📘 Jenkins Interview Questions & Answers

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1. General Questions

What is Jenkins?

Jenkins is an **open-source automation server** that handles **CI/CD (Continuous Integration and Continuous Delivery)** by automating the building, testing, and deployment of applications.

What are the key features of Jenkins?

- **Automated CI/CD pipelines**
- **Extensible via plugins**
- **Distributed builds (master/agent architecture)**
- **Integration with DevOps tools (Git, Docker, Kubernetes, etc.)**
- **Pipeline as Code (Jenkinsfile)**

How do you install Jenkins on different operating systems?

Jenkins can be installed using native system packages, Docker, or as a standalone WAR file. Installation steps vary based on the operating system.

What is a Jenkinsfile?

A **Jenkinsfile** is a text file written in **Groovy** that defines a **Jenkins Pipeline**, including its stages, steps, and post-build actions.

What is a Jenkins job?

A Jenkins job is a task or a set of tasks configured in Jenkins to perform specific operations like building code, running tests, or deploying applications.

What are the types of Jenkins jobs?

- **Freestyle projects** (GUI-based)
- **Pipeline projects** (Jenkinsfile-based)

What is a Jenkins Agent?

A **Jenkins Agent** (formerly called a "slave") is a worker node that executes build jobs assigned by the **Jenkins Master**.

How do you secure Jenkins?

- Enable **authentication (LDAP, GitHub OAuth, etc.)**
- Use **Role-Based Access Control (RBAC)**
- Restrict **agent connections**
- Enable **CSRF protection**

What are the differences between Scripted and Declarative Pipelines?

Declarative pipelines provide a simplified and opinionated syntax, while scripted pipelines offer more flexibility and are written in Groovy.

Scripted Pipeline	Declarative Pipeline
Uses **Groovy scripting**	Uses **structured syntax**
More flexible	More opinionated
Harder to maintain	Easier to read

How do you trigger a Jenkins job automatically?

- **CM Polling** (`/5 * * * *` checks Git every 5 minutes)
- **Webhooks** (GitHub/GitLab triggers Jenkins on `push`)
- **Upstream/downstream jobs**

What is Blue Ocean in Jenkins?

Blue Ocean is a modern UI for Jenkins that provides a **visual pipeline editor** and better **build visualization**.

What is the purpose of `JENKINS_HOME`?

The `JENKINS_HOME` directory stores **all Jenkins configurations, plugins, logs, and job details**.

What is a Multibranch Pipeline?

A **Multibranch Pipeline** automatically creates **Pipelines for each branch** in a repository (e.g., `main`, `dev`).**How do you pass parameters in a Jenkins job?**

Answer: Use **"This project is parameterized"** in the job settings (e.g., `STRING`, `BOOLEAN`, `CHOICE`).

What is the difference between `sh` and `bat` in Jenkins?

- `sh` → Runs **Linux shell commands**
- `bat` → Runs **Windows batch commands**

How do you view Jenkins logs?

```
# On Linux
tail -f /var/log/jenkins/jenkins.log
```

Explain the Jenkins architecture.

Jenkins follows a master-agent architecture where the master manages tasks and agents execute the build jobs.

How do you handle credentials securely in Jenkins?

Jenkins provides a credentials plugin to securely store and manage credentials, which can be used in pipelines without exposing sensitive information.

How do you implement a multi-branch pipeline in Jenkins?

Multi-branch pipelines automatically create Jenkins jobs for each branch in a repository, allowing for individual branch builds and tests.

Describe how to integrate Jenkins with Docker.

Integrate Jenkins with Docker by using Docker plugins, allowing Jenkins to build, run, and manage Docker containers as part of the pipeline.

How can you secure Jenkins and its pipelines?

Implement security measures like role-based access control, secure credentials management, enabling CSRF protection, and keeping Jenkins and plugins up to date.

What is a Jenkins Shared Library?

A **Shared Library** is a **Groovy repository** that stores reusable Pipeline code (e.g., custom functions).

What is the purpose of `agent any` in a Pipeline?

It means **"Run on any available agent"**.

How do you run parallel stages in Jenkins?

```
stage('Parallel Tests') {
parallel {
stage('Unit Tests') { steps { sh 'npm test' } }
stage('Integration Tests') { steps { sh 'mvn verify' } }
}
}
```

How do you archive artifacts in Jenkins?

```
archiveArtifacts artifacts: 'target/*.jar'
```

What is Jenkinsfile `withCredentials`?

It securely injects **credentials** into a Pipeline:

```
withCredentials([usernamePassword(credentialsId: 'aws-creds', usernameVariable: 'AWS_USER', passwordVariable: 'AWS_PASS')]) {
  sh 'echo $AWS_PASS'
}
```

What is the use of `timeout` in Jenkins?

It **aborts a Pipeline if it runs longer than specified**:

```
timeout(time: 30, unit: 'MINUTES') {
  sh './deploy.sh'
}
```

How do you clean up Jenkins workspace?

```
cleanWs()// Using Workspace Cleanup Plugin
```

2. Scenario Based Questions

Jenkins is integrated with Git, but a new commit doesn't trigger a build. How do you troubleshoot this?

Check if the Git webhook is correctly configured to trigger Jenkins on new commits. Ensure the webhook URL points to the correct Jenkins server and job. Verify that the Jenkins job is set to trigger on Git push events. If using SCM polling, confirm that polling is enabled and the schedule is correct.

How do you integrate security practices into the DevOps pipeline?

Incorporate security checks in CI/CD, perform static code analysis, use vulnerability scanning tools, and emphasize continuous monitoring and regular security audits.

Jenkins is running out of disk space. How do you fix it?

- **Clean workspace** (`cleanWs()`)
- **Limit build retention**
- **Archive old builds**

A secret is exposed in Jenkins logs. How do you prevent this?

- Use **`withCredentials`**
- Mask **secrets in logs**
- **Rotate credentials**

You need to run a long-running job without timeout. How?

```
timeout(time: 12, unit: 'HOURS') {
  sh './long-running-job.sh'
}
```

Jenkins cannot connect to a Git repository. How do you debug?

- Check **SSH keys**
- Verify **GitHub token**
- Test **network connectivity**

A Pipeline fails in the middle. How do you restart from the failed stage?

Use **Checkpoints** or **manual stage restart**.

Your Jenkins builds that used to finish in 5 minutes now take 20 minutes. How do you diagnose and resolve the slowdown?

Check agent load, CPU/memory usage, recent plugin updates, Jenkins logs, and any SCM checkout delays. Investigate any recent pipeline changes that introduced additional steps or external dependencies.

Someone installed a plugin without authorization. How do you prevent this?

Implement Role-Based Access Control (RBAC) and restrict plugin installation to admin users only.

Two teams edit the same pipeline job, causing conflicts. How do you manage collaboration?

Store Jenkinsfiles in GitHub Repo, enforce code reviews and use shared libraries to isolate reusable components.

You have 100+ manually triggered jobs. How do you automate and maintain them better?

Migrate jobs to pipelines using Jenkinsfiles stored in SCM and utilize job templates or folders.

Jenkins is filling up the disk quickly. What do you do?

Set job retention policies, archive only necessary artifacts, clean workspace post-build, and configure log rotation.

How would you scale Jenkins in Kubernetes for a team of 200+ developers?

Use the Jenkins Kubernetes plugin, auto-provision agents, monitor resource usage, and isolate namespaces.

Blue-green deployment script fails midway. What do you do?

Roll back to the previous environment, debug the pipeline, add checkpoints, and improve rollback mechanisms.

You want Jenkins to automatically create jobs for new Git branches. How do you implement it?

Use **Multibranch Pipeline** jobs with a Jenkinsfile in the repo and configure branch discovery settings.

Jenkins is crashing frequently due to high memory usage. How do you debug and fix this?

Check `JAVA_OPTS` in `/etc/default/jenkins` and increase heap

```
JAVA_OPTS="-Xms1g -Xmx4g -XX:MaxPermSize=512m"
```

- **Monitor memory** with `htop` or `jstat -gc <PID>`.
- **Limit parallel jobs** (`jenkins.model.Jenkins#numExecutors`).
- **Use lightweight agents** (Docker/Kubernetes).