

Experiment 4

Aim: To understand continuous integration, install and configure Jenkins with Maven/ ANT/ Gradle to setup a build job

Theory:

Jenkins is a self-contained, open-source automation server which can be used to automate all sorts of tasks related to building, testing, and delivering or deploying software.

Jenkins is a software that allows continuous integration. Jenkins will be installed on a server where the central build will take place.


Continuous Integration is a development practice that requires developers to integrate code into a shared repository at regular intervals. This concept was meant to remove the problem of finding later occurrences of issues in the build lifecycle. Continuous integration requires the developers to have frequent builds. The common practice is that whenever a code commit occurs, a build should be triggered.

Output:

Downloading Jenkins

Jenkins is distributed as WAR files, native packages, installers, and Docker images. Follow these installation steps:

1. Before downloading, please take a moment to review the [Hardware and Software requirements](#) section of the User Handbook.
2. Select one of the packages below and follow the download instructions.
3. Once a Jenkins package has been downloaded, proceed to the [Installing Jenkins](#) section of the User Handbook.
4. You may also want to verify the package you downloaded. [Learn more about verifying Jenkins downloads.](#)

 **Download Jenkins 2.303.3 LTS for:**

Generic Java package (.war)
SHA-256:
8a9ae736775b3f31a050faa945f7a3991abdb43d941c7294cac890c1e27


Docker


Ubuntu/Debian


CentOS/Fedora/Red Hat


Windows


openSUSE

FreeBSD 

Gentoo 

macOS 

OpenBSD 

 **Download Jenkins 2.319 for:**

Generic Java package (.war)
SHA-256:
50e9c818cda1bdf3ba7e2a1e590f027a889bd527d5bfc2daea944ce351c7105


Docker


Ubuntu/Debian


CentOS/Fedora/Red Hat


Windows

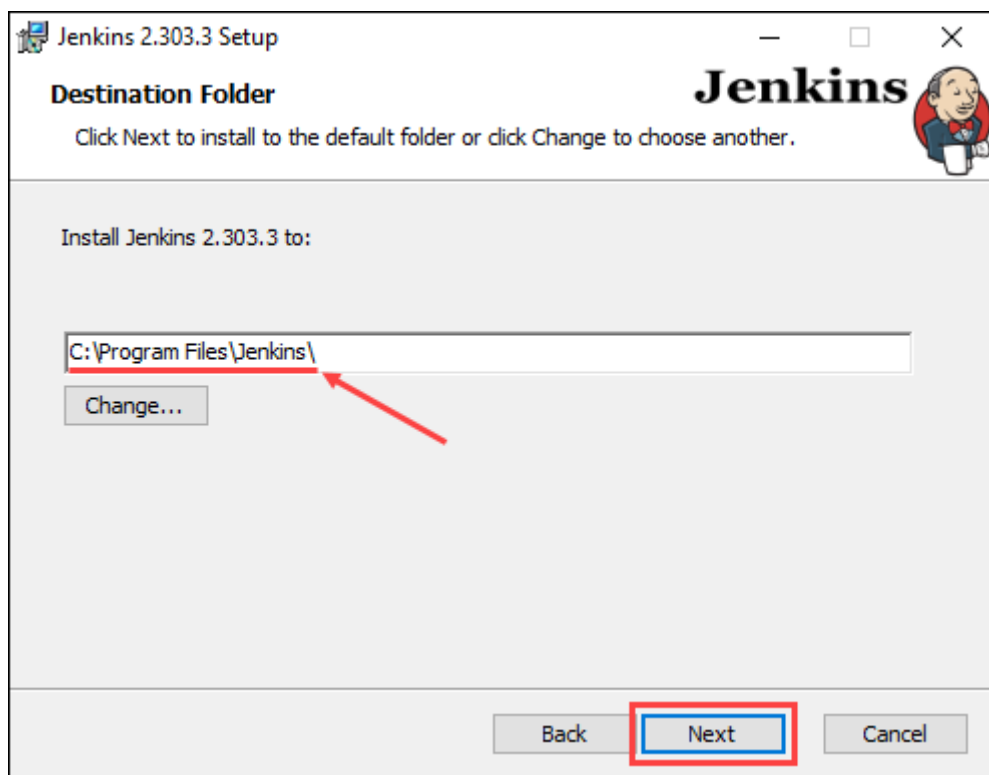
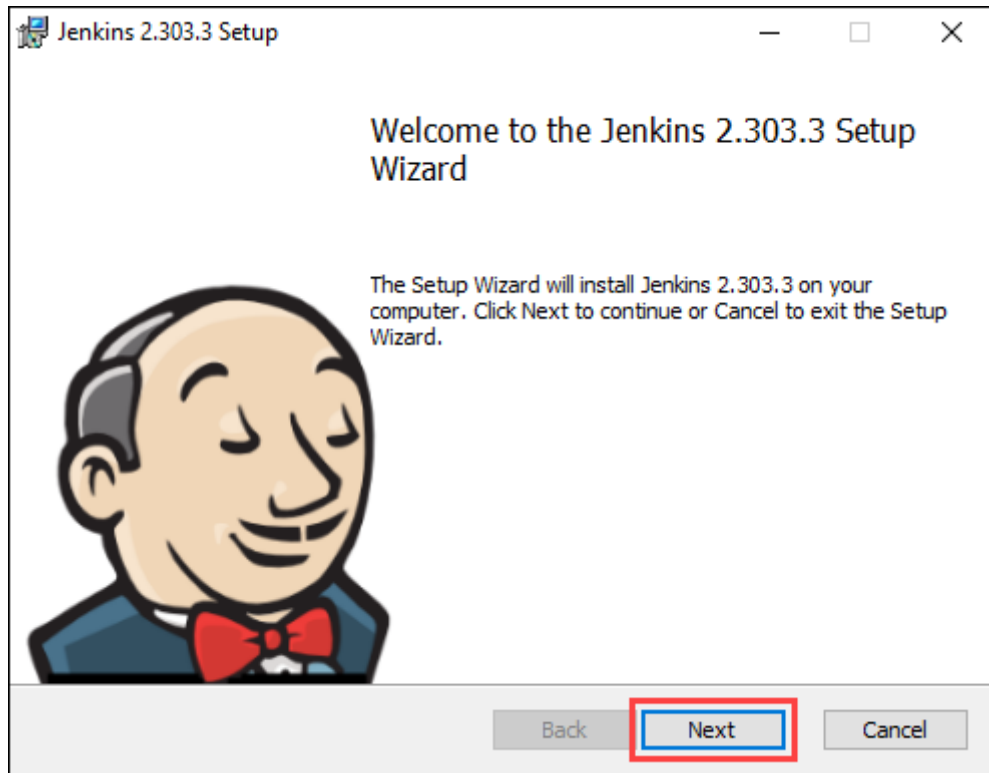
openSUSE

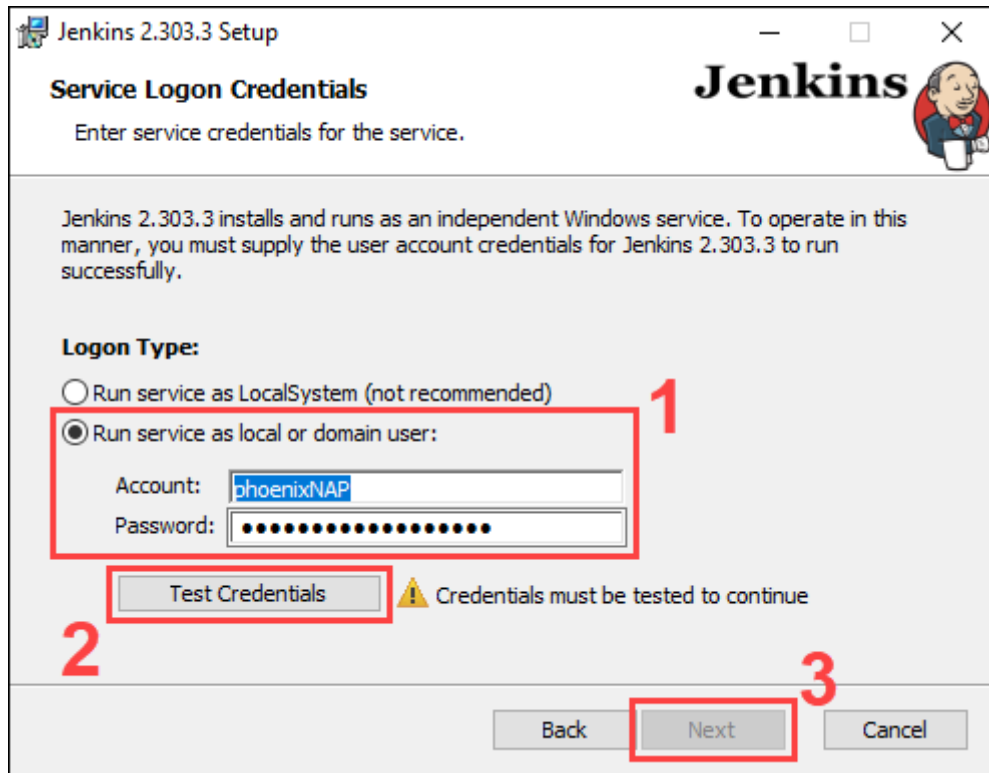
Arch Linux 

FreeBSD 

Gentoo 

macOS 





Jenkins 2.303.3 Setup

Service Logon Credentials

Enter service credentials for the service.

Jenkins 2.303.3 installs and runs as an independent Windows service. To operate in this manner, you must supply the user account credentials for Jenkins 2.303.3 to run successfully.


Logon Type:

☐ Run service as LocalSystem (not recommended)

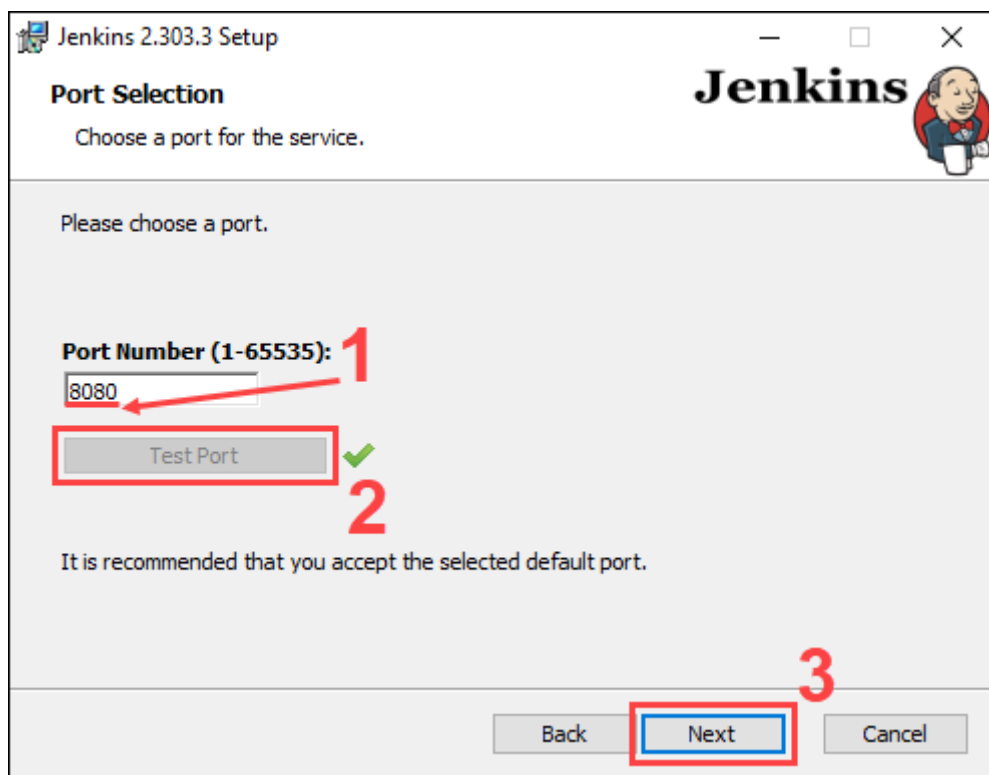
☒ Run service as local or domain user:

Account:

Password:

 Credentials must be tested to continue

Red annotations: 1 points to the 'Run service as local or domain user' option; 2 points to the 'Test Credentials' button; 3 points to the 'Next' button.




Jenkins 2.303.3 Setup

Port Selection

Choose a port for the service.

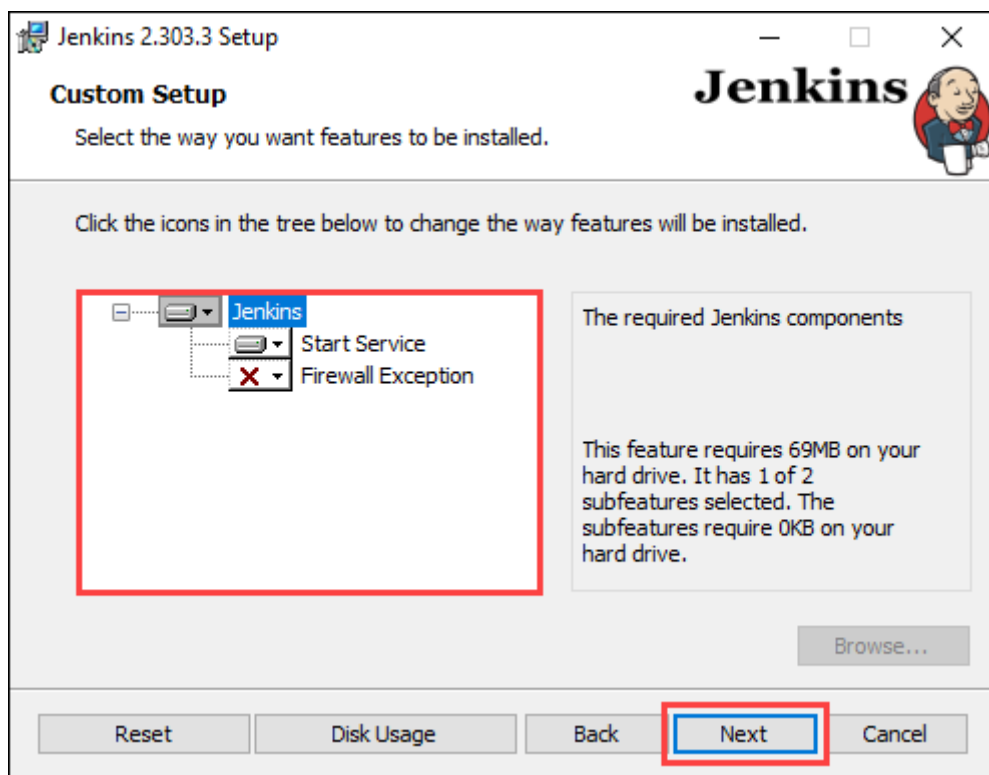
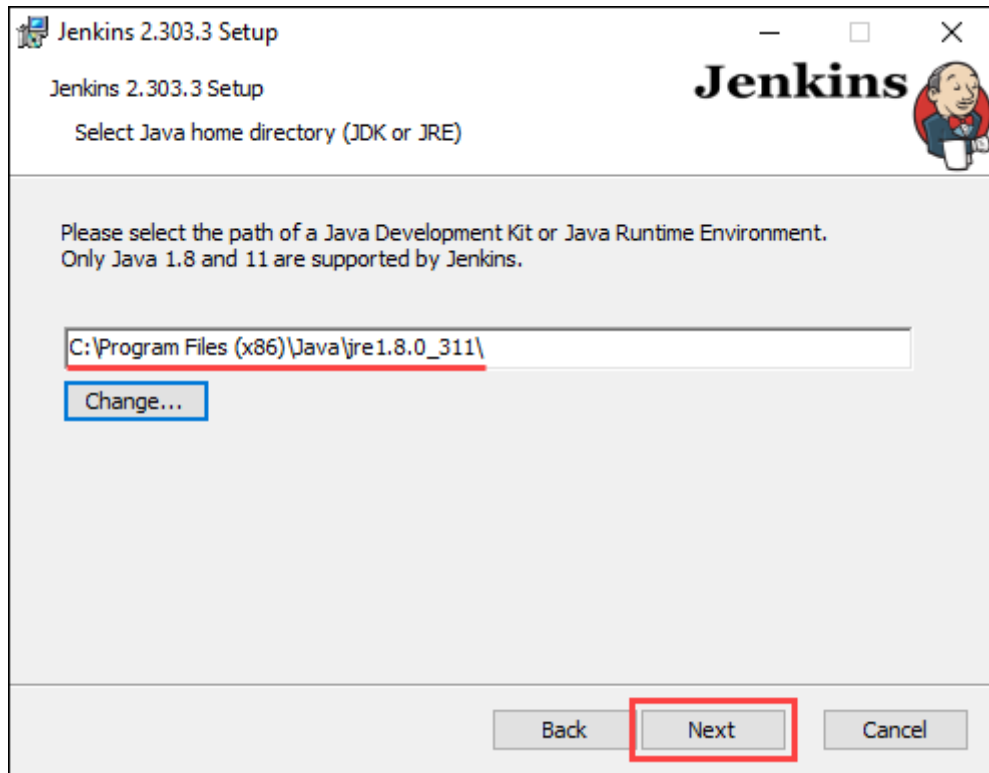
Please choose a port.

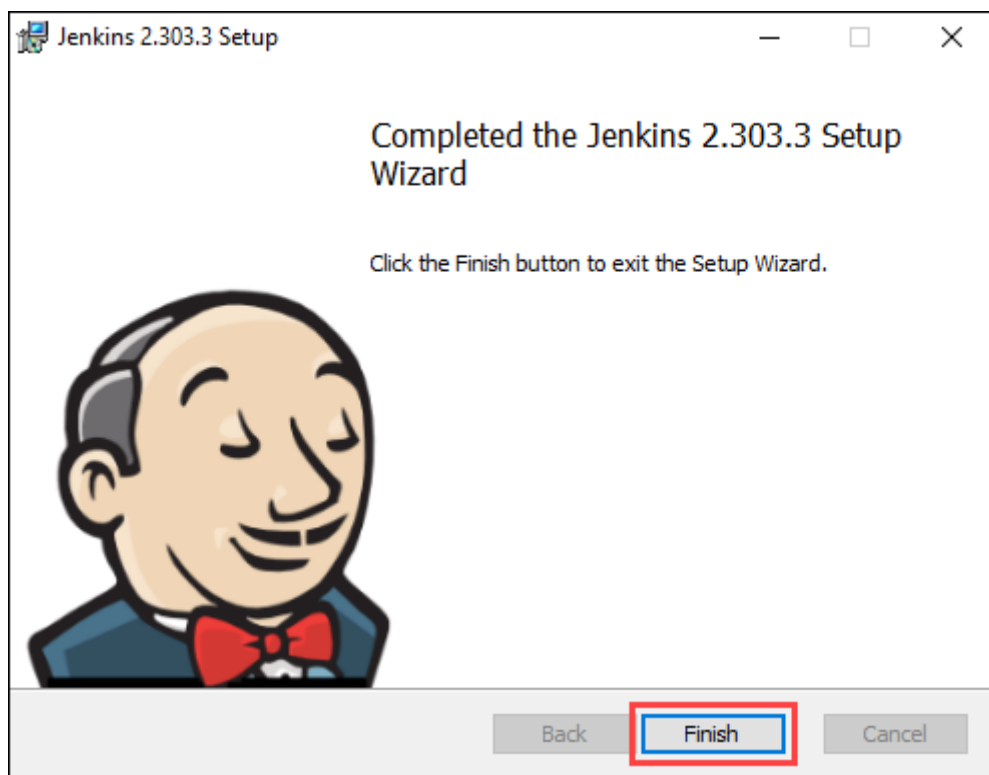
Port Number (1-65535):



It is recommended that you accept the selected default port.

Red annotations: 1 points to the 'Port Number' input field; 2 points to the 'Test Port' button; 3 points to the 'Next' button.





Getting Started


Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log ([not sure where to find it?](#)) and this file on the server:

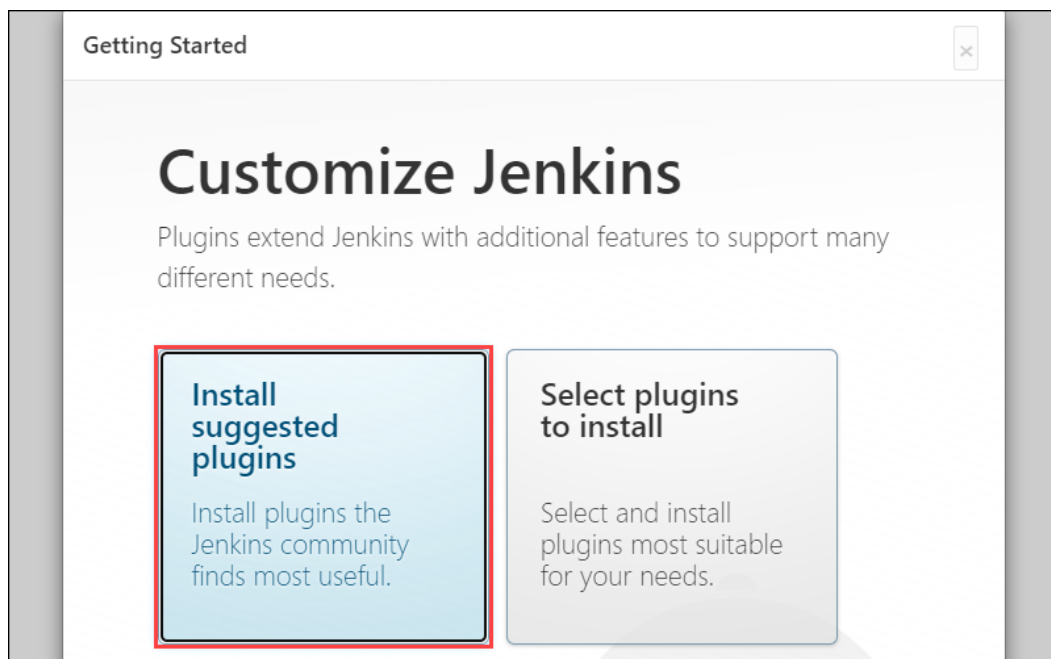
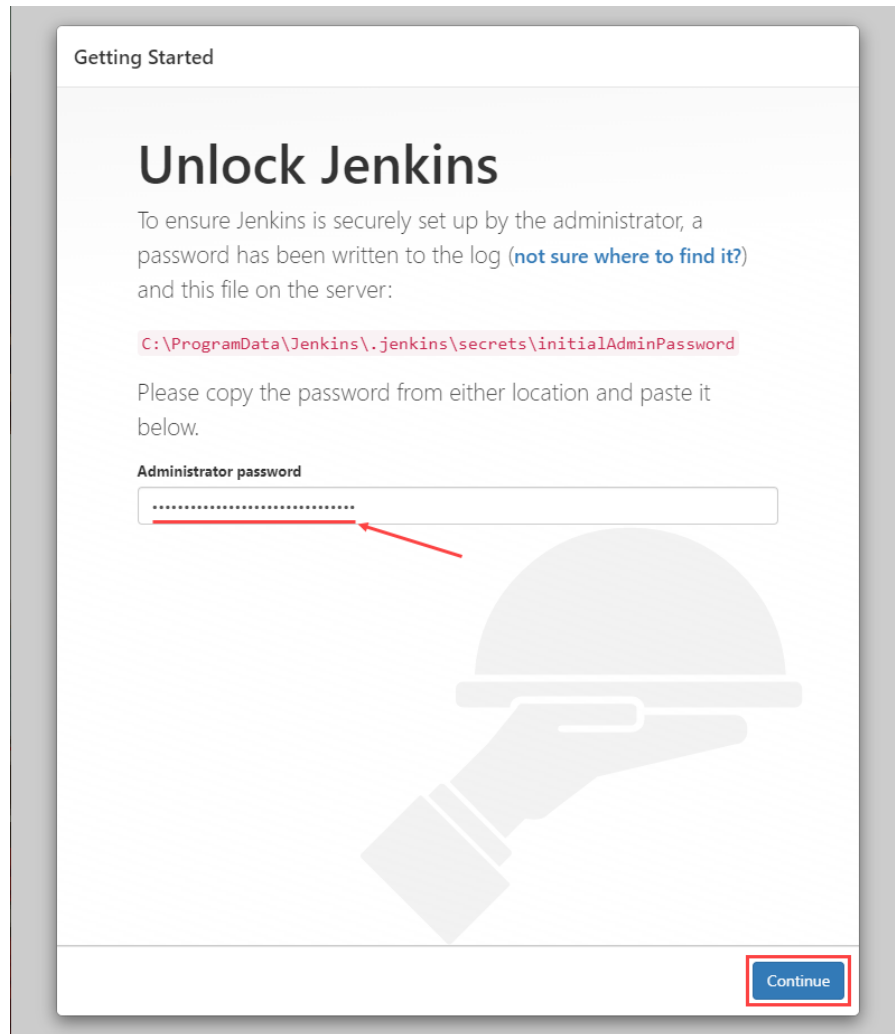
```
C:\ProgramData\Jenkins\.jenkins\secrets\initialAdminPassword
```

Please copy the password from either location and paste it below.

Administrator password



Continue



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.

Jenkins 2.303.3

Not now

Save and Finish

Getting Started


Jenkins is ready!





You have skipped the **setup of an admin user**.

To log in, use the username: "admin" and the administrator password you used to access the setup wizard.

Your Jenkins setup is complete.

Start using Jenkins


 **Jenkins**

   admin  log out


Dashboard > All >

Enter an item name


» Required field

 **Freestyle project**


This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

 **Pipeline**

Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

 **Multi-configuration project**

Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.

 **Folder**


Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a [separate names](#) space, so you can have multiple things of the same name as long as they are in different folders.


OK


Multibranch Pipeline


Dashboard > Experiment4 >


Configuration


 General

 Source Code Management

 Build Triggers

 Build Environment

 Build Steps

 Post-build Actions

Build Steps

Execute Windows batch command ?

Command

[See the list of available environment variables](#)


Advanced...





Add build step

Post-build Actions

Add post-build action

Save Apply

 **Jenkins**

   admin  log out

Dashboard > Experiment4 > #1

Back to Project


Status

Changes

Console Output

View as plain text

Edit Build Information

 **Console Output**

Started by user [admin](#)

Running as SYSTEM

Building on the built-in node in workspace C:\ProgramData\Jenkins\jenkins\workspace\Experiment4

Installing C:\ProgramData\Jenkins\jenkins\tools\udson.model.JDK\jdk_9\jdk.exe

[jdk_9] \$ C:\ProgramData\Jenkins\jenkins\tools\udson.model.JDK\jdk_9\jdk.exe /s ADDLOCAL="ToolsFeature" REBOOT=ReallySuppress

INSTALLDIR=C:\ProgramData\Jenkins\jenkins\tools\udson.model.JDK\jdk_9 /L

C:\ProgramData\Jenkins\jenkins\tools\udson.model.JDK\install18839175748298188159log

[Experiment4] \$ cmd /c call C:\Windows\TEMP\jenkins17402187934131644642.bat

C:\ProgramData\Jenkins\jenkins\workspace\Experiment4>echo this is test

this is test

C:\ProgramData\Jenkins\jenkins\workspace\Experiment4>exit 0

Finished: SUCCESS

REST API Jenkins 2.361.1

Name: Mrunal Vaidya
Roll : 68

XIE ID: 202003060
Batch: C

Dashboard > Manage Jenkins > Global Tool Configuration

Maven installations

List of Maven installations on this system

[Add Maven](#)

Maven Name

☒ Install automatically ?

Install from Apache

Version

3.8.6

[Add Installer](#)

[Add Maven](#)

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

Dashboard > Manage Jenkins > Global Tool Configuration

[Add JDK](#)

JDK Name

☒ Install automatically ?

Install Oracle Java SE Development Kit from the website ?

Version

Java SE Development Kit 9.0.4

☒ I agree to the Java SE Development Kit License Agreement

⚠ Oracle Java SE 11+ is not available for business, commercial or production use without a commercial license.
Public updates for Oracle Java SE 8 released after January 2019 will not be available for business, commercial or production use without a commercial license.
[Oracle Java SE Licensing FAQ](#)

[Add Installer](#)

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

Dashboard > Experiment4 >

Configuration

- General
- Source Code Management**
- Build Triggers
- Build Environment
- Build Steps
- Post-build Actions

Source Code Management

☐ None

☒ Git ?

Repositories ?

Repository URL ?

Credentials ?

- none -

[+ Add](#)

[Advanced...](#)

[Add Repository](#)

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

The screenshot displays the Jenkins Configuration page for 'Experiment4'. The left sidebar shows the configuration menu with 'Build Steps' selected. The main area is divided into 'Build Steps' and 'Post-build Actions' sections.

Build Steps:

- Invoke top-level Maven targets ?** (configurable step)
 - Maven Version: mymaven
 - Goals: compile
 - Advanced... button
- Add build step** button

Post-build Actions:

- Add post-build action** button
- Save** and **Apply** buttons

Build Log:

```
Downloaded from central: https://repo.maven.apache.org/maven2/org/mockito/mockito-all/1.8.5/mockito-all-1.8.5.jar (1.4 MB at 299 kB/s)
[INFO]
[INFO] --- maven-enforcer-plugin:1.0:enforce (enforce-versions) @ gameoflife-web ---
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ gameoflife-web ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] Copying 1 resource
[INFO]
[INFO] --- jacoco-maven-plugin:0.7.2.201409121644:prepare-agent (jacoco-initialize) @ gameoflife-web ---
[INFO] argLine set to -
javaagent:C:\Windows\system32\config\systemprofile\.m2\repository\org\jacoco\org.jacoco.agent\0.7.2.201409121644\org.jacoco.agent-0.7.2.201409121644-runtime.jar-destfile=C:\ProgramData\Jenkins\jenkins\workspace\Experiment4\gameoflife-web\target\jacoco.exec
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ gameoflife-web ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 2 source files to C:\ProgramData\Jenkins\jenkins\workspace\Experiment4\gameoflife-web\target\classes
[INFO]
[INFO] Reactor Summary for gameoflife 1.0-SNAPSHOT:
[INFO]
[INFO] gameoflife ..... SUCCESS [02:08 min]
[INFO] gameoflife-build ..... SUCCESS [ 55.612 s]
[INFO] gameoflife-core ..... SUCCESS [ 0.723 s]
[INFO] gameoflife-web ..... SUCCESS [ 16.341 s]
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 03:44 min
[INFO] Finished at: 2022-10-27T09:48:05+05:30
[INFO]
[INFO] Finished: SUCCESS
```

Conclusion:

From the above Experiment, we can conclude that ,Jenkins which is an automation server, was installed, configured and used to test simple jobs of freestyle type, one to execute a windows batch command and the other to use maven to integrate a project Game of Life. Hence, with this experiment we have achieved the Lab Outcome Three (LO3).

POs Achieved: PO1, PO5, PO12