

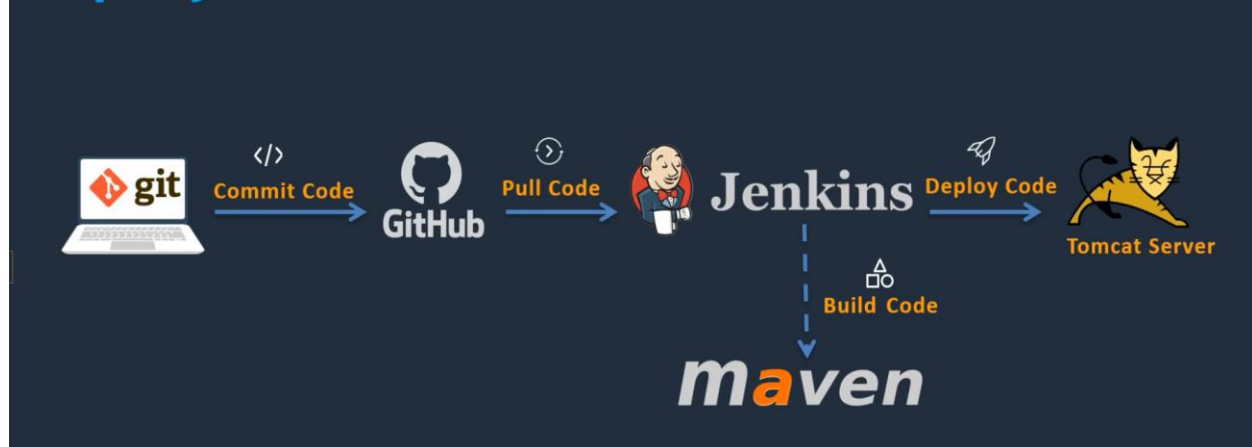
Deploy artifacts on VM

Build and Deploy on Tomcat Server

- Setup CI/CD with GitHub, Jenkins, Maven and Tomcat
 - Setup Jenkins
 - Setup & configure Maven and Git
 - Setup Tomcat Server
 - Integrating GitHub, Maven, Tomcat Server with Jenkins
 - Create a CI and CD job
 - Test the deployment

Second phase deploy artifacts on tomcat server.

Deploy Artifacts on a Tomcat Server



2. Deploy artifacts on a container

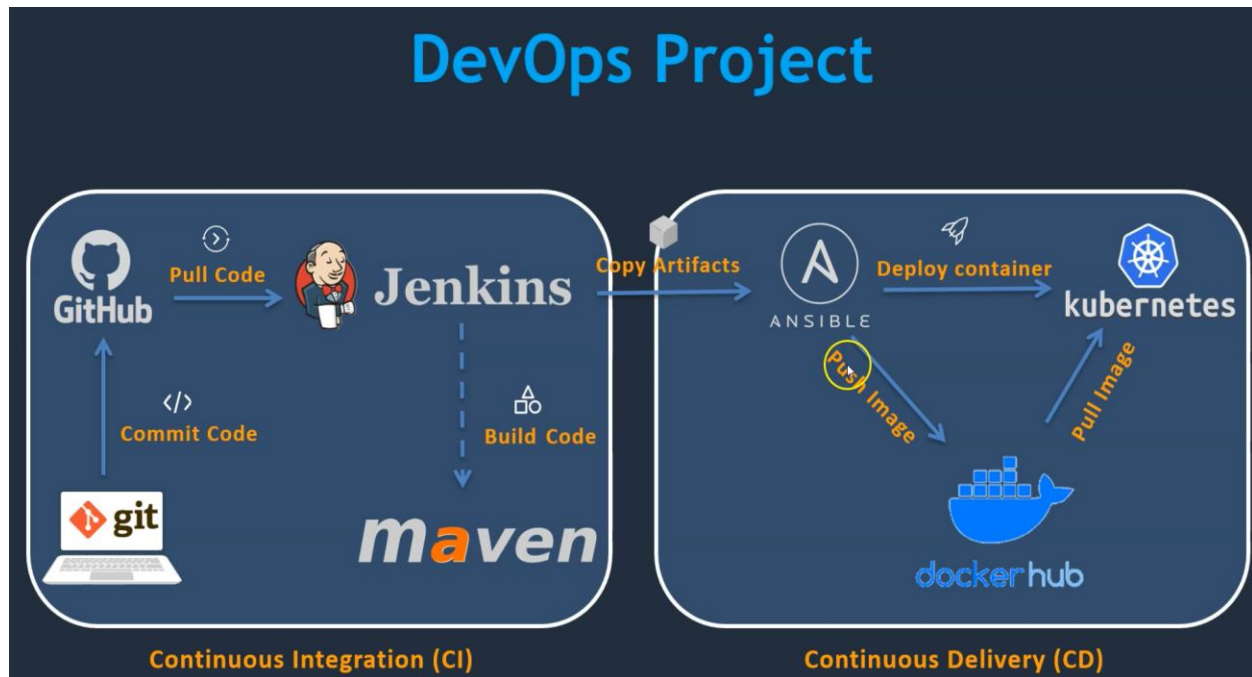
Deploy Artifacts on a Container

- Setup CI/CD with GitHub, Jenkins, Maven and Docker
 - Setting up 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 a container

Simple DevOps Project

- Continuous Integration (CI)
- Continuous Delivery (CD)

- Continuous Deployment (CD)



FOR DOCUMENT

[bunty4200/Udemy-Simple-DevOps-Project: Udemy_Course_Project \(github.com\)](#)

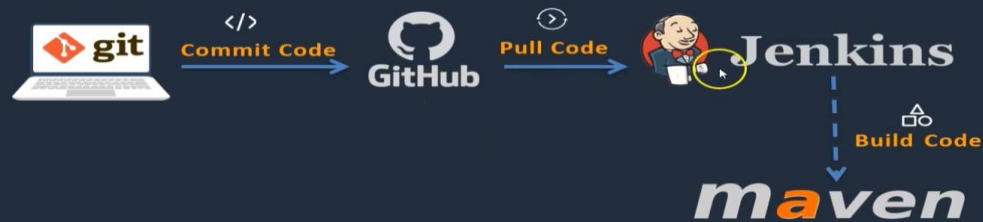
SOURCE CODE

[bunty4200/Udemy-hello-world: Udemy_Course_Project \(github.com\)](#)

STARTING

1. Step

Build Code



Chose AMAZONE LINUX 2

2. Setup Jenkins Server

Setup Jenkins Server

- Setup a Linux EC2 Instance
- Install Java
- Install Jenkins
- Start Jenkins
- Access Web UI on port 8080



Jenkins

3. Create EC2 instance Amazon Linux 2.

Add port number 8080 to the security group.

4. Install Jenkins

[Linux \(jenkins.io\)](https://jenkins.io)

```
sudo wget -O /etc/yum.repos.d/jenkins.repo \  
https://pkg.jenkins.io/redhat/jenkins.repo
```

```
sudo rpm --import https://pkg.jenkins.io/redhat/jenkins.io-2023.key
```

```
sudo yum upgrade
```

```
sudo amazon-linux-extras
```

```
amazon-linux-extras install java-openjdk11
```

```
yum install jenkins
```

```
systemctl daemon-reload
```

```
systemctl enable jenkins
```

```
systemctl start jenkins
```

```
systemctl status jenkins
```

5. Browse publicIP with Port Number 8080 to access Jenkins UI
6. skip Install suggested plugins click on right nd side cross symbol
7. click on start using Jenkins.

```
Run first job in jenkins
```

```
Helloworldjob
```

```
Uptime
```

```
echo "Hello world"
```

8. Integrate Git with Jenkins

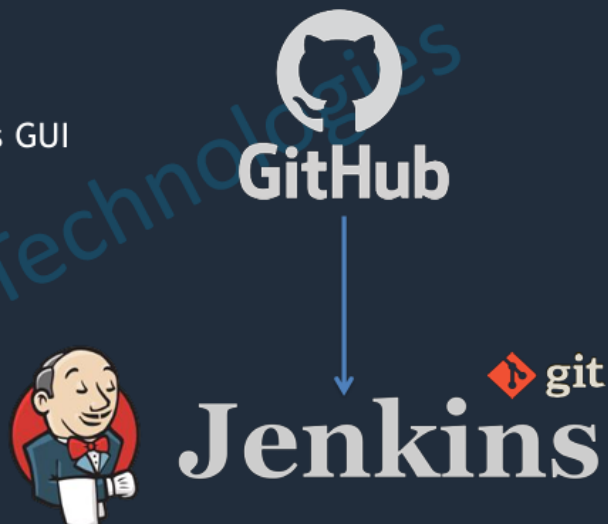
Pull the code from GitHub we need install git on Jenkins

Build Code



Integrate GitHub with Jenkins

- Install Git on Jenkins Instance
- Install GitHub Plugin on Jenkins GUI
- Configure Git on Jenkins GUI



Install Git on Jenkins Instance

```
25 git --version
26 yum install git
27 git --version
28 history
[root@jenkins-server ~]#
[root@jenkins-server ~]#
```

Install GitHub Plugin on Jenkins GUI

Dashboard > Manage Jenkins > Plugins > available plugins > github > install

Configure Git on Jenkins GUI

Dashboard > Manage Jenkins > tools > git

Name git

Path to Git executable


git or using command `whereisgit` in Jenkins instance it will show the executable path

9. Run Jenkins job to pull the code from GitHub

Create new job

Enter an item name

» Required field

 **Freestyle project**
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.

Source Code Management

☐ None

☒ Git ?

Repositories ?

Repository URL ?

Credentials ?

+ Add ▾

Advanced ▾

Add Repository

Apply and save and build job.

```
[root@jenkins-server ~]# cd /var/lib/jenkins/workspace/PullCodeFromGit
[root@jenkins-server PullCodeFromGit]#
[root@jenkins-server PullCodeFromGit]# ls
Dockerfile pom.xml README.md regapp-deploy.yml regapp-service.yml server webapp
[root@jenkins-server PullCodeFromGit]#
[root@jenkins-server PullCodeFromGit]#
```


10. Integrate maven with Jenkins

Setup Maven on Jenkins server

Download maven [Maven – Download Apache Maven](#)

Integrate Maven with Jenkins

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



Build Code




Diagram showing a dashed arrow pointing from the Jenkins logo to the Maven logo, with the text 'Build Code' next to the arrow.

Setup Maven on Jenkins server

```
[root@jenkins-server ~]# cd /opt/
[root@jenkins-server opt]# ls
aws rh
[root@jenkins-server opt]#
[root@jenkins-server opt]# wget https://dlcdn.apache.org/maven/maven-3/3.9.6/binaries/apache-maven-3.9.6-bin.tar.gz
--2024-05-14 10:39:44-- https://dlcdn.apache.org/maven/maven-3/3.9.6/binaries/apache-maven-3.9.6-bin.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: 9410508 (9.0M) [application/x-gzip]
Saving to: 'apache-maven-3.9.6-bin.tar.gz'

100%[=====>] 9,410,508

2024-05-14 10:39:44 (145 MB/s) - 'apache-maven-3.9.6-bin.tar.gz' saved [9410508/9410508]

[root@jenkins-server opt]#
[root@jenkins-server opt]# ls
apache-maven-3.9.6-bin.tar.gz aws rh
[root@jenkins-server opt]#
[root@jenkins-server opt]# tar -xvzf apache-maven-3.9.6-bin.tar.gz
apache-maven-3.9.6/README.txt
apache-maven-3.9.6/LICENSE
apache-maven-3.9.6/NOTICE
apache-maven-3.9.6/lib/
apache-maven-3.9.6/lib/aopalliance.license
apache-maven-3.9.6/lib/commons-cli.license
```

```

[root@jenkins-server opt]# ll
total 9192
drwxr-xr-x 6 root root      99 May 14 10:40 apache-maven-3.9.6
-rw-r--r-- 1 root root 9410508 Dec  1 11:22 apache-maven-3.9.6-bin.tar.gz
drwxr-xr-x 4 root root      33 May  3 23:45 aws
drwxr-xr-x 2 root root       6 Aug 16 2018 rh
[root@jenkins-server opt]#
[root@jenkins-server opt]# mv apache-maven-3.9.6 maven
[root@jenkins-server opt]#
[root@jenkins-server opt]# ll
total 9192
-rw-r--r-- 1 root root 9410508 Dec  1 11:22 apache-maven-3.9.6-bin.tar.gz
drwxr-xr-x 4 root root      33 May  3 23:45 aws
drwxr-xr-x 6 root root      99 May 14 10:40 maven
drwxr-xr-x 2 root root       6 Aug 16 2018 rh
[root@jenkins-server opt]# cd maven/
[root@jenkins-server maven]# ll
total 36
drwxr-xr-x 2 root root      97 May 14 10:40 bin
drwxr-xr-x 2 root root      76 May 14 10:40 boot
drwxr-xr-x 3 root root      63 Nov 28 09:59 conf
drwxr-xr-x 4 root root 4096 May 14 10:40 lib
-rw-r--r-- 1 root root 18945 Nov 28 09:59 LICENSE
-rw-r--r-- 1 root root  5034 Nov 28 09:59 NOTICE
-rw-r--r-- 1 root root  2533 Nov 28 09:59 README.txt
[root@jenkins-server maven]#
[root@jenkins-server maven]# cd bin/
[root@jenkins-server bin]# ll
total 32
-rw-r--r-- 1 root root   327 Nov 28 09:59 m2.conf
-rwxr-xr-x 1 root root  5883 Nov 28 09:59 mvn
-rw-r--r-- 1 root root  6324 Nov 28 09:59 mvn.cmd
-rwxr-xr-x 1 root root  1684 Nov 28 09:59 mvnDebug
-rw-r--r-- 1 root root  2169 Nov 28 09:59 mvnDebug.cmd
-rwxr-xr-x 1 root root  1611 Nov 28 09:59 mvnyjp
[root@jenkins-server bin]#
[root@jenkins-server bin]# mvn -v
bash: mvn: command not found
[root@jenkins-server bin]# ./mvn -v
Apache Maven 3.9.6 (bc0240f3c744dd6b6ec2920b3cd08ddc295161ae)
Maven home: /opt/maven
Java version: 11.0.22, vendor: Red Hat, Inc., runtime: /usr/lib/jvm/java-11-openjdk-11.0.22.0.7-1.amzn2.0.1.x86_64
Default locale: en_US, platform encoding: UTF-8
OS name: "linux", version: "5.10.215-203.850.amzn2.x86_64", arch: "amd64", family: "unix"
[root@jenkins-server bin]#

```

./mvn -v i could able to execute in maven folder but i could not be able to execute to maven

So for that we need to set it up env variable under .bash rc or set it up environment directory.

```

[root@jenkins-server bin]# cd ..
[root@jenkins-server maven]#
[root@jenkins-server maven]#
[root@jenkins-server maven]# ./mvn -v
bash: ./mvn: No such file or directory
[root@jenkins-server maven]# mvn -v
bash: mvn: command not found
[root@jenkins-server maven]#

```

11. Setup Environment Variables • JAVA_HOME, M2, M2_HOME

```
[root@jenkins-server ~]# ls -la
total 20
dr-xr-x---  3 root root 103 May 14 09:08 .
dr-xr-xr-x 18 root root 257 May 14 09:08 ..
-rw-r--r--  1 root root  18 Oct 18  2017 .bash_logout
-rw-r--r--  1 root root 176 Oct 18  2017 .bash_profile
-rw-r--r--  1 root root 176 Oct 18  2017 .bashrc
-rw-r--r--  1 root root 100 Oct 18  2017 .cshrc
drwx-----  2 root root  29 May 14 09:08 .ssh
-rw-r--r--  1 root root 129 Oct 18  2017 .tcshrc
[root@jenkins-server ~]#
[root@jenkins-server ~]# vim .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-11.0.22.0.7-1.amzn2.0.1.x86_64
# User specific environment and startup programs

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

export PATH

~
```

```
[root@jenkins-server ~]# find / -name jvm
/etc/jvm
/usr/lib/jvm
/usr/share/jvm
[root@jenkins-server ~]#
[root@jenkins-server ~]# cd /usr/lib/jvm
[root@jenkins-server jvm]# ll
total 0
drwxr-xr-x  6 root root 68 May 14 09:49 java-11-openjdk-11.0.22.0.7-1.amzn2.0.1.x86_64
lrwxrwxrwx  1 root root 21 May 14 09:49 jre -> /etc/alternatives/jre
lrwxrwxrwx  1 root root 24 May 14 09:49 jre-11 -> /etc/alternatives/jre_11
lrwxrwxrwx  1 root root 32 May 14 09:49 jre-11-openjdk -> /etc/alternatives/jre_11_openjdk
lrwxrwxrwx  1 root root 46 May 14 09:49 jre-11-openjdk-11.0.22.0.7-1.amzn2.0.1.x86_64 -> java-11-openjdk-11.0.22.0.7-1.amzn2.0.1.x86_64
lrwxrwxrwx  1 root root 29 May 14 09:49 jre-openjdk -> /etc/alternatives/jre_openjdk
[root@jenkins-server jvm]#
[root@jenkins-server jvm]# find / -name java-11*
find: '/proc/19323': No such file or directory
/usr/lib/jvm/java-11-openjdk-11.0.22.0.7-1.amzn2.0.1.x86_64
/usr/share/doc/java-11-openjdk-11.0.22.0.7-1.amzn2.0.1.x86_64
[root@jenkins-server jvm]#
[root@jenkins-server jvm]#
```

```
[root@jenkins-server ~]#  
[root@jenkins-server ~]# vim .bash_profile  
[root@jenkins-server ~]#  
[root@jenkins-server ~]#  
[root@jenkins-server ~]# echo $PATH  
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/root/bin  
[root@jenkins-server ~]#  
[root@jenkins-server ~]# source .bash_profile  
[root@jenkins-server ~]# echo $PATH  
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/root/bin:/usr/lib/jvm/java-11-openjdk-11.0.22.0.7-1.amzn2.0.1.x86_64:/opt/maven:/opt/maven/bin  
[root@jenkins-server ~]#  
[root@jenkins-server ~]#
```

```
[root@jenkins-server ~]# mvn -v  
Apache Maven 3.9.6 (bc0240f3c744dd6b6ec2920b3cd08dcc295161ae)  
Maven home: /opt/maven  
Java version: 11.0.22, vendor: Red Hat, Inc., runtime: /usr/lib/jvm/java-11-openjdk-11.0.22.0.7-1.amzn2.0.1.x86_64  
Default locale: en_US, platform encoding: UTF-8  
OS name: "linux", version: "5.10.215-203.850.amzn2.x86_64", arch: "amd64", family: "unix"  
[root@jenkins-server ~]#
```

12. Install Maven Plugin

Dashboard > Manage Jenkins > Plugin > Maven Integration

After that configure Jenkins with maven

Dashboard > Manage Jenkins > Tools

Add java JAVA_HOME in tools

JDK installations

Add JDK

≡

JDK

Name

java-11

JAVA_HOME

/usr/lib/jvm/java-11-openjdk-11.0.22.0.7-1.amzn2.0.1.x86_64

!

 /usr/lib/jvm/java-11-openjdk-11.0.22.0.7-1.amzn2.0.1.x86_64 doesn't look like a JDK directory

☐ Install automatically ?

Maven path in tools

Maven installations

Add Maven

≡ Maven

Name

maven-3.9.6

MAVEN_HOME

/opt/maven

☐ Install automatically ?

Add Maven

13. Build a java project using Jenkins

Enter an item name

FirstMavenProject

» Required field

**Freestyle project**

Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.

**Maven project**

Build a maven project. Jenkins takes advantage of your POM files and drastically reduces the configuration.


If you want to create a new item from other existing, you can use this option:



Copy from

Type to autocomplete

OK

GeneralEnabled 


Description

Plain text [Preview](#)☐ Discard old builds [?](#)☐ GitHub project**Git** [?](#)Repositories [?](#)Repository URL [?](#)Credentials [?](#)[+ Add](#)[Advanced](#)[Add Repository](#)**Build**Root POM [?](#)Goals and options [?](#)[Advanced](#)**Post Steps**☐ Run only if build succeeds☐ Run only if build succeeds or is unstable**Save and Build**

```
[JENKINS] Archiving /var/lib/jenkins/workspace/FirstMavenProject/webapp/pom.xml to com.example.maven-project/webapp/1.0-SNAPSHOT/webapp-1.0-SNAPSHOT.pom
[JENKINS] Archiving /var/lib/jenkins/workspace/FirstMavenProject/webapp/target/webapp.war to com.example.maven-project/webapp/1.0-SNAPSHOT/webapp-1.0-SNAPSHOT.war
[JENKINS] Archiving /var/lib/jenkins/workspace/FirstMavenProject/server/pom.xml to com.example.maven-project/server/1.0-SNAPSHOT/server-1.0-SNAPSHOT.pom
[JENKINS] Archiving /var/lib/jenkins/workspace/FirstMavenProject/server/target/server.jar to com.example.maven-project/server/1.0-SNAPSHOT/server-1.0-SNAPSHOT.jar
[JENKINS] Archiving /var/lib/jenkins/workspace/FirstMavenProject/pom.xml to com.example.maven-project/maven-project/1.0-SNAPSHOT/maven-project-1.0-SNAPSHOT.pom
channel stopped
Finished: SUCCESS
```


```
[INFO] Processing war project
[INFO] Copying webapp resources [/var/lib/jenkins/workspace/FirstMavenProject/webapp/src/main/webapp]
[INFO] Building war: /var/lib/jenkins/workspace/FirstMavenProject/webapp/target/webapp.war
[INFO]
[INFO] --- install:3.1.1:install (default-install) @ webapp ---
```


```
[root@jenkins-server ~]#
[root@jenkins-server ~]#
[root@jenkins-server ~]# cd /var/lib/jenkins/workspace/FirstMavenProject/webapp/target
[root@jenkins-server target]#
[root@jenkins-server target]# ls
maven-archiver  surefire  webapp  webapp.war
[root@jenkins-server target]# ll
total 4
drwxr-xr-x 2 jenkins jenkins  28 May 14 11:50 maven-archiver
drwxr-xr-x 2 jenkins jenkins   6 May 14 11:50 surefire
drwxr-xr-x 4 jenkins jenkins  54 May 14 11:50 webapp
-rw-r--r-- 1 jenkins jenkins 2353 May 14 11:50 webapp.war
[root@jenkins-server target]#
[root@jenkins-server target]#
```





Jenkins


Dashboard > FirstMavenProject > Workspace


 Status


 Changes


 Workspace

 Build Now

 Configure


 Delete Maven project


 Modules


 Rename


Workspace of FirstMavenProject on Built-In Node



FirstMavenProject / webapp / target /

 maven-archiver

 surefire

 webapp

 webapp.war

May 14, 2024, 11:50:49 AM 2.30 KiB  

[\(all files in zip\)](#)

So far we have created artifacts.