -o wide

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

NAME READY STATUS RESTARTS AGE IP NODE NOMINATED NODE READINESS GATES

saifshah-regapp-67dc7d6554-5gdbh 1/1 Running 0 5m38s 192.168.0.41 ip-192-168-0-77.ec2.internal <none> <none>

saifshah-regapp-67dc7d6554-n8vfm 1/1 Running 0 5m38s 192.168.33.84 ip-192-168-48-13.ec2.internal <none> <none>

saifshah-regapp-67dc7d6554-q4bnf 1/1 Running 0 5m38s 192.168.27.33 ip-192-168-0-77.ec2.internal <none> <none>

[root@EKS_Bootstrap_Server ~]#

After deletion 3 pods in replica set :

```
[root@EKS_Bootstrap_Server ~]# kubectl delete pod saifshah-regapp-67dc7d6554-5gdbh

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

pod "saifshah-regapp-67dc7d6554-5gdbh" deleted

[root@EKS_Bootstrap_Server ~]# kubectl get pod -o wide

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

NAME                        READY   STATUS    RESTARTS   AGE   IP              NODE                            NOMINATED NODE   READINESS GATES

saifshah-regapp-67dc7d6554-n8vfm   1/1     Running   0          12m   192.168.33.84   ip-192-168-48-13.ec2.internal   <none>           <none>

saifshah-regapp-67dc7d6554-q4bnf   1/1     Running   0          12m   192.168.27.33   ip-192-168-0-77.ec2.internal    <none>           <none>

saifshah-regapp-67dc7d6554-r6mkj   1/1     Running   0          6s    192.168.18.246   ip-192-168-0-77.ec2.internal    <none>           <none>   //new pod created

[root@EKS_Bootstrap_Server ~]#
```

Integrate Kubernetes Bootstrap Server with Ansible:

On Bootstrap Server:

- **Create ansadmin**
  [root@EKS_Bootstrap_Server ~]# useradd ansadmin
  [root@EKS_Bootstrap_Server ~]# visudo
- **Add ansadmin to sudoers file**

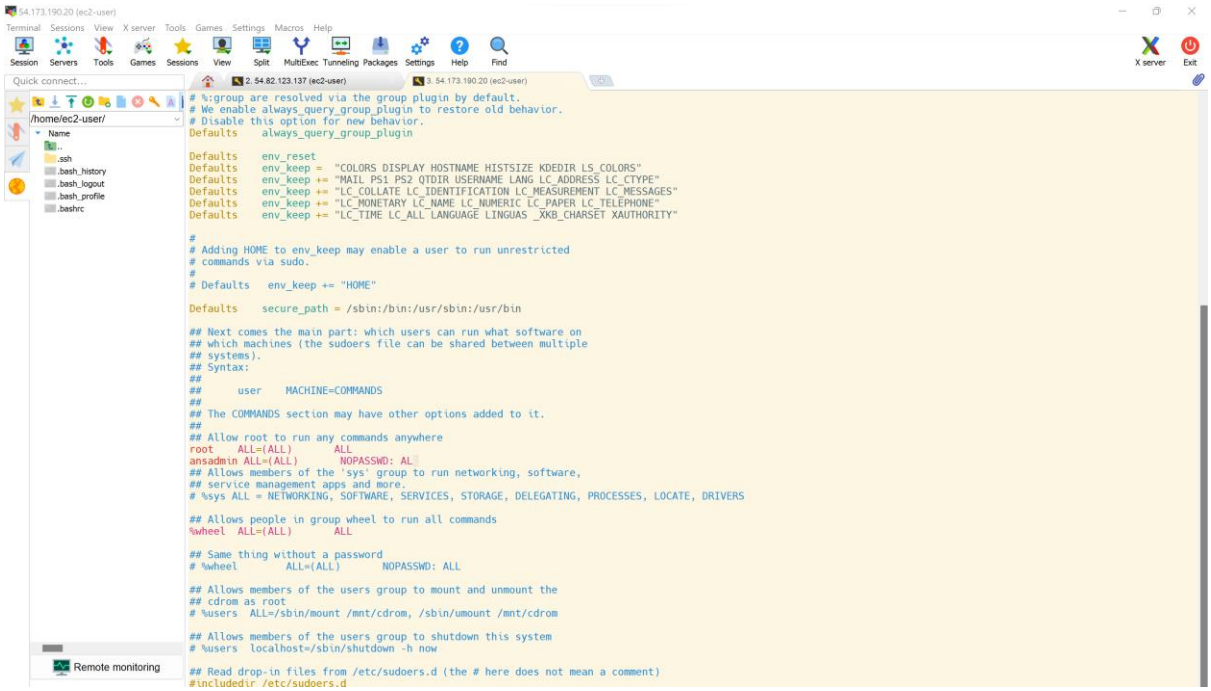


Fig. Add ansadmin to sudoers file

- **Enable Password based login**

[root@EKS_Bootstrap_Server ~]# service sshd reload
Redirecting to /bin/systemctl reload sshd.service

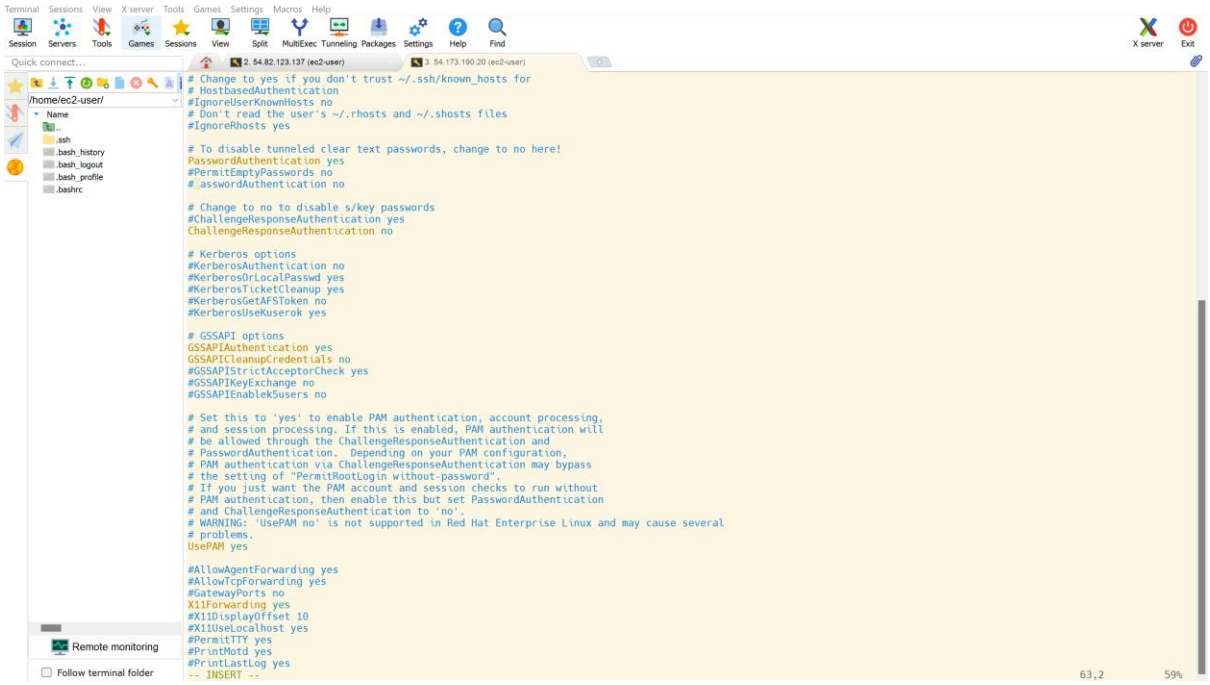


Fig. [root@EKS_Bootstrap_Server ~]# vi /etc/ssh/sshd_config

On Ansible Node:

[root@Ansible_Server ~]# sudo su - ansadmin

Last login: Sat May 14 08:19:14 UTC 2022 from 152.57.213.2 on pts/1

[ansadmin@Ansible_Server ~]$ cd /opt/docker

[ansadmin@Ansible_Server docker]$ ll

total 16

-rw-rw-r-- 1 ansadmin ansadmin 381 May 14 07:49 deploy_regapp.yml

-rw-rw-r-- 1 ansadmin ansadmin 528 May 13 12:12 Dockerfile

-rw-rw-r-- 1 ansadmin ansadmin 357 May 13 18:21 regapp.yml

-rw-rw-r-- 1 ansadmin ansadmin 2913 May 14 08:28 webapp.war

[ansadmin@Ansible_Server docker]$ mv regapp.yml create_image_regapp.yml

[ansadmin@Ansible_Server docker]$ ll

total 16

-rw-rw-r-- 1 ansadmin ansadmin 357 May 13 18:21 create_image_regapp.yml

-rw-rw-r-- 1 ansadmin ansadmin 381 May 14 07:49 deploy_regapp.yml

-rw-rw-r-- 1 ansadmin ansadmin 528 May 13 12:12 Dockerfile

-rw-rw-r-- 1 ansadmin ansadmin 2913 May 14 08:28 webapp.war

[ansadmin@Ansible_Server docker]$ cat deploy_regapp.yml

- hosts : dockerhost

tasks:

- name : stop existing container

command : docker stop regapp-server

- name : remove the container

command : docker rm regapp-server

- name : remove image

command : docker rmi saifshah/regapp:latest

- name : create docker container

command : docker run -d --name regapp-server -p 8082:8080 saifshah/regapp:latest

[ansadmin@Ansible_Server docker]$ mv deploy_regapp.yml docker_deployment_regapp.yml

[ansadmin@Ansible_Server docker]$ ll

total 16

-rw-rw-r-- 1 ansadmin ansadmin 357 May 13 18:21 create_image_regapp.yml

-rw-rw-r-- 1 ansadmin ansadmin 381 May 14 07:49 docker_deployment_regapp.yml

-rw-rw-r-- 1 ansadmin ansadmin 528 May 13 12:12 Dockerfile

-rw-rw-r-- 1 ansadmin ansadmin 2913 May 14 08:28 webapp.war

[ansadmin@Ansible_Server docker]$

[root@EKS_Bootstrap_Server ~]# passwd ansadmin

Changing password for user ansadmin.

New password:

BAD PASSWORD: The password contains the user name in some form

Retype new password:

passwd: all authentication tokens updated successfully.

[root@EKS_Bootstrap_Server ~]#

- **Add to hosts file**

[ansadmin@Ansible_Server docker]$ vi hosts

[ansadmin@Ansible_Server docker]$ cat hosts

localhost

[kubernetes]

172.31.85.40

[ansible]

172.31.26.13

[ansadmin@Ansible_Server docker]$

- Copy ssh keys

  [ansadmin@Ansible_Server docker]$ ssh-copy-id 172.31.85.40
  /usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/ansadmin/.ssh/id_rsa.pub"
  The authenticity of host '172.31.85.40 (172.31.85.40)' can't be established.
  ECDSA key fingerprint is SHA256:eBN1hfJascvuNM/WaTVamjZqJOqCVahsgPQKljMW+0E.
  ECDSA key fingerprint is MD5:5f:dd:07:95:8a:01:be:8a:85:a8:52:7e:4e:e7:46:a2.
  Are you sure you want to continue connecting (yes/no)? yes
  /usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
  /usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new keys
  ansadmin@172.31.85.40's password:

  Number of key(s) added: 1

  Now try logging into the machine, with: "ssh '172.31.85.40'"
  and check to make sure that only the key(s) you wanted were added.

- **Test the Connection**

```
[ansadmin@Ansible_Server docker]$ ansible -i hosts  all -a uptime
[WARNING]: Platform linux on host 172.31.85.40 is using the
discovered Python interpreter at /usr/bin/python, but future
installation of another Python interpreter
could change this. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpret
er_discovery.html for more information.
172.31.85.40 | CHANGED | rc=0 >>
 18:47:04 up 25 min,  3 users,  load average: 0.00, 0.00, 0.00
[WARNING]: Platform linux on host localhost is using the discovered
Python interpreter at /usr/bin/python, but future installation of
another Python interpreter
could change this. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpret
er_discovery.html for more information.
localhost | CHANGED | rc=0 >>
 18:47:04 up 26 min,  4 users,  load average: 0.00, 0.00, 0.00
[WARNING]: Platform linux on host 172.31.26.13 is using the
discovered Python interpreter at /usr/bin/python, but future
installation of another Python interpreter
could change this. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpret
er_discovery.html for more information.
172.31.26.13 | CHANGED | rc=0 >>
 18:47:04 up 26 min,  4 users,  load average: 0.00, 0.00, 0.00
```

Create Ansible Playbooks for deployment and Service File:

[ansadmin@Ansible_Server docker]$ vi kube_deploy.yml

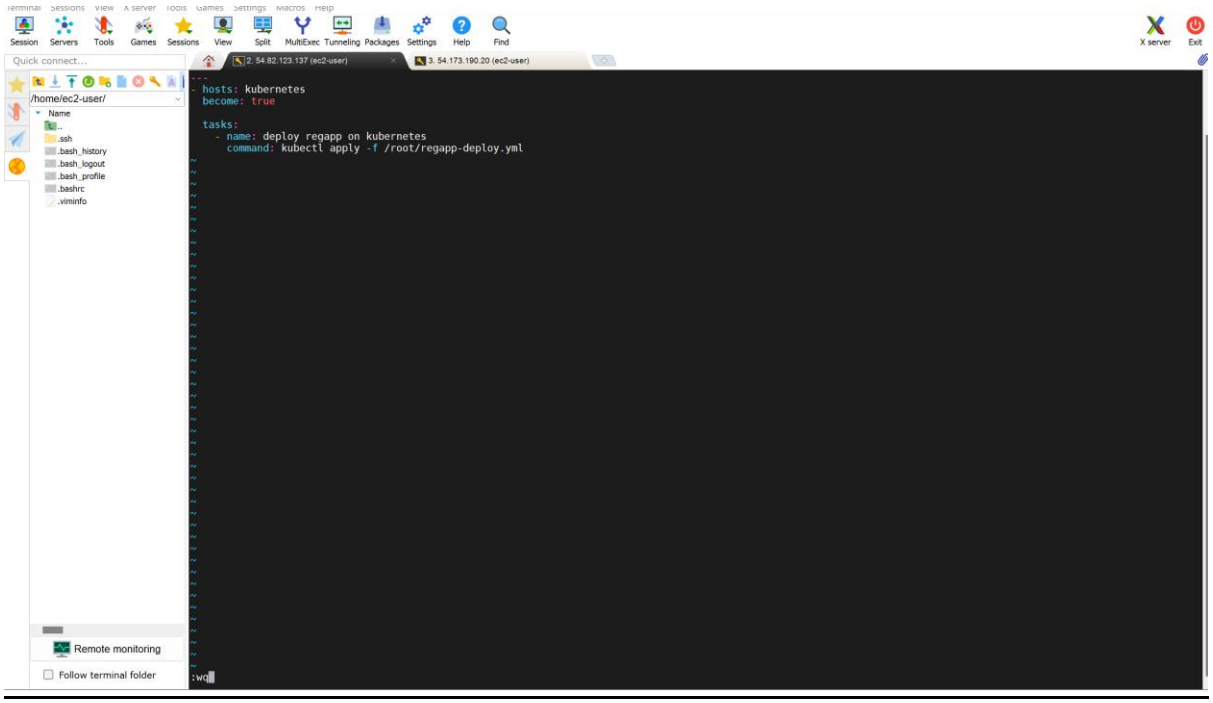


Fig. Kubernetes deploy file created

[ansadmin@Ansible_Server docker]$ vi kube_service.yml

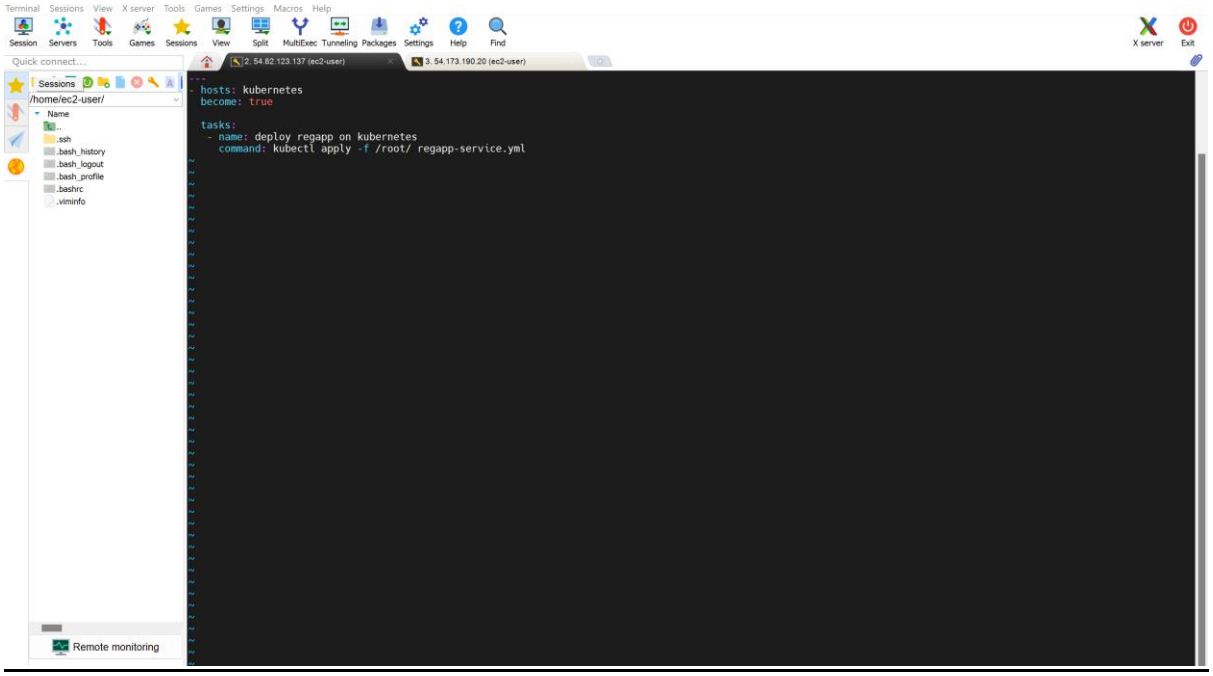


Fig. Kubernetes service file created

[ansadmin@Ansible_Server docker]$ ls

create_image_regapp.yml docker_deployment_regapp.yml Dockerfile hosts webapp.war

[ansadmin@Ansible_Server docker]$ vi kube_deploy.yml

[ansadmin@Ansible_Server docker]$ vi kube_deploy.yml

[ansadmin@Ansible_Server docker]$ ^C

[ansadmin@Ansible_Server docker]$ vi kube_service.yml

[ansadmin@Ansible_Server docker]$ ^C

[ansadmin@Ansible_Server docker]$ ansible-playbook -i /root/docker/hosts kube_deploy.yml

[WARNING]: Unable to parse /root/docker/hosts as an inventory source

[WARNING]: No inventory was parsed, only implicit localhost is available

[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost does not match 'all'

[WARNING]: Could not match supplied host pattern, ignoring: kubernetes

PLAY [kubernetes]
****
****
****

skipping: no hosts matched

PLAY RECAP
****
****
****

[ansadmin@Ansible_Server docker]$ ansible-playbook -i /opt/docker/hosts kube_deploy.yml

PLAY [kubernetes]
****
****
****

TASK [Gathering Facts]
****
****
****

[WARNING]: Platform linux on host 172.31.85.40 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter

could change this. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.

ok: [172.31.85.40]

TASK [deploy regapp on kubernetes]
****
****
***

fatal: [172.31.85.40]: FAILED! => {"changed": false, "cmd": "kubectl apply -f /root/regapp-deploy.yml", "msg": "[Errno 2] No such file or directory", "rc": 2}

PLAY RECAP
****
****
****

172.31.85.40 : ok=1 changed=0 unreachable=0 failed=1 skipped=0 rescued=0 ignored=0

[ansadmin@Ansible_Server docker]$ vi kube_deploy.yml

[ansadmin@Ansible_Server docker]$ ansible-playbook -i /opt/docker/hosts kube_deploy.yml

PLAY [kubernetes] **********

TASK [Gathering Facts] **********

fatal: [172.31.85.40]: UNREACHABLE! => {"changed": false, "msg": "Failed to connect to the host via ssh: Permission denied (publickey,gssapi-keyex,gssapi-with-mic,password).", "unreachable": true}

PLAY RECAP **********

172.31.85.40 : ok=0 changed=0 unreachable=1 failed=0 skipped=0 rescued=0 ignored=0

[ansadmin@Ansible_Server docker]$ vi kube_deploy.yml

[ansadmin@Ansible_Server docker]$ ls

create_image_regapp.yml docker_deployment_regapp.yml Dockerfile hosts kube_deploy.yml kube_service.yml webapp.war

[ansadmin@Ansible_Server docker]$ vi kube_service.yml

[ansadmin@Ansible_Server docker]$

[ansadmin@Ansible_Server docker]$ ansible-playbook -i /opt/docker/hosts kube_deploy.yml

PLAY [kubernetes] **********

TASK [Gathering Facts] **********

fatal: [172.31.85.40]: UNREACHABLE! => {"changed": false, "msg": "Failed to connect to the host via ssh: Permission denied (publickey,gssapi-keyex,gssapi-with-mic,password).", "unreachable": true}

PLAY RECAP **********

172.31.85.40 : ok=0 changed=0 unreachable=1 failed=0 skipped=0 rescued=0 ignored=0

[ansadmin@Ansible_Server docker]$ vi kube_deploy.yml

[ansadmin@Ansible_Server docker]$ ls

create_image_regapp.yml docker_deployment_regapp.yml Dockerfile hosts kube_deploy.yml kube_service.yml webapp.war

[ansadmin@Ansible_Server docker]$ vi kube_service.yml

[ansadmin@Ansible_Server docker]$ ^C

[ansadmin@Ansible_Server docker]$ ansible-playbook -i /opt/docker/hosts kube_deploy.yml

PLAY [kubernetes] **********

TASK [Gathering Facts] **********

fatal: [172.31.85.40]: UNREACHABLE! => {"changed": false, "msg": "Failed to connect to the host via ssh: Permission denied (publickey,gssapi-keyex,gssapi-with-mic,password).", "unreachable": true}

PLAY RECAP **********

172.31.85.40 : ok=0 changed=0 unreachable=1 failed=0 skipped=0 rescued=0 ignored=0

[ansadmin@Ansible_Server docker]$

[ansadmin@Ansible_Server docker]$ ssh_copy-id 172.31.85.40

-bash: ssh_copy-id: command not found

[ansadmin@Ansible_Server docker]$ ssh-copy-id 172.31.85.40

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/ansadmin/.ssh/id_rsa.pub"

/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed

/usr/bin/ssh-copy-id: WARNING: All keys were skipped because they already exist on the remote system.

(if you think this is a mistake, you may want to use -f option)

[ansadmin@Ansible_Server docker]$ ansible-playbook -i /opt/docker/hosts kube_deploy.yml

PLAY [kubernetes]
****

TASK [Gathering Facts]
****

fatal: [172.31.85.40]: UNREACHABLE! => {"changed": false, "msg": "Failed to connect to the host via ssh: Permission denied (publickey,gssapi-keyex,gssapi-with-mic,psword).", "unreachable": true}

PLAY RECAP
****

172.31.85.40 : ok=0 changed=0 unreachable=1 failed=0 skipped=0 rescued=0 ignored=0

[ansadmin@Ansible_Server docker]$ ssh-copy-id 172.31.85.40

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/ansadmin/.ssh/id_rsa.pub"

/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed

/usr/bin/ssh-copy-id: WARNING: All keys were skipped because they already exist on the remote system.

(if you think this is a mistake, you may want to use -f option)

[ansadmin@Ansible_Server docker]$ ssh-copy-id root@172.31.85.40

/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/ansadmin/.ssh/id_rsa.pub"

/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed

/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new keys

root@172.31.85.40's password:

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'root@172.31.85.40'"

and check to make sure that only the key(s) you wanted were added.

[ansadmin@Ansible_Server docker]$ vi kube_service.yml

```
[ansadmin@Ansible_Server docker]$ cat kube_deploy.yml
---
- hosts: kubernetes
  #become: true
  user: root

  tasks:
    - name: deploy regapp on kubernetes
      command: kubectl apply -f regapp-deploy.yml
[ansadmin@Ansible_Server docker]$ cat kube_service.yml
---
- hosts: kubernetes
  # become: true
  user : root

  tasks:
   - name: deploy regapp on kubernetes
     command: kubectl apply -f regapp-service.yml
[ansadmin@Ansible_Server docker]$ ansible-playbook -i /opt/docker/hosts kube_service.yml

PLAY [kubernetes] ****************************************************************************************************************************************************

TASK [Gathering Facts] ****************************************************************
```

****
****

[WARNING]: Platform linux on host 172.31.85.40 is using the discovered Python interpreter at /usr/bin/python, but future installation of another Python interpreter

could change this. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information.

ok: [172.31.85.40]

TASK [deploy regapp on kubernetes]
****
****
*

changed: [172.31.85.40]

PLAY RECAP
****
****
****

172.31.85.40 : ok=2 changed=1 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

[ansadmin@Ansible_Server docker]$

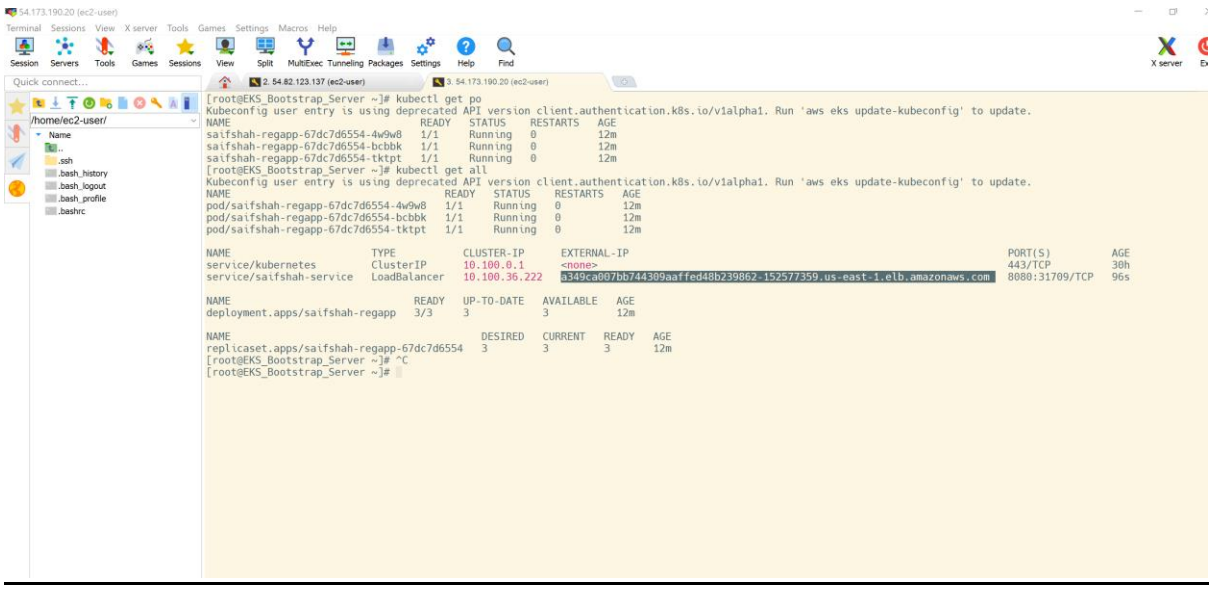


Fig. Ansible Deploy and Service playbook

Create Jenkins Deployment Job for Kubernetes:

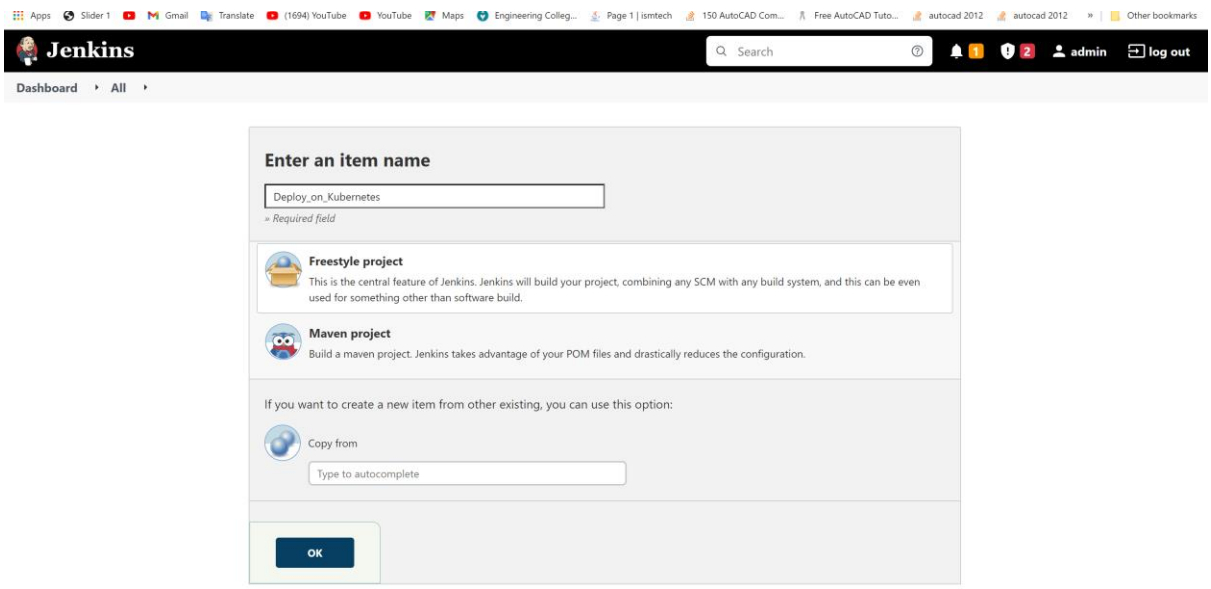


Fig. Deploy_on_Kubernetes

[ansadmin@Ansible_Server docker]$ ll

```
total 28
-rw-rw-r-- 1 ansadmin ansadmin  357 May 13 18:21 create_image_regapp.yml
-rw-rw-r-- 1 ansadmin ansadmin  381 May 14 07:49 docker_deployment_regapp.yml
-rw-rw-r-- 1 ansadmin ansadmin  528 May 13 12:12 Dockerfile
-rw-rw-r-- 1 ansadmin ansadmin   62 May 17 18:42 hosts
-rw-rw-r-- 1 ansadmin ansadmin  154 May 17 19:13 kube_deploy.yml
-rw-rw-r-- 1 ansadmin ansadmin  154 May 17 19:31 kube_service.yml
-rw-rw-r-- 1 ansadmin ansadmin 2913 May 14 08:28 webapp.war
[ansadmin@Ansible_Server docker]$ ansible-playbook -i /opt/docker/hosts kube_service.yml^C
[ansadmin@Ansible_Server docker]$


[root@EKS_Bootstrap_Server ~]# kubectl get all
Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.
NAME                                READY   STATUS    RESTARTS   AGE
pod/saifshah-regapp-67dc7d6554-9pt6r   1/1     Running   0          13h
pod/saifshah-regapp-67dc7d6554-dhnqk   1/1     Running   0          13h
pod/saifshah-regapp-67dc7d6554-nb9rw   1/1     Running   0          13h


NAME                 TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)          AGE
service/kubernetes   ClusterIP   10.100.0.1     <none>        443/TCP          45h
```

service/saifshah-service LoadBalancer 10.100.36.222 a349ca007bb744309aaffed48b239862-152577359.us-east-1.elb.amazonaws.com 8080:31709/TCP 14h

NAME READY UP-TO-DATE AVAILABLE AGE

deployment.apps/saifshah-regapp 3/3 3 3 14h

NAME DESIRED CURRENT READY AGE

replicaset.apps/saifshah-regapp-67dc7d6554 3 3 3 14h

[root@EKS_Bootstrap_Server ~]# kubectl delete deployment.apps/saifshah-regapp

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

deployment.apps "saifshah-regapp" deleted

[root@EKS_Bootstrap_Server ~]# kubectl delete service/saifshah-service

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

service "saifshah-service" deleted

[root@EKS_Bootstrap_Server ~]#

[root@EKS_Bootstrap_Server ~]# clear

[root@EKS_Bootstrap_Server ~]# kubectl get all

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE

service/kubernetes ClusterIP 10.100.0.1 <none> 443/TCP 45h

```
[root@EKS_Bootstrap_Server ~]# kubectl get all
Kubeconfig user entry is using deprecated API version
client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to
update.
NAME                              READY   STATUS    RESTARTS   AGE
pod/saifshah-regapp-67dc7d6554-m4ck9   1/1     Running   0          27s
pod/saifshah-regapp-67dc7d6554-rr58w   1/1     Running   0          27s
pod/saifshah-regapp-67dc7d6554-x24cx   1/1     Running   0          27s

NAME                       TYPE           CLUSTER-IP      EXTERNAL-IP
PORT(S)          AGE
service/kubernetes         ClusterIP      10.100.0.1      <none>
443/TCP          45h
service/saifshah-service   LoadBalancer   10.100.156.66
a5cc75730006140938846b05fc830300-559804141.us-east-
1.elb.amazonaws.com   8080:30620/TCP   23s

NAME                         READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/saifshah-regapp   3/3     3            3           27s

NAME                                    DESIRED   CURRENT   READY   AGE
replicaset.apps/saifshah-regapp-67dc7d6554   3         3         3       27s
[root@EKS_Bootstrap_Server ~]#
```

[ansadmin@Ansible_Server docker]$ vi kube_deploy.yml

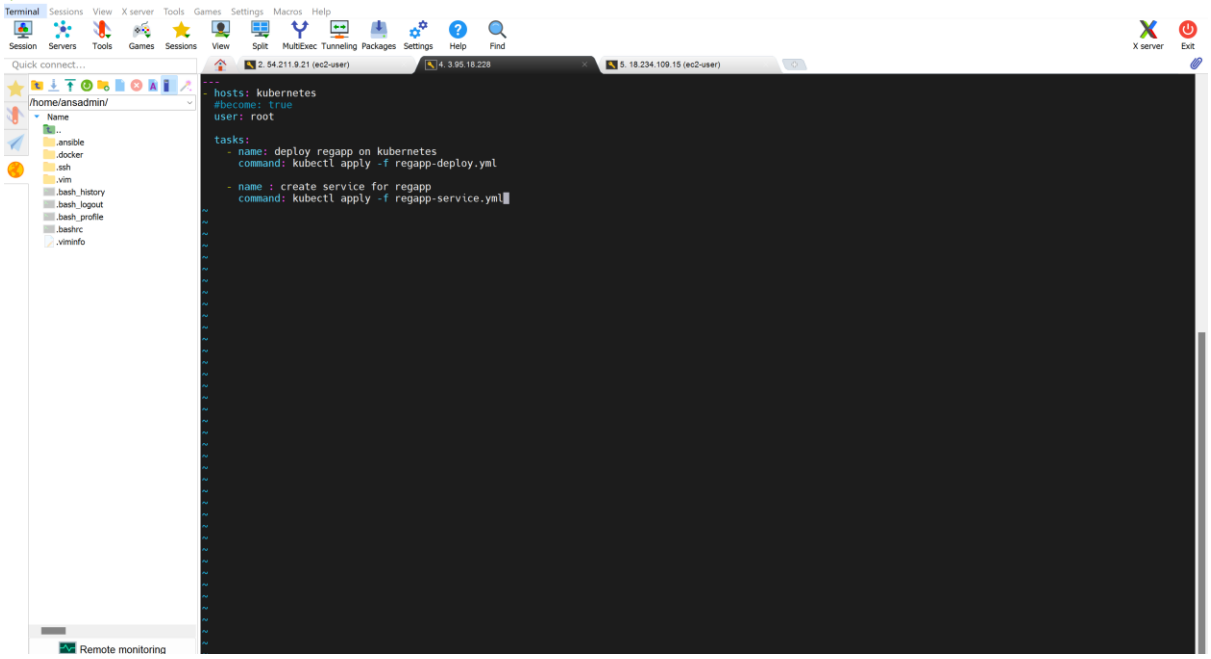


Fig. Merging Service File & Deployment File

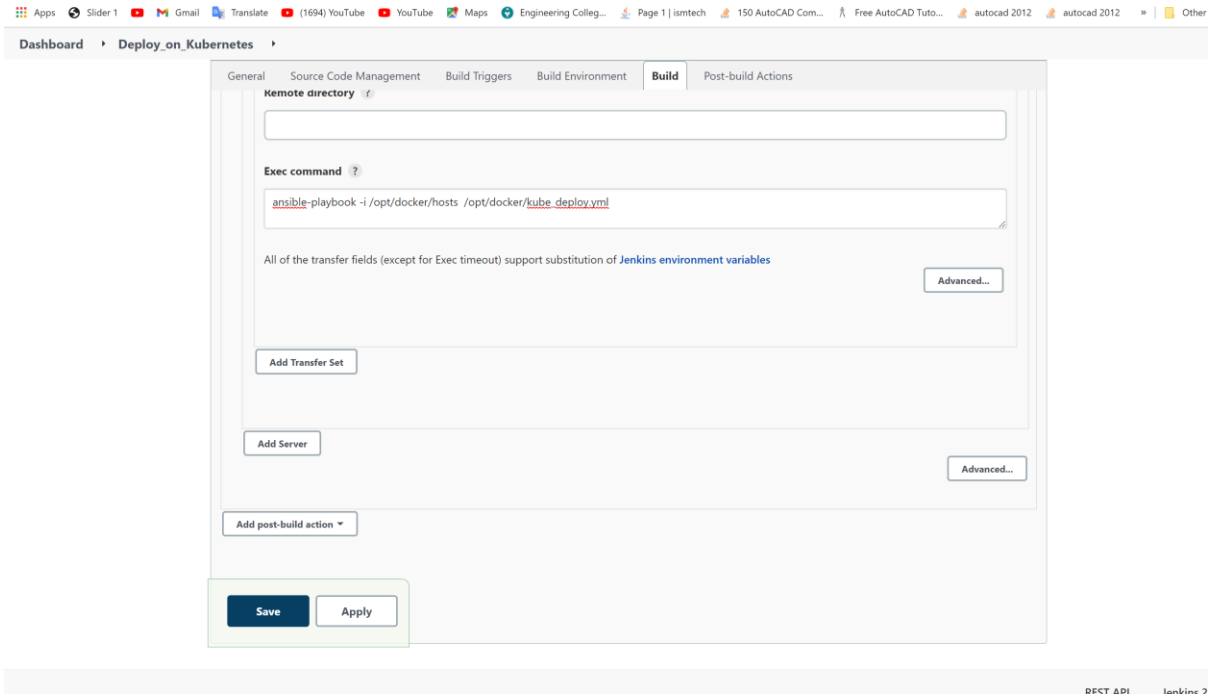


Fig. Exec Command Merge Service File & Deployment File

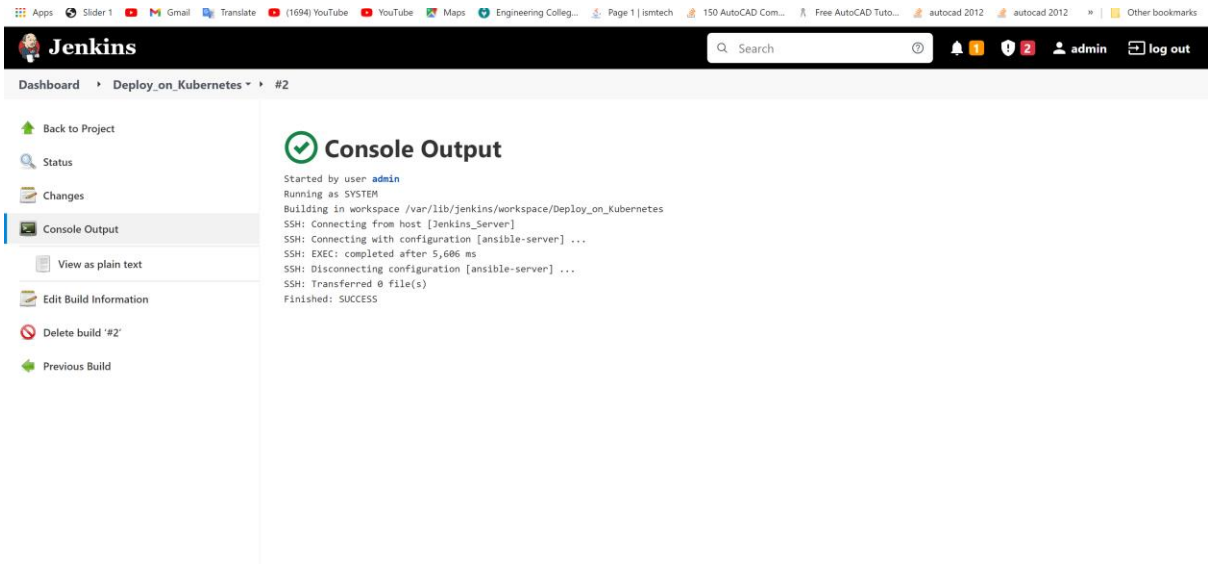


Fig. Build Success

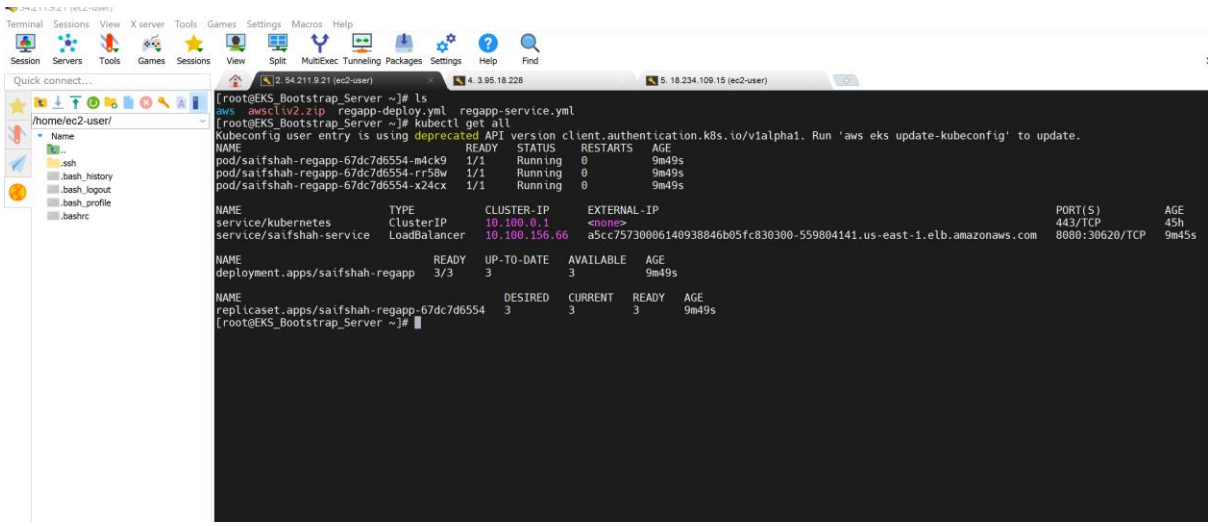


Fig. kubectl get all services & deployment .

CI Job to create Image for Kubernetes:

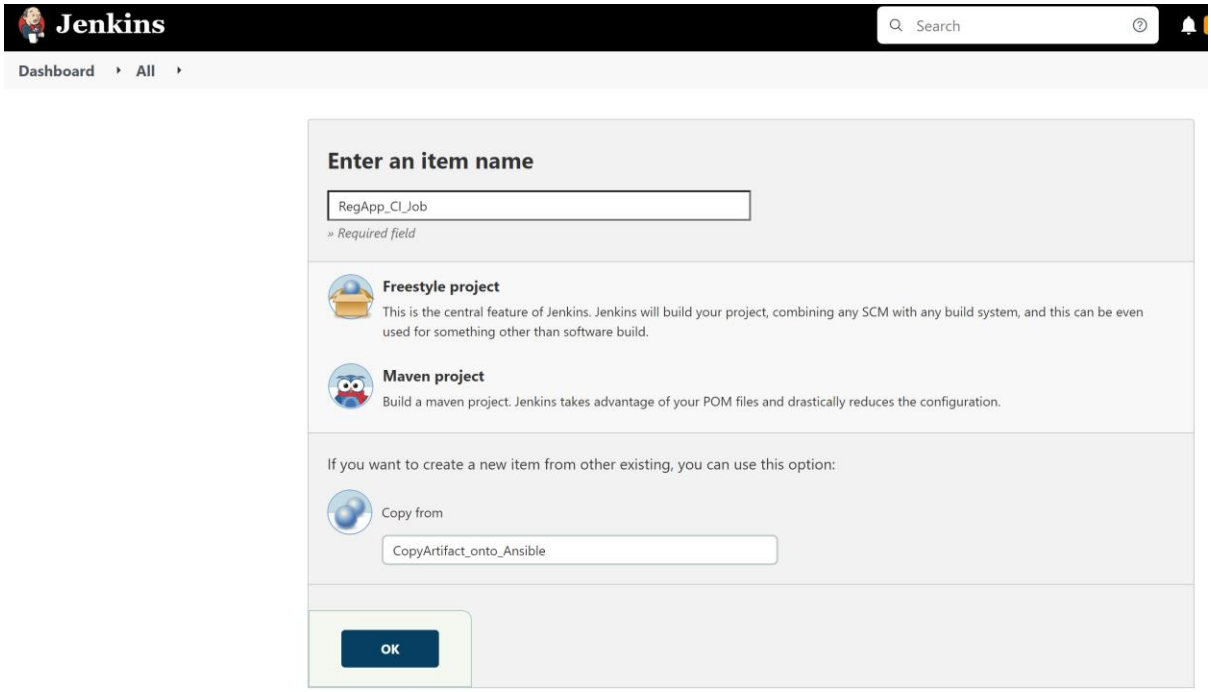


Fig. Creating CI Job

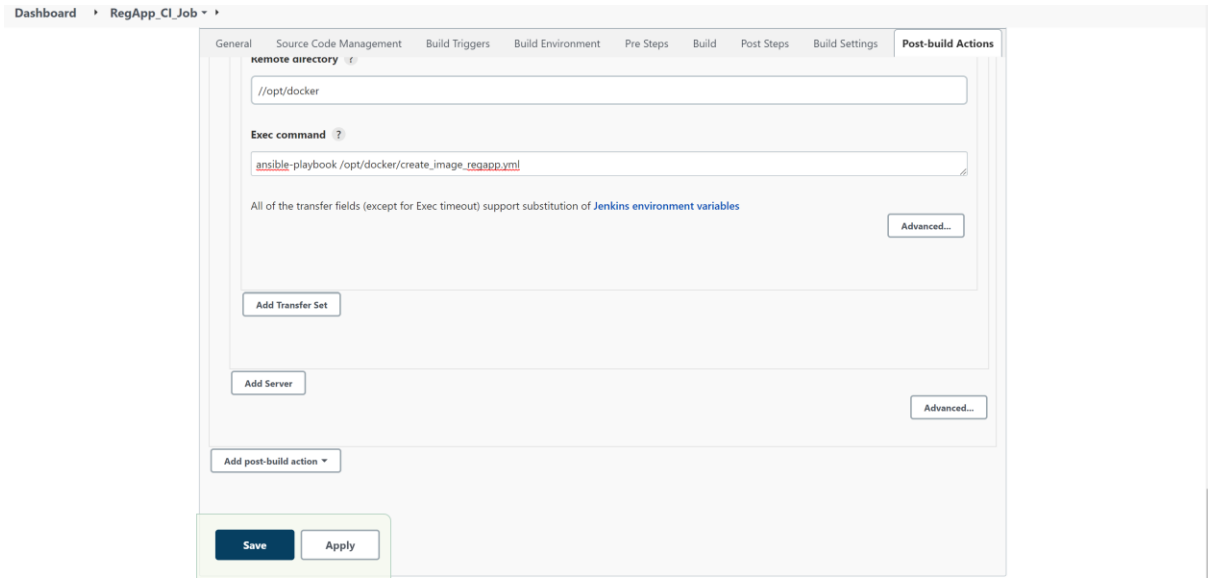


Fig. Adding Image File

[ansadmin@Ansible_Server docker]$ ll

total 28

```
-rw-rw-r-- 1 ansadmin ansadmin  357 May 13 18:21 create_image_regapp.yml
-rw-rw-r-- 1 ansadmin ansadmin  381 May 14 07:49 docker_deployment_regapp.yml
-rw-rw-r-- 1 ansadmin ansadmin  528 May 13 12:12 Dockerfile
-rw-rw-r-- 1 ansadmin ansadmin   62 May 17 18:42 hosts
-rw-rw-r-- 1 ansadmin ansadmin  245 May 18 09:48 kube_deploy.yml
-rw-rw-r-- 1 ansadmin ansadmin  154 May 17 19:31 kube_service.yml
-rw-rw-r-- 1 ansadmin ansadmin 2913 May 14 08:28 webapp.war
[ansadmin@Ansible_Server docker]$ cat create_image_regapp.yml
---
- hosts: ansible

  tasks:

  - name : create docker image
    command : docker build -t regapp:latest .
    args :
      chdir : /opt/docker

  - name : create tag to push image on docker hub
    command : docker tag regapp:latest saifshah/regapp:latest

  - name : push docker image on docker hub
    command : docker push  saifshah/regapp:latest

[ansadmin@Ansible_Server docker]$ ^C
[ansadmin@Ansible_Server docker]$ docker login
```

Authenticating with existing credentials...

Login did not succeed, error: Cannot connect to the Docker daemon at unix:///var/run/docker.sock. Is the docker daemon running?

Login with your Docker ID to push and pull images from Docker Hub. If you don't have a Docker ID, head over to https://hub.docker.com to create one.

Username (saifshah): saifshah

Password:

WARNING! Your password will be stored unencrypted in /home/ansadmin/.docker/config.json.

Configure a credential helper to remove this warning. See

https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded

[ansadmin@Ansible_Server docker]$ docker images

Cannot connect to the Docker daemon at unix:///var/run/docker.sock. Is the docker daemon running?

[ansadmin@Ansible_Server docker]$ service docker start

Redirecting to /bin/systemctl start docker.service

Failed to start docker.service: The name org.freedesktop.PolicyKit1 was not provided by any .service files

See system logs and 'systemctl status docker.service' for details.

[ansadmin@Ansible_Server docker]$ docker images

Cannot connect to the Docker daemon at unix:///var/run/docker.sock. Is the docker daemon running?

[ansadmin@Ansible_Server docker]$ sudo service docker start

Redirecting to /bin/systemctl start docker.service

[ansadmin@Ansible_Server docker]$ docker images

```
REPOSITORY          TAG       IMAGE ID       CREATED        SIZE
saifshah/regapp     latest    15574dfecf93   4 days ago     510MB
regapp              latest    15574dfecf93   4 days ago     510MB
regapp              v1        15574dfecf93   4 days ago     510MB
tomcat              latest    6a1271dfce51   6 days ago     680MB
centos              latest    5d0da3dc9764   8 months ago   231MB
[ansadmin@Ansible_Server docker]$
```

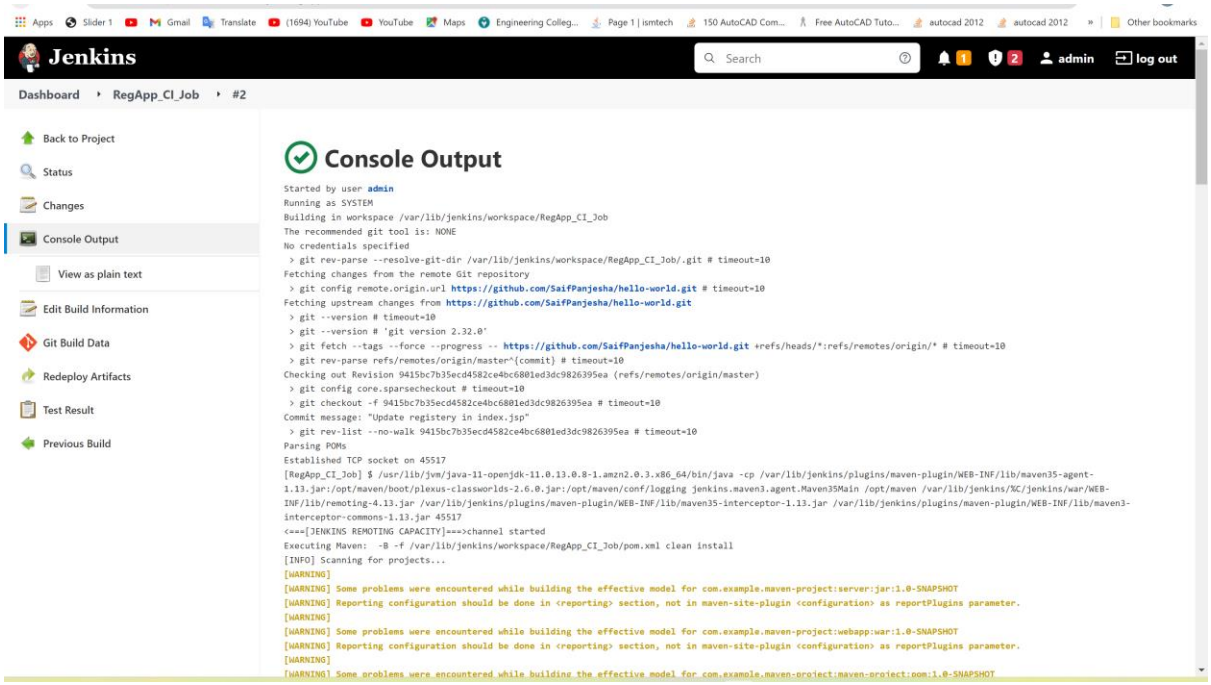


Fig. Build Success

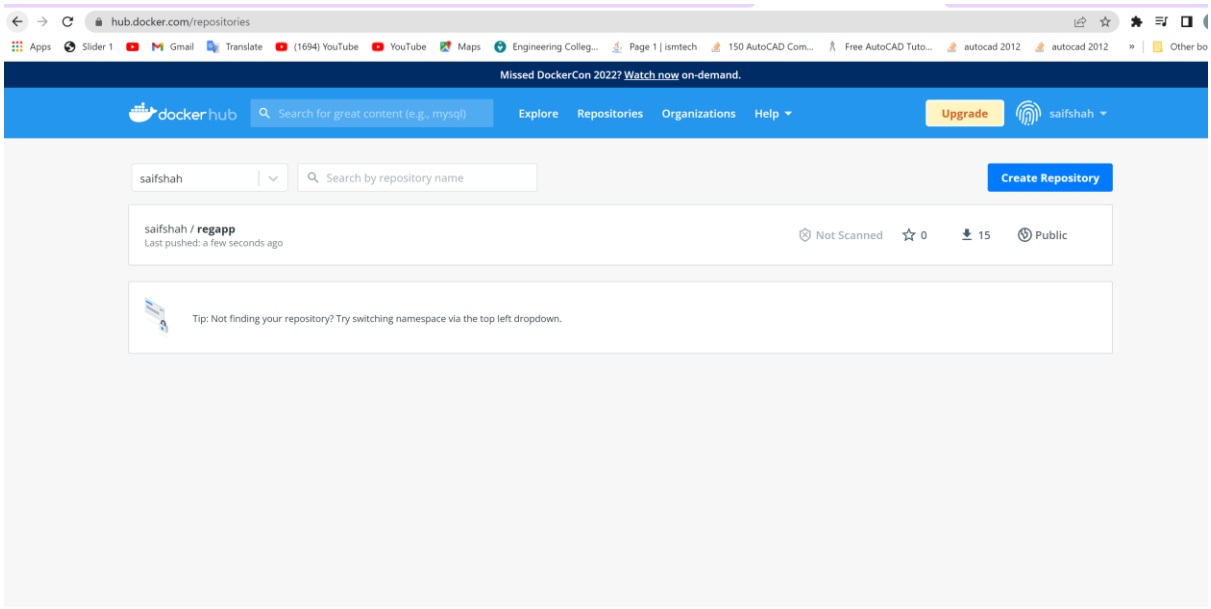


Fig. Image Created on Docker hub

Enable rolling update to create pod from latest docker image:

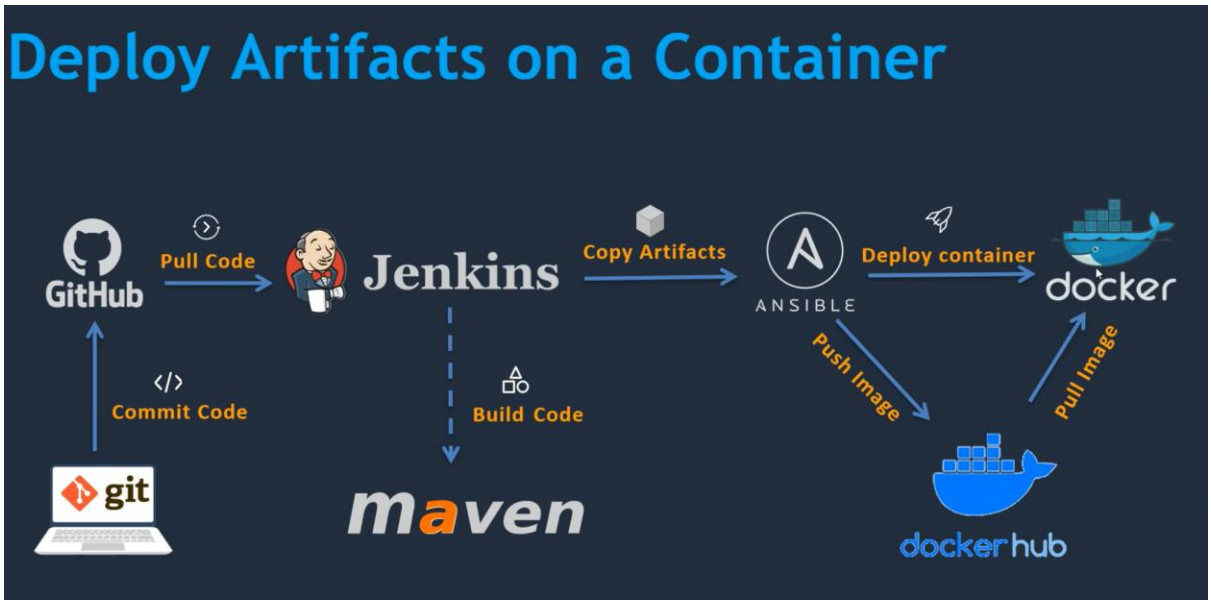


Fig. Deploying on Kubernetes

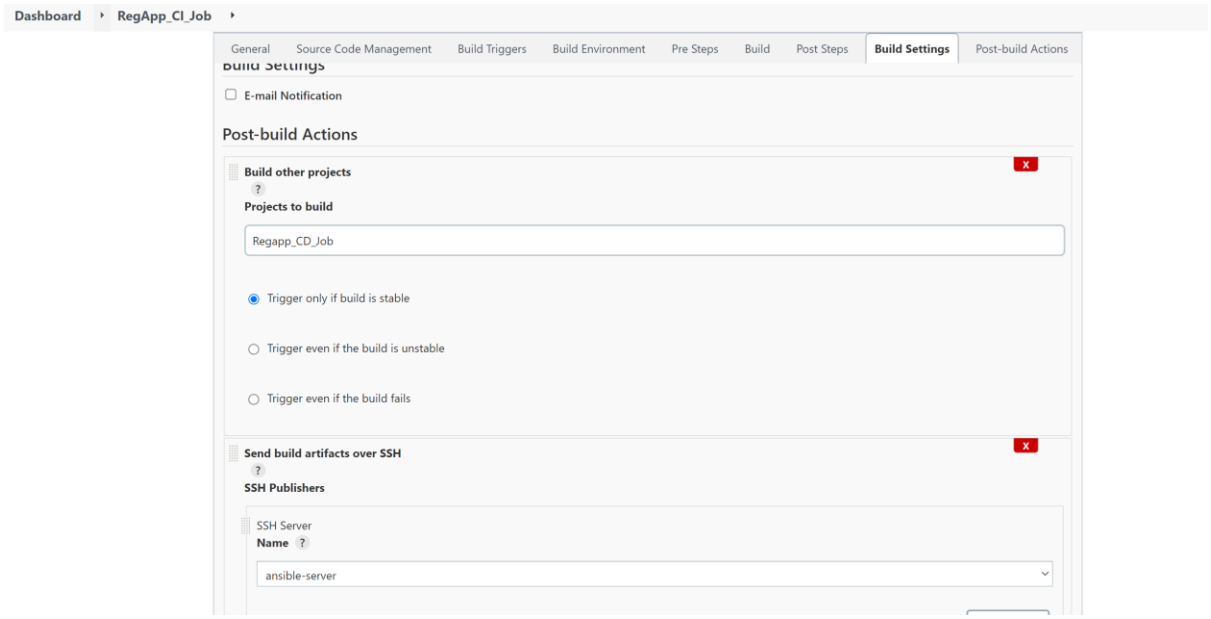
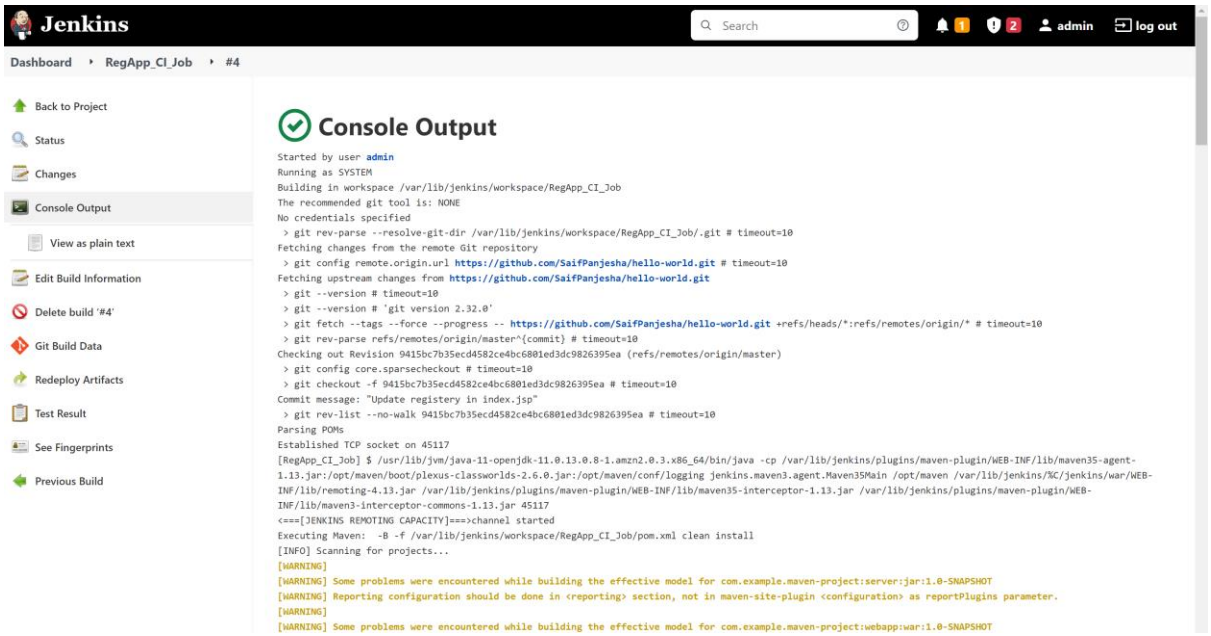


Fig. Rolling update for configuration



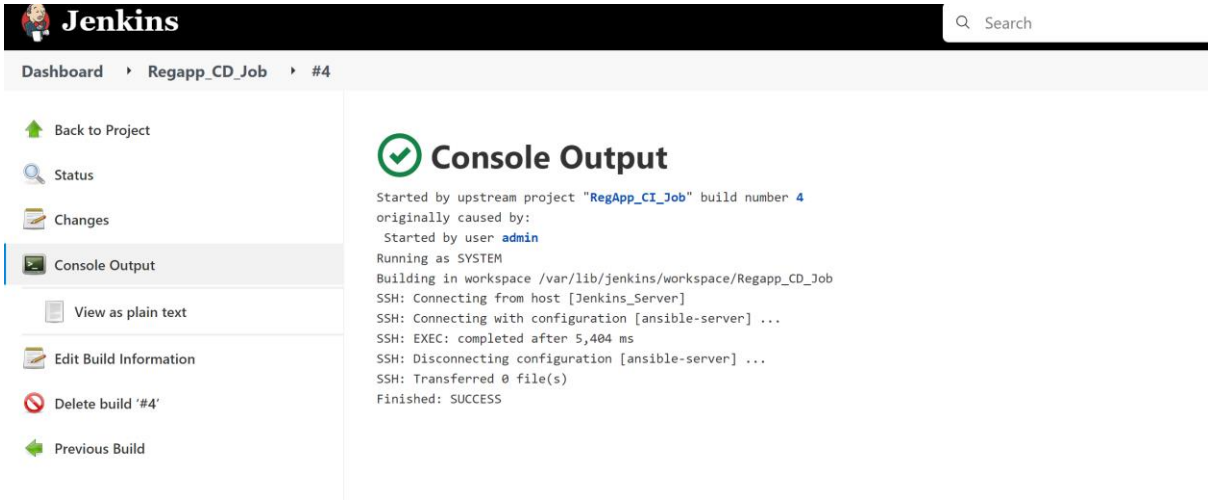


Fig. Build Success

Error : Unable to upload Latest Image

[root@EKS_Bootstrap_Server ~]# cd /opt/docker

-bash: cd: /opt/docker: No such file or directory

[root@EKS_Bootstrap_Server ~]# kubectl get all

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

NAME READY STATUS RESTARTS AGE

pod/saifshah-regapp-67dc7d6554-m4ck9 1/1 Running 0 93m

pod/saifshah-regapp-67dc7d6554-rr58w 1/1 Running 0 93m

pod/saifshah-regapp-67dc7d6554-x24cx 1/1 Running 0 93m

NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE

service/kubernetes ClusterIP 10.100.0.1 <none> 443/TCP 46h

service/saifshah-service LoadBalancer 10.100.156.66 a5cc75730006140938846b05fc830300-559804141.us-east-1.elb.amazonaws.com 8080:30620/TCP 93m

NAME READY UP-TO-DATE AVAILABLE AGE

deployment.apps/saifshah-regapp 3/3 3 3 93m

NAME DESIRED CURRENT READY AGE

replicaset.apps/saifshah-regapp-67dc7d6554 3 3 3 93m

[root@EKS_Bootstrap_Server ~]# ^C

[root@EKS_Bootstrap_Server ~]#

Complete CI and CD job to build and deploy code on Kubernetes:

[ansadmin@Ansible_Server docker]$ ll

total 28

-rw-rw-r-- 1 ansadmin ansadmin 357 May 13 18:21 create_image_regapp.yml

-rw-rw-r-- 1 ansadmin ansadmin 381 May 14 07:49 docker_deployment_regapp.yml

-rw-rw-r-- 1 ansadmin ansadmin 528 May 13 12:12 Dockerfile

-rw-rw-r-- 1 ansadmin ansadmin 62 May 17 18:42 hosts

-rw-rw-r-- 1 ansadmin ansadmin 245 May 18 09:48 kube_deploy.yml

-rw-rw-r-- 1 ansadmin ansadmin 154 May 17 19:31 kube_service.yml

-rw-rw-r-- 1 ansadmin ansadmin 2913 May 18 11:17 webapp.war

[ansadmin@Ansible_Server docker]$ vi kube_deploy.yml

```
[ansadmin@Ansible_Server docker]$ cat  kube_deploy.yml
---
- hosts: kubernetes
  #become: true
  user: root

  tasks:
    - name: deploy regapp on kubernetes
      command: kubectl apply -f regapp-deploy.yml

    - name : create service for regapp
      command: kubectl apply -f regapp-service.yml

    - name: update deployment with new pods if image updated in docker hub
      command: kubectl rollout restart deployment.apps/saifshah-regapp
[ansadmin@Ansible_Server docker]$
```

Output :

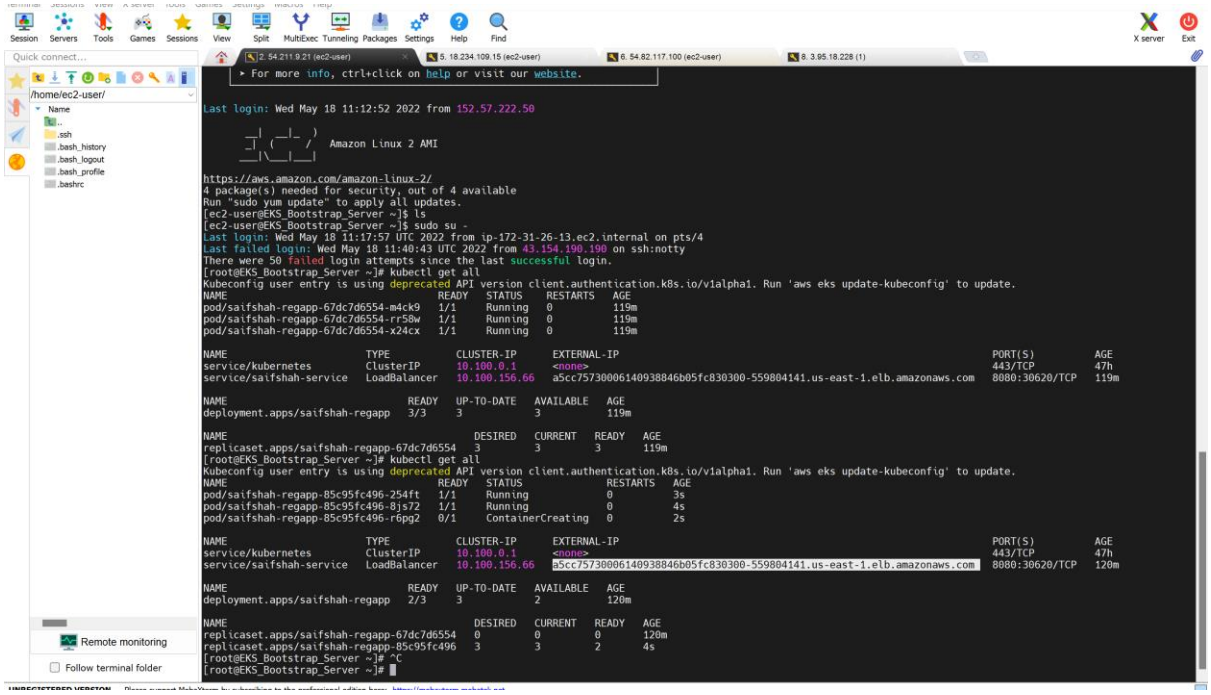


Fig. Bootstrap Server Running

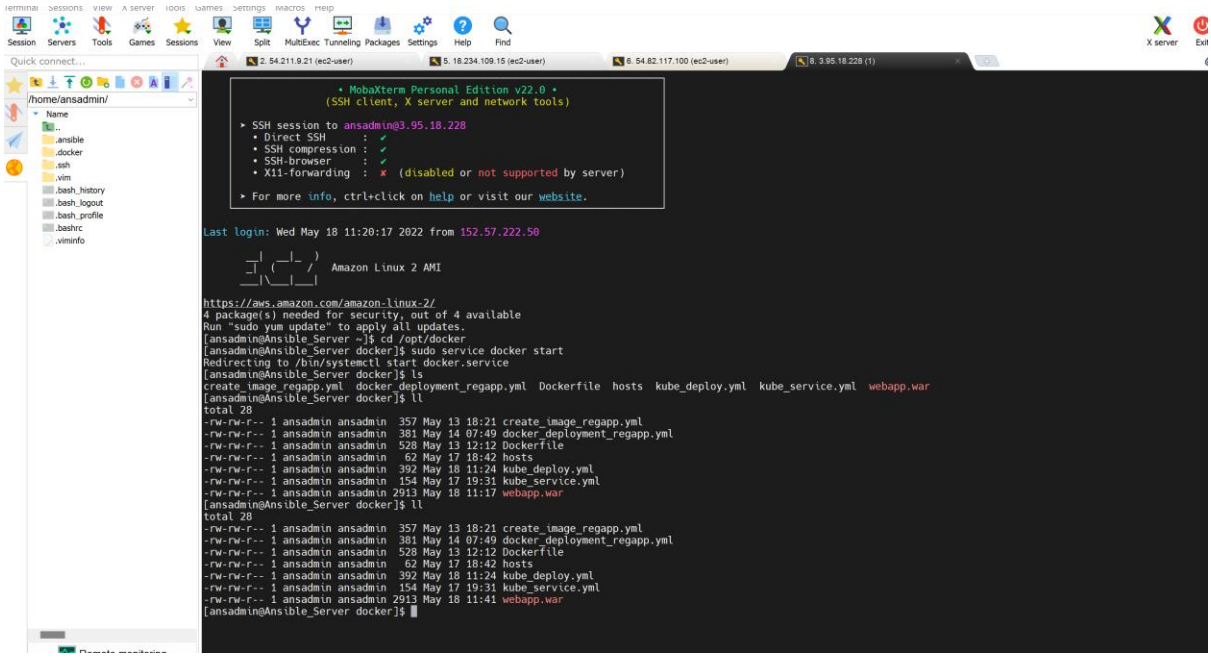


Fig. Ansible Server Webapp.war time change after success

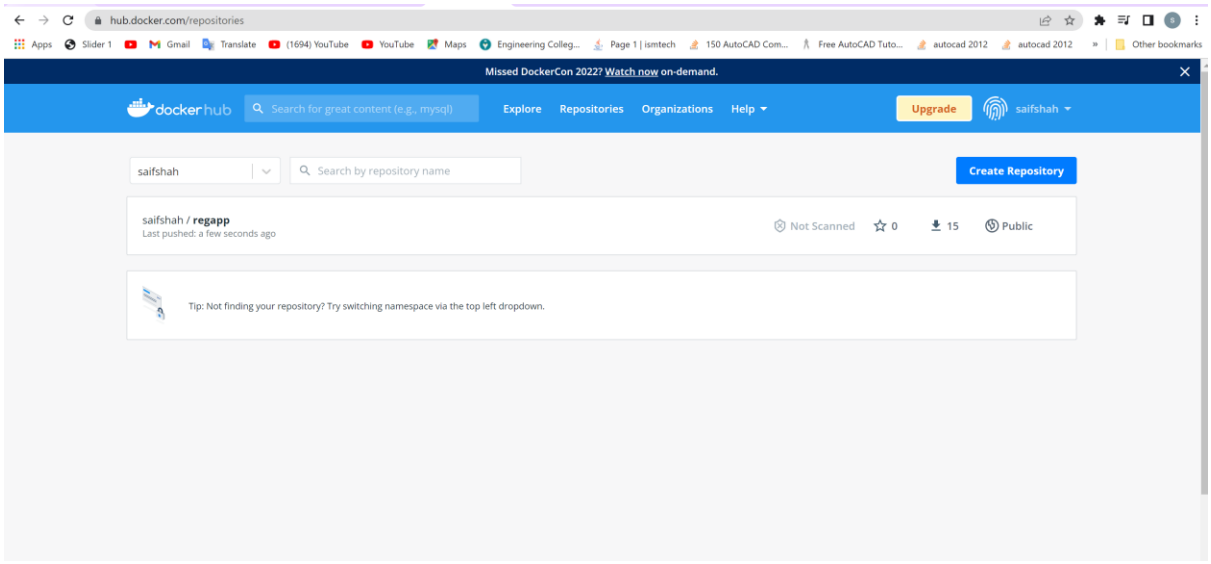


Fig. Docker latest Image

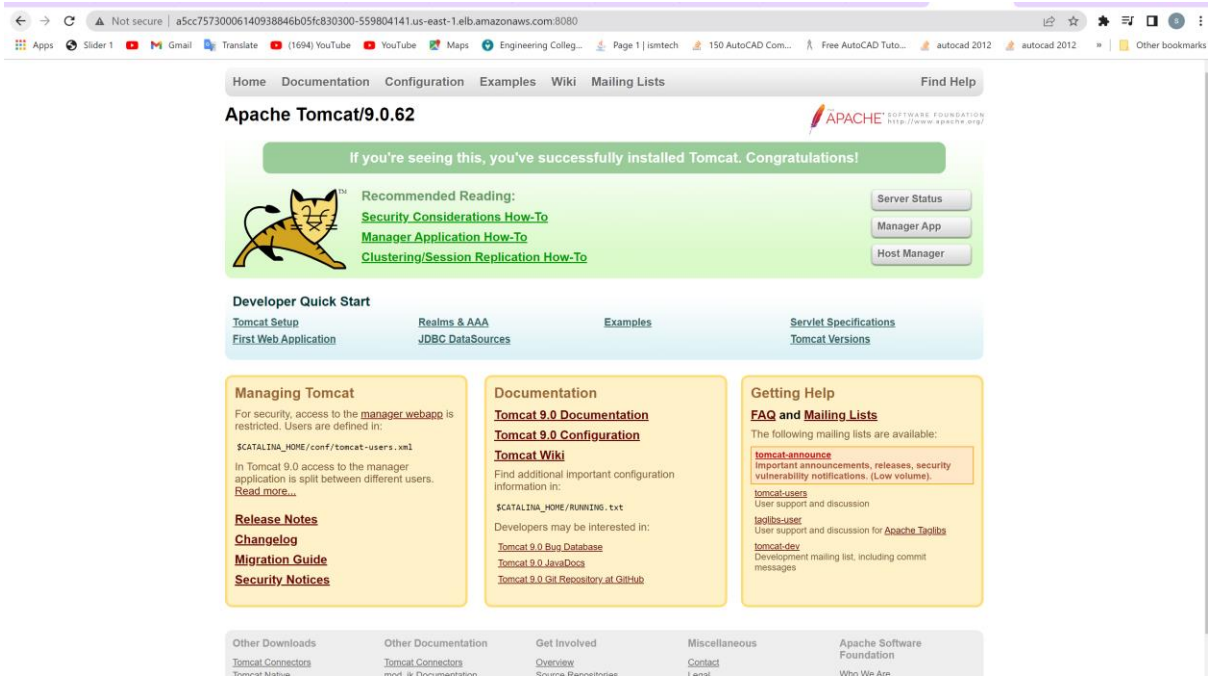


Fig. Access to load balancer on port 8080

Cleaning Setup:

[**root@EKS_Bootstrap_Server ~]# kubectl delete deployment.apps/saifshah-regapp**

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

deployment.apps "saifshah-regapp" deleted

[root@EKS_Bootstrap_Server ~]# kubectl delete service/saifshah-service

Kubeconfig user entry is using deprecated API version client.authentication.k8s.io/v1alpha1. Run 'aws eks update-kubeconfig' to update.

service "saifshah-service" deleted

[root@EKS_Bootstrap_Server ~]#

Deleting Cluster:

eksctl delete cluster saifshah --region us-east-1

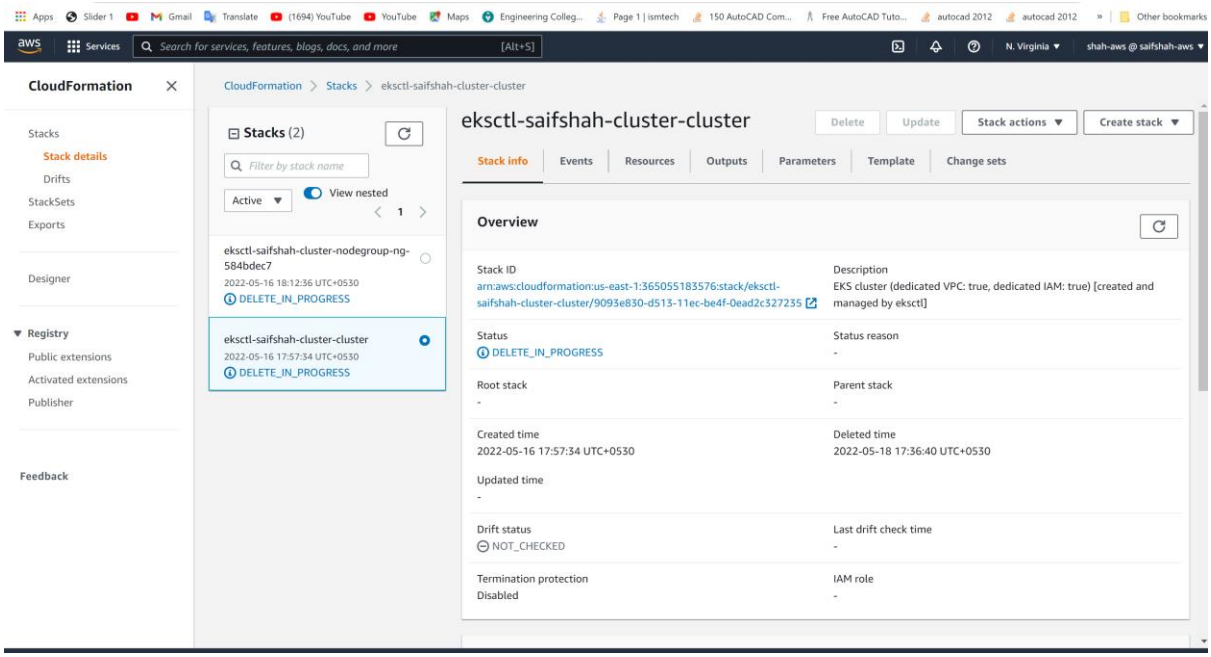


Fig . Cluster Deleted

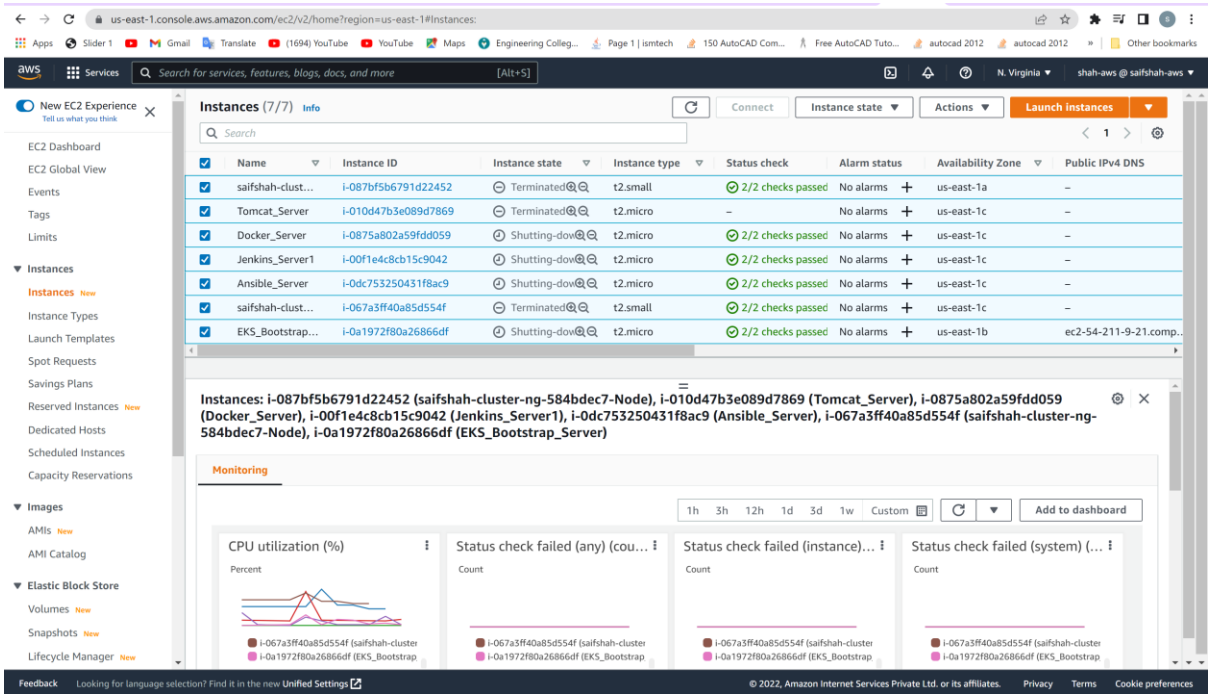


Fig. Terminates all Instances

Other Courses:

Complete DevOps Course:

Ansible For DevOps Beginners And System Admins:

Git and GitHub For DevOps Engineers:

Linux For DevOps Engineers: