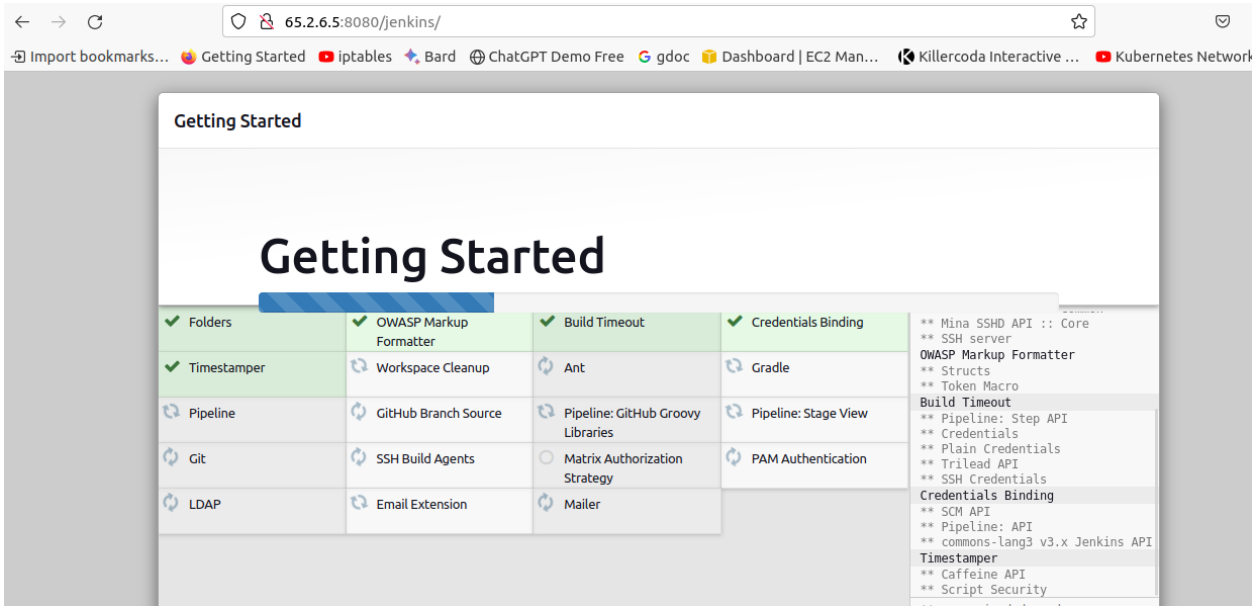
Ci-cd-git-jenkins-nexus-sonarqube-mvn-ansible

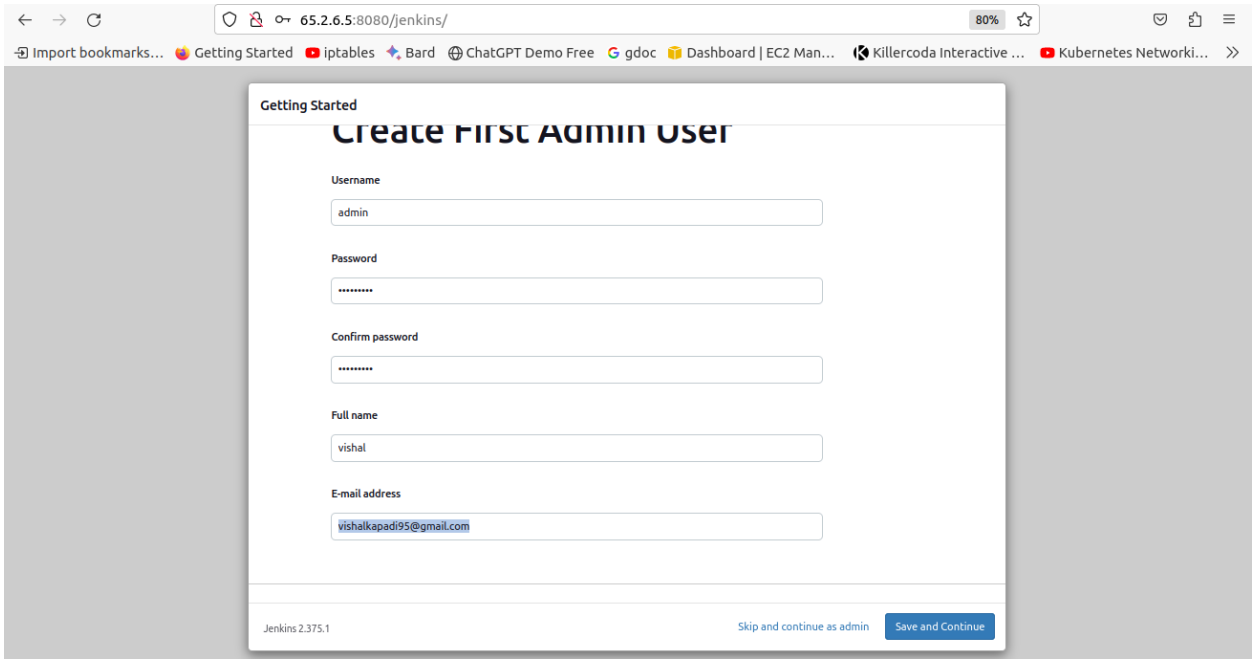
t.me/vishalk17 github.com/vishalk17

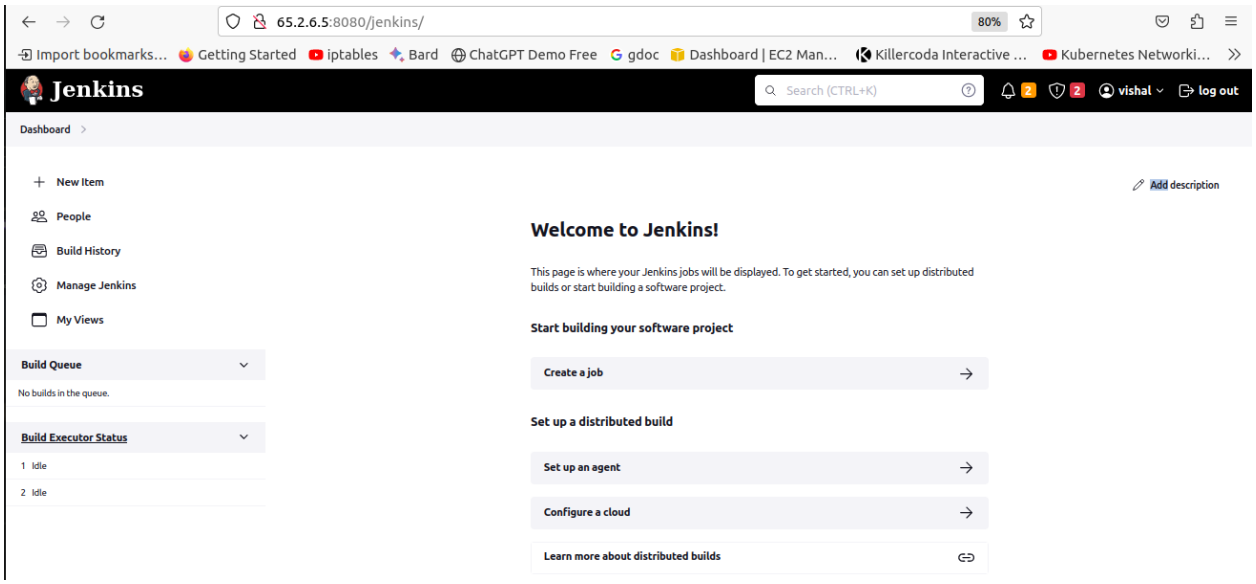
Jenkins installation: using amz linux 2022

```
cd /mnt

yum install tomcat-native.x86_64 -y
amazon-linux-extras install java-openjdk11 -y

mkdir tools
cd tools
wget https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.73/bin/apache-tomcat-9.0.73.zip
unzip apache*tomcat*.zip

cd apache-tomcat-9.*/
cd webapps
wget https://get.jenkins.io/war-stable/2.375.1/jenkins.war

cd ../bin
chmod +x *.sh

## start jenkins or not ##
read  -p "Start Jenkins? (yes/no) " answer

if [ "$answer" == "yes" ]
then
        bash "startup.sh"
        sleep 3
        echo "Started Jenkins successfully."
else
        echo "Start Jenkins manually later on."
fi
#
```

- Access jenkins from url http://public-ip:8080/jenkins/
  In my case it is http://13.233.38.126:8080/jenkins/


65.2.6.5:8080/jenkins/
Import bookmarks...
Getting Started
iptables
Bard
ChatGPT Demo Free
gdoc
Dashboard | EC2 Man...
Killercoda Interactive ...
Kubernetes Network
Getting Started
Getting Started
Folders
OWASP Markup Formatter
Build Timeout
Credentials Binding
Timestamper
Workspace Cleanup
Ant
Gradle
Pipeline
GitHub Branch Source
Pipeline: GitHub Groovy Libraries
Pipeline: Stage View
Git
SSH Build Agents
Matrix Authorization Strategy
PAM Authentication
LDAP
Email Extension
Mailer
** Mina SSHD API :: Core
** SSH server
OWASP Markup Formatter
** Structs
** Token Macro
Build Timeout
** Pipeline: Step API
** Credentials
** Plain Credentials
** Trilead API
** SSH Credentials
Credentials Binding
** SCM API
** Pipeline: API
** commons-lang3 v3.x Jenkins API
Timestamper
** Caffeine API
** Script Security


65.2.6.5:8080/jenkins/
80%
Import bookmarks...
Getting Started
iptables
Bard
ChatGPT Demo Free
gdoc
Dashboard | EC2 Man...
Killercoda Interactive ...
Kubernetes Networki...
Getting Started
Create First Admin User
Username
admin
Password
Confirm password
Full name
vishal
E-mail address
vishalkapadi95@gmail.com
Jenkins 2.375.1
Skip and continue as admin
Save and Continue



Installing apache-maven

```
mkdir -p /mnt/tools
cd /mnt/tools
wget https://dlcdn.apache.org/maven/maven-3/3.9.3/binaries/apache-maven-3.9.3-bin.zip
unzip apache-maven-*.zip

# Add Maven to PATH
echo 'export PATH="/mnt/tools/apache-maven-3.9.3/bin:$PATH"' >> ~/.bash_profile
source ~/.bash_profile

echo " Maven installation completed"
```

Installing sonar-scanner :

```
# Update package manager
sudo yum update -y

# Install OpenJDK 11
sudo amazon-linux-extras install java-openjdk11 -y

# Create tools directory
sudo mkdir -p /mnt/tools

# Download SonarScanner
wget -P /mnt/tools
https://binaries.sonarsource.com/Distribution/sonar-scanner-cli/sonar-scanner-cli-4.6.2.2472-linux
.zip

cd  /mnt/tools/
unzip  sonar-scanner-cli-*



cd sonar-scanner-cli-*

# Add SonarScanner to PATH
echo 'export PATH="/mnt/tools/sonar-scanner-4.6.2.2472-linux/bin:$PATH"' >> ~/.bash_profile
source ~/.bash_profile
```

Sonarqube Installation :

- Let we use container for it

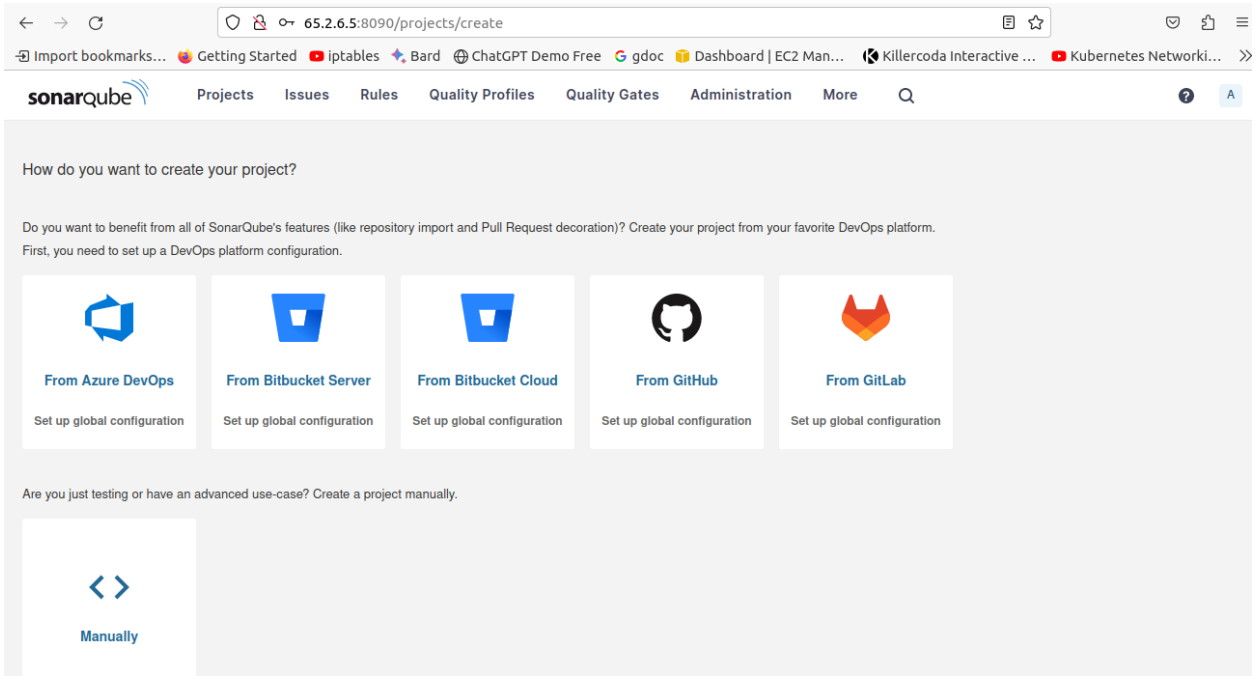
vi docker-compose.yml :

```
version: '3'
services:
  sonarqube:
    image: sonarqube
    ports:
      - 8090:9000
    networks:
      - sonarnet
    environment:
      - SONARQUBE_JDBC_URL=jdbc:h2:tcp://sonarqube-db:9092/sonar
      - SONARQUBE_JDBC_USERNAME=sonar
      - SONARQUBE_JDBC_PASSWORD=sonar
    volumes:
      - sonarqube_data:/opt/sonarqube/data
      - sonarqube_extensions:/opt/sonarqube/extensions
      - sonarqube_logs:/opt/sonarqube/logs

networks:
  sonarnet:

volumes:
  sonarqube_data:
  sonarqube_extensions:
  sonarqube_logs:
```

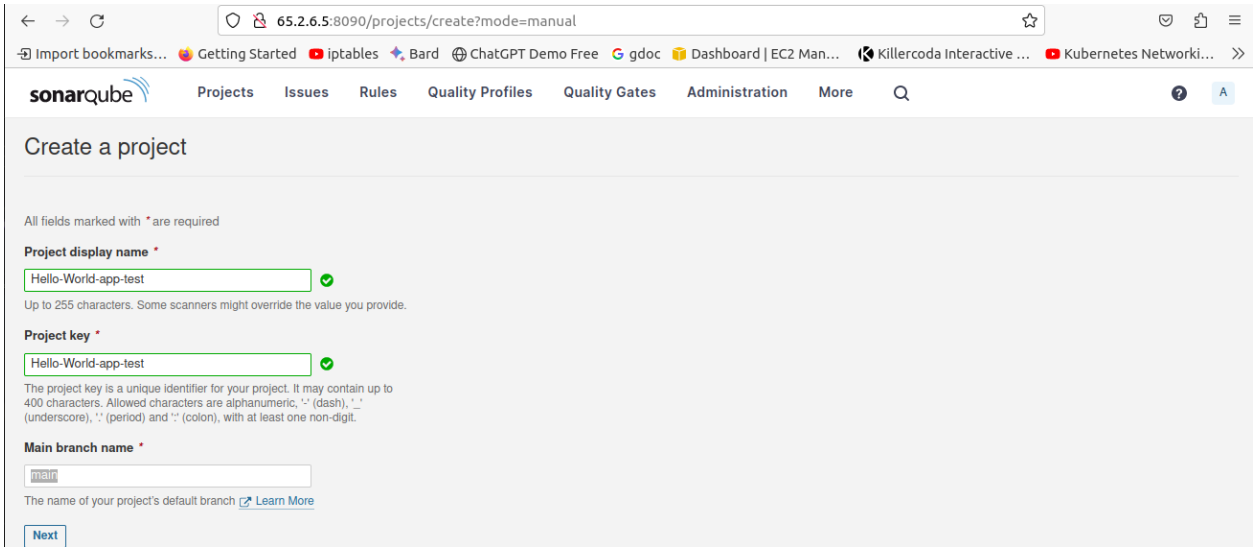
Access SonarQube Web UI: Open a web browser and navigate to `http://public-ip:9000`. This will bring up the SonarQube Web UI.

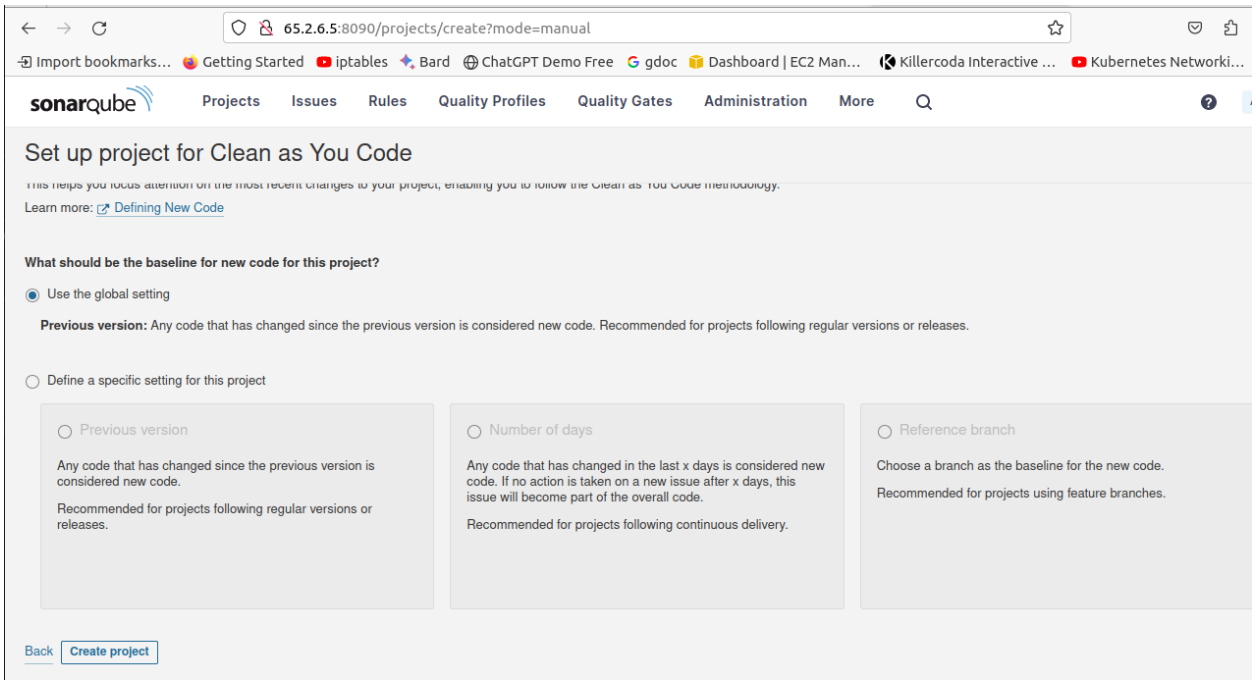
In my case , as per my Dockercompose file it is http://13.233.38.126:8090

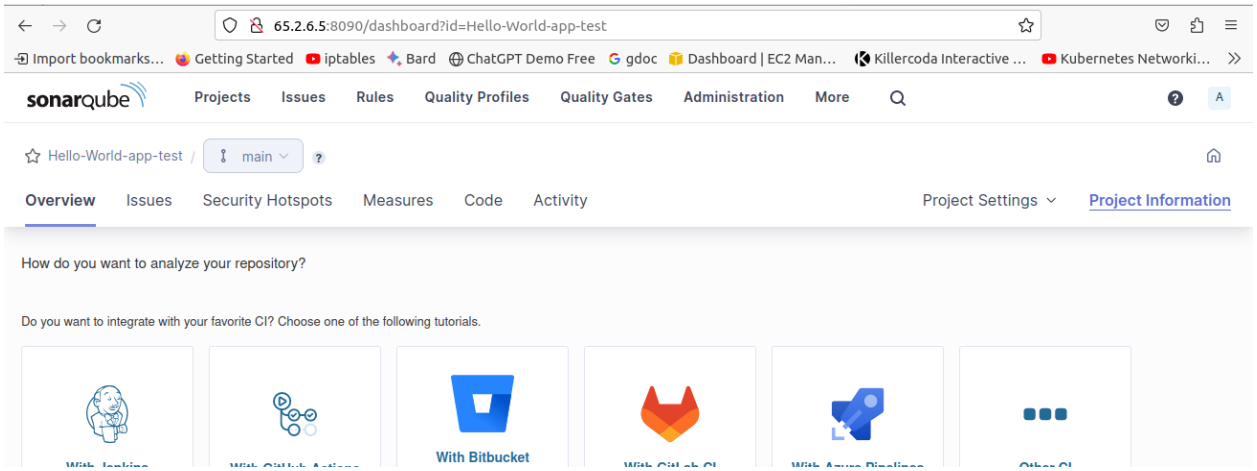
- Log in to SonarQube: Use the default credentials to log in. The default username is "admin" and the default password is "admin". You will be prompted to change the password after the first login.



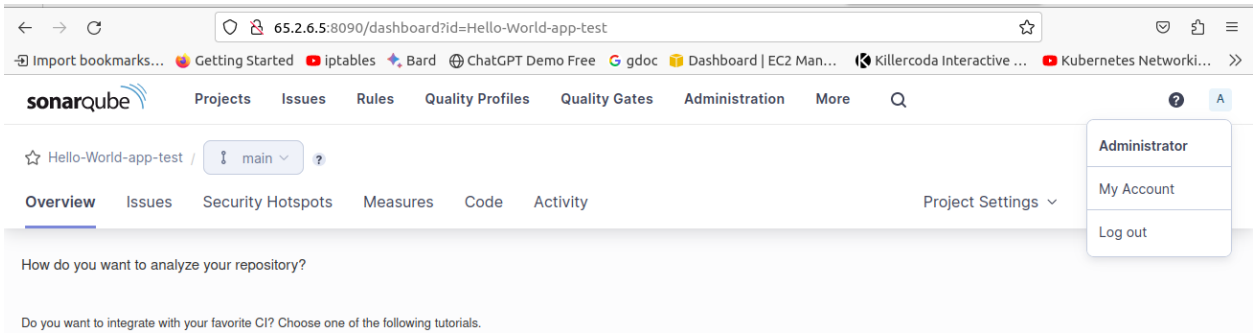
- Create a new project: Once logged in, click on the " manually Create new project" button on the SonarQube Web UI. Provide a unique project key, name, and display name for your project.

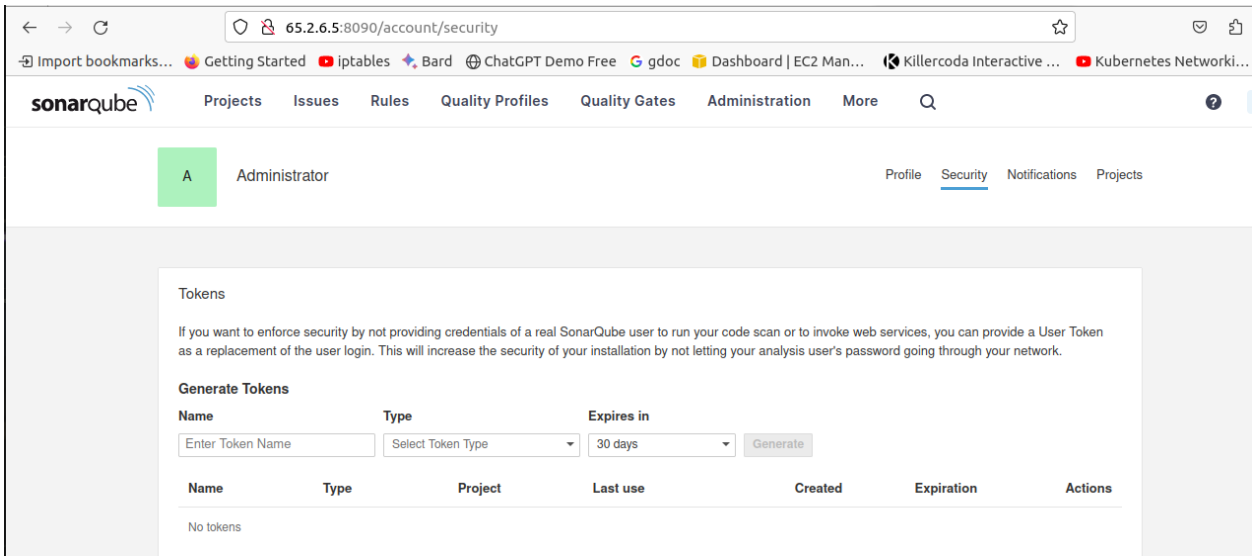


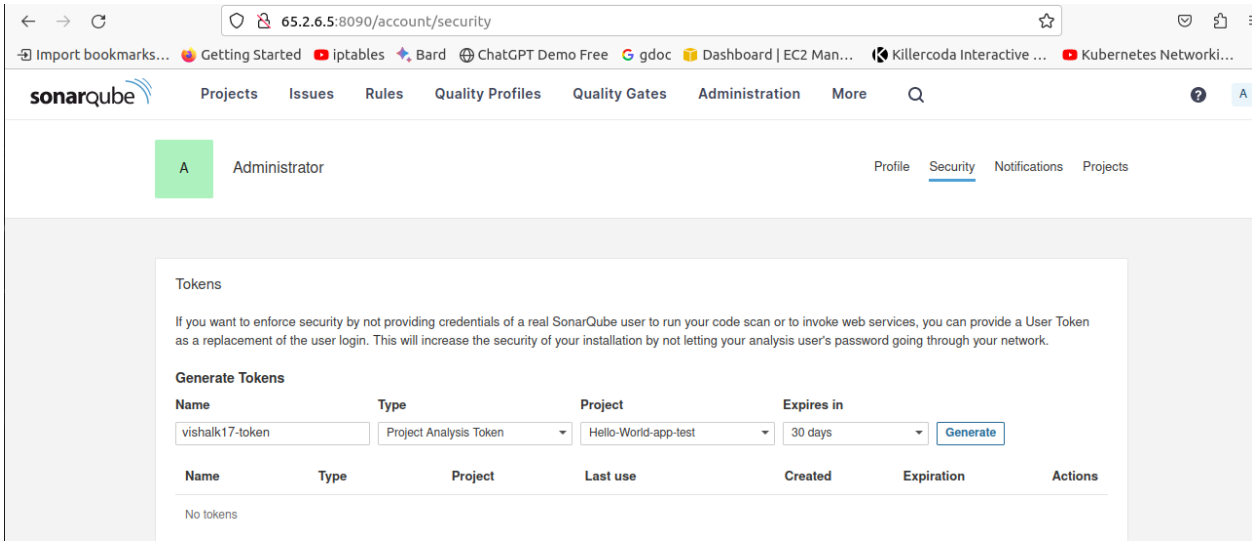


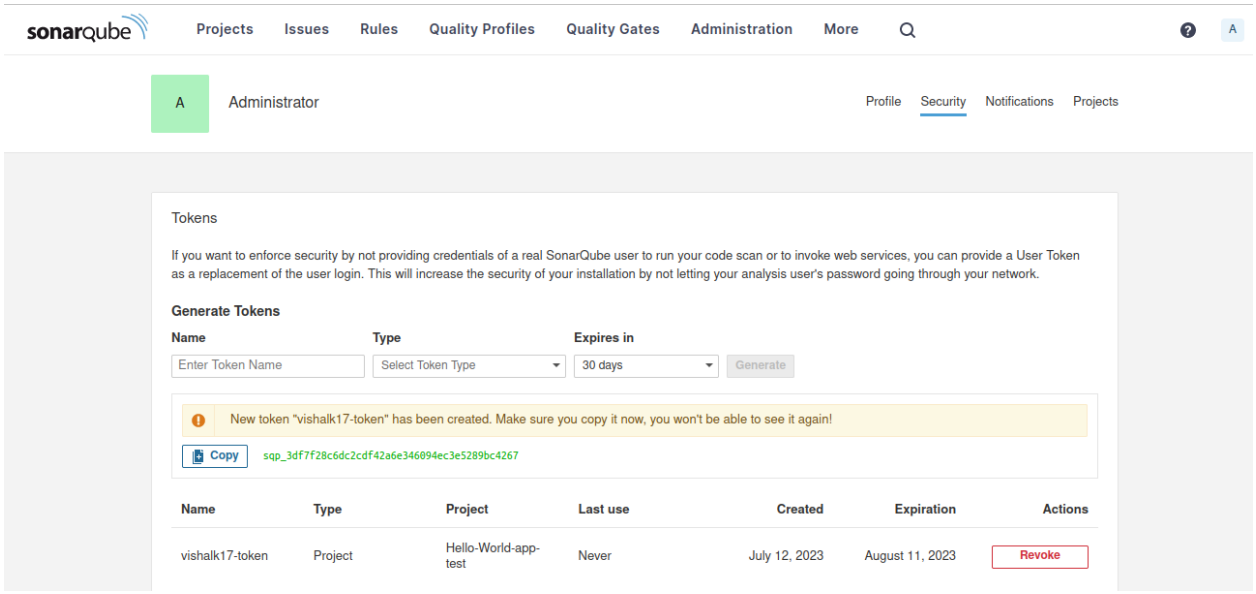


- Generate an authentication token: Go to "My Account" -> "Security" -> "Tokens" and generate a new authentication token. Make sure to copy the generated token as you will need it later for the analysis.




65.2.6.5:8090/account/security
Import bookmarks... Getting Started iptables Bard ChatGPT Demo Free gdoc Dashboard | EC2 Man... Killercoda Interactive ... Kubernetes Networki...
sonarqube
Projects Issues Rules Quality Profiles Quality Gates Administration More
A Administrator
Profile Security Notifications Projects
Tokens
If you want to enforce security by not providing credentials of a real SonarQube user to run your code scan or to invoke web services, you can provide a User Token as a replacement of the user login. This will increase the security of your installation by not letting your analysis user's password going through your network.
Generate Tokens
Name Type Expires in
Enter Token Name
Select Token Type
30 days
Generate
Name Type Project Last use Created Expiration Actions
No tokens


65.2.6.5:8090/account/security
Import bookmarks... Getting Started iptables Bard ChatGPT Demo Free gdoc Dashboard | EC2 Man... Killercoda Interactive ... Kubernetes Networki...
sonarqube
Projects Issues Rules Quality Profiles Quality Gates Administration More
A Administrator
Profile Security Notifications Projects
Tokens
If you want to enforce security by not providing credentials of a real SonarQube user to run your code scan or to invoke web services, you can provide a User Token as a replacement of the user login. This will increase the security of your installation by not letting your analysis user's password going through your network.
Generate Tokens
Name Type Project Expires in
vishalk17-token
Project Analysis Token
Hello-World-app-test
30 days
Generate
Name Type Project Last use Created Expiration Actions
No tokens


sonarqube
Projects Issues Rules Quality Profiles Quality Gates Administration More
A Administrator
Profile Security Notifications Projects
Tokens
If you want to enforce security by not providing credentials of a real SonarQube user to run your code scan or to invoke web services, you can provide a User Token as a replacement of the user login. This will increase the security of your installation by not letting your analysis user's password going through your network.
Generate Tokens
Name Type Expires in
Enter Token Name
Select Token Type
30 days
Generate
New token "vishalk17-token" has been created. Make sure you copy it now, you won't be able to see it again!
Copy
sqp_3df7f28c6dc2cdf42a6e346094ec3e5289bc4267
Name Type Project Last use Created Expiration Actions
vishalk17-token Project Hello-World-app-test Never July 12, 2023 August 11, 2023 Revoke

- Generated token is : sqp_3df7f28c6dc2cdf42a6e346094ec3e5289bc4267

Lets test and do the sonarqube analysis on github project I have created, So that we can integrated with jenkins to do ci cd later on

What we have:

Sonarqube url as per container created: http://13.233.38.126:8090
Project key from sornarqube : Hello-World-app-test
Auth token: sqp_3df7f28c6dc2cdf42a6e346094ec3e5289bc4267

- Clone git url to the location

Git url : https://github.com/vishalk17/sample-hello-world-maven-project

```
8. master-amz-lnx
[root@ip-172-31-8-207 sample]#
[root@ip-172-31-8-207 sample]# git clone https://github.com/vishalk17/sample-hello-world-maven-project hello-world
Cloning into 'hello-world'...
remote: Enumerating objects: 18, done.
remote: Counting objects: 100% (18/18), done.
remote: Compressing objects: 100% (10/10), done.
remote: Total 18 (delta 2), reused 18 (delta 2), pack-reused 0
Receiving objects: 100% (18/18), done.
Resolving deltas: 100% (2/2), done.
[root@ip-172-31-8-207 sample]#
[root@ip-172-31-8-207 sample]# cd hello-world/
[root@ip-172-31-8-207 hello-world]#
[root@ip-172-31-8-207 hello-world]# ls
pom.xml  src
[root@ip-172-31-8-207 hello-world]#
```

- cd hello-world

Note : I have integrated sonarqube properties in pom.xml , so you only need to replace above things there

- Open the pom.xml

```
<properties>
  <maven.compiler.source>1.8</maven.compiler.source>
  <maven.compiler.target>1.8</maven.compiler.target>
  <!-- SonarQube properties -->
  <sonar.host.url>http://localhost:9000</sonar.host.url>
  <sonar.login>YOUR_SONARQUBE_LOGIN_TOKEN</sonar.login>
  <sonar.projectKey>my-webapp</sonar.projectKey>
  <sonar.projectName>My Web App</sonar.projectName>
  <sonar.projectVersion>1.0-SNAPSHOT</sonar.projectVersion>
  <sonar.language>java</sonar.language>
</properties>

<dependencies>
  <dependency>
```

- Replace sonar properties with things we have

```
<properties>
  <maven.compiler.source>1.8</maven.compiler.source>
  <maven.compiler.target>1.8</maven.compiler.target>
  <!-- SonarQube properties -->
  <sonar.host.url>http://localhost:8090</sonar.host.url>
  <sonar.login>sqp_3df7f28c6dc2cdf42a6e346094ec3e5289bc4267</sonar.login>
  <sonar.projectKey>Hello-World-app-test</sonar.projectKey>
  <sonar.projectName>Hello-World-app-test</sonar.projectName>
  <sonar.projectVersion>1.0-SNAPSHOT</sonar.projectVersion>
  <sonar.language>java</sonar.language>
</properties>
```

- Save and exit

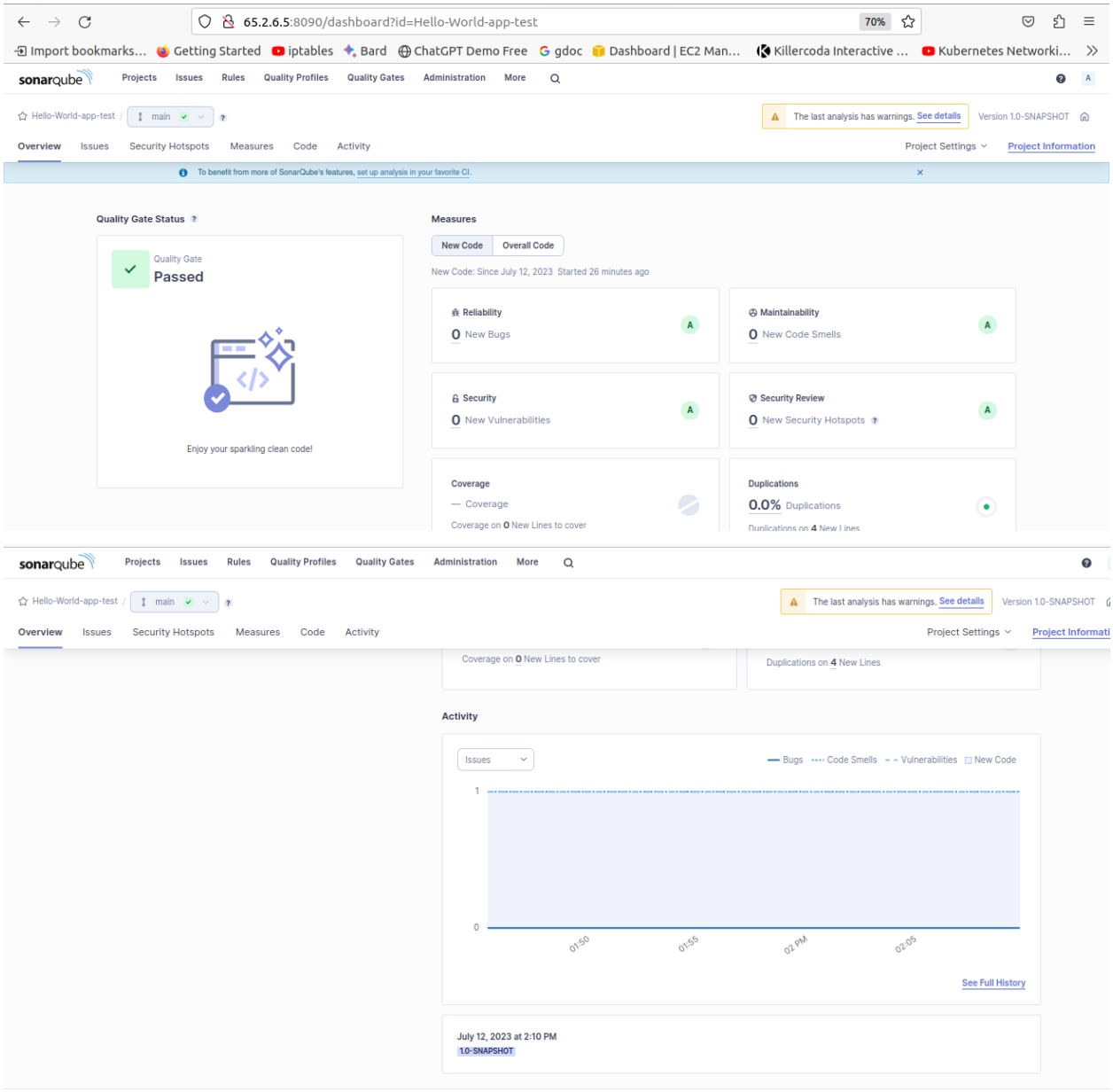
Lets have a analysis

- mvn clean install sonar:sonar

```
8. master-amz-lnx
[root@ip-172-31-8-207 sample]# cp docker-compose.yml ~/
[root@ip-172-31-8-207 sample]# ls
docker-compose.yml
[root@ip-172-31-8-207 sample]# clear
[root@ip-172-31-8-207 sample]#
[root@ip-172-31-8-207 sample]# git clone https://github.com/vishalk17/sample-hello-world-maven-project hello-world
Cloning into 'hello-world'...
remote: Enumerating objects: 18, done.
remote: Counting objects: 100% (18/18), done.
remote: Compressing objects: 100% (10/10), done.
remote: Total 18 (delta 2), reused 18 (delta 2), pack-reused 0
Receiving objects: 100% (18/18), done.
Resolving deltas: 100% (2/2), done.
[root@ip-172-31-8-207 sample]#
[root@ip-172-31-8-207 sample]# cd hello-world/
[root@ip-172-31-8-207 hello-world]#
[root@ip-172-31-8-207 hello-world]# ls
pom.xml  src
[root@ip-172-31-8-207 hello-world]# vi pom.xml
[root@ip-172-31-8-207 hello-world]#
[root@ip-172-31-8-207 hello-world]# mvn clean install sonar:sonar
[INFO] Scanning for projects...
[WARNING] The artifact org.codehaus.mojo:sonar-maven-plugin:jar:3.9.1.2184 has been relocated to org.sonarsource.scanner:sonar-maven-plugin:3.9.1.2184: SonarQube plugin was moved to SonarSource organisation
[INFO]
[INFO] ------------------------< com.example:my-webapp >-------------------------
[INFO] Building my-webapp 1.0-SNAPSHOT
[INFO]   from pom.xml
```

```
[INFO] Sensor Analysis Warnings import [csharp]
[INFO] Sensor Analysis Warnings import [csharp] (done) | time=1ms
[INFO] Sensor Zero Coverage Sensor
[INFO] Sensor Zero Coverage Sensor (done) | time=8ms
[INFO] Sensor Java CPD Block Indexer
[INFO] Sensor Java CPD Block Indexer (done) | time=54ms
[INFO] SCM Publisher SCM provider for this project is: git
[INFO] SCM Publisher 1 source file to be analyzed
[INFO] SCM Publisher 1/1 source file have been analyzed (done) | time=185ms
[INFO] CPD Executor 1 file had no CPD blocks
[INFO] CPD Executor Calculating CPD for 0 files
[INFO] CPD Executor CPD calculation finished (done) | time=1ms
[INFO] Analysis report generated in 81ms, dir size=136.6 kB
[INFO] Analysis report compressed in 17ms, zip size=21.2 kB
[INFO] Analysis report uploaded in 29ms
[INFO] ANALYSIS SUCCESSFUL, you can find the results at: http://65.2.6.5:8090/dashboard?id=Hello-World-app-test
[INFO] Note that you will be able to access the updated dashboard once the server has processed the submitted analysis report
[INFO] More about the report processing at http://65.2.6.5:8090/api/ce/task?id=AYlJQhbLAgc5uBUVweZI
[INFO] Analysis total time: 7.626 s
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  14.357 s
[INFO] Finished at: 2023-07-12T08:40:15Z
[INFO] ------------------------------------------------------------------------
[root@ip-172-31-8-207 hello-world]#
```

Lets have a look on sonarqube dashboard



- **Everything seems ok**

……

After compilation , our final binary file created inside target dir.

```
[root@ip-172-31-8-207 hello-world]# ls
pom.xml  src  target
[root@ip-172-31-8-207 hello-world]# cd target
[root@ip-172-31-8-207 target]# ls
classes  generated-sources  maven-archiver  maven-status  my-webapp-1.0-SNAPSHOT  my-webapp-1.0-SNAPSHOT.war  sonar
[root@ip-172-31-8-207 target]#
```

Setup nexus artifact.

vi docker-compose-nexus.yml

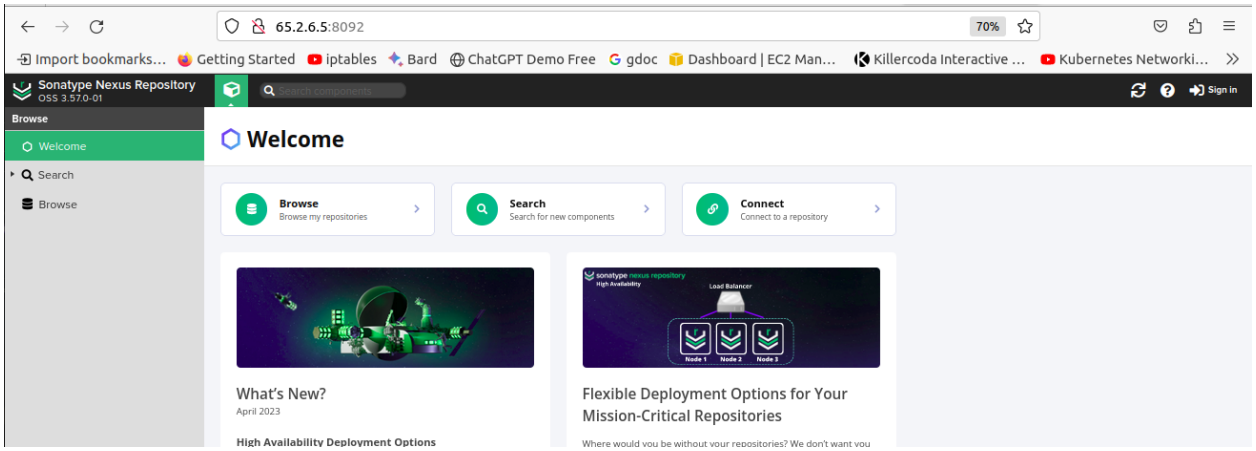
```
version: '3'
services:
  nexus:
    image: sonatype/nexus3:latest
    container_name: nexus-instance
    ports:
      - 8092:8081
    volumes:
      - nexus-data:/nexus-data

volumes:
  nexus-data:
```

docker-compose -f docker-compose-nexus.yml up -d

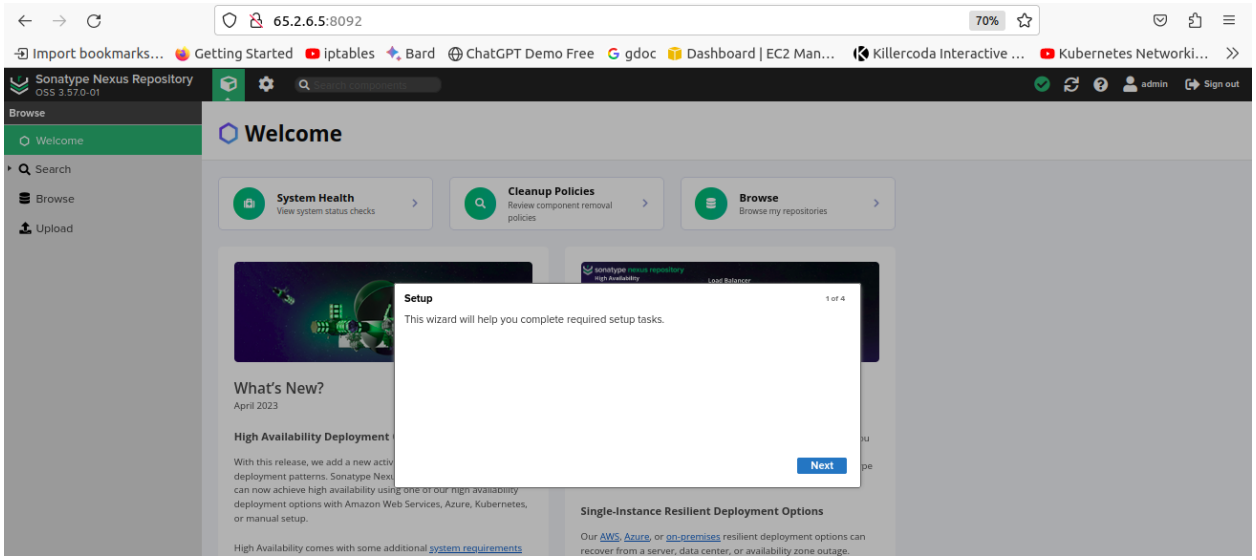
```
8. master-amz-lnx   9. master-amz-lnx
[root@ip-172-31-8-207 nexus]# docker-compose ls
NAME                STATUS              CONFIG FILES
nexus               running(1)          /mnt/sample/nexus/docker-compose-nexus.yml
sample              running(1)          /mnt/sample/docker-compose.yml
[root@ip-172-31-8-207 nexus]# docker ps
CONTAINER ID   IMAGE                    COMMAND                  CREATED          STATUS          PORTS                                                NAMES
7253a4fd5056   sonatype/nexus3:latest   "/opt/sonatype/nexus…"   14 minutes ago   Up 2 minutes    0.0.0.0:8092->8081/tcp, :::8092->8081/tcp            nexus-instance
8e220320c2bf   sonarqube                "/opt/sonarqube/dock…"   3 hours ago      Up 3 hours      0.0.0.0:8090->9000/tcp, :::8090->9000/tcp            sample-sonarqube-1
```

Lets access nexus url

As per docker-compose file my url is : http://13.233.38.126:8092/



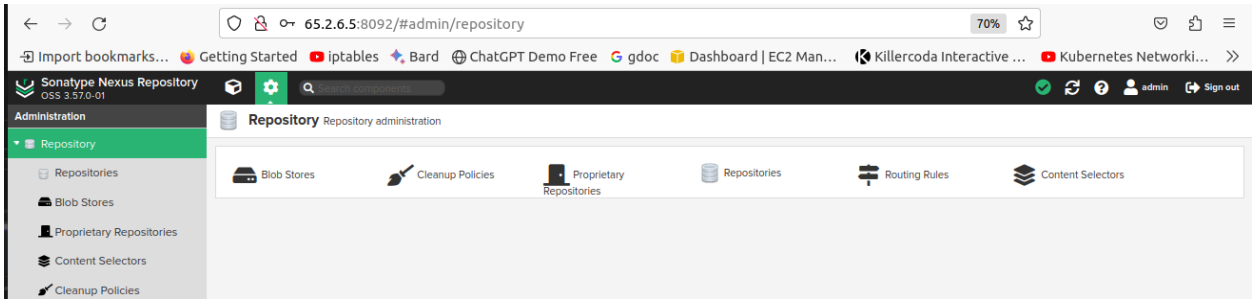
- Click on sign in
- Click username as a admin
- Password you will get from /nexus-data/admin-password
  cat /nexus-data/admin-password

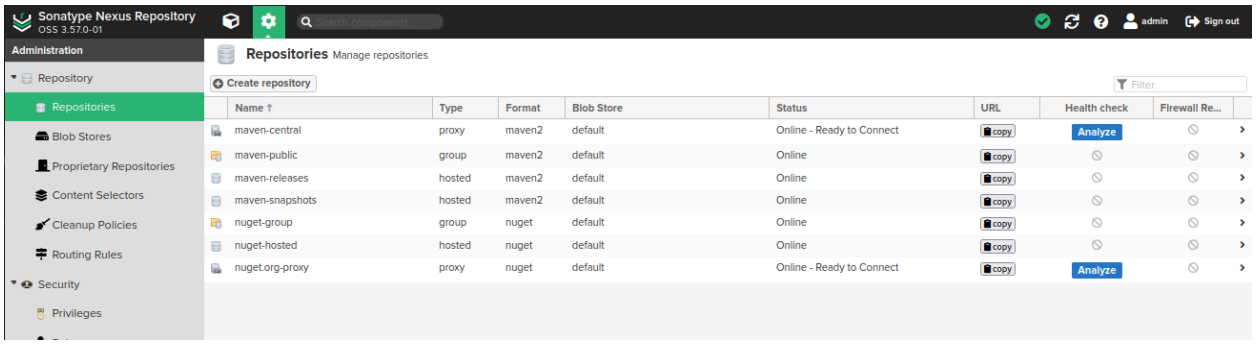


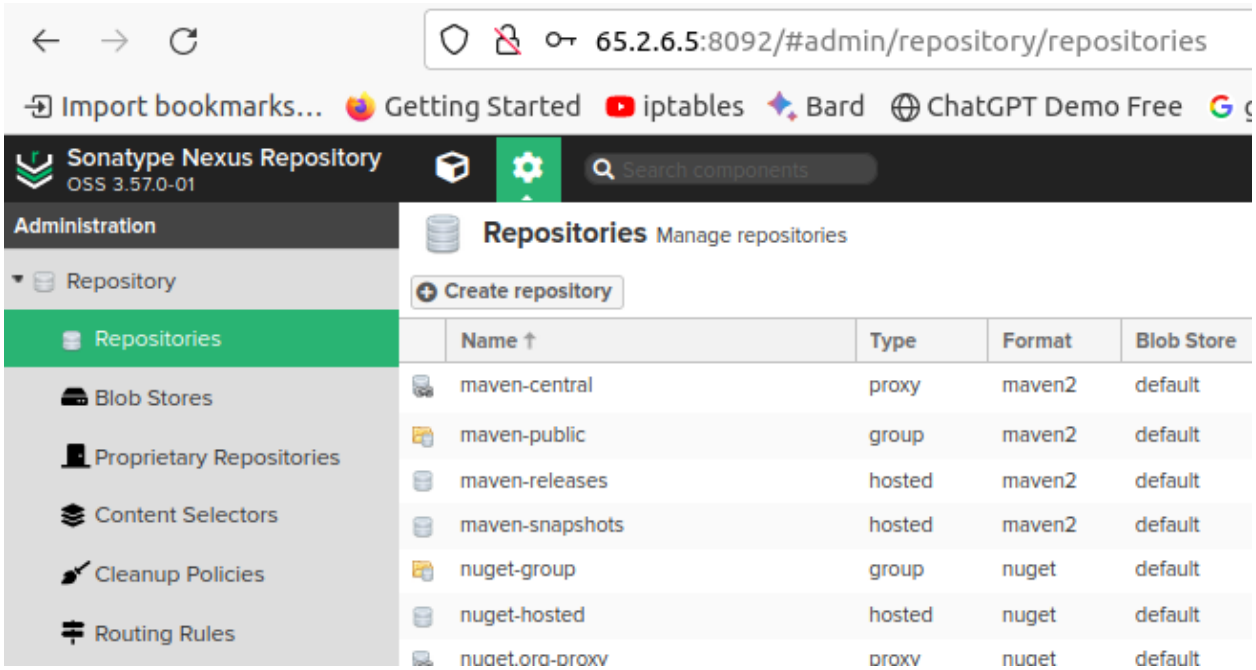
- Setup admin acc

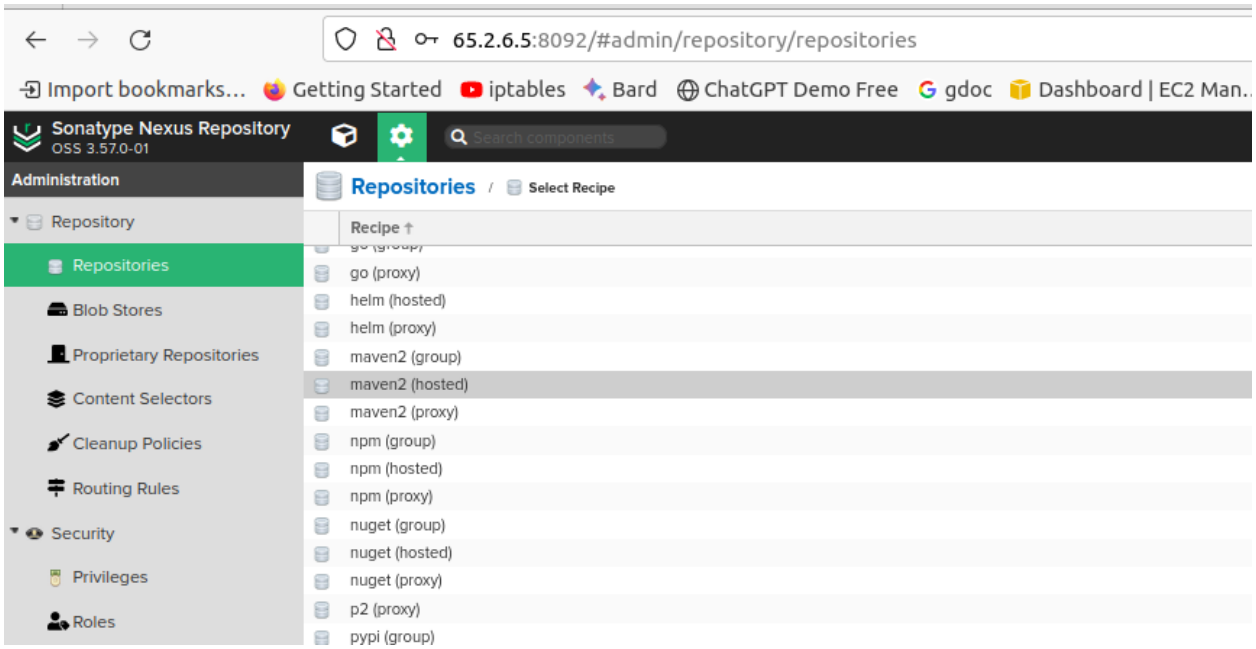
Create a Maven Repository:

- Click on the "Settings" cogwheel icon in the left sidebar.
- Under the "Repositories" section, click on "Repositories".
- Click on the "Create Repository" button.
- Select "Maven2 (hosted)" as the recipe.
- Fill in the required information, such as the repository name and storage location.
- Click on the "Create Repository" button to create the Maven repository.

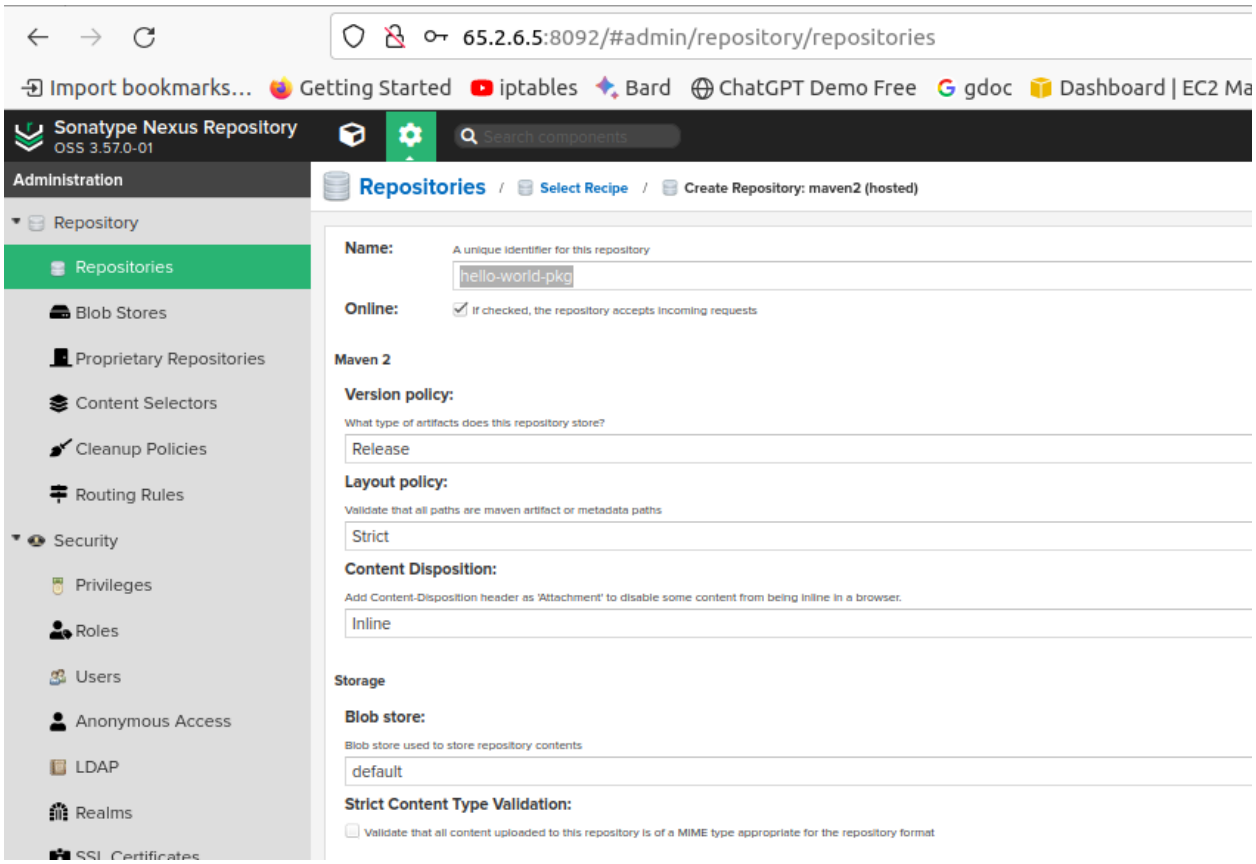


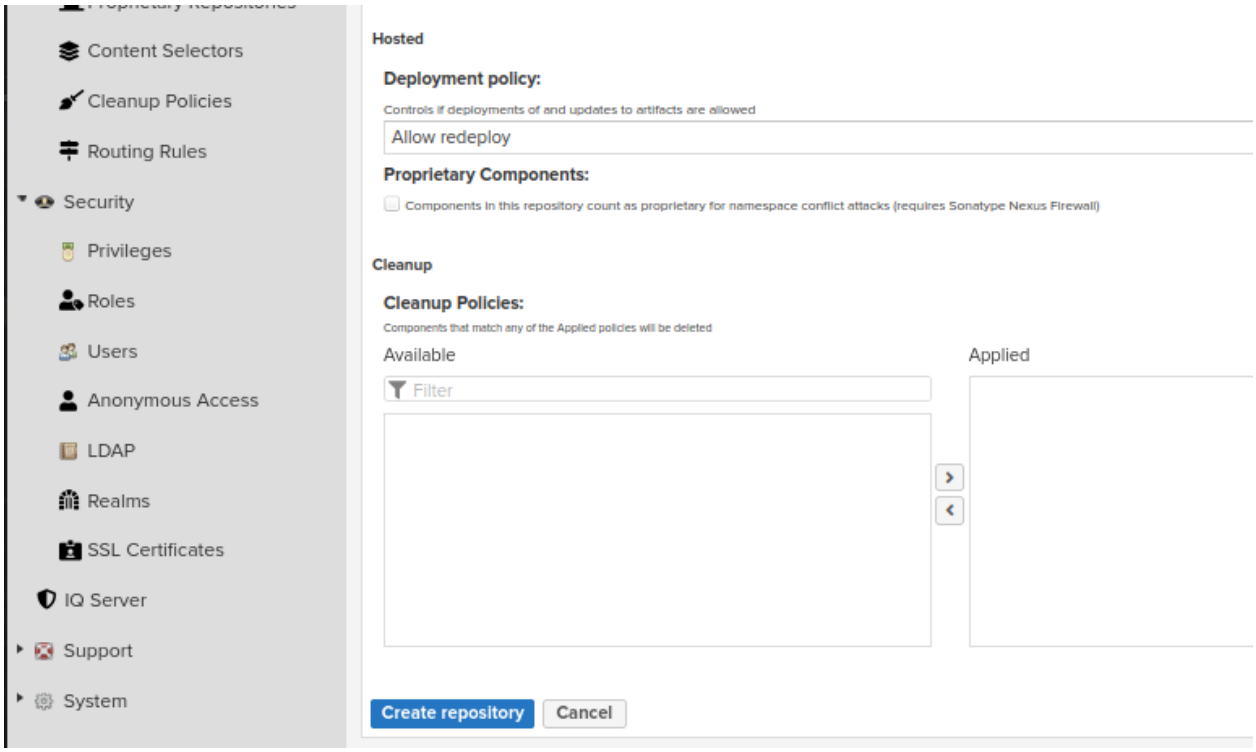




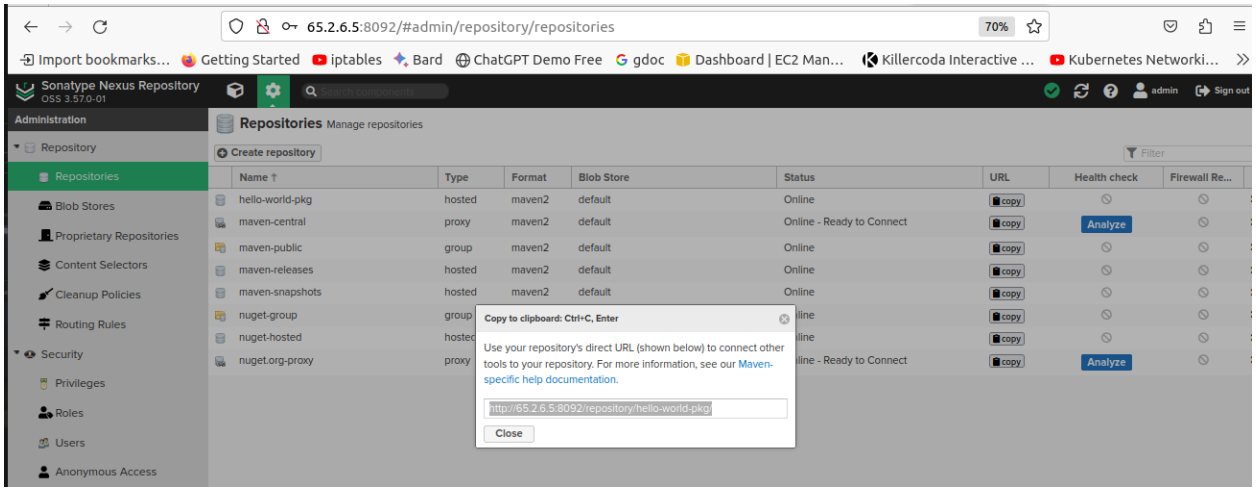


- Give name of the repository: hello-world-pkg

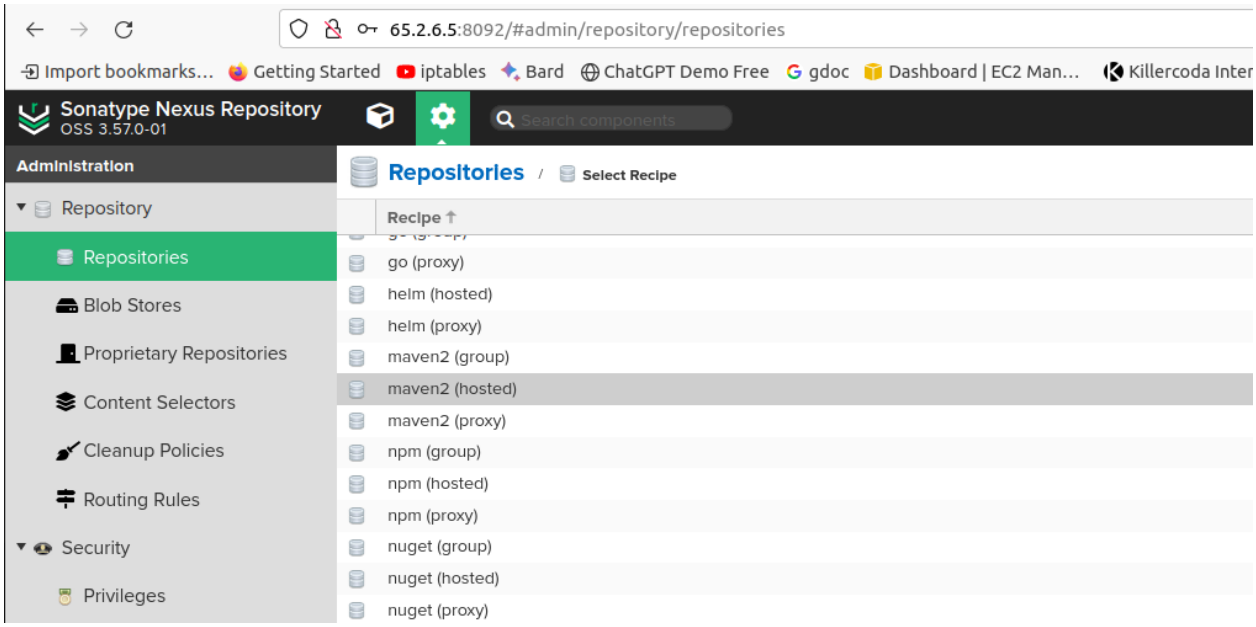




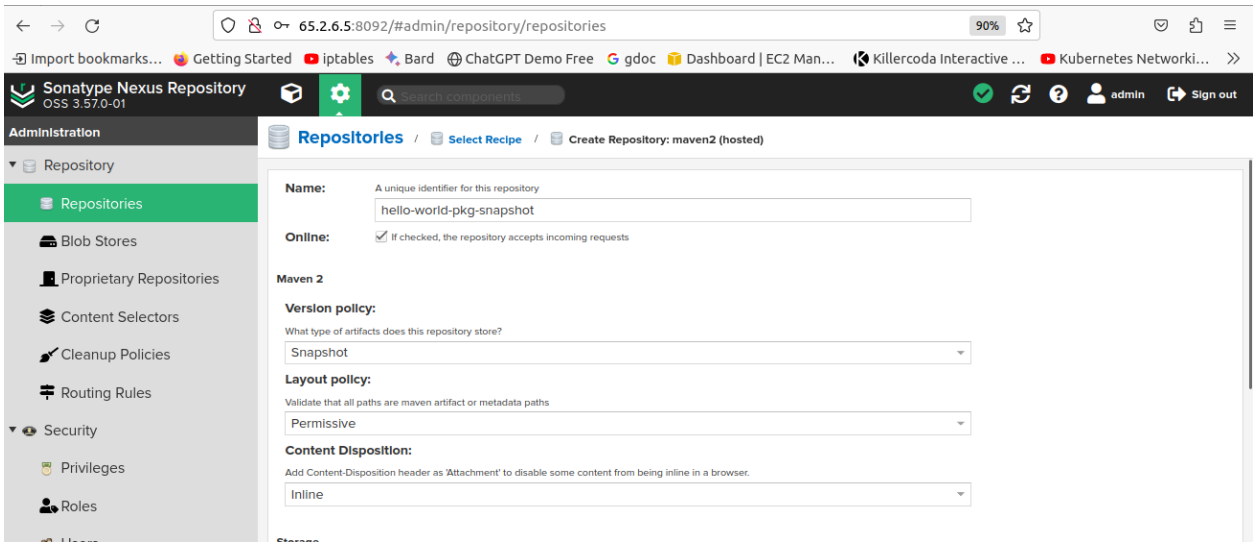
- get url from repository
  In our case it is http://13.233.38.126:8092/repository/hello-world-pkg/

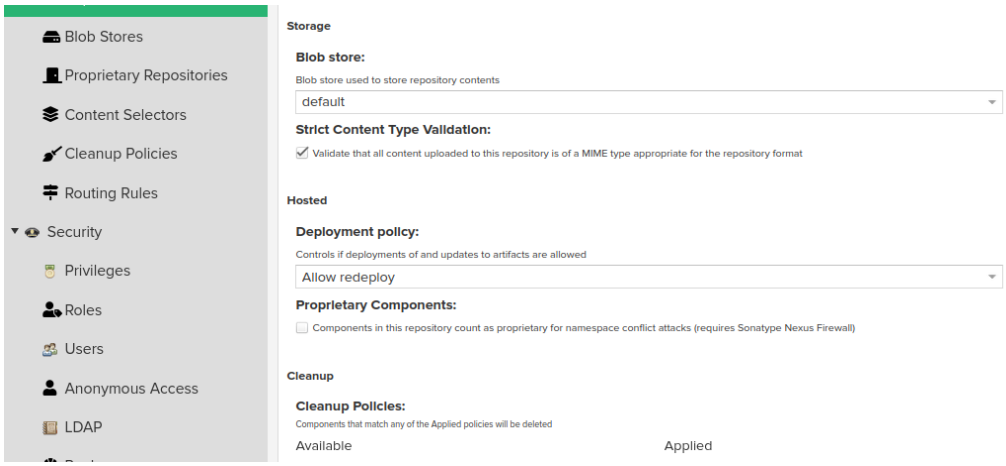


Create another repository for snap releases:



- select maven2 hosted
  Repo name: hello-world-pkg-snapshot
  Version policy : snapshot
  Layout policy : permissive
  Deployment policy : allow redeploy
  Create repo.





Ok now setup nexus integration in pom.xml so that . after build it will upload to the nexus repo.

- I have setup following things:

Nexus username : admin
Nexus password : v17041995
Repo url for releases : http://13.233.38.126:8092/repository/hello-world-pkg/
Repo url for snapshot : http://13.233.38.126:8092/repository/hello-world-pkg/

Add following things in pom.xml

```
<distributionManagement>

  <repository>
    <id>nexus-releases</id>
    <url>http://13.233.38.126:8092/repository/hello-world-pkg/</url>
  </repository>

  <snapshotRepository>
    <id>nexus-snapshots</id>
    <url>http://13.233.38.126:8092/repository/hello-world-pkg-snapshot/</url>
  </snapshotRepository>

</distributionManagement>
```

```
<distributionManagement>

  <repository>
    <id>nexus-releases</id>
    <url>http://65.2.6.5:8092/repository/hello-world-pkg/</url>
  </repository>

  <snapshotRepository>
    <id>nexus-snapshots</id>
    <url>http://65.2.6.5:8092/repository/hello-world-pkg-snapshot/</url>
  </snapshotRepository>

</distributionManagement>
```

- Save and exit

We have maven configs in **/mnt/tools/apache*maven*/conf**

- vi settings.xml
  Add following configs ,save,exit

```
<server>
  <id>nexus-releases</id>
  <username>admin</username>
  <password>v17041995</password>
</server>
<server>
  <id>nexus-snapshots</id>
  <username>admin</username>
  <password>v17041995</password>
</server>
```

```
19. master-amz-lnx   17. master-amz-lnx   18. ma
[root@ip-172-31-8-207 apache-maven-3.9.3]# cd conf
[root@ip-172-31-8-207 conf]# ls
logging  settings.xml  toolchains.xml
[root@ip-172-31-8-207 conf]# pwd
/mnt/tools/apache-maven-3.9.3/conf
[root@ip-172-31-8-207 conf]#
[root@ip-172-31-8-207 conf]# vi settings.xml
[root@ip-172-31-8-207 conf]#
```

```
    <!-- Another sample, using keys to authenticate.
    <server>
      <id>siteServer</id>
      <privateKey>/path/to/private/key</privateKey>
      <passphrase>optional; leave empty if not used.</passphrase>
    </server>
    -->

  <server>
    <id>nexus-releases</id>
    <username>admin</username>
    <password>v17041995</password>
  </server>
  <server>
    <id>nexus-snapshots</id>
    <username>admin</username>
    <password>v17041995</password>
  </server>

  </servers>

  <!-- mirrors
```

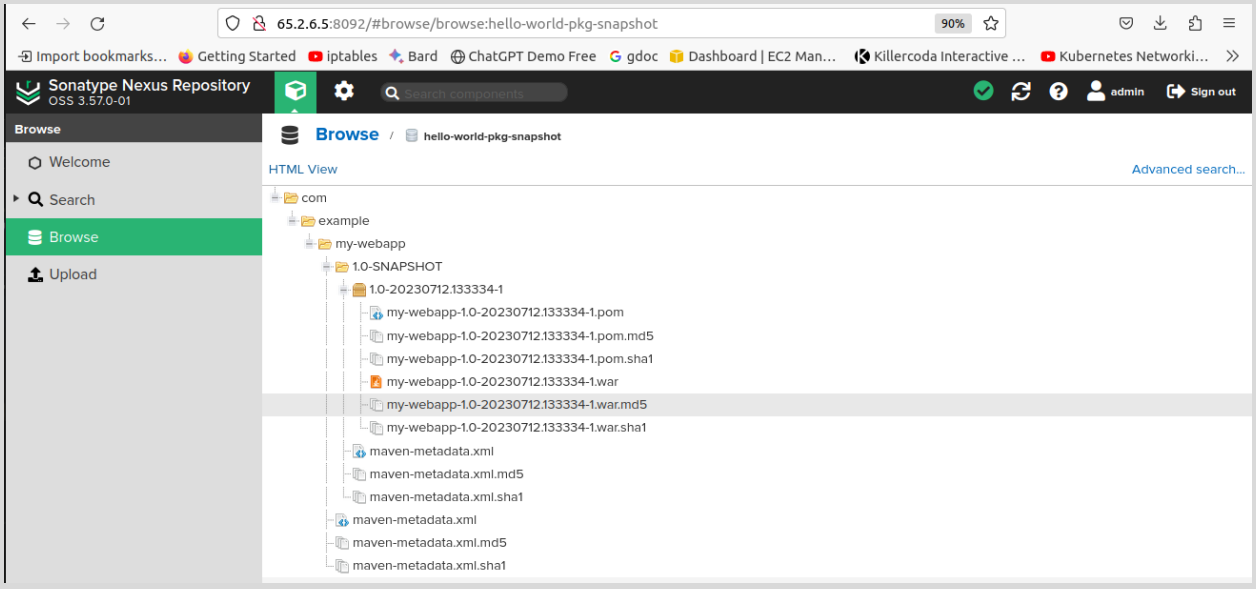
Lets have a test whether build is getting uploaded or not to nexus

mvn deploy

```
INFO]
INFO] --- deploy:3.1.1:deploy (default-deploy) @ my-webapp ---
ownloading from nexus-snapshots: http://65.2.6.5:8092/repository/hello-world-pkg-snapshot/com/example/my-webapp/1.0-SNAPSHOT/
-metadata.xml
ploading to nexus-snapshots: http://65.2.6.5:8092/repository/hello-world-pkg-snapshot/com/example/my-webapp/1.0-SNAPSHOT/my-w
-1.0-20230712.133334-1.pom
ploaded to nexus-snapshots: http://65.2.6.5:8092/repository/hello-world-pkg-snapshot/com/example/my-webapp/1.0-SNAPSHOT/my-we
1.0-20230712.133334-1.pom (1.8 kB at 14 kB/s)
ploading to nexus-snapshots: http://65.2.6.5:8092/repository/hello-world-pkg-snapshot/com/example/my-webapp/1.0-SNAPSHOT/my-w
-1.0-20230712.133334-1.war
ploaded to nexus-snapshots: http://65.2.6.5:8092/repository/hello-world-pkg-snapshot/com/example/my-webapp/1.0-SNAPSHOT/my-we
1.0-20230712.133334-1.war (2.9 kB at 25 kB/s)
ownloading from nexus-snapshots: http://65.2.6.5:8092/repository/hello-world-pkg-snapshot/com/example/my-webapp/maven-metadat

ploading to nexus-snapshots: http://65.2.6.5:8092/repository/hello-world-pkg-snapshot/com/example/my-webapp/1.0-SNAPSHOT/mave
adata.xml
ploaded to nexus-snapshots: http://65.2.6.5:8092/repository/hello-world-pkg-snapshot/com/example/my-webapp/1.0-SNAPSHOT/maven
data.xml (764 B at 15 kB/s)
ploading to nexus-snapshots: http://65.2.6.5:8092/repository/hello-world-pkg-snapshot/com/example/my-webapp/maven-metadata.xm
ploaded to nexus-snapshots: http://65.2.6.5:8092/repository/hello-world-pkg-snapshot/com/example/my-webapp/maven-metadata.xml
 B at 5.8 kB/s)
INFO] ------------------------------------------------------------------------
INFO] BUILD SUCCESS
INFO] ------------------------------------------------------------------------
INFO] Total time:  2.679 s
INFO] Finished at: 2023-07-12T13:33:36Z
INFO] ------------------------------------------------------------------------
```

Got successful , lets have a look on nexus repo

Check nexus url : http://13.233.38.126:8092/#browse/browse:hello-world-pkg-snapshot



—--------- move forward to release instead of snapshot ——-------------------

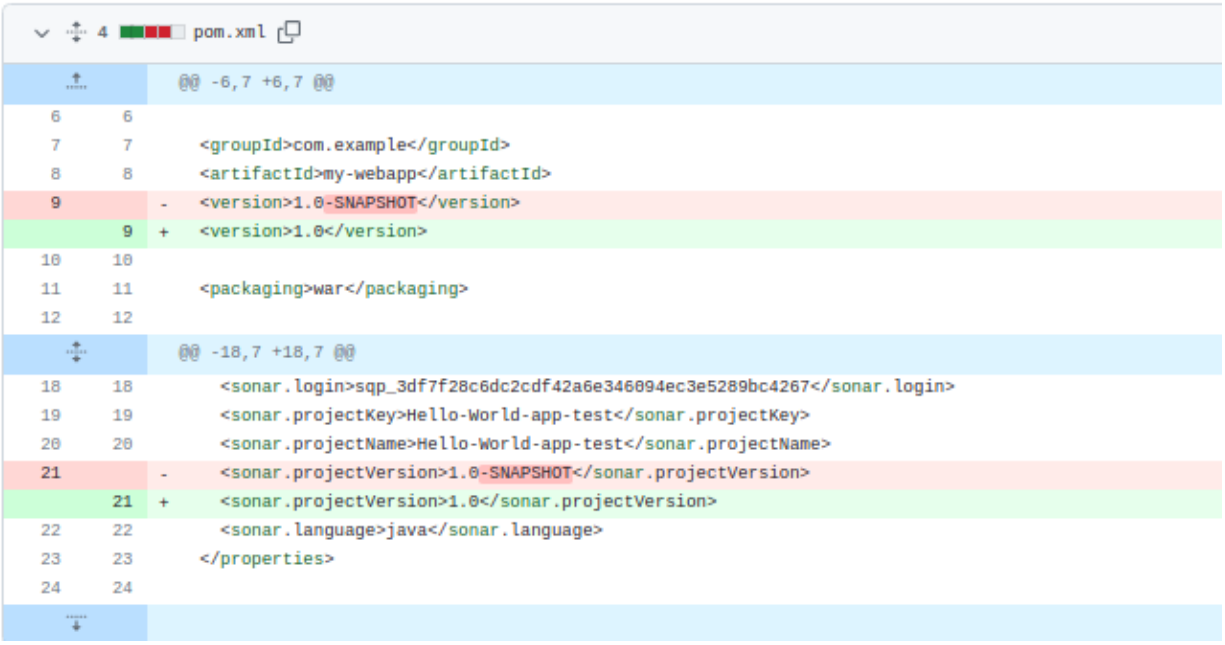
Little bit change in pom.xml to make release version

Why i m doing :

- Not able to get what i expect it from metadata.xml snapshot repo
- I want to run the script that will automatically fetch latest version of war file And download the binary , so that I can later on use it for ci-cd
- With release version , i m getting what I expecting
- I will use shell script to retrieve latest version of war file from metadata.xml

Did following change as you can see in below commit :

- Link : https://github.com/vishalk17/sample-hello-world-maven-project/commit/1b7978937013c923fab17ded4aefecc5f2d0e322



4 pom.xml

```
@@ -6,7 +6,7 @@
      <groupId>com.example</groupId>
      <artifactId>my-webapp</artifactId>
-     <version>1.0-SNAPSHOT</version>
+     <version>1.0</version>

      <packaging>war</packaging>

@@ -18,7 +18,7 @@
        <sonar.login>sqp_3df7f28c6dc2cdf42a6e346094ec3e5289bc4267</sonar.login>
        <sonar.projectKey>Hello-World-app-test</sonar.projectKey>
        <sonar.projectName>Hello-World-app-test</sonar.projectName>
-       <sonar.projectVersion>1.0-SNAPSHOT</sonar.projectVersion>
+       <sonar.projectVersion>1.0</sonar.projectVersion>
        <sonar.language>java</sonar.language>
      </properties>
```

If I again deploy then war will go in relese repo that is
In my case it is : **http://13.233.38.126:8092/repository/hello-world-pkg/**

What if I update release version in pom.xml ?? how it will looks like, lets have a look ,

- Update release version in pom.xml to 1.1 from 1.0
- Link : **https://github.com/vishalk17/sample-hello-world-maven-project/commit/151f5bb145880d58580d1a0ddb3c9d595d4c9e1b**

pom.xml: release 2.0

master

vishalk17 committed 12 minutes ago

Showing **1 changed file** with **2 additions** and **2 deletions**.

4 pom.xml

```
@@ -6,7 +6,7 @@
6  6
7  7     <groupId>com.example</groupId>
8  8     <artifactId>my-webapp</artifactId>
9     -  <version>1.0</version>
   9  +  <version>1.1</version>
10 10
11 11    <packaging>war</packaging>
12 12
@@ -18,7 +18,7 @@
18 18      <sonar.login>sqp_3df7f28c6dc2cdf42a6e346094ec3e5289bc4267</sonar.login>
19 19      <sonar.projectKey>Hello-World-app-test</sonar.projectKey>
20 20      <sonar.projectName>Hello-World-app-test</sonar.projectName>
21    -    <sonar.projectVersion>1.0</sonar.projectVersion>
   21 +    <sonar.projectVersion>1.1</sonar.projectVersion>
22 22      <sonar.language>java</sonar.language>
23 23    </properties>
24 24
```

Lets do maven deploy again :

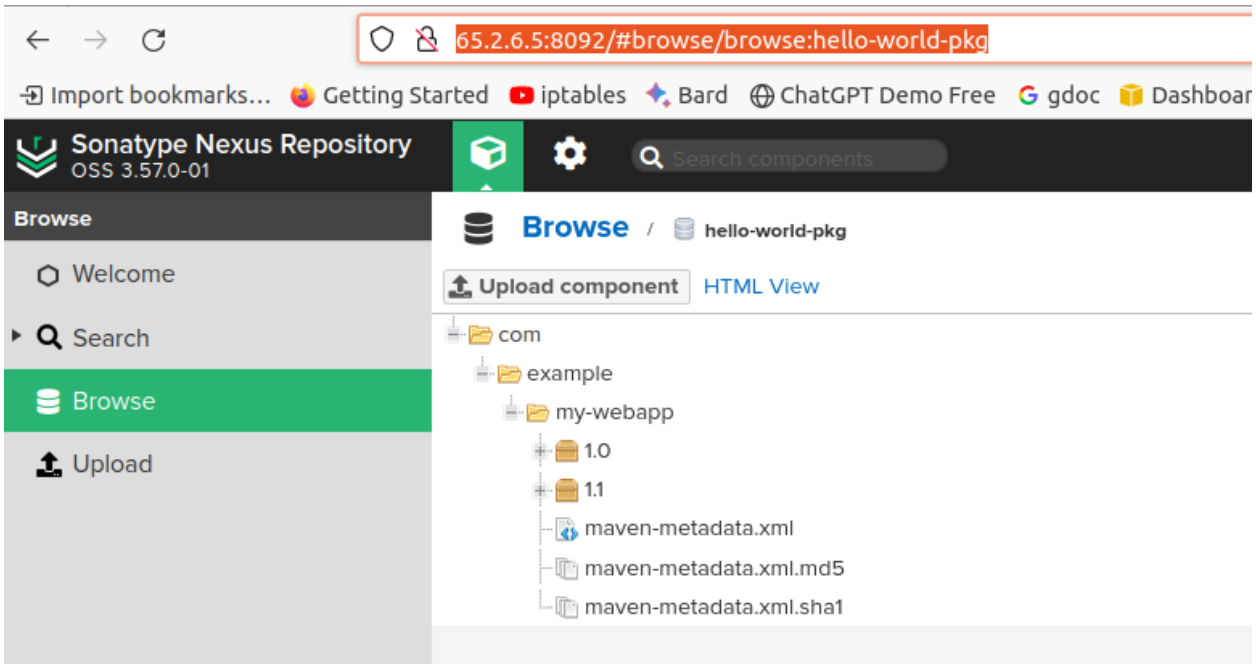
```
mvn deploy
```

```
1.war
[INFO]
[INFO] --- deploy:3.1.1:deploy (default-deploy) @ my-webapp ---
Uploading to nexus-releases: http://65.2.6.5:8092/repository/hello-world-pkg/com/example/my-webapp/1.1/my-webapp-1.1.pom
Uploaded to nexus-releases: http://65.2.6.5:8092/repository/hello-world-pkg/com/example/my-webapp/1.1/my-webapp-1.1.pom (1.8 kB a
t 14 kB/s)
Uploading to nexus-releases: http://65.2.6.5:8092/repository/hello-world-pkg/com/example/my-webapp/1.1/my-webapp-1.1.war
Uploaded to nexus-releases: http://65.2.6.5:8092/repository/hello-world-pkg/com/example/my-webapp/1.1/my-webapp-1.1.war (2.8 kB a
t 41 kB/s)
Downloading from nexus-releases: http://65.2.6.5:8092/repository/hello-world-pkg/com/example/my-webapp/maven-metadata.xml
Downloaded from nexus-releases: http://65.2.6.5:8092/repository/hello-world-pkg/com/example/my-webapp/maven-metadata.xml (296 B a
t 18 kB/s)
Uploading to nexus-releases: http://65.2.6.5:8092/repository/hello-world-pkg/com/example/my-webapp/maven-metadata.xml
Uploaded to nexus-releases: http://65.2.6.5:8092/repository/hello-world-pkg/com/example/my-webapp/maven-metadata.xml (325 B at 7.
4 kB/s)
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  2.428 s
[INFO] Finished at: 2023-07-13T05:07:02Z
[INFO] ------------------------------------------------------------------------
[root@ip-172-31-8-207 hello-world]# ls
```

- Got successful

Lets have a look on nexus repo :

My nexus url : http://13.233.38.126:8092/#browse/browse:hello-world-pkg



- Lets check what inside of maven-metadata.xml


```
-<metadata>
   <groupId>com.example</groupId>
   <artifactId>my-webapp</artifactId>
  -<versioning>
     <release>1.1</release>
    -<versions>
       <version>1.0</version>
       <version>1.1</version>
     </versions>
     <lastUpdated>20230713050700</lastUpdated>
   </versioning>
 </metadata>
```

Make a shell script to retrieve latest version and download latest binary whenever executing the bash script

- get-web-app-latest-war.sh

```
#!/bin/bash

# Define the Nexus URL and the artifact coordinates.
NEXUS_URL="http://13.233.38.126:8092/repository/hello-world-pkg/com/example/my-webapp/maven-metadata.x
ml"
GROUP_ID="com.example"
ARTIFACT_ID="my-webapp"
war_path="http://13.233.38.126:8092/repository/hello-world-pkg/com/example/my-webapp"
# Get the latest version of the artifact.
LATEST_VERSION=$(curl -s "$NEXUS_URL" | grep -oP "(?<=<version>)[^<]*(?=</version>)" | sort -V | tail -1)

# remove any previous war app

sudo rm -rf my-webapp.war

# Download the latest artifact.
curl -o my-webapp.war  "$war_path/$LATEST_VERSION/my-webapp-$LATEST_VERSION.war"
```

Integration of ansible in jenkins :

Requirement

- Ansible setup on both server
- Setup of inventry file
- In jenkins
    - Ansible plugin integration
    - Ansible credentials

- Installation of ansible on both server
- I am using amz linux 2022 on both server

Ip of both servers:

Master server: 13.233.38.126
Slave server : 13.234.110.144

I already have the script, so without wasting time , lets have a look:

You can check here:

https://github.com/vishalk17/devops/blob/main/ansible/general_setup.sh

```
#!/bin/bash

# ****** allow further script only if root user executing the script start*******
if [[ $EUID == 0 ]]
then

    ## install require pkges ##
    amazon-linux-extras install ansible2 -y
    yum install git -y
    sleep 4

    ### add user with password start ###
    # -m : The user's home directory will be created if it does not exist.
    # -p EncryptedPasswordHere : The encrypted password, as returned by crypt().
    # username : Add this user to the Linux system,
    #
    #  useradd -m username
    #
    #  change/set password of ansible user
    #  echo "newuser:newpassword" | chpasswd
    #
    useradd -m ansible
    echo "ansible:ansible" | chpasswd
    #
    ### add user with password End ###

    ### provide ansible as a user root privilege start ####
    #
    echo 'ansible ALL=(ALL)       NOPASSWD: ALL' >> /etc/sudoers
    #
    ### provide ansible as a user root privilege end ####

    ##              edit /etc/ansible/ansible.cfg  start ###
    #               uncomment inventory line to enable hosts file
    #               uncomment sudo_user line
    #               replace lines by sed command
    #               sed -i "s%old_line%new_line%g" /path/to/the/file
    #
    sed -i "s%#inventory      = /etc/ansible/hosts%inventory      = /etc/ansible/hosts%g" /etc/ansible/ansible.cfg
    sed -i "s%#sudo_user      = root%sudo_user      = root%g" /etc/ansible/ansible.cfg
    #
    ##              edit /etc/ansible/ansible.cfg  End ###

    ##              edit /etc/ssh/sshd_config start ###
    #
    #               uncomment PermitRootLogin yes
    #               uncomment PasswordAuthentication yes
    #               comment PasswordAuthentication no
    #               restart sshd service
    #
    sed -i "s%#PermitRootLogin yes%PermitRootLogin yes%g" /etc/ssh/sshd_config
    sed -i "s%#PasswordAuthentication yes%PasswordAuthentication yes%g" /etc/ssh/sshd_config
    sed -i "s%PasswordAuthentication no%#PasswordAuthentication no%g" /etc/ssh/sshd_config

    service sshd restart
    #
    ##              edit /etc/ssh/sshd_config end ###
    #
else
                    echo " you are normal user, only root user can excute this script $0"
fi
#
# ****** allow further script only if root user executing the script End*******
```

- Execute above script on both setup this is general setup to do
- Above script will create necessary things
    - Our ansible user name : ansible
    - Our ansible password : ansible

- Setup inventory file on ansible server
    - It is located in /etc/hosts/host.conf

vi /etc/ansible//hosts

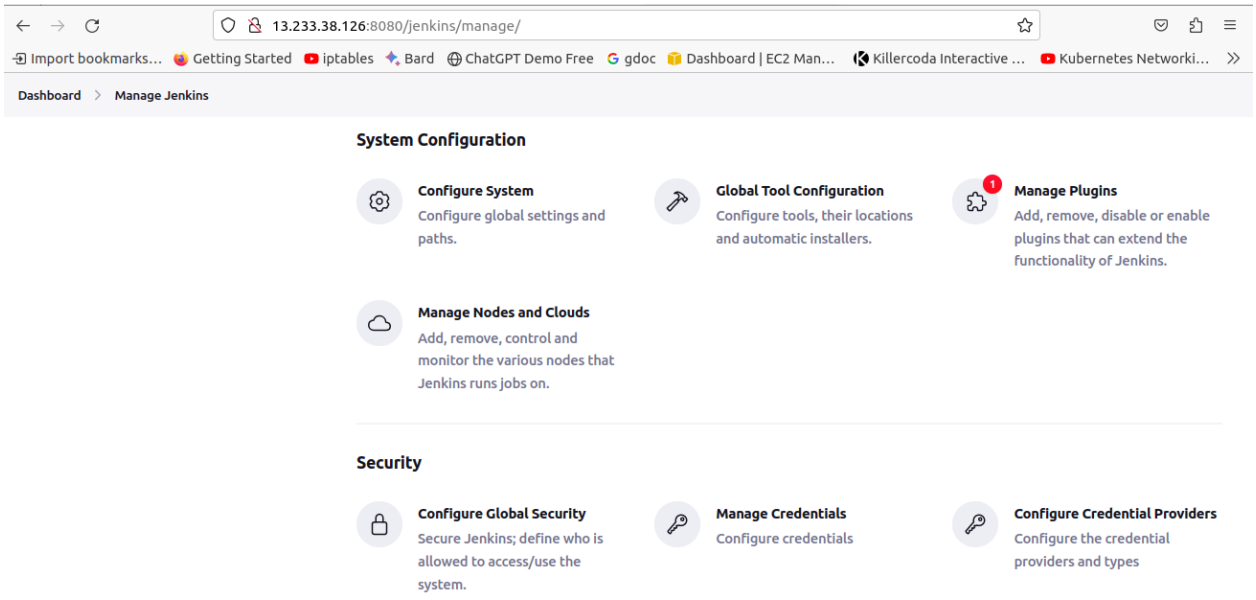
- Add nodes ip in the group
- In my case my group is deploy-war-app
- In our case slave1 ip are as follows
    - Public-ip: 13.234.110.144
    - Private ip : 172.31.36.98
    - Our both ansible server and node (slave one in same vpc)

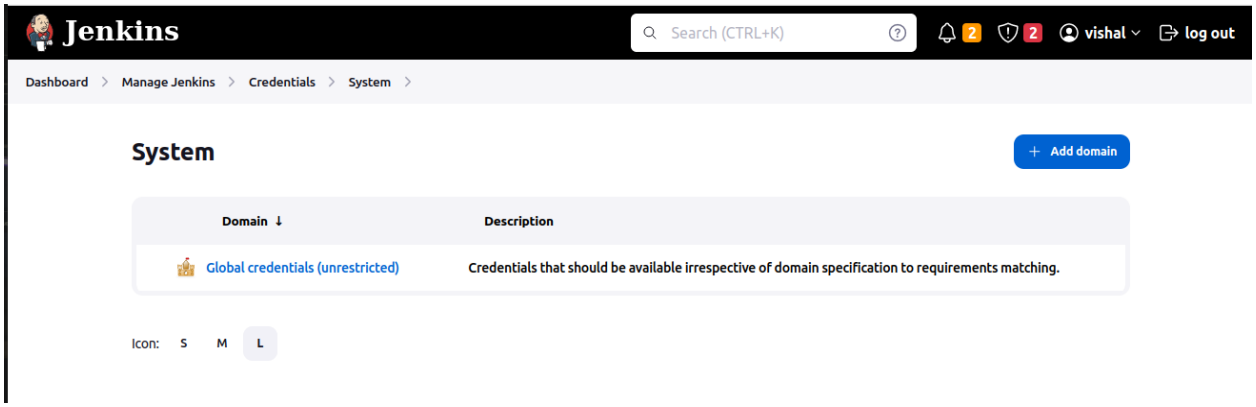
```
## 10.25.1.57

# Here's another example of host ranges, this t
# leading 0s:

## db-[99:101]-node.example.com

[deploy-war-app]
172.31.36.98
"/etc/ansible//hosts" 46L, 1046B
```

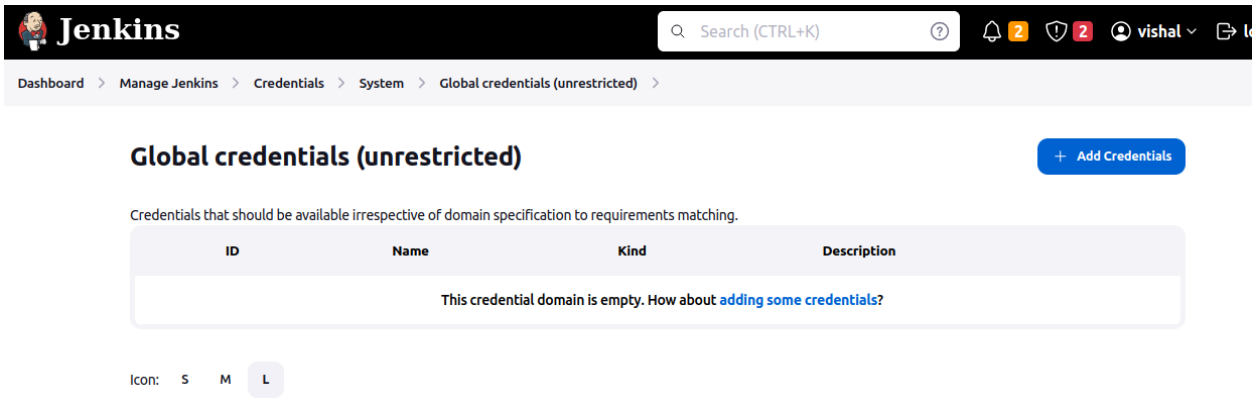
- Save and exit
- Follow next steps using ref provide below
- https://github.com/vishalk17/devops/blob/main/ansible_notes_vishalk17.pdf
    - Transfer ssh keys to other server
    - So that we have authentication from ansible server to its node

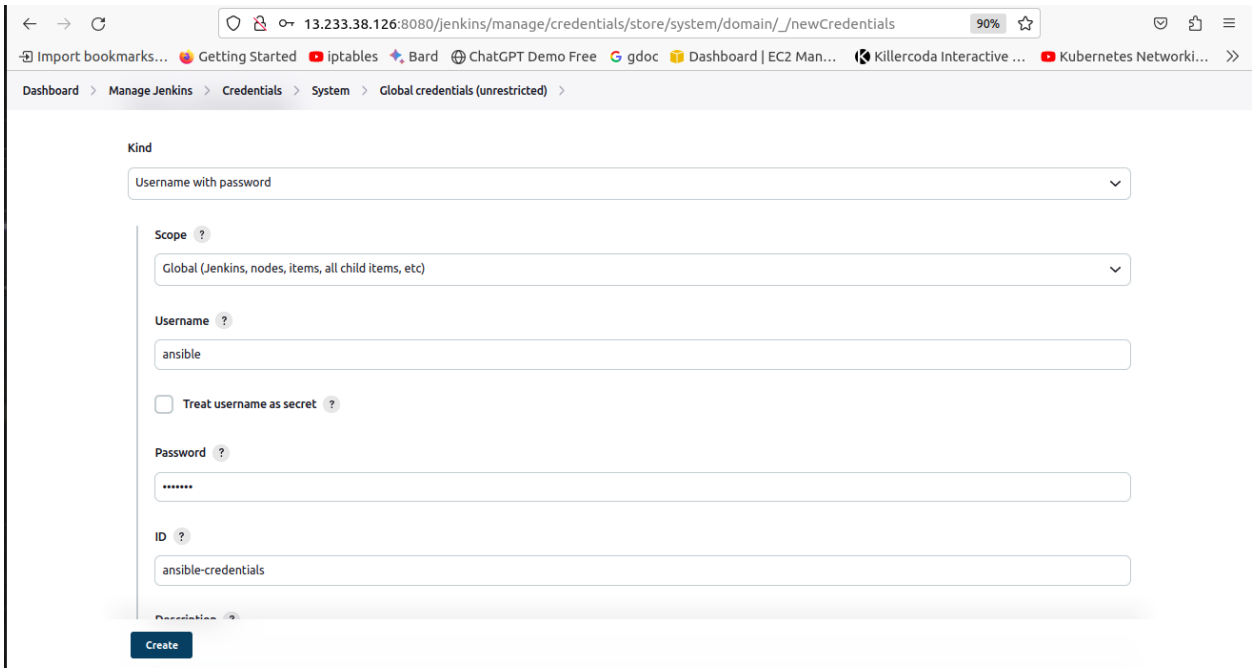
Create a new Jenkins credential:

- Go to the Jenkins dashboard.
- Click on "Manage Jenkins" in the left sidebar.
- Select "Manage Credentials".
- Click on "Jenkins" under "Stores scoped to Jenkins".
- Click on "Global credentials (unrestricted)" or any other appropriate domain.
- Click on "Add Credentials".
- Fill in the necessary details, including the username and password of the Ansible user.
- Click on "OK" to save the credential.

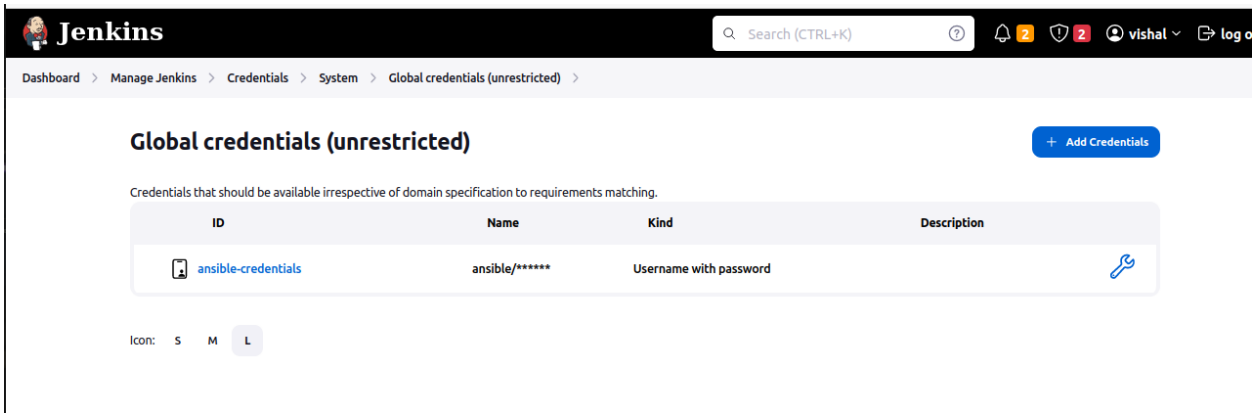

13.233.38.126:8080/jenkins/manage/
Import bookmarks... Getting Started iptables Bard ChatGPT Demo Free gdoc Dashboard | EC2 Man... Killercoda Interactive ... Kubernetes Networki...
Dashboard > Manage Jenkins
System Configuration
Configure System
Configure global settings and paths.
Global Tool Configuration
Configure tools, their locations and automatic installers.
Manage Plugins
Add, remove, disable or enable plugins that can extend the functionality of Jenkins.
Manage Nodes and Clouds
Add, remove, control and monitor the various nodes that Jenkins runs jobs on.
Security
Configure Global Security
Secure Jenkins; define who is allowed to access/use the system.
Manage Credentials
Configure credentials
Configure Credential Providers
Configure the credential providers and types


Jenkins
Search (CTRL+K)
vishal
log out
Dashboard > Manage Jenkins > Credentials > System >
System
Add domain
Domain
Description
Global credentials (unrestricted)
Credentials that should be available irrespective of domain specification to requirements matching.
Icon: S M L


Jenkins
Search (CTRL+K)
vishal
Dashboard > Manage Jenkins > Credentials > System > Global credentials (unrestricted) >
Global credentials (unrestricted)
Add Credentials
Credentials that should be available irrespective of domain specification to requirements matching.
ID
Name
Kind
Description
This credential domain is empty. How about adding some credentials?
Icon: S M L

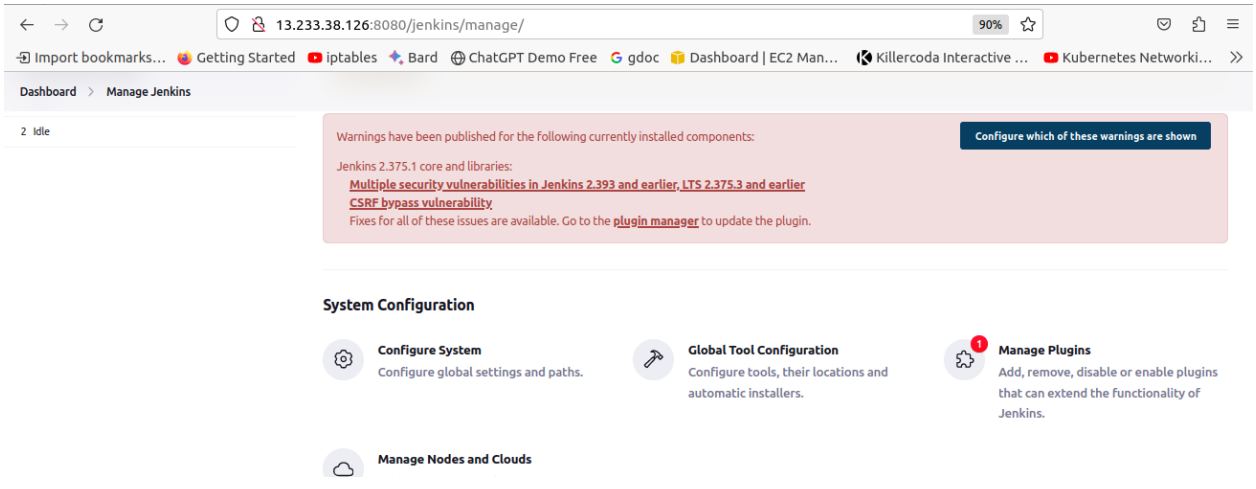


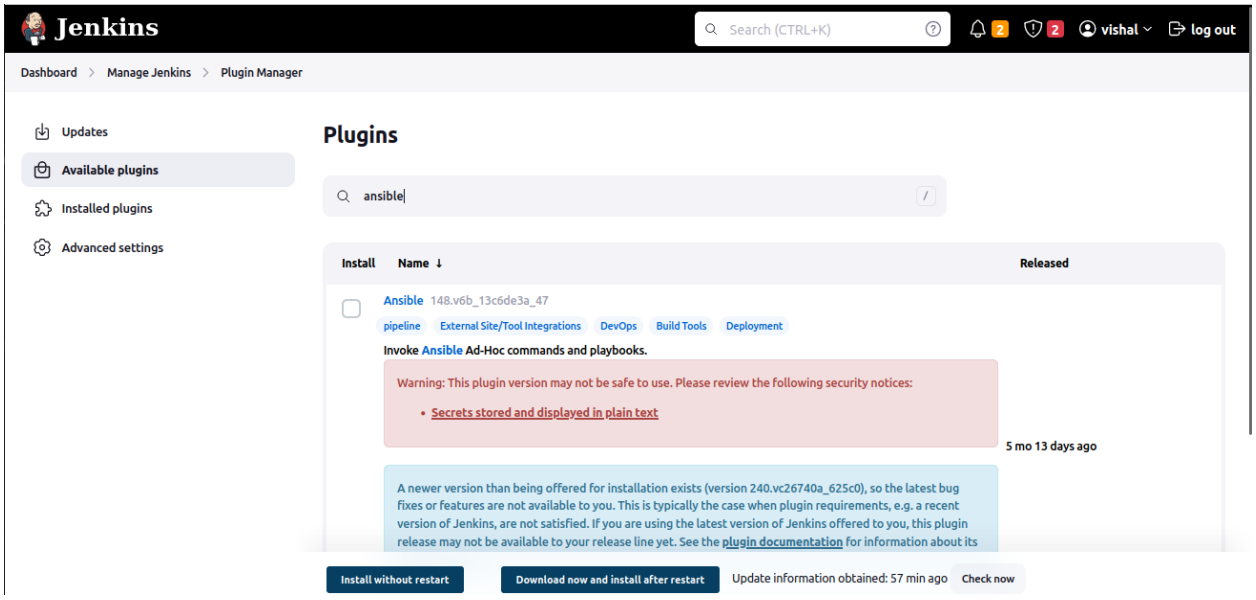
- In previous section as per ansible script
- Username : ansible
- Pass: ansible

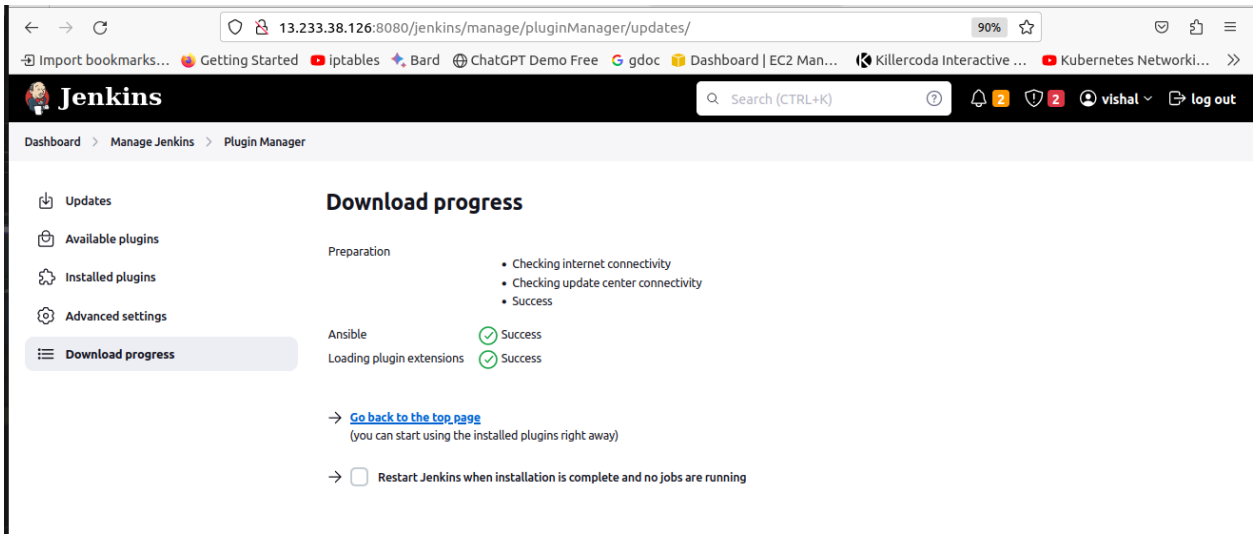


Install the Ansible plugin in Jenkins:

- Go to the Jenkins dashboard.
- Click on "Manage Jenkins" in the left sidebar.
- Select "Manage Plugins".
- Go to the "Available" tab and search for "Ansible".
- Check the box next to the "Ansible" plugin.
- Click on "Install without restart" or "Download now and install after restart" depending on your preference.

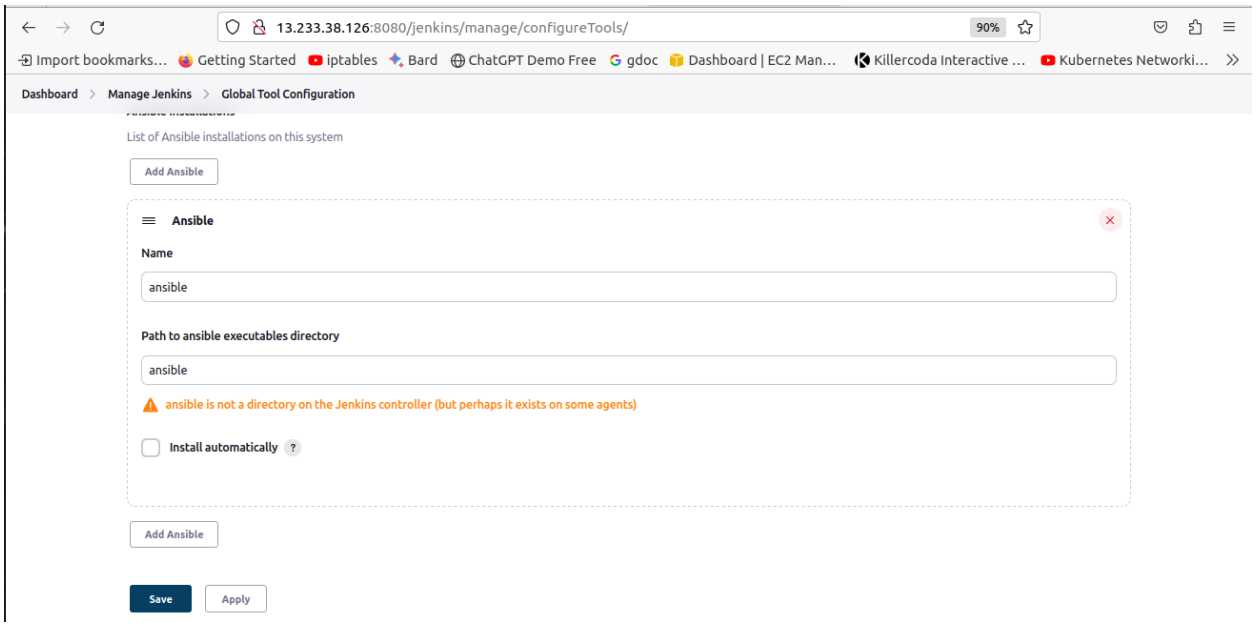

13.233.38.126:8080/jenkins/manage/
Dashboard > Manage Jenkins
Warnings have been published for the following currently installed components:
Configure which of these warnings are shown
Jenkins 2.375.1 core and libraries:
Multiple security vulnerabilities in Jenkins 2.393 and earlier, LTS 2.375.3 and earlier
CSRF bypass vulnerability
Fixes for all of these issues are available. Go to the plugin manager to update the plugin.
System Configuration
Configure System
Configure global settings and paths.
Global Tool Configuration
Configure tools, their locations and automatic installers.
Manage Plugins
Add, remove, disable or enable plugins that can extend the functionality of Jenkins.
Manage Nodes and Clouds


Jenkins
Search (CTRL+K)
vishal
log out
Dashboard > Manage Jenkins > Plugin Manager
Updates
Available plugins
Installed plugins
Advanced settings
Plugins
ansible
Install
Name
Released
Ansible 148.v6b_13c6de3a_47
pipeline
External Site/Tool Integrations
DevOps
Build Tools
Deployment
Invoke Ansible Ad-Hoc commands and playbooks.
Warning: This plugin version may not be safe to use. Please review the following security notices:
Secrets stored and displayed in plain text
5 mo 13 days ago
A newer version than being offered for installation exists (version 240.vc26740a_625c0), so the latest bug fixes or features are not available to you. This is typically the case when plugin requirements, e.g. a recent version of Jenkins, are not satisfied. If you are using the latest version of Jenkins offered to you, this plugin release may not be available to your release line yet. See the plugin documentation for information about its
Install without restart
Download now and install after restart
Update information obtained: 57 min ago
Check now


13.233.38.126:8080/jenkins/manage/pluginManager/updates/
Jenkins
Search (CTRL+K)
vishal
log out
Dashboard > Manage Jenkins > Plugin Manager
Updates
Available plugins
Installed plugins
Advanced settings
Download progress
Download progress
Preparation
Checking internet connectivity
Checking update center connectivity
Success
Ansible
Success
Loading plugin extensions
Success
Go back to the top page
(you can start using the installed plugins right away)
Restart Jenkins when installation is complete and no jobs are running

Configure Ansible on Jenkins:

- Go to the Jenkins dashboard.
- Click on "Manage Jenkins" in the left sidebar.
- Select "Global Tool Configuration".
- Scroll down to the "Ansible" section.
- Click on "Add Ansible" to add a new Ansible installation.
- Provide a name for the Ansible installation and specify the path to the Ansible executable.
- Click on "Save" to save the configuration.



- Standalone Ansible already installed thus no need to give full path

Create Jenkins Job - use of ansible- to deploy war on remote server i.e, salve1

- Tomcat server on slave1
  - Location /mnt/tools/apache

– on server one, i.e., ansible server;

Script to use downloading latest war from nexus artifact located in **/mnt/ansible**

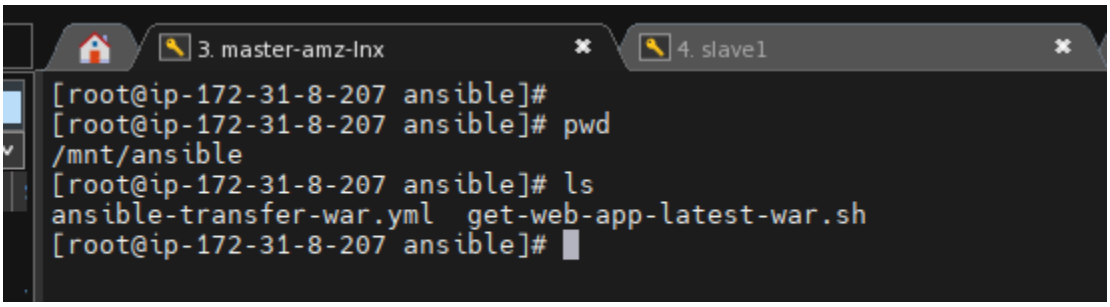
- Make a ansible-playbook to transfer downloaded war to remote server over ansible

vi ansible-transfer-war.yml

```
---
- hosts: deploy-war-app
  user: ansible
  become: yes
  connection: ssh
  gather_facts: yes
  tasks:
    - name: stop tomcat server
      command: bash /mnt/tools/apache-tomcat-9.0.78/bin/shutdown.sh

    - name: copy war file to tomcat dir
      copy:
        src: my-webapp.war
        dest: /mnt/tools/apache-tomcat-9.0.78/webapps/

    - name: start tomacat server
      command: bash /mnt/tools/apache-tomcat-9.0.78/bin/startup.sh
```

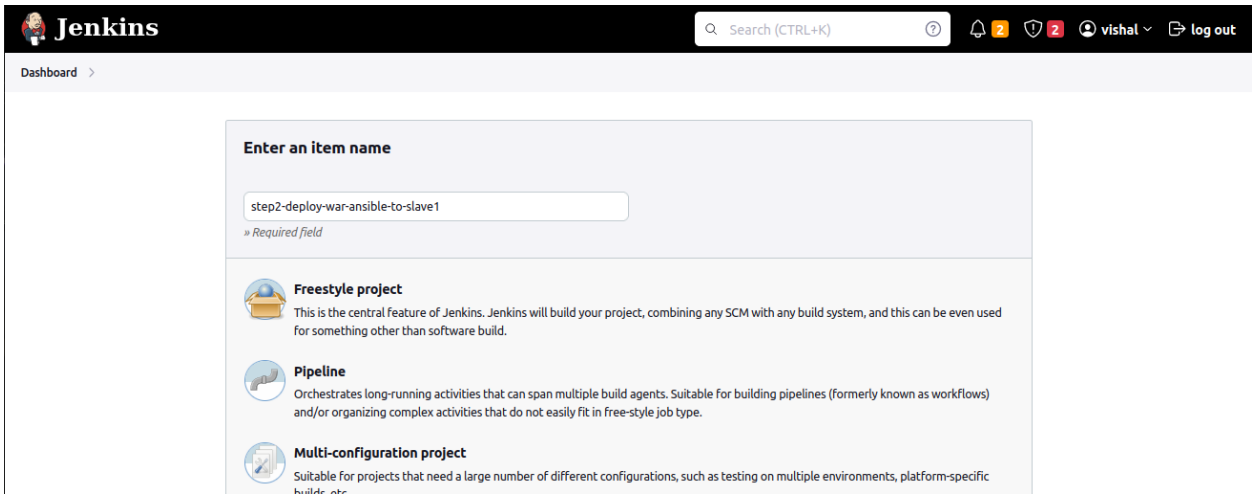
- Save and exit

- In /mnt/ansible folder we have following things

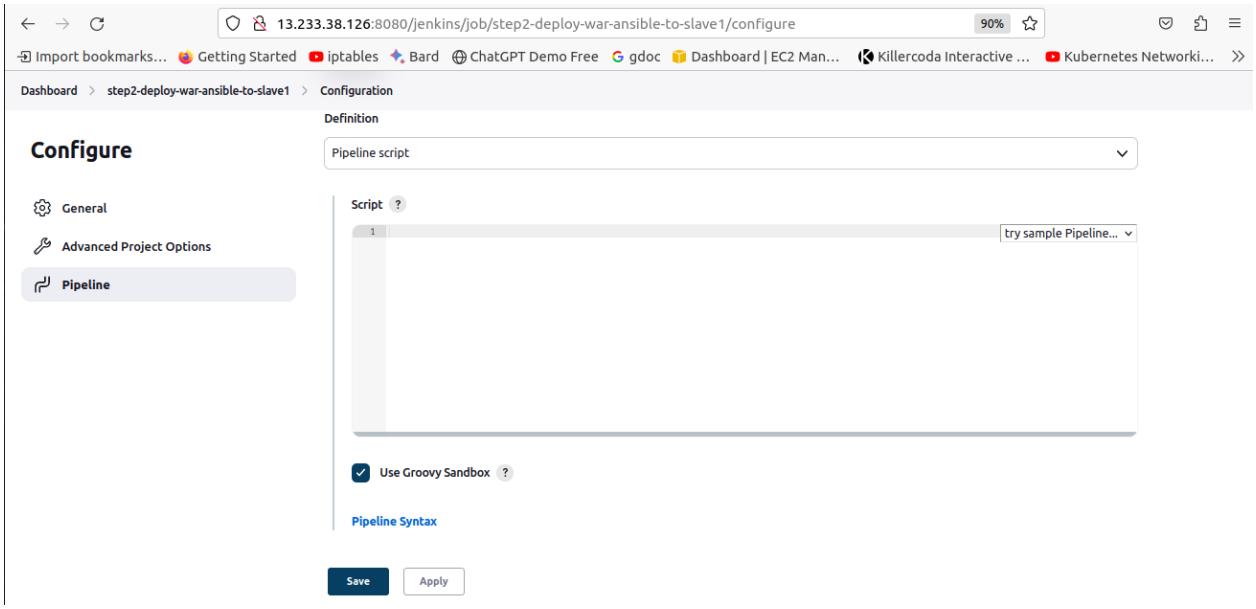


Lets integrate above thing in jenkins

- Click on Create job or new item
- Select pipeline
- Item name : step2-deploy-war-ansible-to-slave1
- Click on ok



- Scroll down and write pipeline script



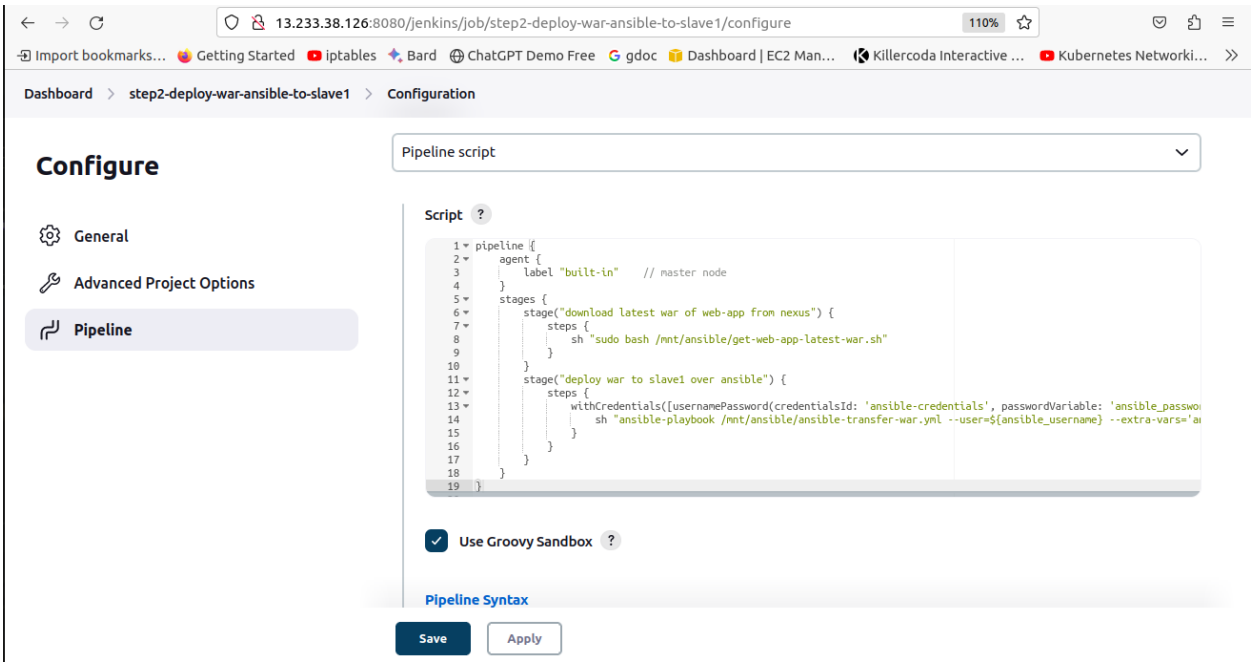
Pipeline script as follows:

```
pipeline {
    agent {
        label "built-in"    // master node
    }
    stages {
        stage("download latest war of web-app from nexus") {
            steps {
                sh "sudo bash /mnt/ansible/get-web-app-latest-war.sh"
            }
        }
        stage("deploy war to slave1 over ansible") {
            steps {
                withCredentials([usernamePassword(credentialsId: 'ansible-credentials', passwordVariable:
'ansible_password', usernameVariable: 'ansible_username')]) {
                    sh "ansible-playbook /mnt/ansible/ansible-transfer-war.yml --user=${ansible_username}
--extra-vars='ansible_ssh_pass=${ansible_password}'"
                }
            }
        }
    }
}
```

1. The `pipeline` block defines the main structure of the Jenkins pipeline.
2. The `agent` block specifies the agent or node on which the pipeline will be executed. In this case, it is set to the "built-in" label, which typically refers to the master node.
3. The `stages` block contains one or more `stage` blocks, representing different stages or phases of the pipeline.
4. The first stage is named "download latest war of web-app from nexus". Inside this stage, there is a `steps` block that contains the actual steps to be executed.
5. The `sh` step is used to execute shell commands. In this case, it runs the command `sudo bash /mnt/ansible/get-web-app-latest-war.sh`. This script is responsible for downloading the latest version of the war file for the web application from a Nexus repository.
6. The second stage is named "deploy war to slave1 over ansible". Inside this stage, there is a `steps` block that contains the steps to be executed.
7. The `withCredentials` block is used to retrieve the Ansible credentials from Jenkins. It takes the credentials ID (`ansible-credentials`) and the variable names (`ansible_password` and `ansible_username`) to store the credential values.
8. The `sh` step is used again to execute the `ansible-playbook` command. It runs the playbook `/mnt/ansible/ansible-transfer-war.yml` using the Ansible credentials obtained in the previous step. The `--user` flag specifies the username for the Ansible connection, and the `--extra-vars` flag passes the password for the
9. Ansible connection.

Overall, this script downloads the latest war file for the web application using the `get-web-app-latest-war.sh` script and then deploys it to a target server using Ansible via the `ansible-playbook` command.

Make sure to replace `'ansible-credentials'` with the actual ID of the Ansible credential stored in Jenkins.



- Save script
- Click on buildnow

- Successfully deploy

- Try to access that webpage for which we deployed war file on slave1 server
- `web application will be accessible at the following URL: http://<tomcat_server_ip>:<tomcat_port>/my-webapp/hello`
- Slave1 : public ip is : 13.234.110.144
  Thus my url will be http://13.234.110.144:8080/my-webapp/hello

This way I have completed th 2nd step of my ci-cd using jenkins , lets do first step

First stage of ci-cd using jenkins

Flow of whole ci-cd :

- Devloper push code to the git repository
- Git web-hook configure with jenkins
- Git web-hook trigger jenkins to execute 1st stage
- In first stage after completion ,we trigger 2nd stage

What I m goint to do in first stage:

- Create pipeline script in which
  - Download code from gitub repository
  - Compile using maven and at the same time do sonar-scanner analysis
  - Compiled war file will go in nexus repo
  - trigger 2nd stage

Configure git web-hook

A git web hook is a way to integrate external services with Git. When a specific event happens in a Git repository, a web hook can be configured to trigger an HTTP POST request to a specified URL. This can be used to automate tasks such as sending notifications, updating build status, or deploying code.

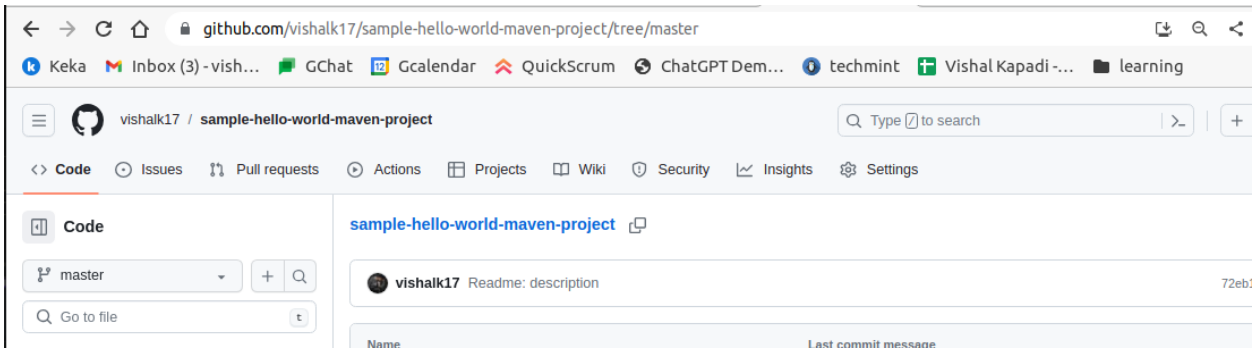
A git web hook with Jenkins is a way to integrate Jenkins with Git. When a specific event happens in a Git repository, a web hook can be configured to trigger a Jenkins job. This can be used to automate tasks such as building, testing, and deploying code.

For example, you could configure a web hook to be triggered whenever a new commit is pushed to a Git repository. When this happens, the web hook would trigger a Jenkins job that would build, test, and deploy the code to a production server.

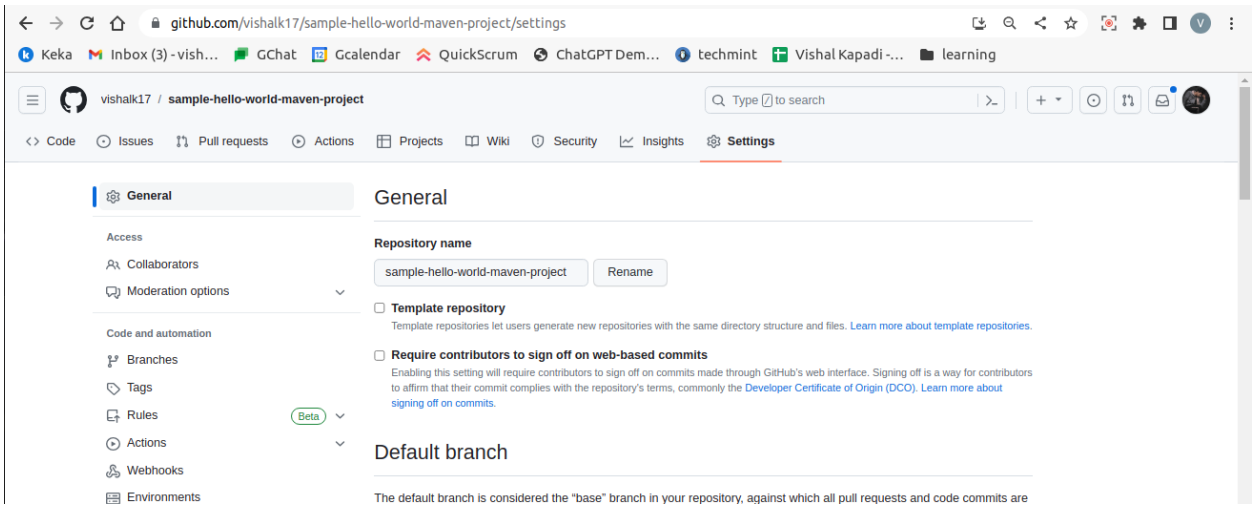
To set up a git web hook with Jenkins, you will need to:

1. Create a Jenkins job that will be triggered by the web hook.
2. Configure the web hook in your Git repository.

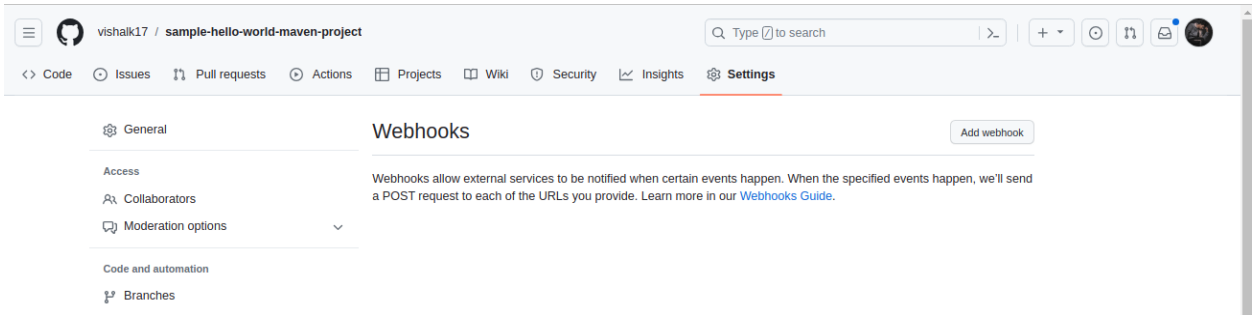
- Go the repo setting where you want to add git web-hook



- On left side bar, click on webhook



- Click on add web-hook

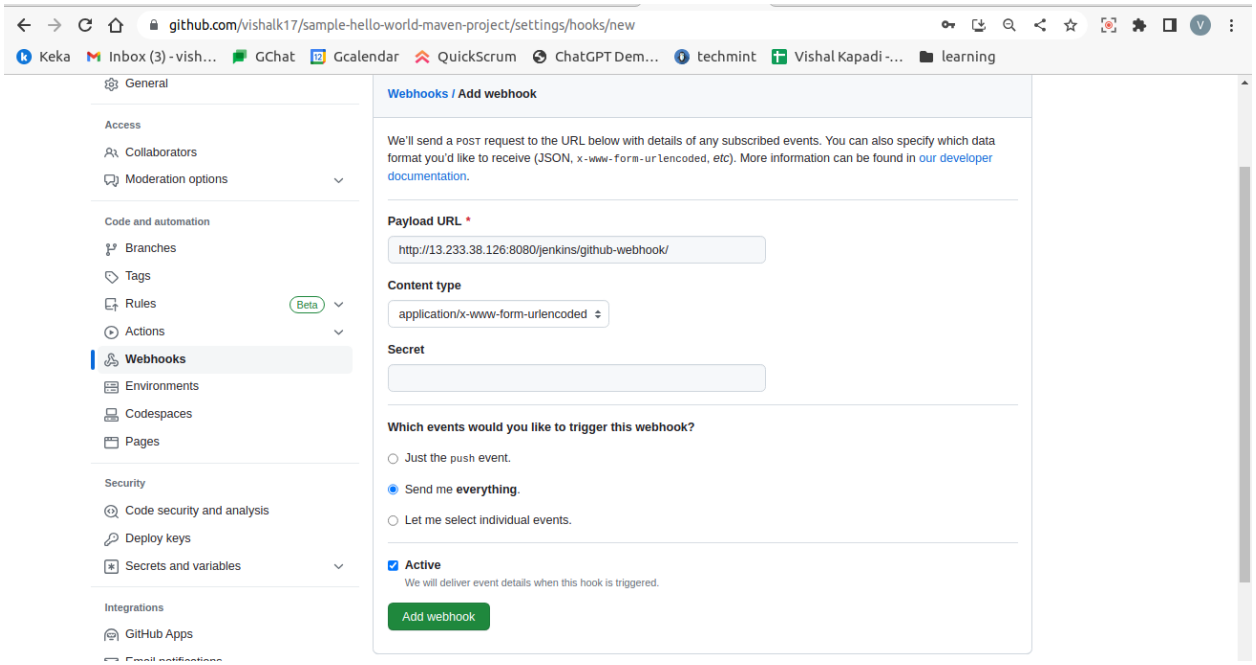


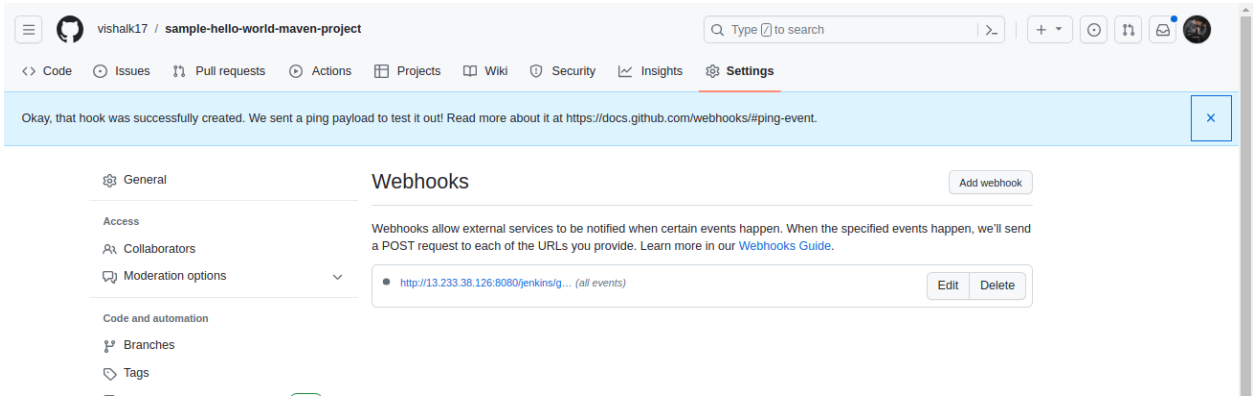
- Provide the Jenkins URL in the "Payload URL" field.
- The webhook URL of Jenkins is typically in the format: http://<jenkins_server>/github-webhook/

  In my case it is

http://13.233.38.126:8080/jenkins/github-webhook/

- Select send me everything
- Click on add-webhook and finish



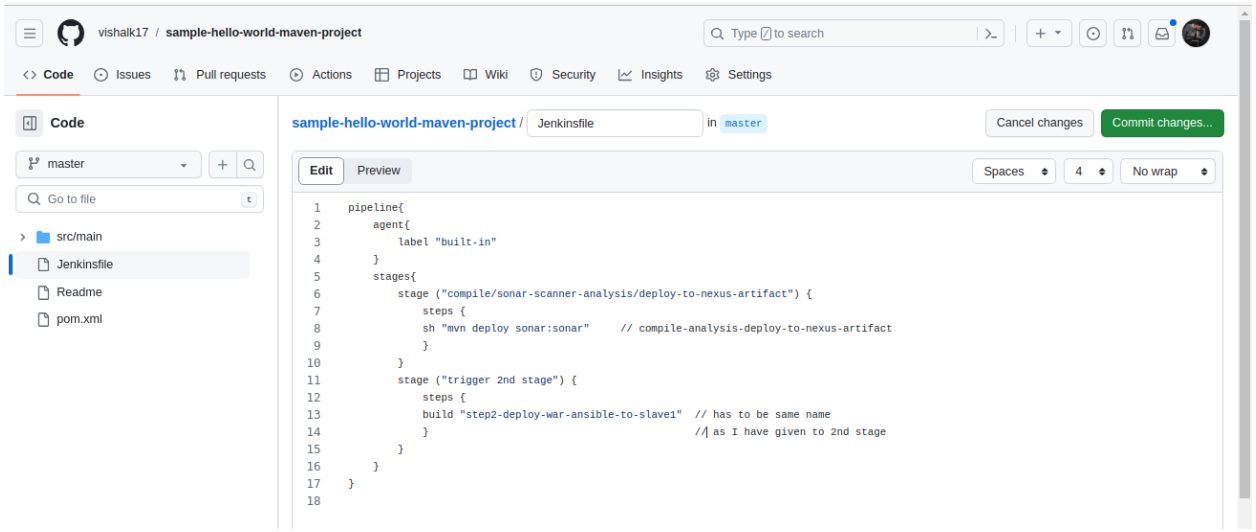


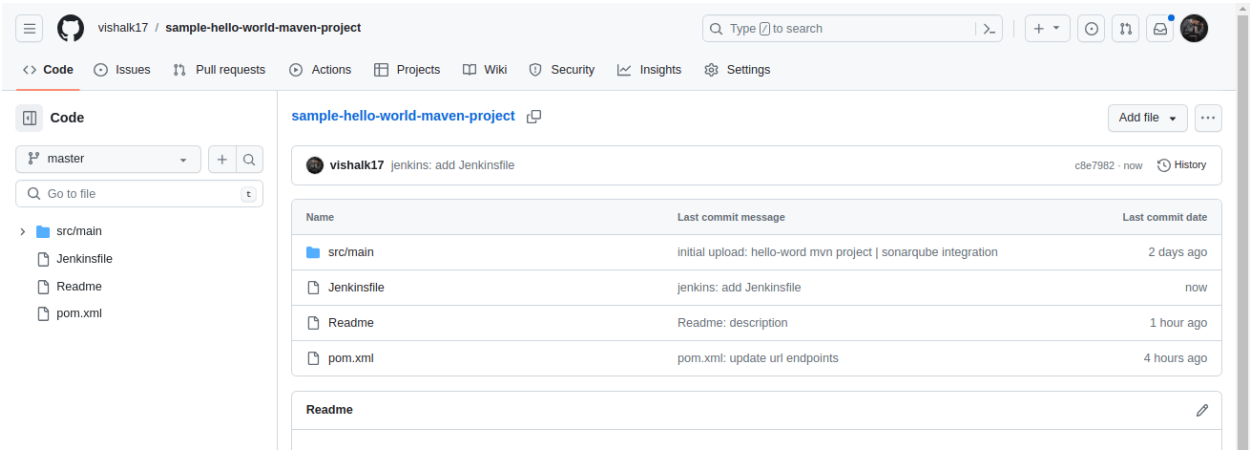
Create Jenkinsfile in root of ther repo

- So that we can add it in jenkins job directly from there

In Jenkinsfile we need to provide pipeline script

```
pipeline{
    agent{
        label "built-in"
    }
    stages{
        stage ("compile/sonar-scanner-analysis/deploy-to-nexus-artifact") {
            steps {
            sh "mvn deploy sonar:sonar"                 # compile-analysis-deploy-to-nexus-artifact
            }
        }
        stage ("trigger 2nd stage") {
            steps {
            build "step2-deploy-war-ansible-to-slave1"              # has to be same name
            }

                                                                    # as I have given to 2nd stage
        }
    }
}
```

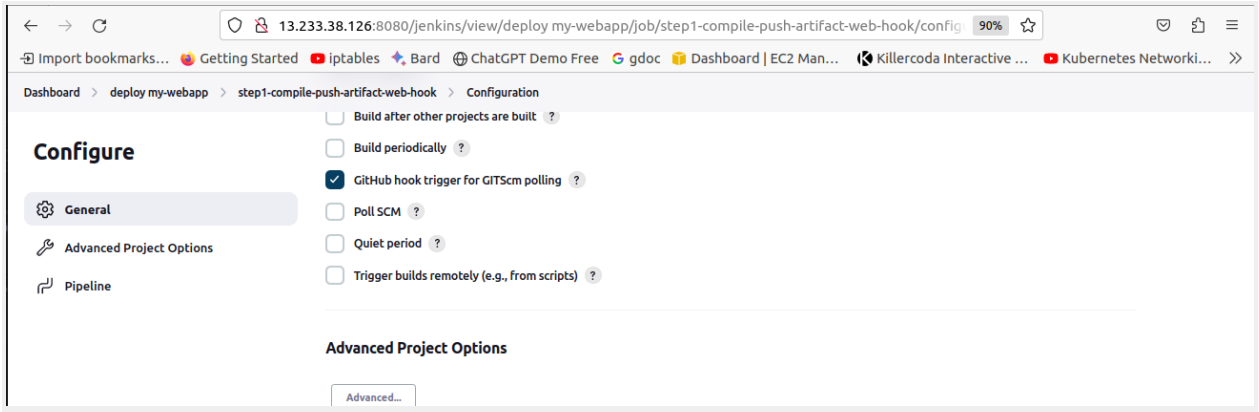




Configure job in jenkins:

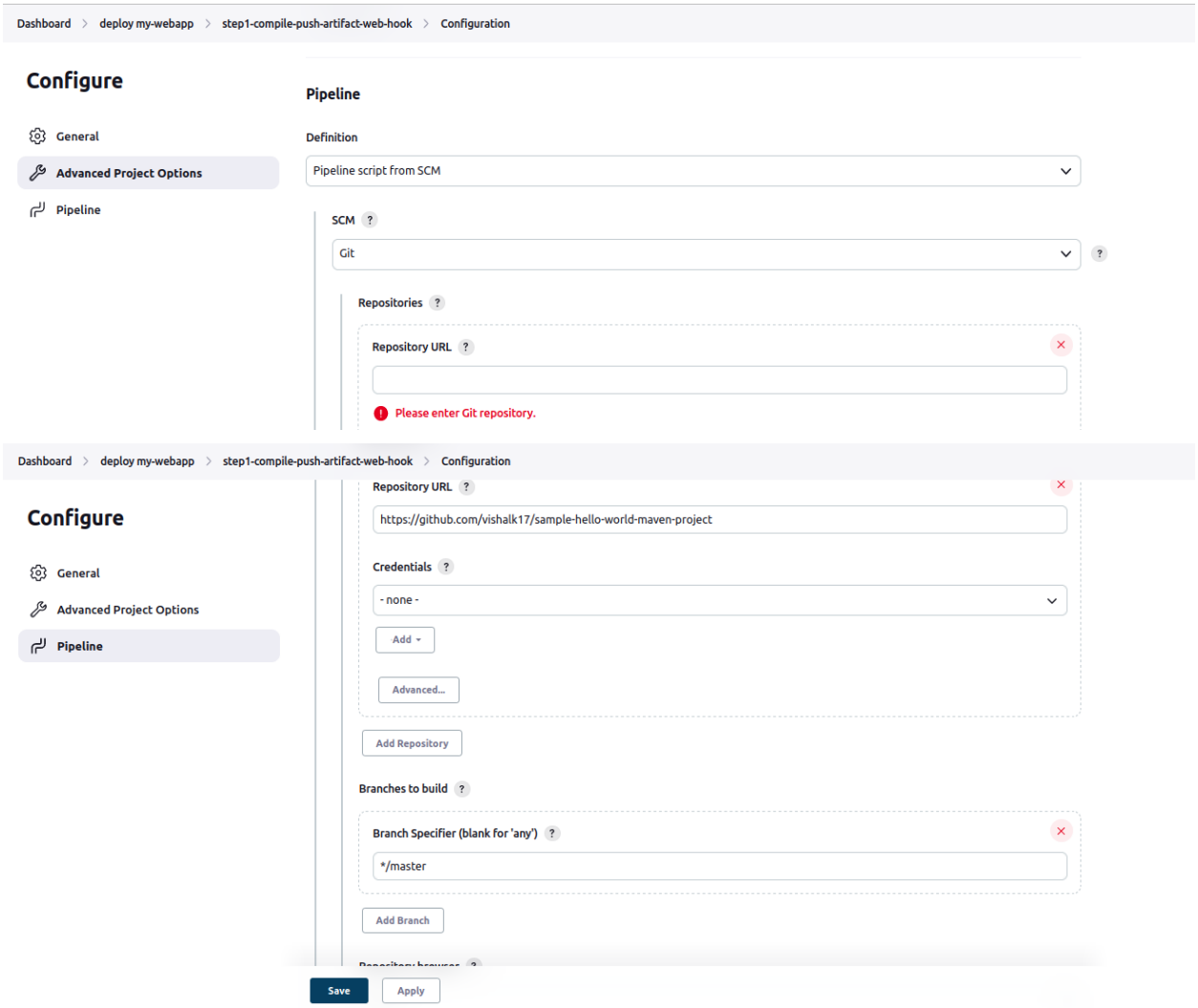
- Click on Create job or new item
- Select pipeline
- Item name : Step1-compile-push-artifact-web-hook
- Click on ok

2nd step job name : step2-deploy-war-ansible-to-slave1

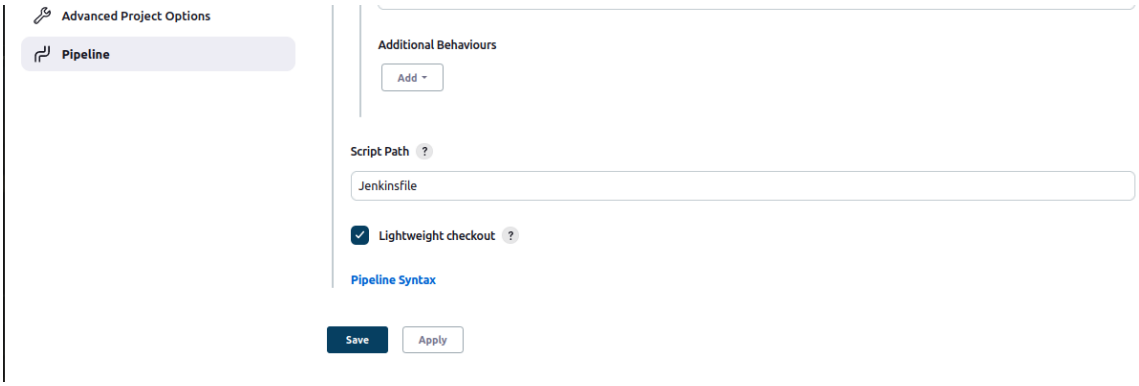


- Select GitHub hook trigger for GITScm polling
- Scroll down below

- In pipeline field , select option " pipeline script from scm"
- In scm field select "git"
    - Provide git url , and specify branch name



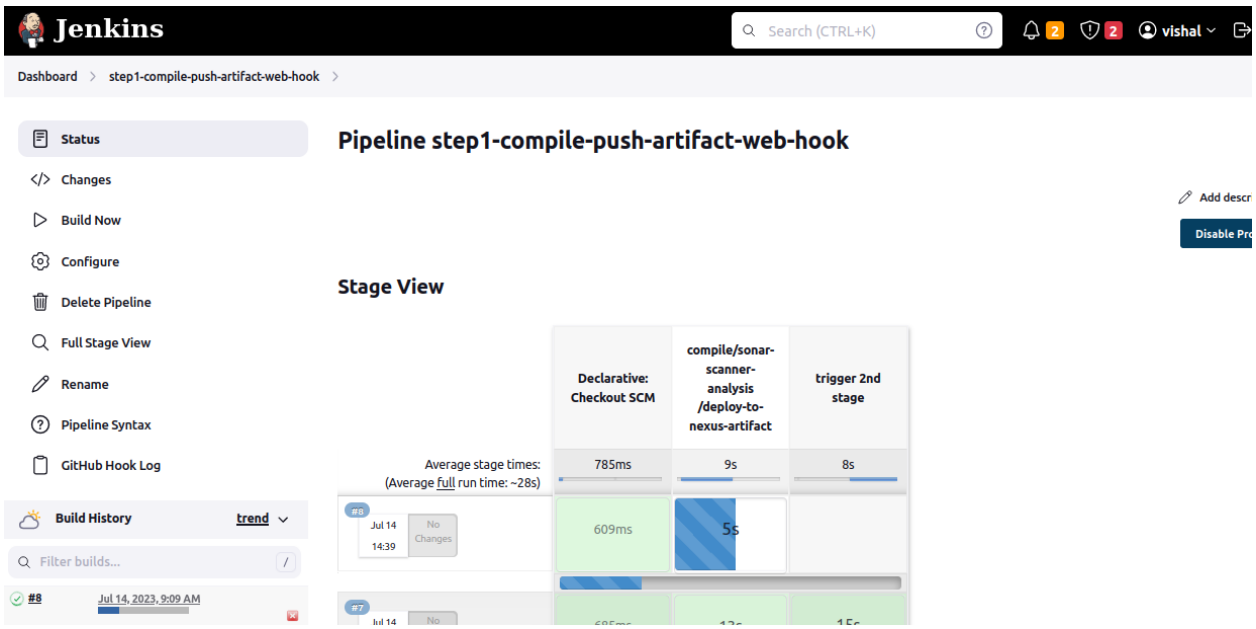
- Scrolldown and given path to Jenkins file in repo
- In my case it is in root of repo
- Finally click on save

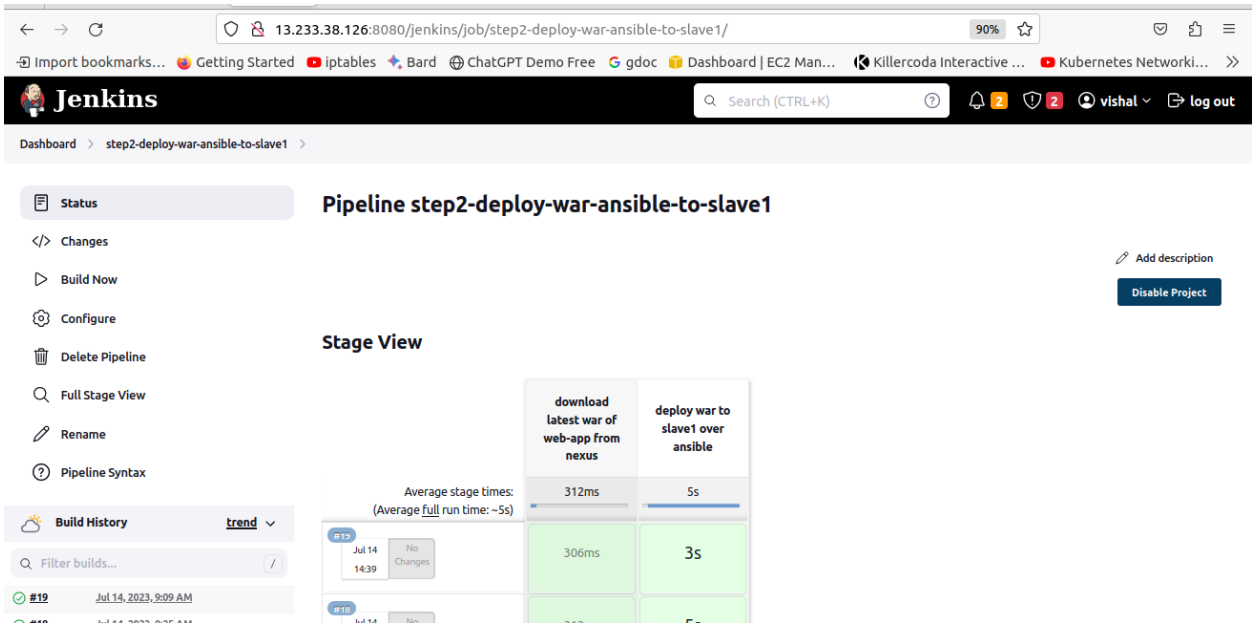


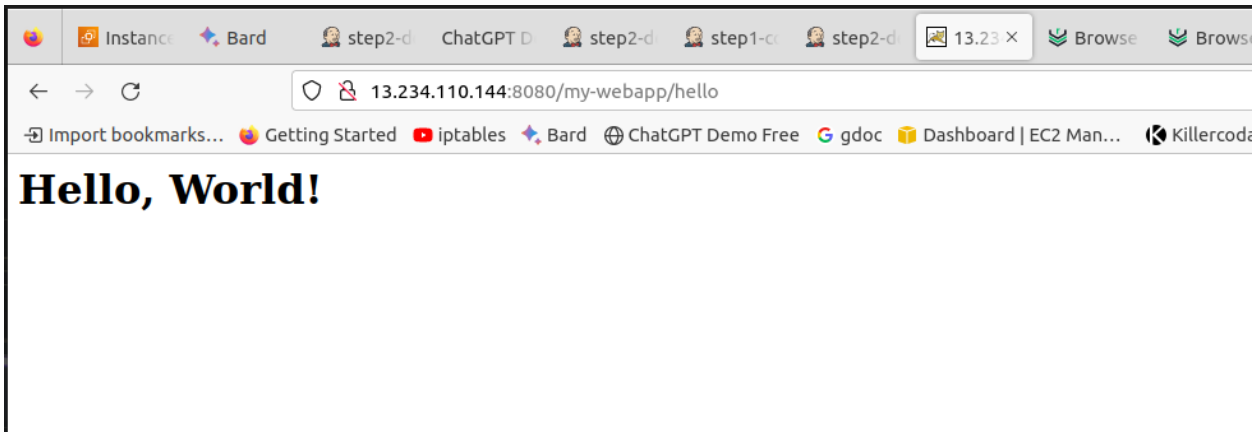
Run the job so that we can check ci-cd

- In ci cd , we will update or push code to git repo
- Git will notify to the jenkins
- Jenkins then trigger first job in which
    - Pull source code to the local
    - Compile it using maven and do sonar-scanner analysis
    - Deploy war file to the nexus artifact
    - Trigger 2nd job
        - It download latest war file from nexus artifact
        - Then it will transfer that war to other server using ansible playbook
        - Then ansible playbook start tomcat server

-finally our web page accessible from the web




13.233.38.126:8080/jenkins/job/step2-deploy-war-ansible-to-slave1/
Jenkins
Search (CTRL+K)
vishal
log out
Dashboard
step2-deploy-war-ansible-to-slave1
Status
Changes
Build Now
Configure
Delete Pipeline
Full Stage View
Rename
Pipeline Syntax
Build History
trend
Filter builds...
#19
Jul 14, 2023, 9:09 AM
Pipeline step2-deploy-war-ansible-to-slave1
Add description
Disable Project
Stage View
download latest war of web-app from nexus
deploy war to slave1 over ansible
Average stage times:
(Average full run time: ~5s)
312ms
5s
306ms
3s


13.234.110.144:8080/my-webapp/hello
Import bookmarks...
Getting Started
iptables
Bard
ChatGPT Demo Free
gdoc
Dashboard | EC2 Man...
Hello, World!

My devops repo :

- https://github.com/vishalk17/devops

My telegram channel:

- https://t.me/vishalk17_devops

Contact:

Telegram : t.me/vishalk17

vishalk17 My youtube Channel :

- YouTube https://www.youtube.com/@vishalk17