

INDUSTRIAL TRAINING REPORT

ON

AWS AND DEVOPS

AT

SV GLOBAL SERVICES INDIA PRIVATE LIMITED

Submitted in the partial fulfillment of the

Requirement for the award of

IN

DIPLOMA IN COMPUTER SCIENCE AND ENGINEERING

Submitted by

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CERTIFICATE

This is to certify that the project entitle “**AMAZON WEB SERVICES (AWS) AND DEVOPS**” has been carried by **GASIKANTI AKSHITHA** bearing PIN **22054-CS-004** in partial fulfilment for the award of DIPLOMA IN COMPUTER SCIENCE ENGINEERING to the STATE BOARD OF TECHNICAL EDUCATION AND TRAINING, Hyderabad at GOVERNMENT INSTITUTE OF ELECTRONICS, East Marredpally , Hyderabad during the Academic year 2024-2025

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We are also thankful to other staff members for their support during the course of the project and in completing the project successfully.

We thank all those who directly and indirectly helped us in the successful completion of the project in time

DECLARATION:

We the undersigned declare that the project report entitled “**INDUSTRIAL TRAINING REPORT**” written and submitted by us in an original work done under the guidance of **Sri. T. NITESH**. The matter here in is not reproduced from any other source. I hereby declare that this project was outcome of efforts and is not been submitted to any other university for the award of any degree or diploma.

GASIKANTI AKSHITHA

22054-CS-004

ABSTRACT

This industrial training report presents a comprehensive overview of the practical experience and technical knowledge gained during the six-month training period at SV Global Services India Pvt. Ltd., Hyderabad, focusing on the core areas of AWS and DevOps. The project emphasizes the significance of modern software development methodologies and deployment strategies through the implementation of DevOps tools such as Git, Jenkins, Maven, Docker, Kubernetes, and Selenium.

The report also explores the role of infrastructure as code (IAC), containerization, and monitoring in streamlining IT operations and improving development productivity. Through real-time application of tools and collaborative practices, the training enhanced the team's skills in project automation, deployment, and infrastructure management, aligning with current industry standards.

This project marks a significant step towards bridging academic knowledge with industrial practices, preparing students for real-world DevOps and cloud engineering roles.

INDEX

SNO	CONTENTS	PAGE .NO
1	INTRODUCTION	9-10
	1.1 DevOps	11
	1.2 DevOps Technologies	12
2	Introduction to Jenkins	13
	2.1 Key Features of Jenkins	14
	2.2 Jenkins Applications	15-16
3	Introduction to Maven	17
4	Installing Jenkins and Mavens	18-20
5	Building a Maven project in Jenkins	21-22
6	Output	23
7	Conclusion and References	24

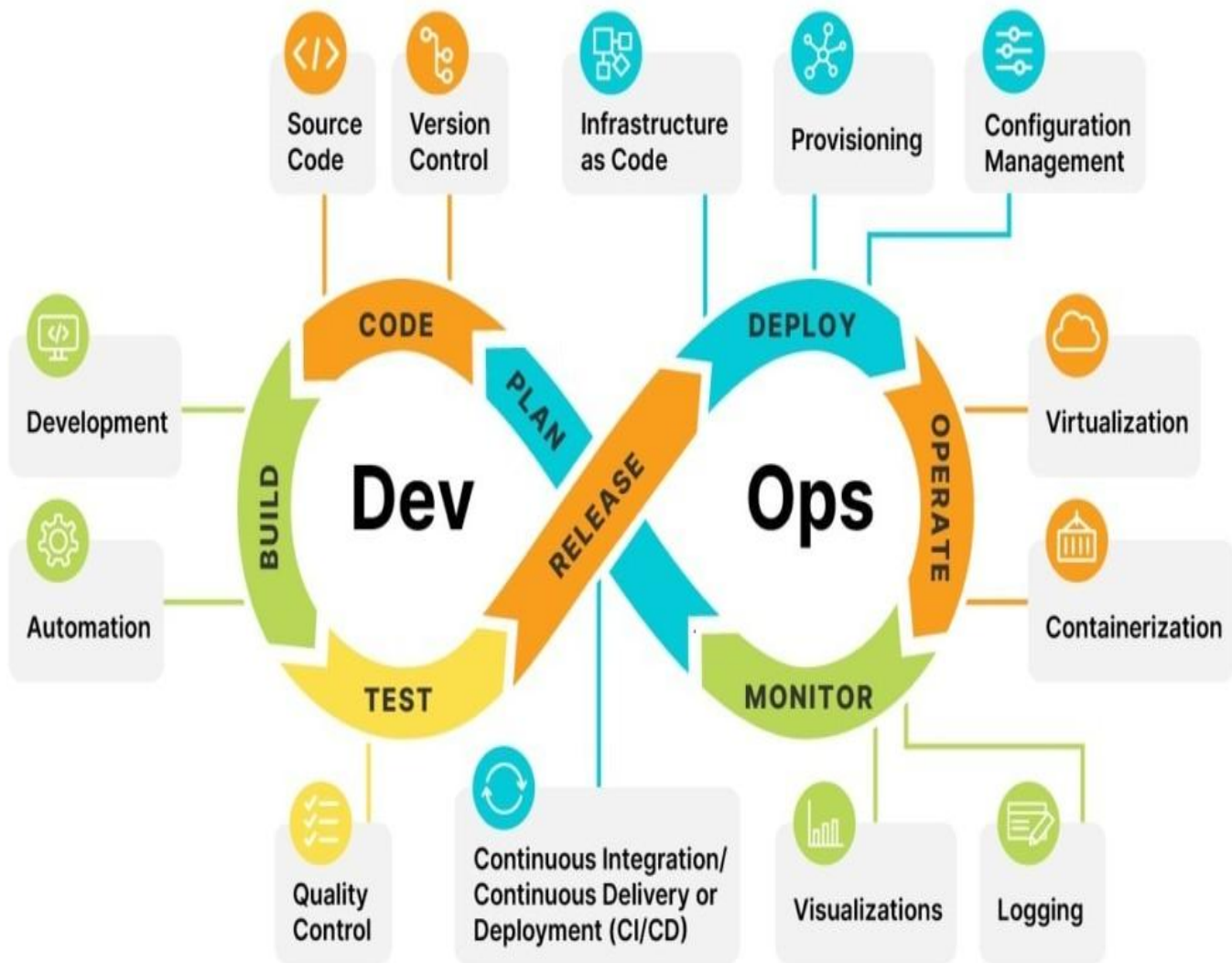
INTRODUCTION TO DEVOPS

Software is the backbone of modern technological advancement, powering everything from mobile applications to complex enterprise systems. In its essence, software refers to a set of instructions or programs that enable computers and other devices to perform specific tasks or functions. From simple utilities that organize daily tasks to sophisticated algorithms driving artificial intelligence, software encompasses a vast array of applications that shape our digital world.

As technology continues to evolve, so does the demand for innovative software solutions that streamline processes, enhance productivity, and enrich user experiences.

Understanding the principles of software development, including design, coding, testing, and maintenance, is essential for navigating today's digital landscape and driving meaningful change through technology.

Continuous growth in software is not merely a trend but a fundamental aspect of the industry's evolution. With technology advancing at an unprecedented pace, software development constantly expands its horizons to meet ever-changing demands and challenges. For this continuous growth of software DevOps also plays a crucial play. We use DevOps in almost every sector for better utilization and better productive



DEVOPS

DevOps an amalgamation of "development" and "operations," represents a transformative approach to software development and IT operations. It emphasizes collaboration, communication, and integration between traditionally siloed teams, aiming to streamline the software delivery process and improve overall organizational performance.

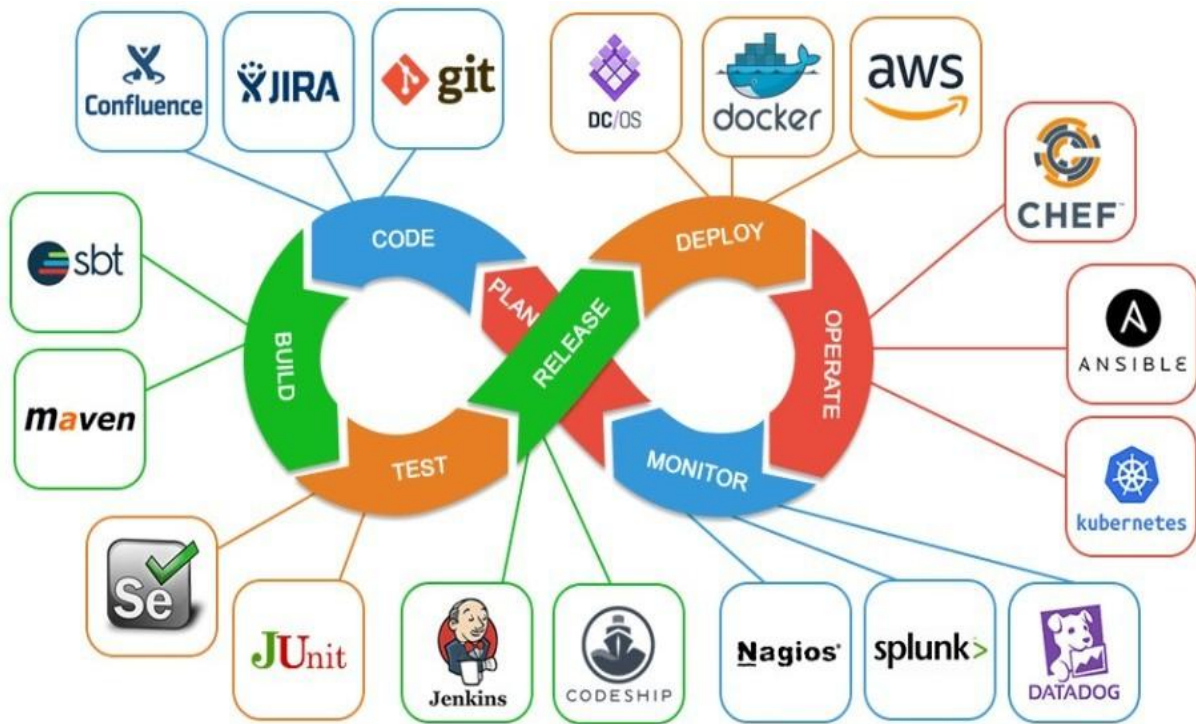
In today's fast-paced digital landscape, DevOps has emerged as a cornerstone of modern software development practices, empowering teams to innovate faster, respond to market changes more effectively, and drive business success.

Devops goes beyond continuous integration and continuous delivery to enable near-instantaneous deployment of products and services in the cloud.

DevOps Technologies

There are many technologies used in DevOps. Each technology is used for specific function.

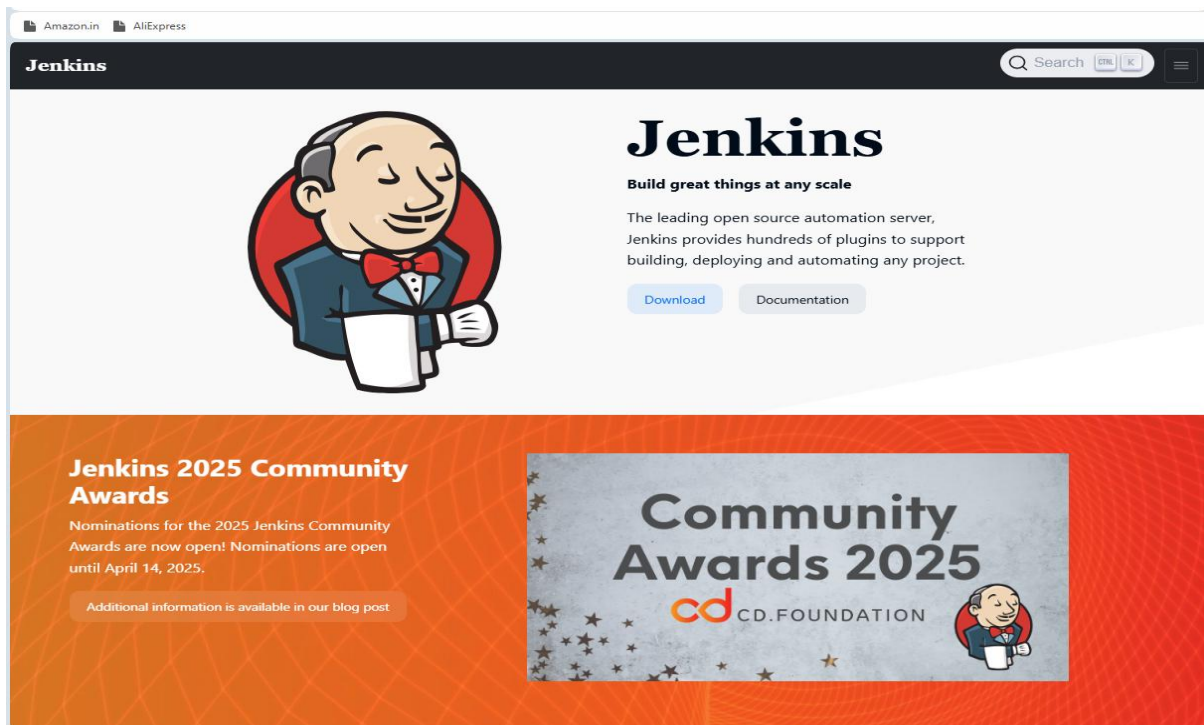
Some of the technologies with their usage are:



- **GIT** – Used for writing code in DevOps.
- **MAVEN**- Used for build.
- **SELENIUM** – Used for test the project.
- **JENKINS** – Used for release of project.
- **DOCKER** – Used for deploy project.
- **KUBERNETES** – Used to operate project.
- **SPLUNK** – Used for monitoring project

JENKINS

- Jenkins is an opensource **continuous integration /continuous delivery** and deployment (CI/CD) automation software
- **DevOps** tool written in the **Java** programming language. It is used to implement CI/CD workflows called pipelines.
- CI/CD pipelines automate testing and reporting on isolated changes in a larger codebase in real time. They also facilitate the integration of disparate branches of the code into a main branch.
- Pipelines rapidly detect defects in a codebase, build the software, automate testing of builds, prepare the codebase for deployment and delivery, and ultimately deploy code to containers and virtual machines



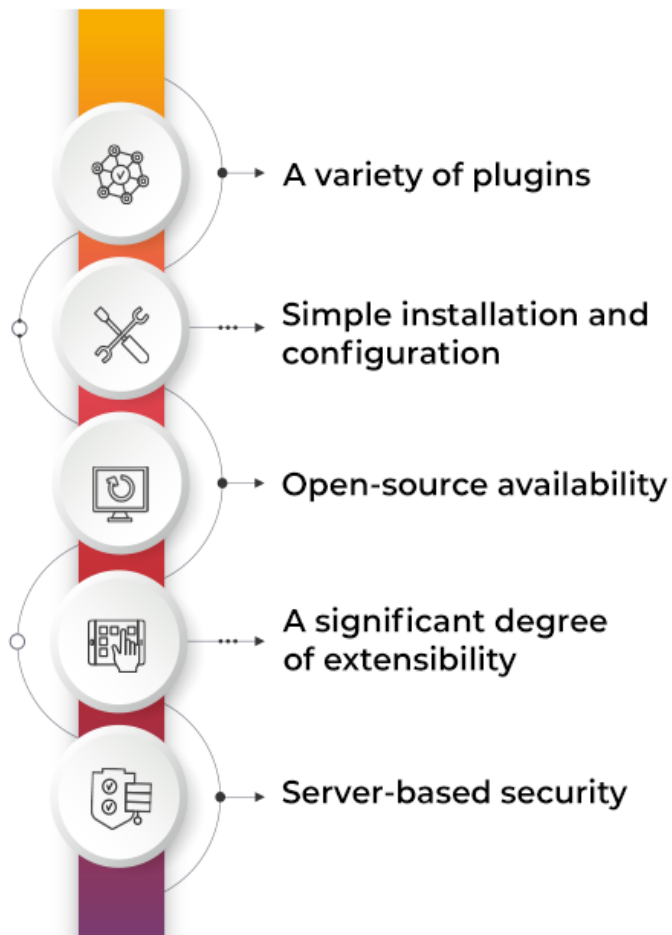
Key Features of Jenkins

Jenkins is simple to set up and customize. Jenkins has many plugins that give it a lot of versatility. It delivers code instantaneously, generates a report after deployment, highlights errors in code or tests, and detects and resolves various issues in near real-time. It's also ideal for integration because it's all done automatically.

There is also a fantastic support community. These features in more detail:



KEY FEATURES OF JENKINS



Jenkins Applications

Jenkins is a popular open-source automation server that provides a robust platform for implementing continuous integration and continuous delivery (CI/CD) pipelines. Its flexibility and extensive plugin ecosystem allow it to fit into nearly any development workflow, supporting a wide range of use cases across software development and deployment. Here are some detailed applications of Jenkins:

1. Continuous Integration (CI)

Jenkins is primarily used to automate the process of continuous integration, where it builds and tests code every time a change is committed to a version control system. This helps developers detect issues early in the development cycle, improving code quality and reducing the time needed to validate and release new software updates.

- **Automated Builds:** Jenkins can compile and build code from various environments and languages.
- **Automated Testing:** It can run a suite of tests (unit, integration, system) on new code to ensure it doesn't break anything.

2. Continuous Delivery (CD)

Beyond continuous integration, Jenkins can automate steps in software delivery, making it easier to deploy and release new versions. It allows for the automation of the deployment process, making sure that you can release reliably at any time.

- **Automated Deployment:** Jenkins can automate the deployment of applications to various environments, including testing, staging, and production.
- **Rollbacks:** It can also automate the rollback of a deployment if the deployment fails, ensuring quick recovery from errors.

3. Infrastructure as Code (IAC)

Jenkins is used to implement Infrastructure as Code practices, which involve managing and provisioning infrastructure through code instead of through manual processes.

- **Configuration Management:** Jenkins can integrate with tools like Ansible, Chef, and Puppet to automate the configuration of servers.

- **Server Provisioning:** It can also use scripts or templates to create or update servers.

4. Monitoring and Reporting

Jenkins can be configured to monitor its own performance and to generate reports on various aspects of the development process.

- **Build Monitoring:** Jenkins can keep track of build success rates and notify developers of failures.
- **Performance Trends:** It can generate reports that track performance metrics over time, helping teams understand trends.

5. DevOps and Multibranch Pipeline

Jenkins supports DevOps practices by enabling teams to implement multibranch pipelines, where each branch of the version control system can have its own tailored CI/CD pipeline.

- **Pipeline as Code:** Jenkins Pipelines allow defining build, test, and deploy stages that are stored in a Jenkins file and versioned along with the code.
- **Parallel Execution:** Jenkins can execute jobs in parallel, reducing the time required for builds and tests.

6. Containerization Support

Jenkins has robust support for Docker and Kubernetes, allowing teams to use containers for builds, tests, and deployments.

- **Docker Integration:** Jenkins can build Docker images and push them to Docker registries.
- **Kubernetes Integration:** It can manage Kubernetes pods, enabling dynamic provisioning of agents for builds and tests.

7. Third-Party Integration

Jenkins' extensive plugin ecosystem allows it to integrate with virtually any tool used in software development, from version control systems like Git to issue tracking systems like JIRA, and artifact repositories like Artifactory.

8. Security and Compliance

Jenkins can help enforce security policies and compliance standards by automating security scans and compliance checks.

- **Static Code Analysis:** Plugins can scan source code for security vulnerabilities.

MAVEN

- Maven is a build tool that uses a **POM (project object model)** to help build processes through plugins. It's not unlike how MS Build helps with C#, or MAKE with C/C++, or even npm /Grunt and JavaScript.
- A POM is the core of a project's configuration in Maven. It's an XML file containing info about the project, configuration details, and default values for most projects.
- Maven helps developers maintain Java-based applications through projects that organize code files and build scripts to run compiler tools, version numbers for compiled code, and dependency management that lets one project reference a version of another project.
- Jenkins allows you to run Maven, and decide when to call a POM file, what condition to call, and what to do with the outcome. And since Jenkins can listen to different events, e.g svn commit, the current time is 12:00 AM, etc. Jenkins and Maven can become quite a powerful duo. For example, you can ask Jenkins to trigger a build or run through all JUnit tests whenever a new code is committed and then, if the unit tests are passed, deploy on a target machine.



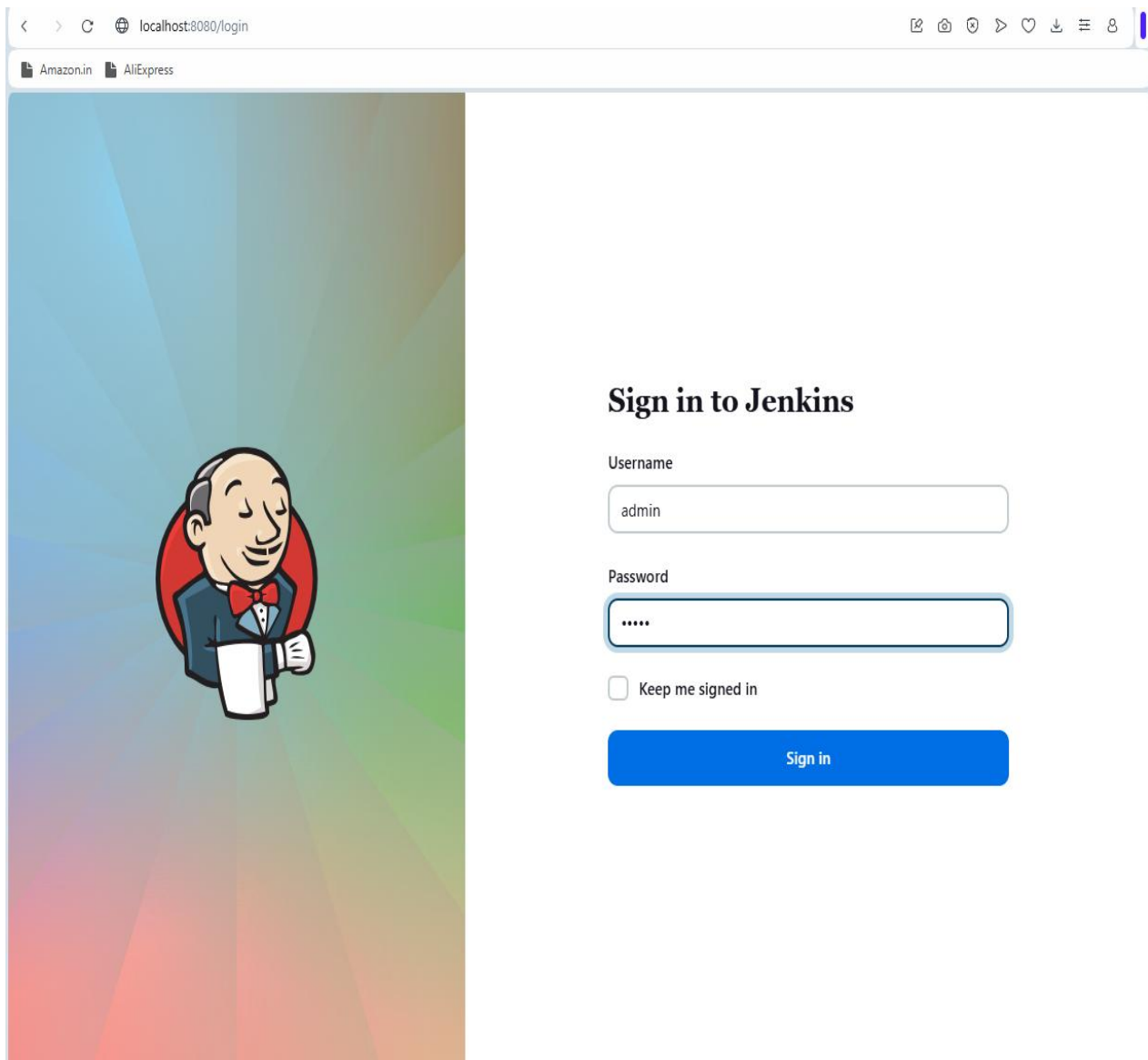
- Maven projects are then published to a **Maven Repository**, which is essentially like a web-based file share. There are index files in Maven repositories that list what projects and versions are stored in the repository, as well as metadata files that describe what each project is.

- Adding Maven to your Jenkins is just as simple as adding any other plugin. Simply install the Maven plugin in Jenkins. This will add a “Build” section to your projects where you can specify exactly what to execute.

Installing Jenkins and Maven

Step 1: Installing Jenkins

- Install Jenkins in our local desktop
- Sign into the Jenkins



localhost:8080/login

Amazon.in AliExpress

Sign in to Jenkins

Username

Password

☐ Keep me signed in

Sign in

Step 2: Installing Maven

- Go to Manage Jenkins

Would you like the password manager to save the password for "localhost:8080"? Save Never x

Jenkins ? 🔔 1 🛡️ 2 👤 samika ▼ 🚪 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

REST API Jenkins 2.440.1

- Go to the Plugin manager

Jenkins

Search (CTRL+K)

Dashboard > Manage Jenkins

Manage Jenkins

New version of Jenkins (2.492.2) is available for [download](#) ([changelog](#)). [Or Upgrade Automatically](#)

Building on the built-in node can be a security issue. You should set up distributed builds. See [the documentation](#). [Set up agent](#) [Set up cloud](#) [Dismiss](#)

Warnings have been published for the following currently installed components: [Go to plugin manager](#) [Configure which of these warnings are shown](#)

Jenkins 2.440.1 core and libraries:

- [Terrapin SSH vulnerability in Jenkins CLI client](#)
- [Multiple security vulnerabilities in Jenkins 2.470 and earlier, LTS 2.452.3 and earlier](#)
- [Denial of service vulnerability in bundled json-lib](#)
- [HTTP/2 denial of service vulnerability in bundled Jetty](#)
- [Multiple security vulnerabilities in Jenkins 2.499 and earlier, LTS 2.492.1 and earlier](#)
- [Multiple security vulnerabilities in Jenkins 2.478 and earlier, LTS 2.462.2 and earlier](#)

Fixes for all of these issues are available. Update Jenkins now.

Trilead API Plugin 2.133.vfb_8a_7b_9c5dd1:

- [Terrapin SSH vulnerability](#)

A fix for this issue is available. Go to the [plugin manager](#) to update the plugin.

Struts Plugin 337.v1b_04ea_4df7c8:

- [Exposure of secrets through system log](#)

A fix for this issue is available. Go to the [plugin manager](#) to update the plugin.

Script Security Plugin 1326.vdb_c154de8669:

- [Missing permission check](#)
- [Multiple sandbox bypass vulnerabilities](#)

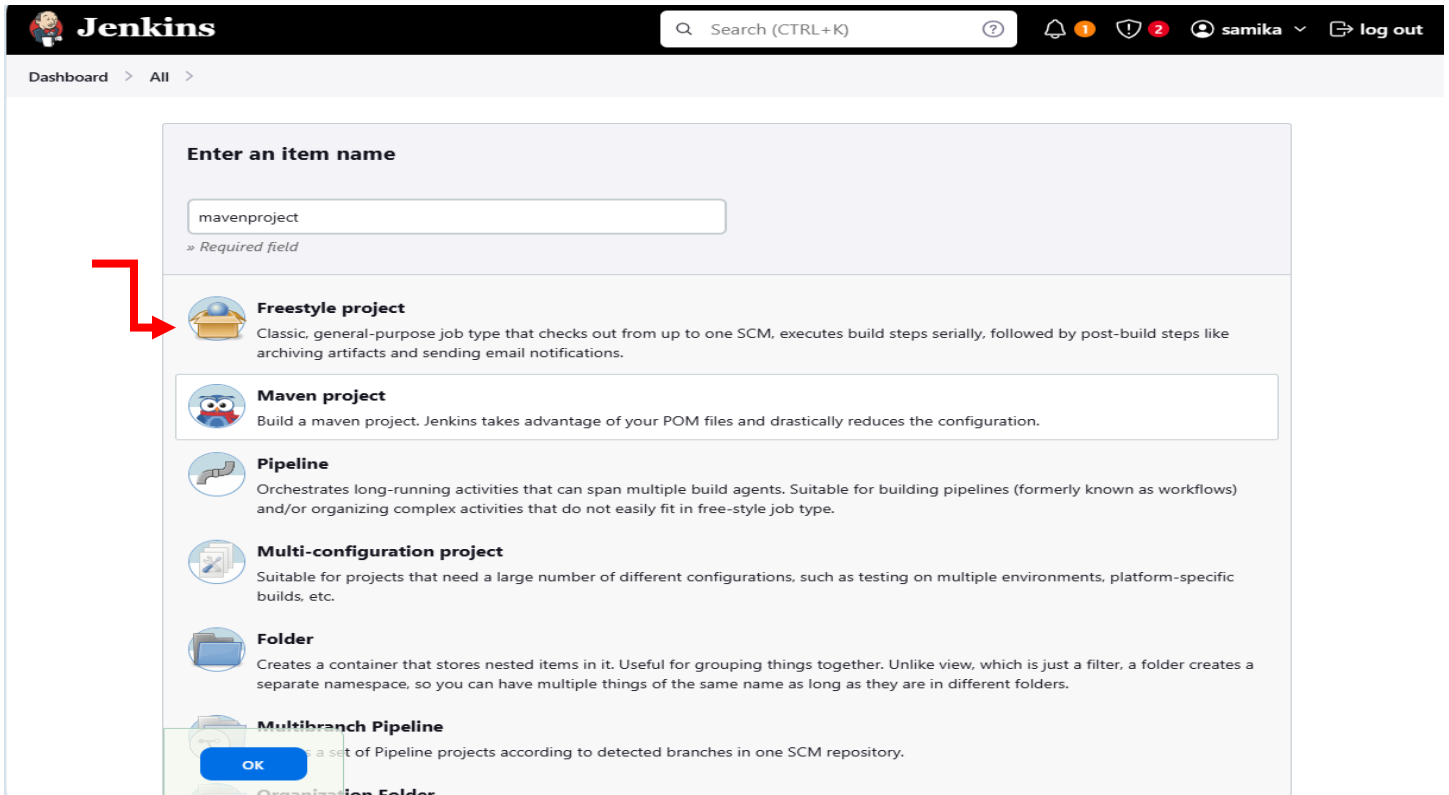
Fixes for all of these issues are available. Go to the [plugin manager](#) to update the plugin.

- Go to the Available Plugins
- Install the Maven by searching in search engine

To check whether the Maven is installed, go to installed plugins and search Maven.

Building a Maven Project in Jenkins

- Go to the Jenkins dashboard and click on new item.
- Now enter the item name and select freestyle project



The screenshot shows the Jenkins 'New Item' form. At the top, the Jenkins logo and a search bar are visible. Below the search bar, the breadcrumb 'Dashboard > All >' is shown. The main form area has a section titled 'Enter an item name' with a text input field containing 'mavenproject' and a 'Required field' label. Below this, there is a list of project types, each with an icon and a description. A red arrow points to the 'Freestyle project' option, which is highlighted with a blue border. The other options are 'Maven project', 'Pipeline', 'Multi-configuration project', 'Folder', and 'Multibranch Pipeline'. At the bottom of the form, there is an 'OK' button.

Enter an item name

mavenproject

» 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.

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 namespace, so you can have multiple things of the same name as long as they are in different folders.

Multibranch Pipeline
Builds a set of Pipeline projects according to detected branches in one SCM repository.

Organization Folder

OK

- Now write the description of project (optional)

Configure

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

General

Enabled 

Description

this is my maven project

Plain text [Preview](#)

- ☐ Discard old builds ?
- ☐ GitHub project
- ☐ This project is parameterized ?
- ☐ Throttle builds ?
- ☐ Execute concurrent builds if necessary ?

Advanced 

Source Code Management

Save

Apply

- Now select the source code management as GIT, now paste the GIT repository URL

Source Code Management

☐ None☒ Git ?

Repositories ?


Repository URL ?

https://github.com/pkvanda/spring-petclinic

Credentials ?

- none -

+ Add

Advanced 

Add Repository

- Now select the build trigger (i.e GitHub hook trigger for GIT Scm polling)

Configure

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

Build Triggers

- ☐ Trigger builds remotely (e.g., from scripts) ?
- ☐ Build after other projects are built ?
- ☐ Build periodically ?
- ☒ GitHub hook trigger for GITScm polling ?
- ☐ Poll SCM ?

Build Environment

- ☐ Delete workspace before build starts
- ☐ Use secret text(s) or file(s) ?
- ☐ Add timestamps to the Console Output
- ☒ Inspect build log for published build scans
- ☐ Terminate a build if it's stuck
- ☐ With Ant ?

Build Steps

Add build step ▼


Post-build Actions



Save

Apply


- Now click on the Build now
- To check whether the project is build, go to the workspace then you will find the project output

Output

 **Jenkins**


Q Search (CTRL+K) ?  1  2 samika v log out


Dashboard > maven > Workspace


 Status


</> Changes


Workspace


 Wipe Out Current Workspace


 Build Now

 Configure


 Delete Project

 GitHub Hook Log



 Rename

 Build History trend v

Q Filter... /


 #1


| Apr 7, 2025, 3:50 AM


 Atom feed for all  Atom feed for failures



Workspace of maven on Built-In Node



maven / →



 .git



 .mvn/wrapper



 src



 .bowerrc Apr 7, 2025, 3:50:44 AM 48 B 



 .editorconfig Apr 7, 2025, 3:50:44 AM 204 B 



 .gitignore Apr 7, 2025, 3:50:44 AM 68 B 



 .springBeans Apr 7, 2025, 3:50:44 AM 746 B 



 .travis.yml Apr 7, 2025, 3:50:44 AM 33 B 



 bower.json Apr 7, 2025, 3:50:44 AM 142 B 



 Jenkinsfile Apr 7, 2025, 3:50:44 AM 184 B 



 mvnw Apr 7, 2025, 3:50:44 AM 7.17 KiB 


 mvnw.cmd Apr 7, 2025, 3:50:44 AM 5.06 KiB 

 pom.xml Apr 7, 2025, 3:50:44 AM 17.16 KiB 

 readme.md Apr 7, 2025, 3:50:44 AM 8.53 KiB 

 Readme.txt Apr 7, 2025, 3:50:44 AM 0 B 

 sonar-project.properties Apr 7, 2025, 3:50:44 AM 344 B 

 (all files in zip)

CONCLUSION

Hence we build a Maven Project in Jenkins & Using build triggers.

References

- <https://www.simplilearn.com/tutorials/jenkins-tutorial/what-is-jenkins>
- <https://maven.apache.org/what-is-maven.html>
- <https://www.techtarget.com/searchitoperations/definition/GitHub>