

# What is Jenkins?

Jenkins is an open-source automation server used to automate parts of software development such as building, testing, and deploying. It supports Continuous Integration (CI) and Continuous Delivery (CD), which are key practices in DevOps.

## Key Features of Jenkins

- Free and open-source
- Java-based, platform-independent
- Large plugin ecosystem (over 1800 plugins)
- Easily integrates with tools like Git, Maven, Docker, Kubernetes, and more
- Web-based UI for managing builds and jobs
- Supports pipelines as code using Jenkinsfile

## Jenkins Architecture:-

**Master:** Main Jenkins server that schedules jobs, dispatches builds, and records results.

**Agent (or Slave):** A machine that performs tasks delegated by the master.

## Common Jenkins Plugins:-

- Git
- Maven Integration
- Docker Pipeline
- Pipeline: Multibranch
- Blue Ocean (Modern UI)
- Slack Notification

## Jenkins in DevOps Workflow:-

- Developer pushes code to Git
- Jenkins triggers build automatically
- Jenkins runs unit tests
- Build is deployed to test/staging
- After approval, it is deployed to production

This automates the CI/CD pipeline, improving deployment frequency and reducing manual errors

## Advantages of Jenkins:-

- **Open Source & Free**  
Jenkins is free to use, with strong community support and continuous updates.
- **Cross-Platform**  
Works on Windows, macOS, and Linux.
- **Easy Integration**  
Supports 1800+ plugins to integrate with tools like Git, Maven, Docker, Kubernetes, Slack, etc.
- **Automates CI/CD**  
Automates build, test, and deployment processes, enabling faster and more reliable software delivery.
- **Pipeline as Code**  
Jenkins supports scripted and declarative pipelines using `Jenkinsfile`, making automation reproducible and version-controlled.
- **Extensible**  
You can create custom plugins or configure it for any stage of your DevOps pipeline.
- **Easy Installation & Configuration**  
Simple web-based UI for setting up jobs and managing plugins.
- **Scalable**  
Supports master-agent architecture for distributed builds across multiple systems.
- **Active Community**  
Large global community offering plugins, support, and documentation.
- **Real-Time Feedback**  
Instantly notifies developers about build/test failures to fix issues early.