

Continuous Integration and Deployment

Assignment-2

Ques: Perform following steps using Git, Jenkins, Maven and Nexus.

Step 1: Create a Maven project using Eclipse.

Step2: Push the same running project on GitHub using Eclipse or IDE.

Step 3: Create a Jenkins Pipeline to generate build and push the generated build on Nexus Server using Jenkinsfile in GitHub.

SOLUTION:

1. So, go to the directory where your jenkins.war file is present.

Start the Jenkins service using the java -jar jenkins.war command in the command prompt in administrator mode.

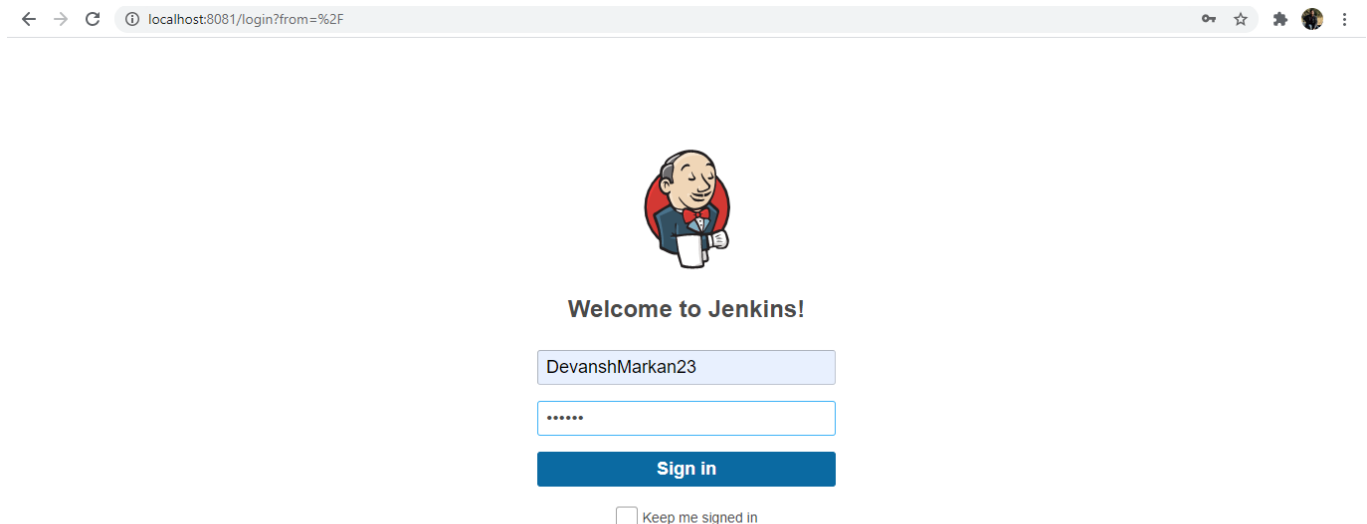
```
Administrator: Command Prompt - java -jar jenkins.war
Microsoft Windows [Version 10.0.18362.1082]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\Program Files\Jenkins


C:\Program Files\Jenkins>java -jar jenkins.war
Running from: C:\Program Files\Jenkins\Jenkins.war
webroot: $user.home/.jenkins
2020-10-15 17:52:09.297+0000 [id=1] INFO org.eclipse.jetty.util.log.Log#initialized: Logging initialized @5070ms to org.ecl
2020-10-15 17:52:09.781+0000 [id=1] INFO winstone.Logger#logInternal: Beginning extraction from war file
2020-10-15 17:52:10.085+0000 [id=1] WARNING o.e.j.s.handler.ContextHandler#setContextPath: Empty contextPath
2020-10-15 17:52:10.493+0000 [id=1] INFO org.eclipse.jetty.server.Server#doStart: jetty-9.4.30.v20200611; built: 2020-06-11T
2b7bb13ef5a92a927634b0d; jvm 11.0.8+10-LTS
2020-10-15 17:52:17.628+0000 [id=1] INFO o.e.j.w.StandardDescriptorProcessor#visitServlet: NO JSP Support for /, did not fin
et
2020-10-15 17:52:18.237+0000 [id=1] INFO o.e.j.s.s.DefaultSessionIdManager#doStart: DefaultSessionIdManager workerName=node0
2020-10-15 17:52:18.237+0000 [id=1] INFO o.e.j.s.s.DefaultSessionIdManager#doStart: No SessionScavenger set, using defaults
2020-10-15 17:52:18.329+0000 [id=1] INFO o.e.j.server.session.HouseKeeper#startScavenging: node0 Scavenging every 600000ms
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by com.thoughtworks.xstream.core.util.Fields (file:/C:/Users/91935/.jenkins/war/WEB-INF/lib/xstr
a.util.TreeMap.comparator
WARNING: Please consider reporting this to the maintainers of com.thoughtworks.xstream.core.util.Fields
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release
2020-10-15 17:52:20.268+0000 [id=1] INFO hudson.WebAppMain#contextInitialized: Jenkins home directory: C:\Users\91935\.jenki
2020-10-15 17:52:22.092+0000 [id=1] INFO o.e.j.s.handler.ContextHandler#doStart: Started w.01bb9aa43{Jenkins v2.255./,file:/
BLE}{C:\Users\91935\.jenkins\war}
2020-10-15 17:52:22.421+0000 [id=1] INFO o.e.j.server.AbstractConnector#doStart: Started ServerConnector@17f7cd29{HTTP/1.1,
2020-10-15 17:52:22.429+0000 [id=1] INFO org.eclipse.jetty.server.Server#doStart: Started @18268ms
2020-10-15 17:52:22.434+0000 [id=24] INFO winstone.Logger#logInternal: Winstone Servlet Engine running: controlPort=disabled
2020-10-15 17:52:23.799+0000 [id=31] INFO jenkins.InitReactorRunner$1#onAttained: Started initialization
2020-10-15 17:52:23.930+0000 [id=36] INFO jenkins.InitReactorRunner$1#onAttained: Listed all plugins
2020-10-15 17:52:26.675+0000 [id=30] INFO jenkins.InitReactorRunner$1#onAttained: Prepared all plugins
2020-10-15 17:52:26.698+0000 [id=34] INFO jenkins.InitReactorRunner$1#onAttained: Started all plugins
2020-10-15 17:52:26.709+0000 [id=35] INFO jenkins.InitReactorRunner$1#onAttained: Augmented all extensions
2020-10-15 17:52:27.258+0000 [id=29] INFO jenkins.InitReactorRunner$1#onAttained: System config loaded
2020-10-15 17:52:27.259+0000 [id=29] INFO jenkins.InitReactorRunner$1#onAttained: System config adapted
2020-10-15 17:52:27.259+0000 [id=36] INFO jenkins.InitReactorRunner$1#onAttained: Loaded all jobs
2020-10-15 17:52:27.259+0000 [id=29] INFO jenkins.InitReactorRunner$1#onAttained: Configuration for all jobs updated
2020-10-15 17:52:27.622+0000 [id=49] INFO hudson.model.AsyncPeriodicWork#lambda$doRun$0: Started Download metadata
2020-10-15 17:52:27.712+0000 [id=49] INFO hudson.util.Retrier#start: Attempt #1 to do the action check updates server
2020-10-15 17:52:30.662+0000 [id=36] INFO o.s.c.s.AbstractApplicationContext#prepareRefresh: Refreshing org.springframework.w
onContext@4c9a547b: display name [Root WebApplicationContext]; startup date [Thu Oct 15 23:22:30 IST 2020]; root of context hierarc
2020-10-15 17:52:30.662+0000 [id=36] INFO o.s.c.s.AbstractApplicationContext#obtainFreshBeanFactory: Bean factory for applica
```

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2020-10-15 17:52:26.698+0000 [id=34] INFO jenkins.InitReactorRunner$1#onAttained: Started all plugins
2020-10-15 17:52:26.709+0000 [id=35] INFO jenkins.InitReactorRunner$1#onAttained: Augmented all extensions
2020-10-15 17:52:27.258+0000 [id=29] INFO jenkins.InitReactorRunner$1#onAttained: System config loaded
2020-10-15 17:52:27.259+0000 [id=29] INFO jenkins.InitReactorRunner$1#onAttained: System config adapted
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2020-10-15 17:52:27.259+0000 [id=29] INFO jenkins.InitReactorRunner$1#onAttained: Configuration for all jobs updated
2020-10-15 17:52:27.622+0000 [id=49] INFO hudson.model.AsyncPeriodicWork#lambda$doRun$0: Started Download metadata
2020-10-15 17:52:27.712+0000 [id=49] INFO hudson.util.Retrier#start: Attempt #1 to do the action check updates server
2020-10-15 17:52:30.662+0000 [id=36] INFO o.s.c.s.AbstractApplicationContext#prepareRefresh: Refreshing org.springframework.web.con
onContext@4c9a547b: display name [Root WebApplicationContext]; startup date [Thu Oct 15 23:22:30 IST 2020]; root of context hierarchy
2020-10-15 17:52:30.662+0000 [id=36] INFO o.s.c.s.AbstractApplicationContext#obtainFreshBeanFactory: Bean factory for application co
.context.support.StaticWebApplicationContext@4c9a547b: org.springframework.beans.factory.support.DefaultListableBeanFactory@188d7ca
2020-10-15 17:52:30.679+0000 [id=36] INFO o.s.b.f.s.DefaultListableBeanFactory#preInstantiateSingletons: Pre-instantiating singleton
.factory.support.DefaultListableBeanFactory@188d7ca: defining beans [authenticationManager]; root of factory hierarchy
2020-10-15 17:52:31.081+0000 [id=36] INFO o.s.c.s.AbstractApplicationContext#prepareRefresh: Refreshing org.springframework.web.con
onContext@682d18cd: display name [Root WebApplicationContext]; startup date [Thu Oct 15 23:22:31 IST 2020]; root of context hierarchy
2020-10-15 17:52:31.083+0000 [id=36] INFO o.s.c.s.AbstractApplicationContext#obtainFreshBeanFactory: Bean factory for application co
.context.support.StaticWebApplicationContext@682d18cd: org.springframework.beans.factory.support.DefaultListableBeanFactory@221cbaf3
2020-10-15 17:52:31.084+0000 [id=36] INFO o.s.b.f.s.DefaultListableBeanFactory#preInstantiateSingletons: Pre-instantiating singleton
.factory.support.DefaultListableBeanFactory@221cbaf3: defining beans [filter,legacy]; root of factory hierarchy
2020-10-15 17:52:31.194+0000 [id=36] INFO jenkins.InitReactorRunner$1#onAttained: Completed initialization
2020-10-15 17:52:31.313+0000 [id=23] INFO hudson.WebAppMain$3#run: Jenkins is fully up and running
```

2. Now, go to the Jenkins dashboard at localhost:8080 and Jenkins will open and will ask for your username and password.



← → ↻ localhost:8081/login?from=%2F



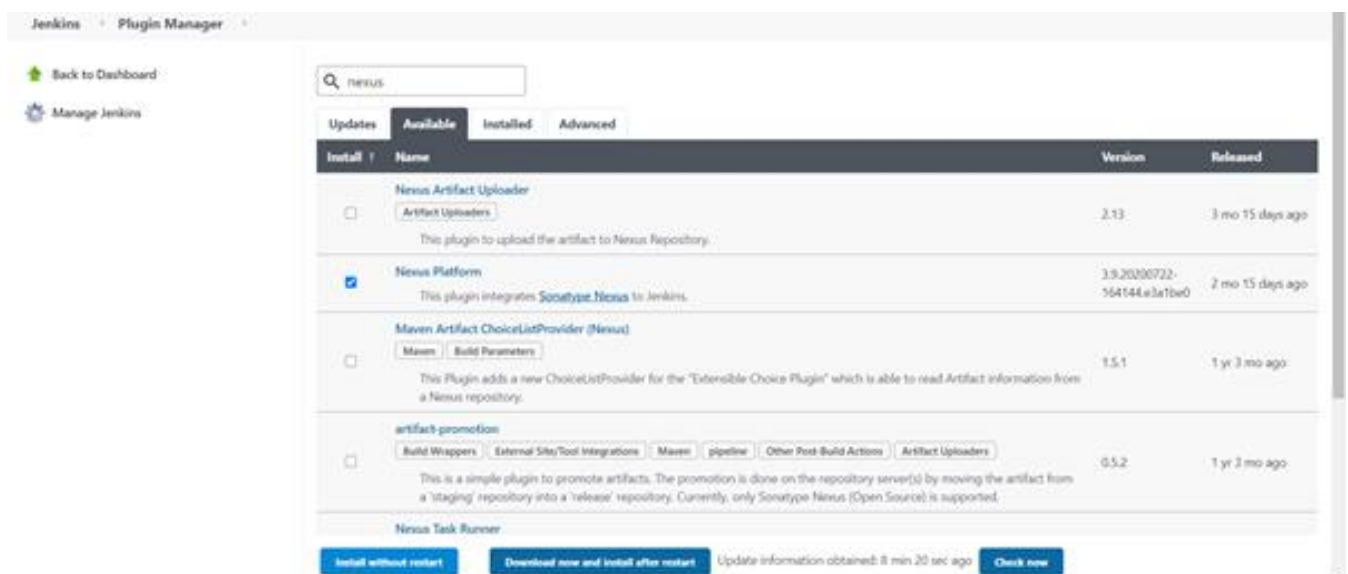
Welcome to Jenkins!

DevanshMarkan23

Sign in

☐ Keep me signed in

3. In global tools configuration, both Maven and JDKs are installed previously. Now, we have to install Nexus Plugin in Jenkins. So, Go to Manage PlugIn option-



Jenkins Plugin Manager

Back to Dashboard Manage Jenkins

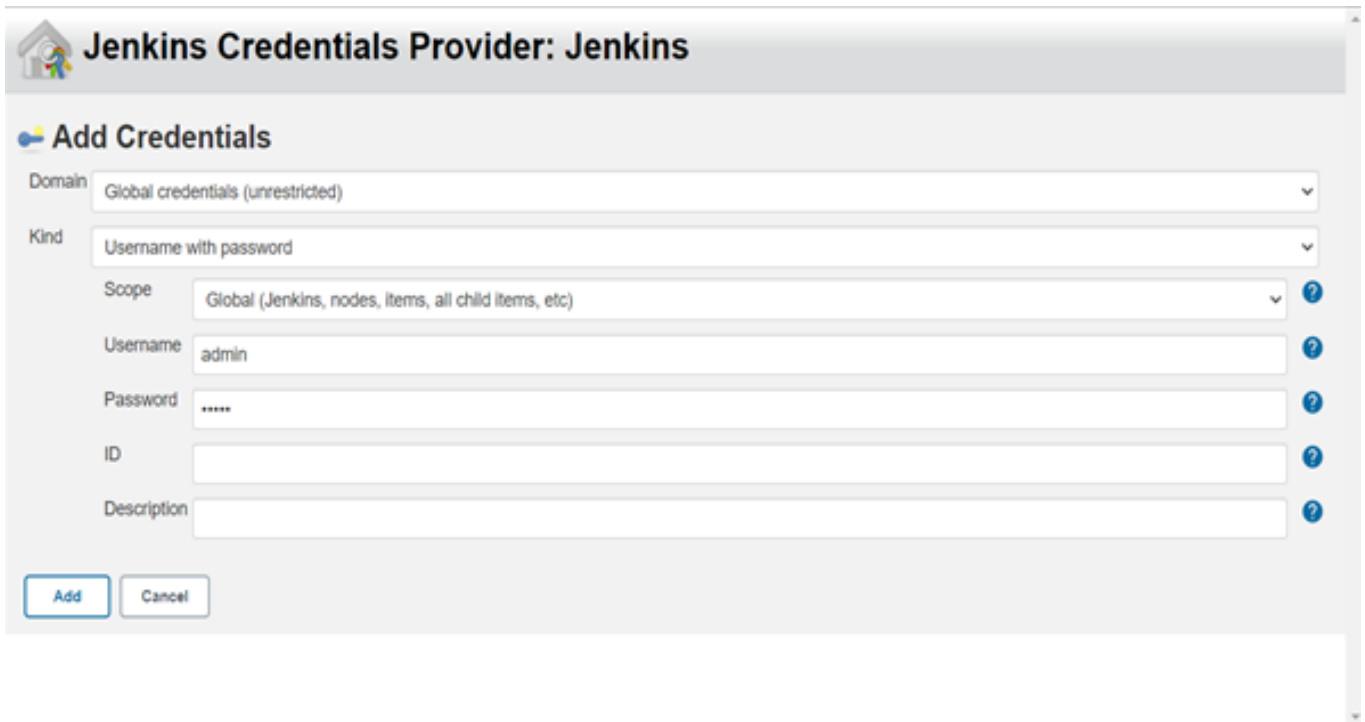
Search: nexus

Updates Available Installed Advanced

Install	Name	Version	Released
<input type="checkbox"/>	Nexus Artifact Uploader Artifact Uploader This plugin to upload the artifact to Nexus Repository.	2.13	3 mo 15 days ago
<input checked="" type="checkbox"/>	Nexus Platform This plugin integrates Sonatype Nexus to Jenkins.	3.9.20200722-764144e3a1be0	2 mo 15 days ago
<input type="checkbox"/>	Maven Artifact ChoiceListProvider (Nexus) Maven Build Parameters This Plugin adds a new ChoiceListProvider for the "Extensible Choice Plugin" which is able to read Artifact information from a Nexus repository.	1.5.1	1 yr 3 mo ago
<input type="checkbox"/>	artifact-promotion Build Wrappers External Site/Tool Integrations Maven pipeline Other Post-Build Actions Artifact Uploaders This is a simple plugin to promote artifacts. The promotion is done on the repository server(s) by moving the artifact from a 'staging' repository into a 'release' repository. Currently, only Sonatype Nexus (Open Source) is supported.	0.5.2	1 yr 3 mo ago
	Nexus Task Runner		

Install without restart Download now and install after restart Update information obtained: 8 min 20 sec ago Click now

4. Now, after that, Click on add option displayed in front of credentials. You will get a similar window. Provide your Nexus Server credentials here.



Jenkins Credentials Provider: Jenkins

Add Credentials

Domain: Global credentials (unrestricted)

Kind: Username with password

Scope: Global (Jenkins, nodes, items, all child items, etc)

Username: admin

Password: *****

ID:

Description:

5. Now, using Jenkins, upload a maven project on Github and create a JenkinsFile in it. This JenkinsFile will be used by Jenkins.

So, this is the content of JenkinsFile (File)

```
1 pipeline{
2     agent any
3     stages{
4         stage('Clean'){
5             steps{
6                 bat 'mvn clean'
7             }
8         }
9         stage('Deploy'){
10            steps{
11                bat 'mvn deploy'
12            }
13        }
14    }
15 }
```

6. Now, Move to the location where Nexus is installed.

Find nexus.exe file which will be in bin folder.

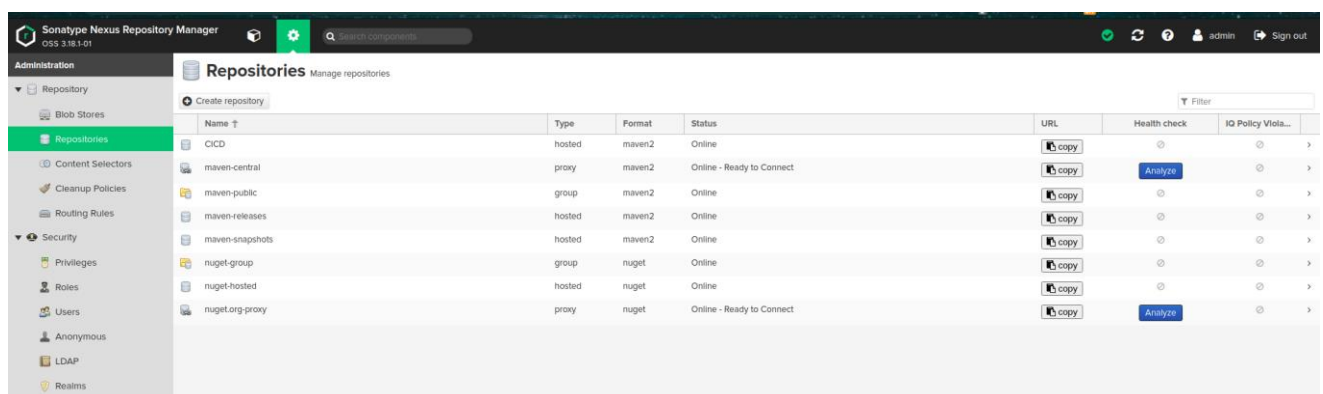
7. Open command prompt in administrator mode in the same folder and run the following command : Nexus.exe /run

```
nexus\nexus-3.18.1-01\bin>nexus.exe /run
853+0530 INFO [FelixStartLevel] *SYSTEM org.sonatype.nexus
126+0530 WARN [FelixStartLevel] *SYSTEM uk.org.lidalia.sy
amework class org.ops4j.pax.logging.slf4j.Slf4jLogger is n
on the console you will need to register it by calling reg
128+0530 INFO [FelixStartLevel] *SYSTEM uk.org.lidalia.sy
ing.slf4j registered; all classes within it or subpackages
```

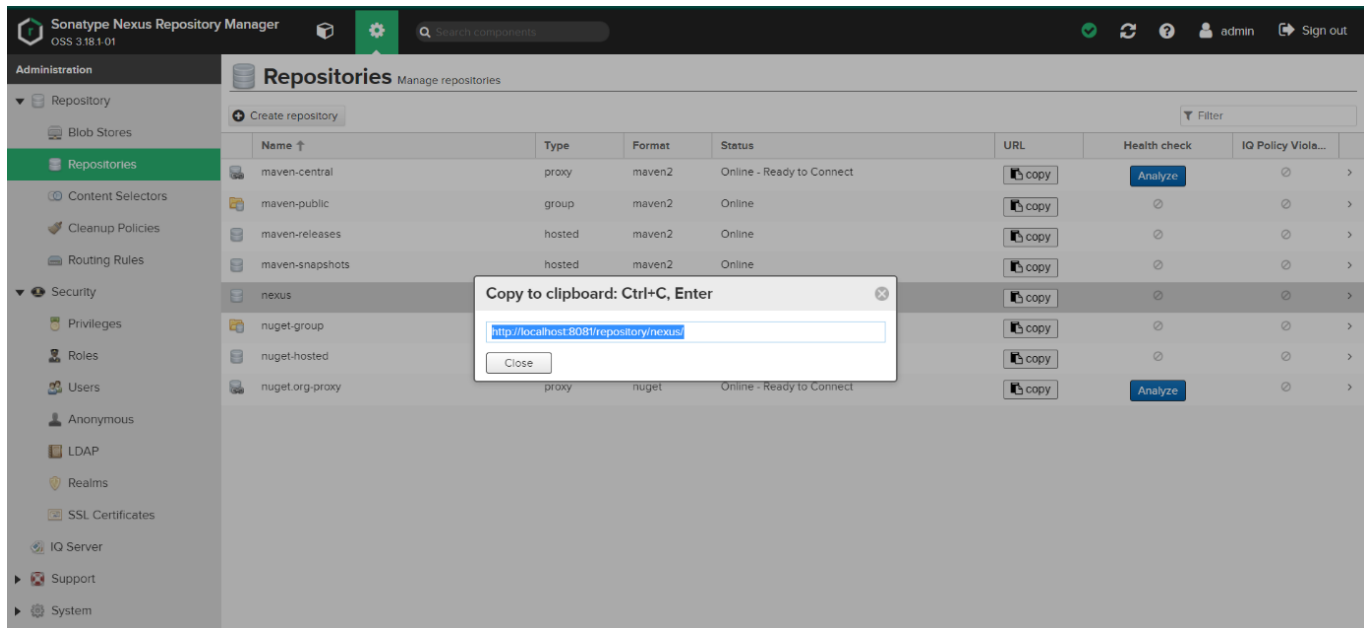
8. After this command is successful and Nexus Server is up, you have to open Nexus. Nexus will be accessible to localhost at port 8081 by default.

So, initially, for the first time, Nexus requests the password which is in the file that comes with the installation kit.

Find the default password at the sonatype-works/nexus3/ folder and the file name is admin.password.



9. Now create a new repository in Nexus. Copy the URL of the repository.

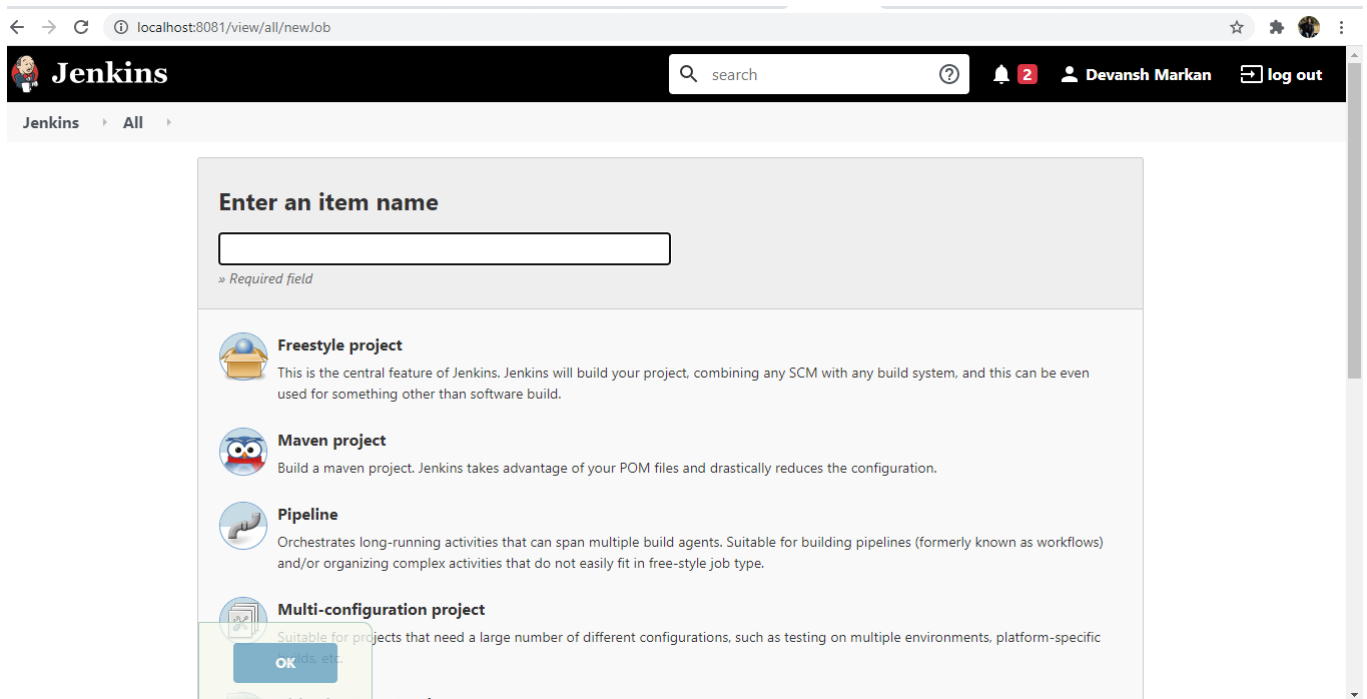


The screenshot shows the Sonatype Nexus Repository Manager interface. The left sidebar contains navigation links for Administration, Repository, Blob Stores, Repositories, Content Selectors, Cleanup Policies, Routing Rules, Security, Privileges, Roles, Users, Anonymous, LDAP, Realms, SSL Certificates, IO Server, Support, and System. The main panel displays the 'Repositories' page with a table of existing repositories. A modal dialog is open over the 'nexus' repository row, showing the URL 'http://localhost:8081/repository/nexus/' and a 'Copy to clipboard: Ctrl+C, Enter' message.

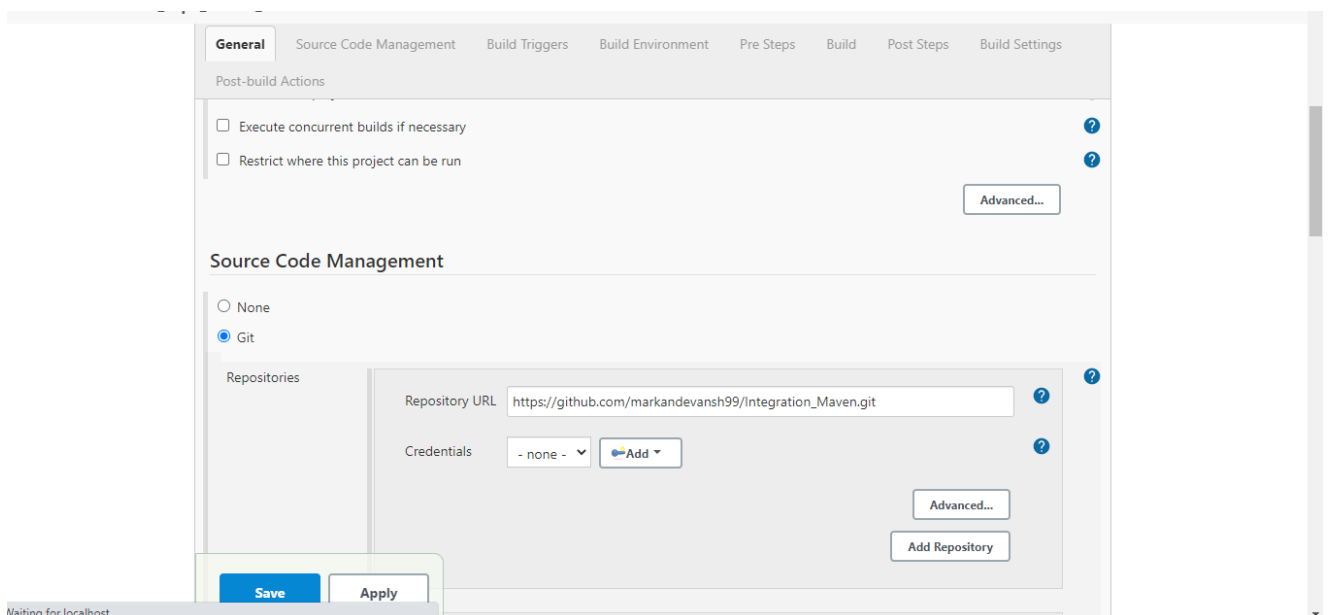
Name	Type	Format	Status	URL	Health check	IQ Policy Viola...
maven-central	proxy	maven2	Online - Ready to Connect	copy	Analyze	
maven-public	group	maven2	Online	copy		
maven-releases	hosted	maven2	Online	copy		
maven-snapshots	hosted	maven2	Online	copy		
nexus				copy		
nuget-group				copy		
nuget-hosted				copy		
nuget.org-proxy	proxy	nuget	Online - Ready to Connect	copy	Analyze	

10. Now, open the pom.xml of the Maven project to be published to Nexus. Make the required changes as below-

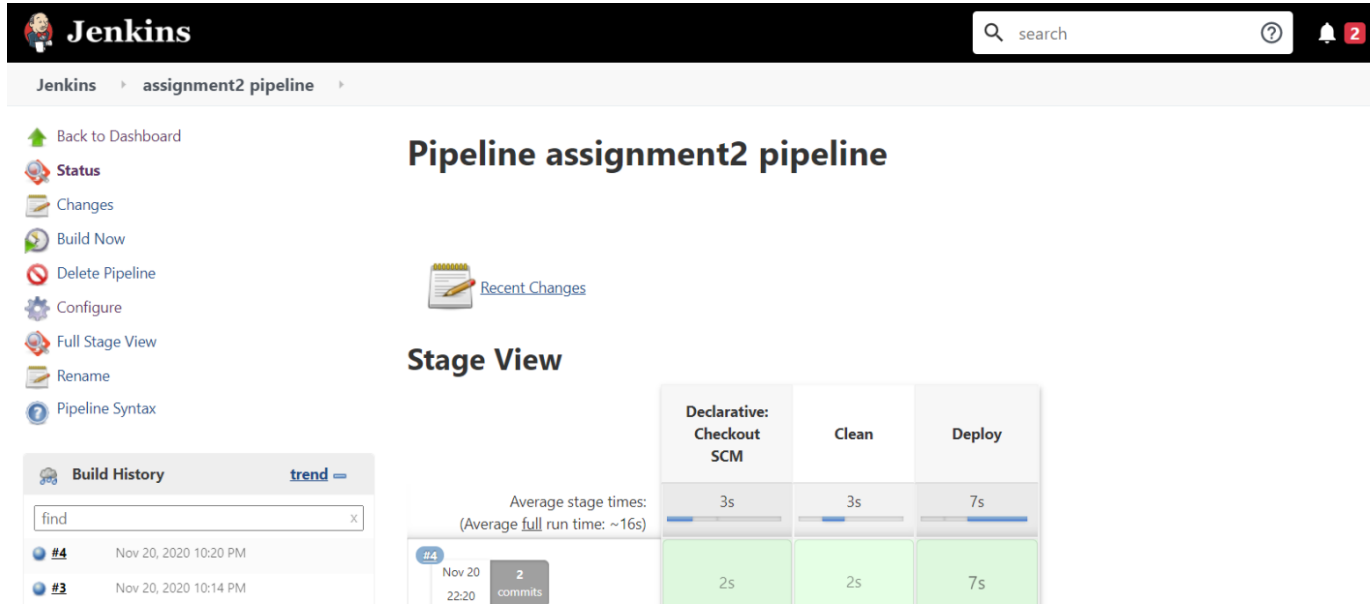
```
4 <artifactId>Maven-1</artifactId>
5 <version>0.0.1-SNAPSHOT</version>
6
7 <properties>
8   <maven.compiler.source>1.8</maven.compiler.source>
9   <maven.compiler.target>1.8</maven.compiler.target>
10 </properties>
11
12
13 <distributionManagement>
14   <snapshotRepository>
15     <id>nexus</id>
16     <name>nexus</name>
17     <url>http://localhost:8081/repository/nexus/</url>
18   </snapshotRepository>
19 </distributionManagement>
20
21 </project>
```



11. In the pipeline section, Select “Pipeline Script from Source Code Management” and provide the Github URL and click on save and apply.



12. Now, the dashboard will look like this! All we have to do now is click on BUILD NOW option and it will starting building it.



The screenshot shows the Jenkins dashboard for a pipeline named 'assignment2 pipeline'. The left sidebar contains navigation links: Back to Dashboard, Status, Changes, Build Now, Delete Pipeline, Configure, Full Stage View, Rename, and Pipeline Syntax. The main area displays the pipeline name 'Pipeline assignment2 pipeline' and a 'Recent Changes' section. Below this is the 'Stage View' section, which includes a table of stage times and a 'Build History' section.

Build History

#	Time
#4	Nov 20, 2020 10:20 PM
#3	Nov 20, 2020 10:14 PM

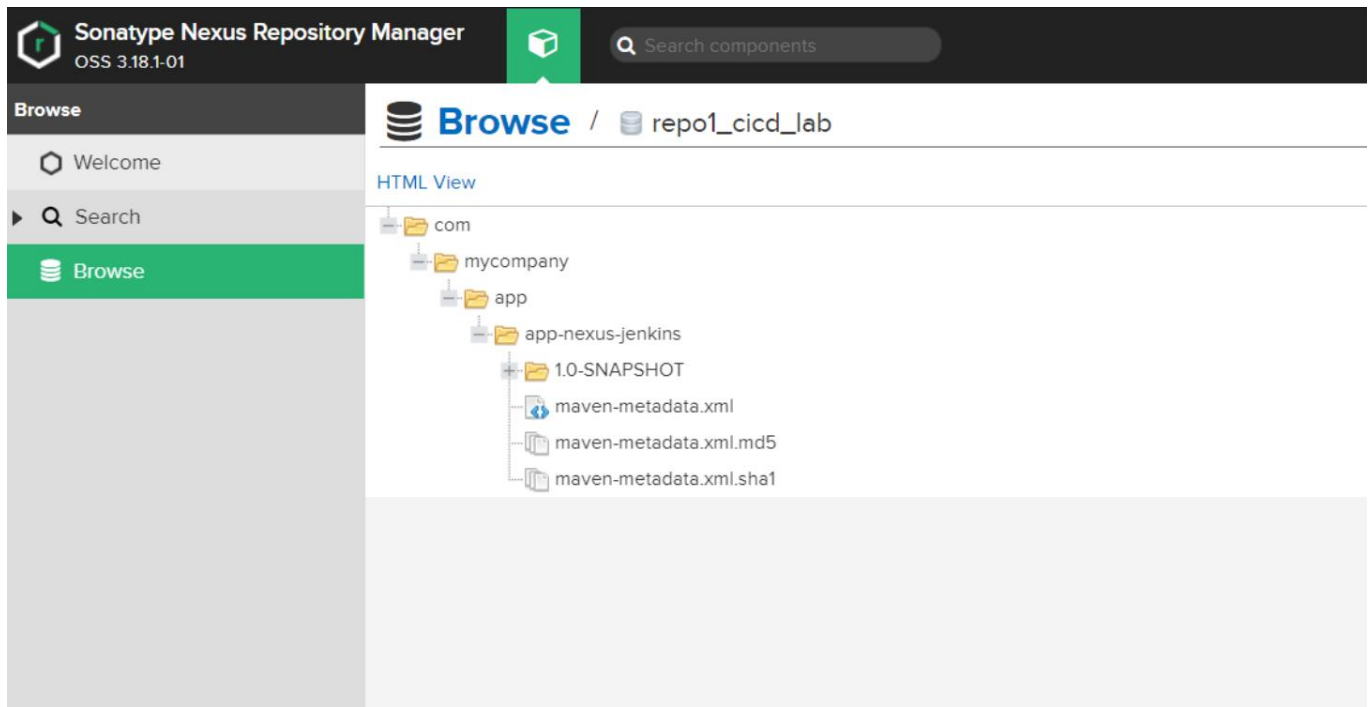
Stage View

Average stage times: 3s, 3s, 7s (Average full run time: ~16s)

Declarative: Checkout SCM	Clean	Deploy
3s	3s	7s
2s	2s	7s

13. Run “mvn deploy” to deploy the built jar on the Nexus server.

You will see that your Maven repository is deployed at the specified nexus server URL. So this shows that the project is successful. Again to check the Repo, we can do it like this:



This shows that it is successful.