

Jenkins Installation & Configuration

System Requirements

Before installing Jenkins, the following software and system requirements were ensured:

- **Operating System:** Windows 10 (64-bit)
- **Java Development Kit (JDK):** Version 11 or later
- **Jenkins Version:** Jenkins Long-Term Support (LTS)
- **Git for Windows:** Installed for source code management
- **Web Browser:** Google Chrome / Microsoft Edge

Java was verified using the command:

```
cmd  
java -version
```

Git was verified using:

```
cmd  
git --version
```

Jenkins Installation on Windows

The Jenkins installation process was carried out using the official Jenkins LTS installer.

Steps Followed:

1. The Jenkins LTS installer was downloaded from the official Jenkins website.
2. The installer was executed and Jenkins was installed as a Windows service.
3. The default installation path was selected.
4. Jenkins was configured to run on port **8080**.
5. After installation, Jenkins was accessed using the URL:

```
http://localhost:8080
```

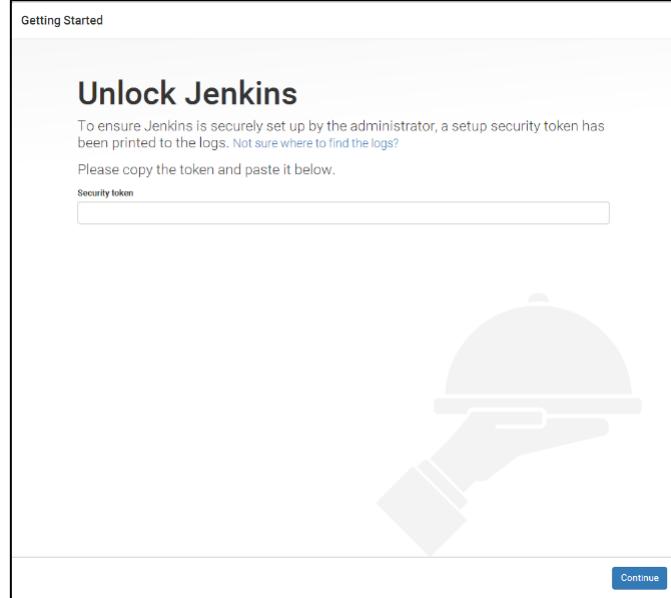


Figure 1. Jenkins initial “Unlock Jenkins” page

Initial Setup Wizard

After launching Jenkins for the first time, the Initial Setup Wizard appeared.

Steps Performed:

1. The initial administrator password was retrieved from:

```
C:\Program Files\Jenkins\secrets\initialAdminPassword
```

2. The password was entered on the Unlock Jenkins screen.
3. The option “**Install suggested plugins**” was selected.
4. Jenkins automatically installed the recommended plugins such as Git, Pipeline, and Email Extension plugins.



Figure 2. “Install suggested plugins” screen

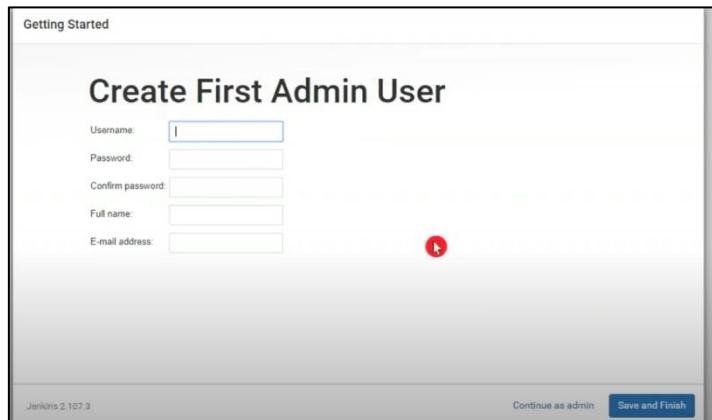
Admin User Creation

After plugin installation, Jenkins prompted for user creation.

Configuration:

- Username: Enrolment Number
- Password: (secure password set)
- Full name and email ID were entered

This account was created as the Jenkins administrator.



The screenshot shows the Jenkins 'Create First Admin User' configuration page. It features a title 'Create First Admin User' and five input fields for 'Username', 'Password', 'Confirm password', 'Full name', and 'E-mail address'. A red circular button with a question mark is positioned below the fields. At the bottom, there are 'Continue as admin' and 'Save and Finish' buttons.

Figure 3. Create First Admin User page

Jenkins Dashboard Verification

Once the setup was completed, the Jenkins dashboard was displayed successfully.

The dashboard provides access to:

- Job creation
- Plugin management
- System configuration
- Build history and logs

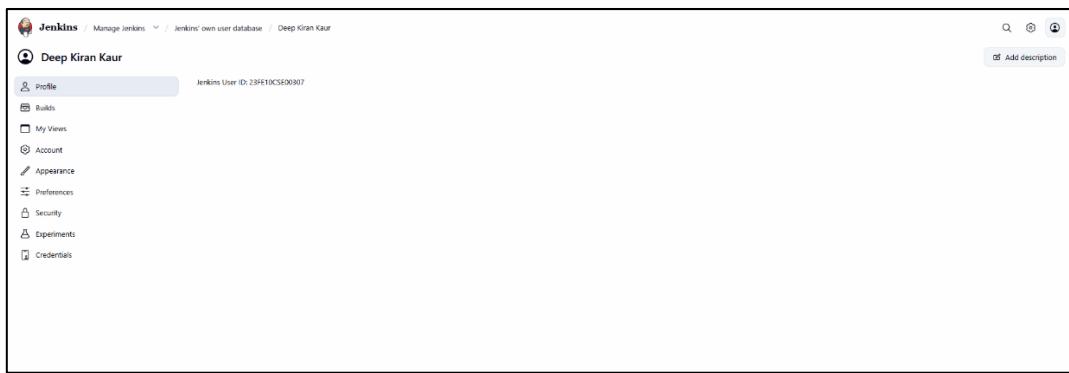


Figure 4. Jenkins Dashboard

Global Tool Configuration

Jenkins tools were configured to support build and testing operations.

Tools Configured:

- **JDK:** Path to installed Java JDK configured
- **Git:** Path to Git executable configured
- **Maven:** Apache Maven configured for build automation

These configurations allow Jenkins to compile and test Java projects automatically.

Steps:

1. Navigated to **Manage Jenkins → Global Tool Configuration**
2. Added JDK, Git, and Maven installations
3. Saved the configuration

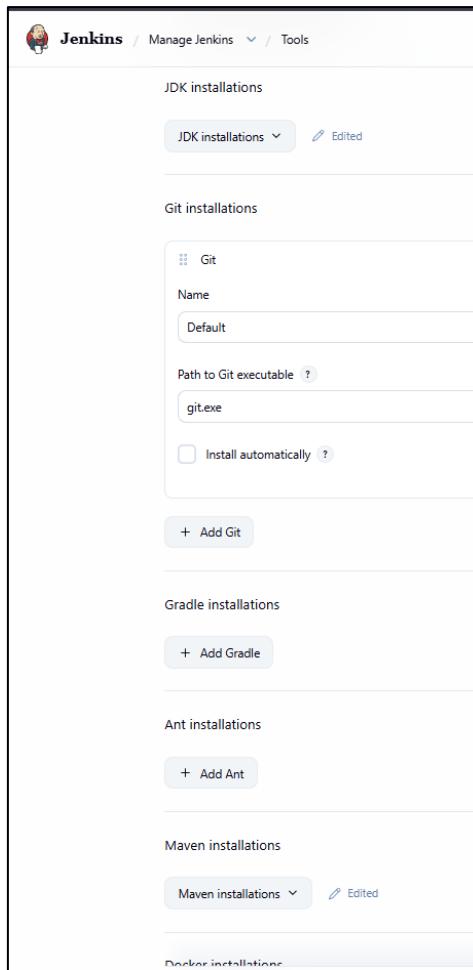


Figure 5. Global Tool Configuration page showing JDK, Git, Maven

Configure System Settings

System-level configurations were completed.

Settings Configured:

- **Jenkins URL:** Set to <http://localhost:8080>

- **SMTP Server:** Configured for email notifications
- **System Environment Variables:** Configured as required

Steps:

1. Navigated to **Manage Jenkins → Configure System**
2. Set Jenkins URL
3. Entered SMTP credentials
4. Saved settings

The image contains two side-by-side screenshots of the Jenkins 'Configure System' page.

Left Screenshot (Jenkins URL Configuration):

- Jenkins URL: http://localhost:8080/ (highlighted in orange)
- Error message: Please set a valid host name, instead of localhost
- System Admin e-mail address: address not configured yet <nobody@nowhere>
- Serve resource files from another domain (Resource Root URL: http://localhost:8080/)
- Global properties section showing environment variable JAVA_HOME with value C:\Program Files\Eclipse Adoptium\jdk-17.0.17-hotspot

Right Screenshot (SMTP Configuration):

- SMTP server: smtp.gmail.com
- Default user e-mail suffix: @gmail.com
- Advanced settings:
 - Use SMTP Authentication (checked): User Name - indeepkiranikaur@gmail.com (warning: For security when using authentication it is recommended to enable either TLS or SSL)
 - Use SSL (unchecked)
 - Use TLS (checked)
 - SMTP Port: 587
 - Reply-To Address: (empty)
 - Charset: UTF-8
- Test configuration by sending test e-mail (checked): Test e-mail recipient - indeepkiranikaur@gmail.com (Email was successfully sent)

Figure 6. Configure System page showing Jenkins URL and SMTP configuration

Security Configuration

Security was configured to prevent unauthorized access.

Security Measures Implemented:

- **Security Realm:** Jenkins' own user database
- **Authorization Strategy:** Matrix-based security
- **CSRF Protection:** Enabled

Steps:

1. Navigated to **Manage Jenkins → Configure Global Security**
2. Enabled user authentication
3. Assigned permissions using matrix-based strategy
4. Enabled CSRF protection
5. Saved configuration

The screenshot shows the Jenkins Global Security configuration page. It includes sections for Authentication (Disable "Keep me signed in"), Security Realm (Jenkins' own user database), and Authorization (Matrix-based security). The authorization matrix allows setting permissions for roles like Administer, Read, Create, Delete, View, and more across Jenkins features like Overall, Credentials, Agent, Job, Run, View, SCM, Metrics, and ThreatModeling. A specific user, 'Deep Kiran Kaur', is highlighted in the matrix, showing that they have full permissions for most features. There are also buttons for 'Add user...' and 'Add group...'.

Figure 7. Configure Global Security page

User Management

User accounts were managed using Jenkins user management.

Actions Performed:

- Admin user created
- Permissions assigned
- User details verified

The screenshot shows the Jenkins User Management screen. It displays a list of users under the heading 'Users 1'. The user 'Deep Kiran Kaur' is listed with a User ID of '23FE10CSE00307'. There is a 'Create User' button at the top right. The interface includes standard navigation and search tools.

Figure 8. User Management Screen

Summary

Jenkins was successfully installed and configured on the local Windows system. All essential tools such as JDK, Git, and Maven were integrated. Security settings were applied and administrative access was established. This setup provided a stable environment for creating Jenkins jobs and pipelines for Continuous Integration.