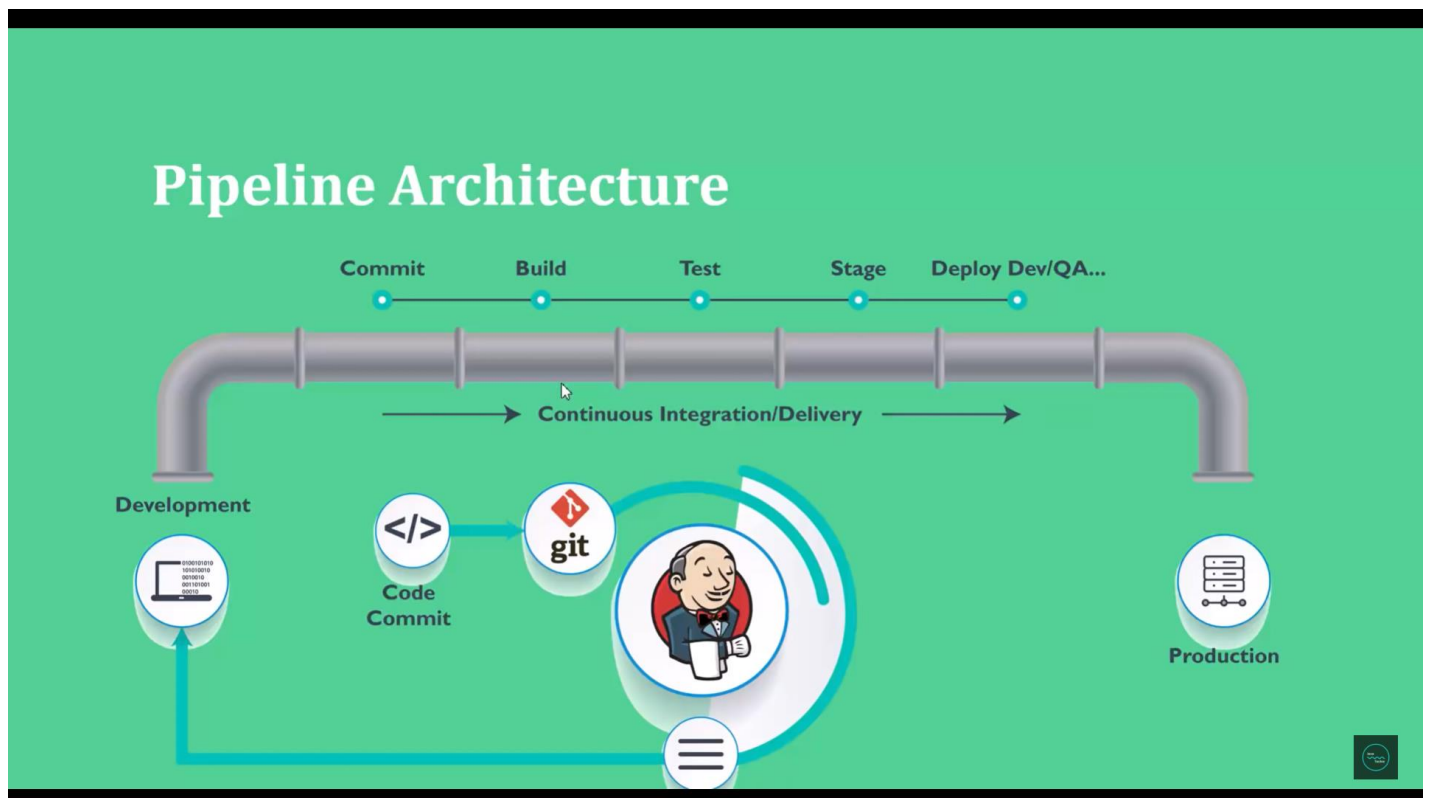


JENKINS

Jenkins is a Java-based open-source automation platform with plugins designed for continuous integration. It is used to continually create and test software projects, making it easier for developers and DevOps engineers to integrate changes to the project and for consumers to get a new build.

PIPELINE



- ➔ There is an external trigger that starts the pipeline.
- ➔ The latest code gets fetched from the source code repository.
- ➔ Then the code gets compiled, built, and packaged.
- ➔ Bunch of tests get run.
- ➔ Then, the compiled output gets published somewhere.
- ➔ Then, if we do continuous delivery, it gets deployed to live servers.
- ➔ The final output is some sort of notification to say whether the build is succeeded or not.

All the features in the pipeline comes from the plugins. We cannot do this with plain installation of Jenkins.

In Jenkins, all the plugins come from a central online catalog, which also gets used for installation and ongoing updates,

which includes both feature updates and to add new functionality to the plugins,

but also security fixes if there are any vulnerabilities in the plugins.

If we want to use some functionality available already in another plugin, we can just import the dependency on that plugin.

Due to this, we ended up with a huge dependency graph where we only installed 5-6 plugins

but ended up with 50-60 that are deployed or with these interrelated dependencies.

INSTALLATION

Basic steps –

1. Install Java Development Kit (JDK) (minimum jdk version 11 required) –
<https://www.oracle.com/java/technologies/downloads/#jdk17-windows>

x64 Installer

159.94 MB

2. Set the Path for the Environmental Variable for JDK

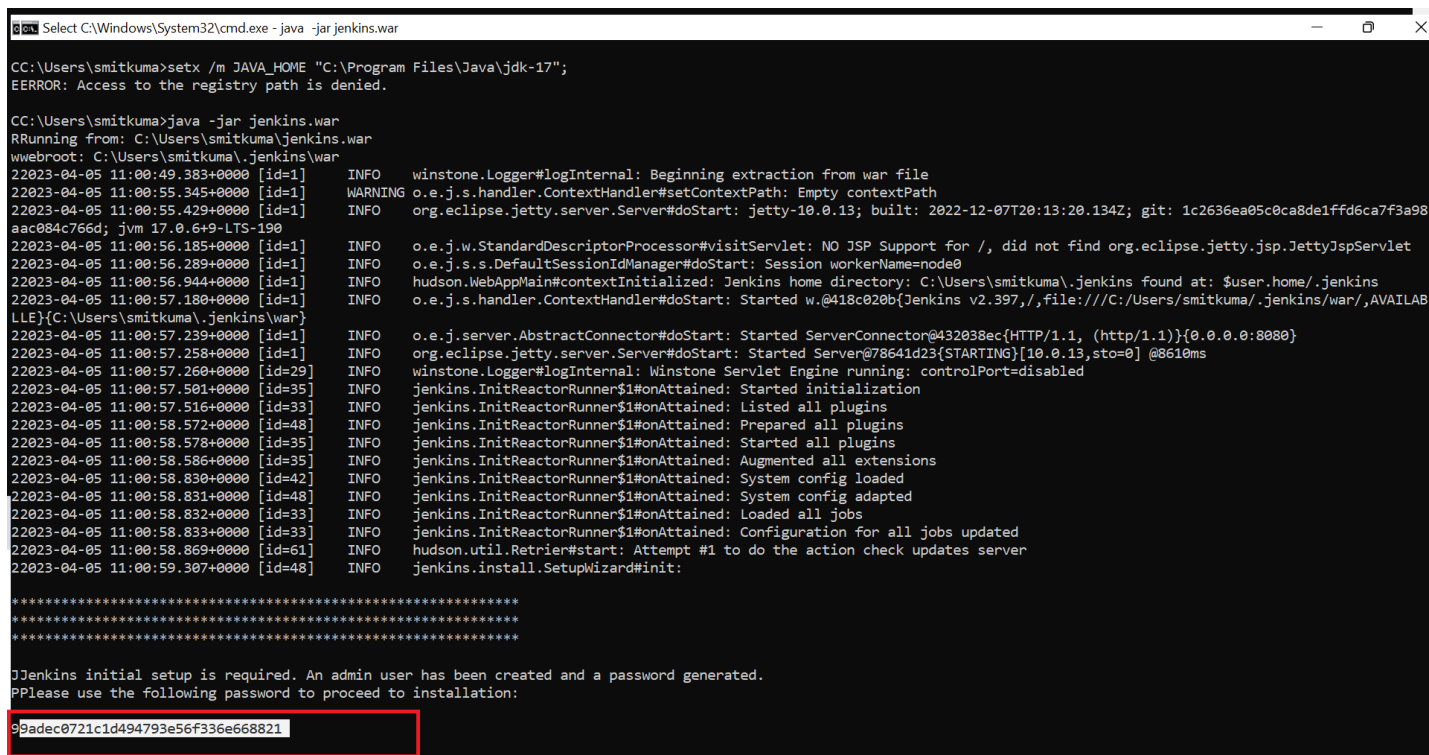
Download and run Jenkins

3. [Download Jenkins Generic Java package \(.war\)](#)
4. Open up a terminal in the download directory
5. Run `java -jar jenkins.war --httpPort=8080`
6. Browse to `http://localhost:8080`
7. Follow the instructions to complete the installation

When the installation is complete, you can start putting Jenkins to work!

[Continue to "Create your first Pipeline"](#)

1. Initialize the jenkins.war file with the command “`java -jar jenkins.war`” and install it.



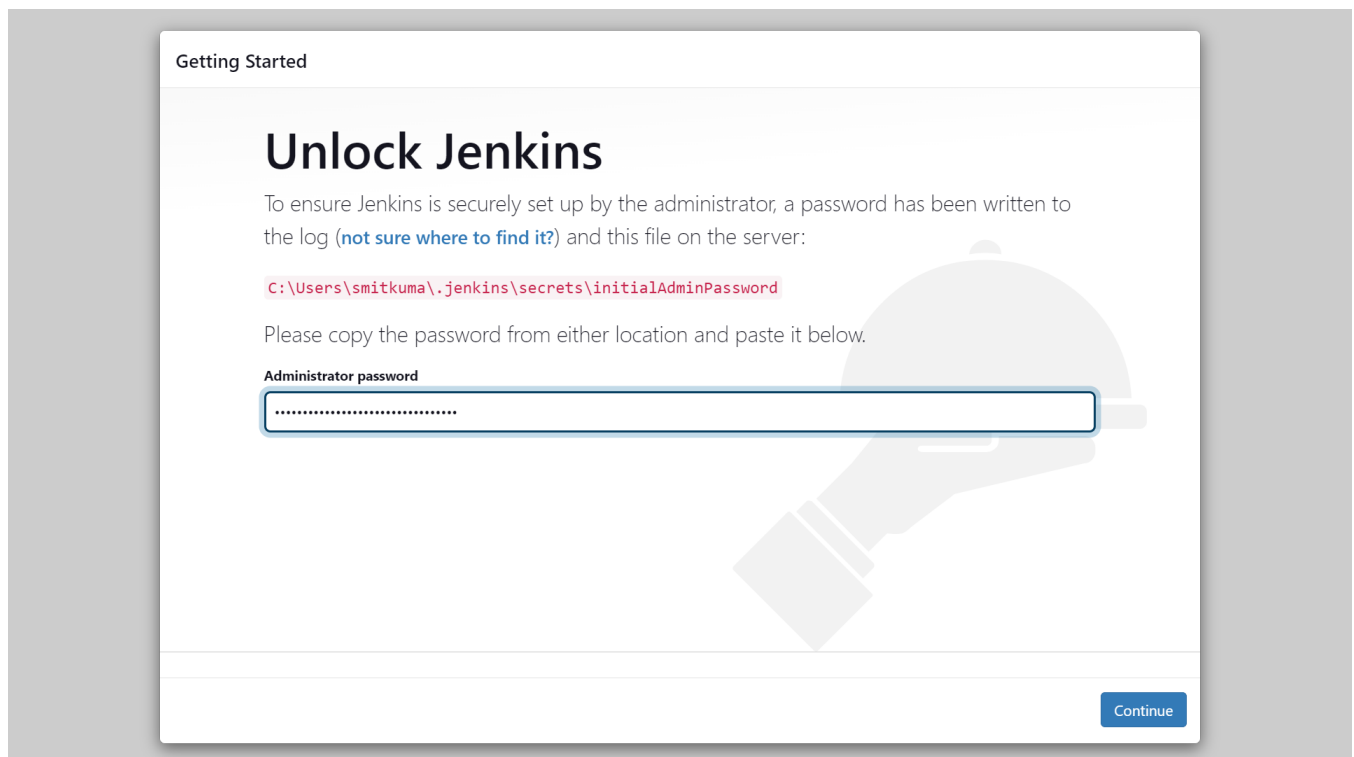
```
Select C:\Windows\System32\cmd.exe - java -jar jenkins.war

CC:\Users\smitkuma>setx /m JAVA_HOME "C:\Program Files\Java\jdk-17";
ERROR: Access to the registry path is denied.

CC:\Users\smitkuma>java -jar jenkins.war
RRunning from: C:\Users\smitkuma\jenkins.war
webroot: C:\Users\smitkuma\jenkins.war
2023-04-05 11:00:49.383+0000 [id=1] INFO winstone.Logger#logInternal: Beginning extraction from war file
2023-04-05 11:00:55.345+0000 [id=1] WARNING o.e.j.s.handler.ContextHandler#setContextPath: Empty contextPath
2023-04-05 11:00:55.429+0000 [id=1] INFO org.eclipse.jetty.server.Server#doStart: jetty-10.0.13; built: 2022-12-07T20:13:20.134Z; git: 1c2636ea05c0ca8de1ffd6ca7f3a98
aac084c766d; jvm 17.0.6+9-LTS-190
2023-04-05 11:00:56.185+0000 [id=1] INFO o.e.j.w.StandardDescriptorProcessor#visitServlet: NO JSP Support for /, did not find org.eclipse.jetty.jsp.JettyJspServlet
2023-04-05 11:00:56.289+0000 [id=1] INFO o.e.j.s.s.DefaultSessionIdManager#doStart: Session workerName=node0
2023-04-05 11:00:56.944+0000 [id=1] INFO hudson.WebAppMain#contextInitialized: Jenkins home directory: C:\Users\smitkuma\jenkins found at: $user.home/.jenkins
2023-04-05 11:00:57.180+0000 [id=1] INFO o.e.j.s.handler.ContextHandler#doStart: Started w.@418c020b{Jenkins v2.397.1, file:///C:/Users/smitkuma/.jenkins/war/, AVAILAB
LLE}{C:\Users\smitkuma\jenkins.war}
2023-04-05 11:00:57.239+0000 [id=1] INFO o.e.j.server.AbstractConnector#doStart: Started ServerConnector@432038ec{HTTP/1.1, (http/1.1)}{0.0.0.0:8080}
2023-04-05 11:00:57.258+0000 [id=1] INFO org.eclipse.jetty.server.Server#doStart: Started Server@78641d23{STARTING}[10.0.13,sto=0] @8610ms
2023-04-05 11:00:57.260+0000 [id=29] INFO winstone.Logger#logInternal: Winstone Servlet Engine running: controlPort=disabled
2023-04-05 11:00:57.501+0000 [id=35] INFO jenkins.InitReactorRunner$1#onAttained: Started initialization
2023-04-05 11:00:57.516+0000 [id=33] INFO jenkins.InitReactorRunner$1#onAttained: Listed all plugins
2023-04-05 11:00:57.572+0000 [id=48] INFO jenkins.InitReactorRunner$1#onAttained: Prepared all plugins
2023-04-05 11:00:58.578+0000 [id=35] INFO jenkins.InitReactorRunner$1#onAttained: Started all plugins
2023-04-05 11:00:58.586+0000 [id=35] INFO jenkins.InitReactorRunner$1#onAttained: Augmented all extensions
2023-04-05 11:00:58.830+0000 [id=42] INFO jenkins.InitReactorRunner$1#onAttained: System config loaded
2023-04-05 11:00:58.831+0000 [id=48] INFO jenkins.InitReactorRunner$1#onAttained: System config adapted
2023-04-05 11:00:58.832+0000 [id=33] INFO jenkins.InitReactorRunner$1#onAttained: Loaded all jobs
2023-04-05 11:00:58.833+0000 [id=33] INFO jenkins.InitReactorRunner$1#onAttained: Configuration for all jobs updated
2023-04-05 11:00:58.869+0000 [id=61] INFO hudson.util.Retrier#start: Attempt #1 to do the action check updates server
2023-04-05 11:00:59.307+0000 [id=48] INFO jenkins.install.SetupWizard#init:

*****
*****
*****
Jenkins initial setup is required. An admin user has been created and a password generated.
Please use the following password to proceed to installation:
9badec0721c1d494793e56f336e68821
```

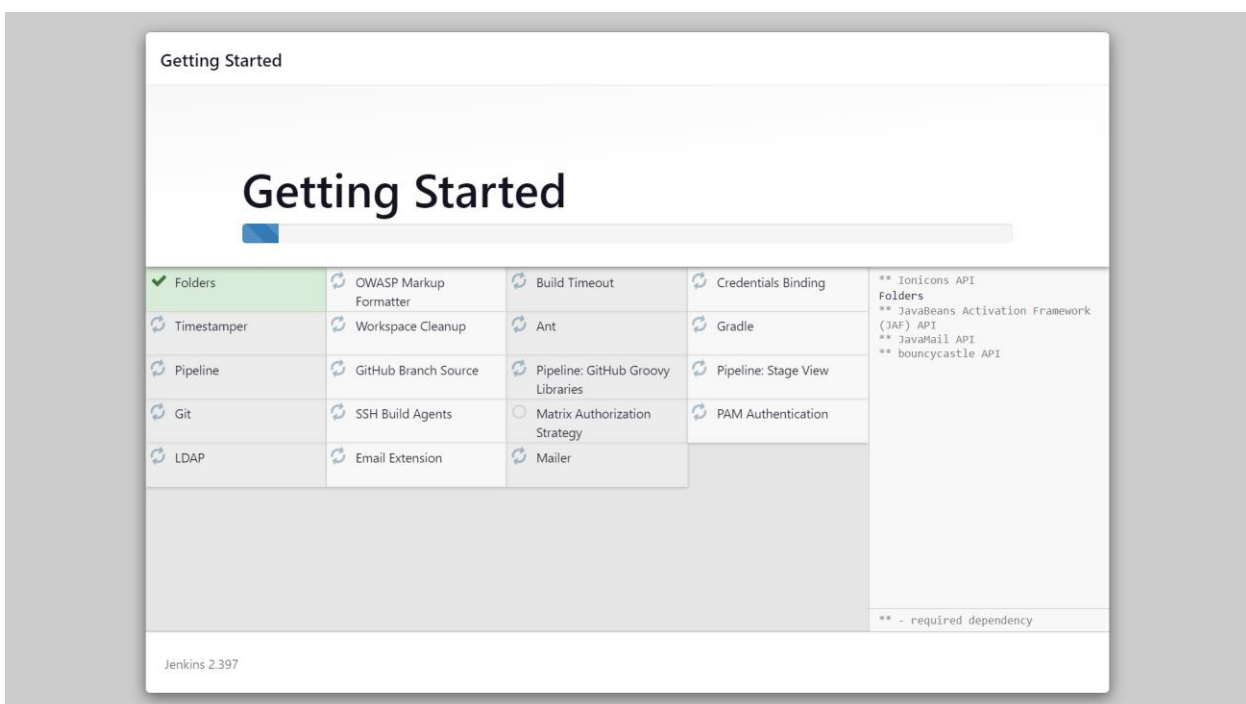
2. Make sure you copy paste the admin password which has been generated-
99adec0721c1d494793e56f336e668821
3. (This may also be found at: C:\Users\smitkuma\.jenkins\secrets\initialAdminPassword)
4. To use Jenkins run <https://localhost:8080> (the default port) and enter the key obtained after installing Jenkins as shown above to unlock Jenkins. Save this key this is our admin password.



5. Select the required plugins and initiate your jenkins profile



6. Now it will take few minutes to install the plugins.



7. Now we can create a personal profile or login as admin – give a simple password which you can remember ex: Password@123

Getting Started

Create First Admin User

Username

Password

Confirm password

Full name

E-mail address

Jenkins 2.397

[Skip and continue as admin](#) [Save and Continue](#)

8. We can change the instance if needed at this step

Getting Started

Instance Configuration

Jenkins URL:

The Jenkins URL is used to provide the root URL for absolute links to various Jenkins resources. That means this value is required for proper operation of many Jenkins features including email notifications, PR status updates, and the BUILD_URL environment variable provided to build steps.

The proposed default value shown is **not saved yet** and is generated from the current request, if possible. The best practice is to set this value to the URL that users are expected to use. This will avoid confusion when sharing or viewing links.

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[Not now](#) [Save and Finish](#)

9. Jenkins is installed successfully.

Jenkins is ready!

Your Jenkins setup is complete.

Start using Jenkins

Jenkins 2.397



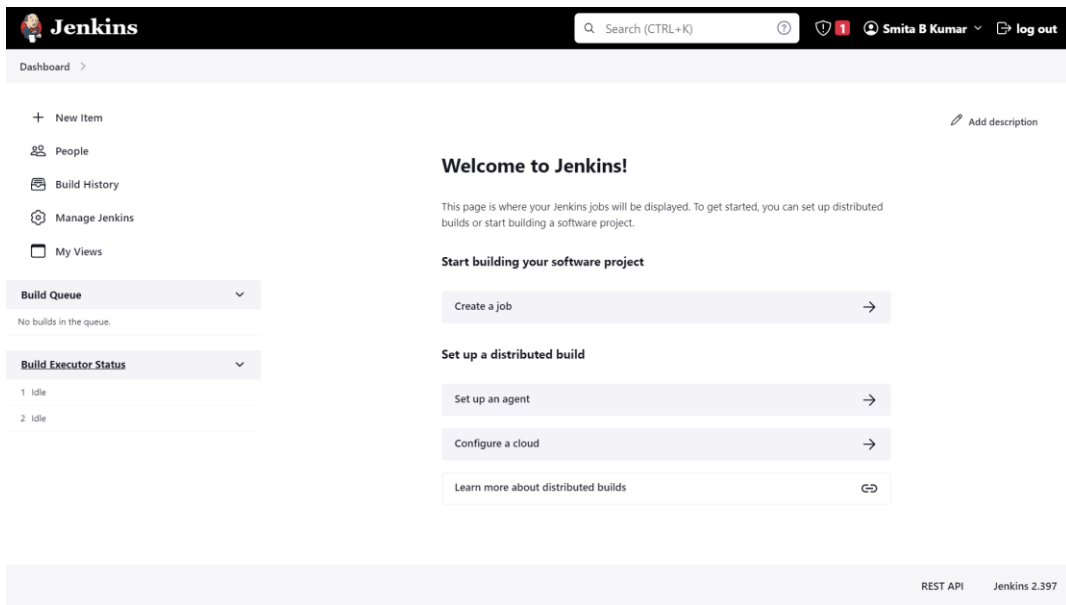
Welcome to Jenkins!

smita

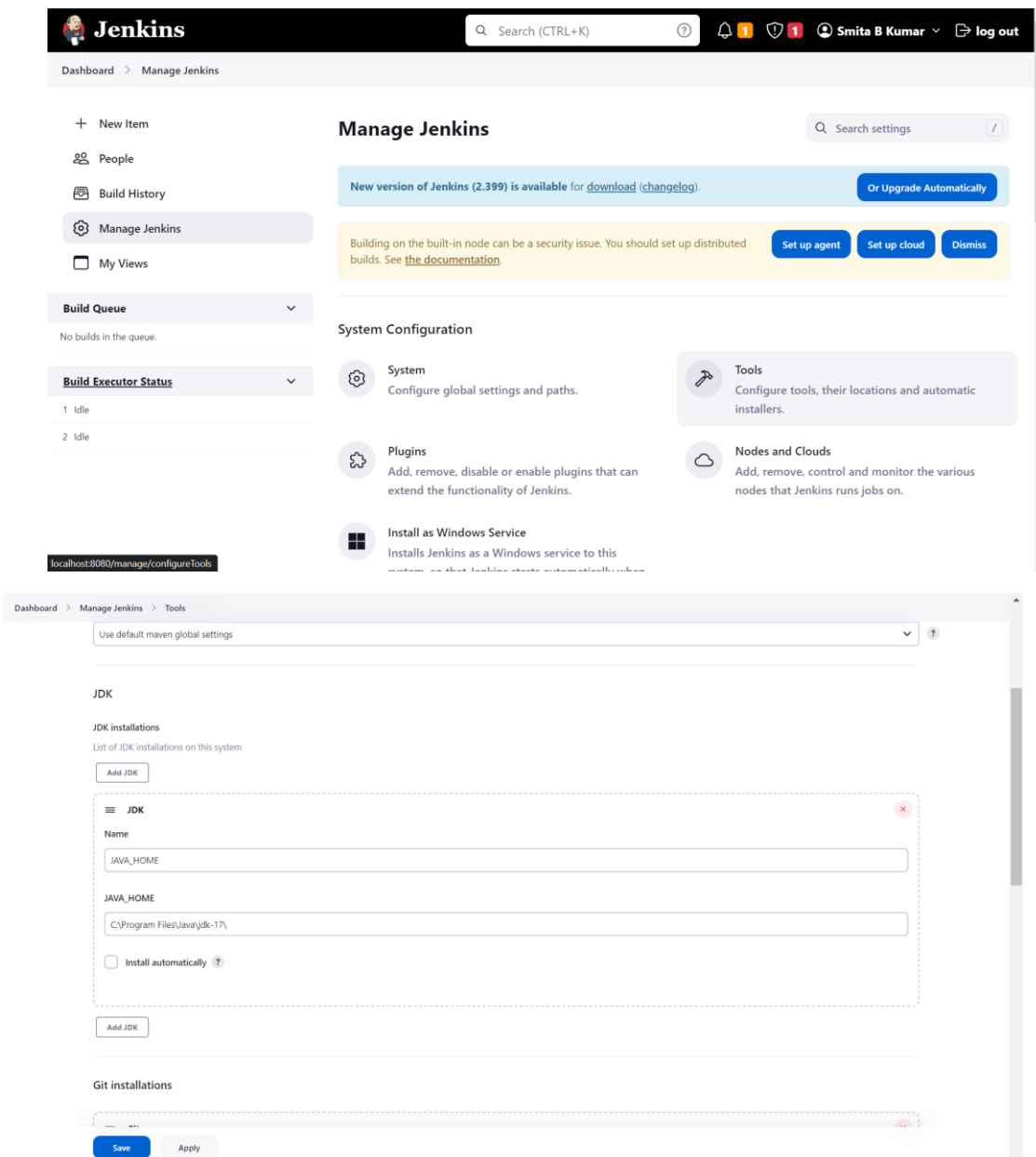
☒ Keep me signed in

Sign in

10. Now we can create a job my following these steps and cloning any project.



11. Now Click on **Manage Jenkins-> Tool** -> Script the **Java Home Path & Maven Home Path** and repository URL and the project will be ready to build.



Dashboard > Manage Jenkins > Tools

Maven

Maven installations

List of Maven installations on this system

[Add Maven](#)

≡

Maven

✕

Name

MAVEN_HOME

MAVEN_HOME

C:\Program Files\apache-maven-3.6.2\

☐ Install automatically ?

[Add Maven](#)

[Save](#) [Apply](#)

Jenkins 2.397

Dashboard > Manage Jenkins > Tools

Git installations

≡

Git

✕

Name

Default

Path to Git executable ?


C:\Program Files\Git\bin\git.exe

☐ Install automatically ?





[Add Git](#)

[Save](#) [Apply](#)

Create a new job


 **Jenkins**


Search (CTRL+K)


 2  1  Smita B Kumar  log out

Dashboard >

+ New Item

 People

 Build History

 Manage Jenkins

☐ My Views

Build Queue

No builds in the queue.

Build Executor Status

1 Idle

2 Idle

Welcome to Jenkins!

This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.

Start building your software project


[Create a job](#)

Set up a distributed build

[Set up an agent](#)

[Configure a cloud](#)

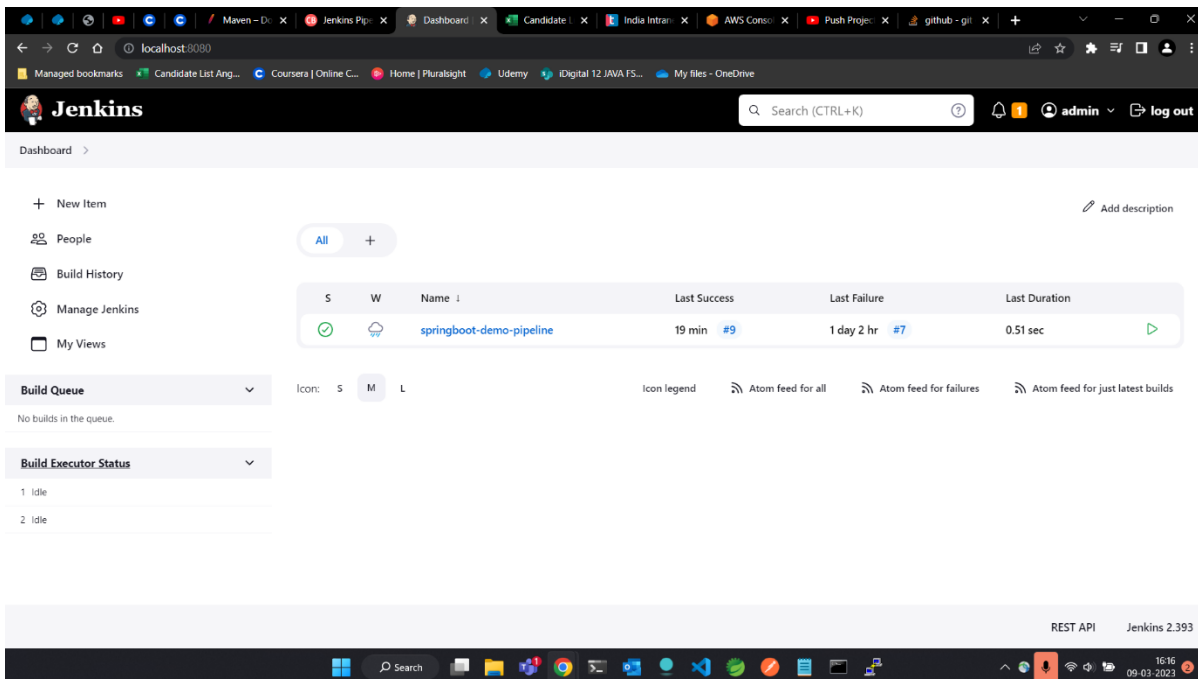
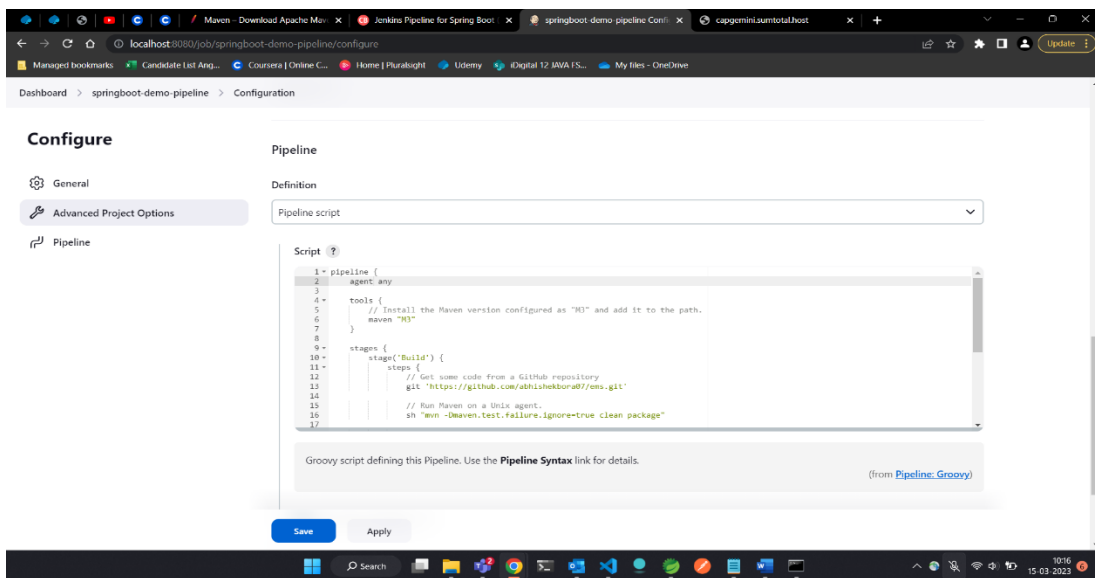
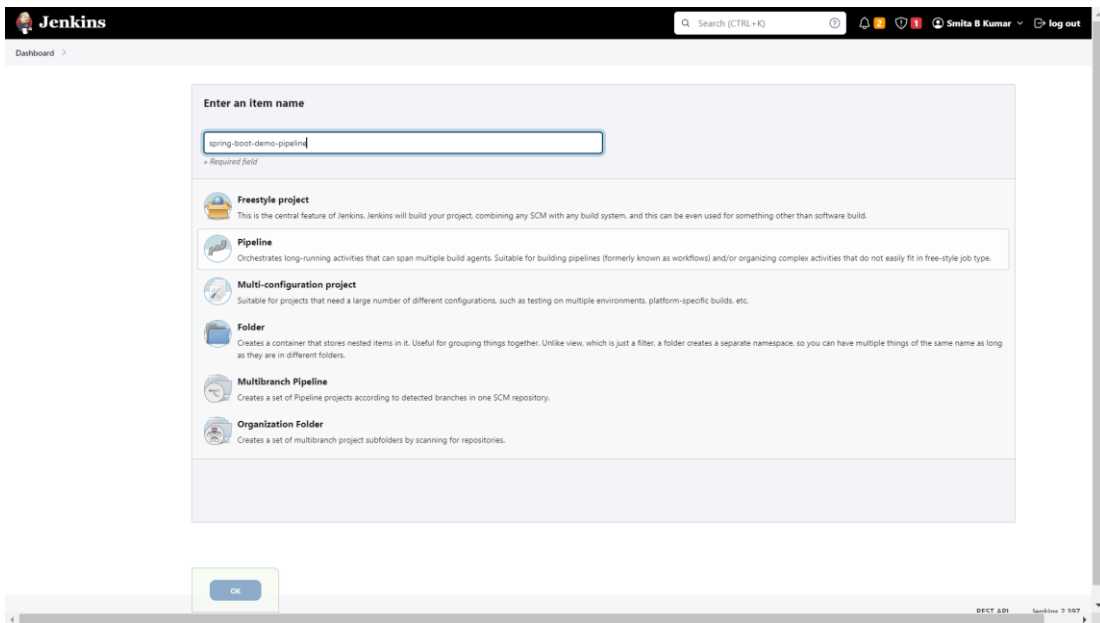
[Learn more about distributed builds](#)

 Add description

localhost:8080/newJob

Enter the name - **spring-boot-demo-pipeline**

Select **Pipeline**



```

[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO]
[INFO] --- maven-jar-plugin:3.2.2:jar (default-jar) @ devcom ---
[INFO] Building jar: C:\Users\uditya\.jenkins\workspace\groceryapp\target\groceryapp.jar
[INFO]
[INFO] --- spring-boot-maven-plugin:2.7.3:repackage (repackage) @ devcom ---
[INFO] Replacing main artifact with repackaged archive
[INFO]
[INFO] --- maven-install-plugin:2.5.2:install (default-install) @ devcom ---
[INFO] Installing C:\Users\uditya\.jenkins\workspace\groceryapp\target\groceryapp.jar to C:\Users\uditya\.m2\repository\com\devcom\devcom\0.0.1-SNAPSHOT\devcom-0.0.1-SNAPSHOT.jar
[INFO] Installing C:\Users\uditya\.jenkins\workspace\groceryapp\pom.xml to C:\Users\uditya\.m2\repository\com\devcom\devcom\0.0.1-SNAPSHOT\devcom-0.0.1-SNAPSHOT.pom
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 57.111 s
[INFO] Finished at: 2022-12-30T11:54:47+05:30
[INFO] -----
[INFO]
[INFO] [groceryapp] $ docker build -t udiya21/groceryapp --pull=true C:\Users\uditya\.jenkins\workspace\groceryapp
#1 [internal] load build definition from Dockerfile
#1 sha256:fc5fa2d9ce3b88c830d82c2b577a02190f7823d21f20fb804950ca21a2b0021b
#1 transferring dockerfile: 1618 0.0s done
#1 DONE 0.2s
#2 [internal] load .dockerignore

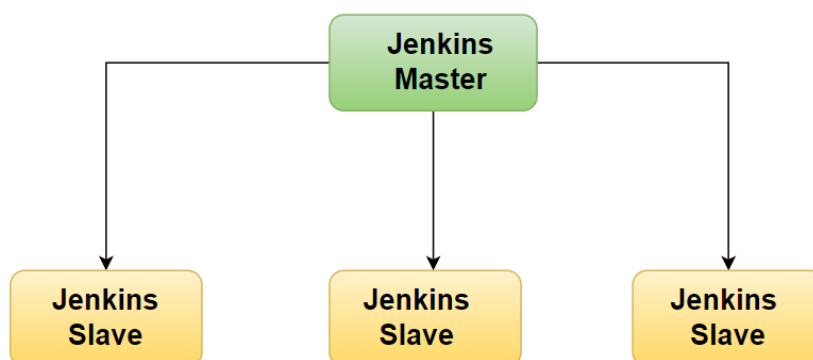
```

ARCHITECTURE

- ➔ Developers commit changes to the source code, found in the repository.
- ➔ The Jenkins CI server checks the repository at regular intervals and pulls any newly available code.
- ➔ The Build Server builds the code into an executable file. In case the build fails, feedback is sent to the developers.
- ➔ Jenkins deploys the build application to the test server. If the test fails, the developers are alerted.
- ➔ If the code is error-free, the tested application is deployed on the production server.

The files can contain different code and be very large, requiring multiple builds. However, a single Jenkins server cannot handle multiple files and builds simultaneously; for that, a distributed Jenkins architecture is necessary.

The Workload of the Jenkins Master will be distributed to the Slave



➔ Jenkins Master

The Jenkins master is in charge of scheduling the jobs, assigning slaves, and .

sending builds to slaves to execute the jobs. It'll also keep track of the slave state (offline or online)

and retrieve the build result responses from slaves and display them on the console output.

➔ Jenkins Slave

It runs on the remote server. The Jenkins server follows the requests of the Jenkins master and is compatible with all operating systems. Building jobs dispatched by the master are executed by the slave.

Also, the project can be configured to choose a specific slave machine.