Jenkins Interview Questions For Freshers

1. What is Jenkins?

Jenkins is a self-contained, open-source automation server that can be used to automate all sorts of tasks related to building, testing, and delivering or deploying software. Jenkins can be installed through native system packages, Docker, or even run standalone by any machine with a Java Runtime Environment (JRE) installed.

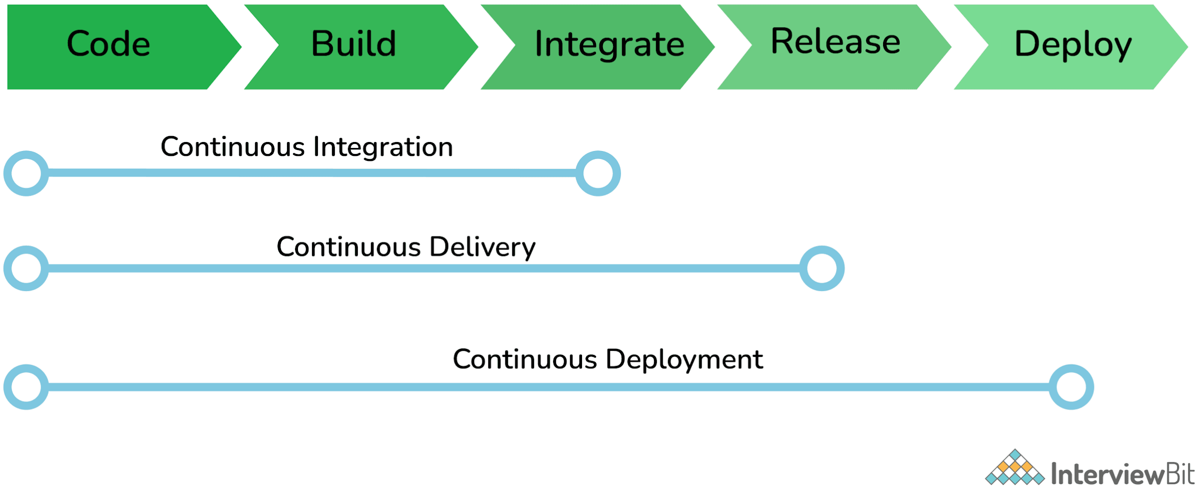
2. Tell me something about Continuous Integration, Continuous Delivery, and Continuous Deployment?

Continuous Integration: A software development process where the changes made to software are integrated into the main code as and when a patch is ready so that the software will be always ready to be - built, tested, deployed, monitored - continuously.

Continuous Delivery: This is a Software Development Process where the continuously integrated (CI) changes will be tested & deployed continuously into a specific environment, generally through a manual release process, after all the quality checks are successful

Continuous Deployment: A Software Development practice where the continuously integrated (CI) changes are deployed automatically into the target environment after all the quality checks are successful

Based on the level of automation, the above three paradigms can be better represented as below -



CI/CD and Continuous Deployment

3. What are the common use cases Jenkins is used for?

Jenkins being open-source automation can be used for any kind of software-based automation. Some of the common use-cases include but not limited to -

- Software build jobs
- Sanity/Smoke/CI/Regression test jobs
- Web/Data Scraping related jobs
- Code coverage measurement jobs
- General-purpose automation
- Reverse Engineering jobs
- Key Decoding jobs & many other jobs where software automation will be applicable.

You can download a PDF version of Jenkins Interview Questions.

4. What are the ways to install Jenkins?

Jenkins can be installed using -

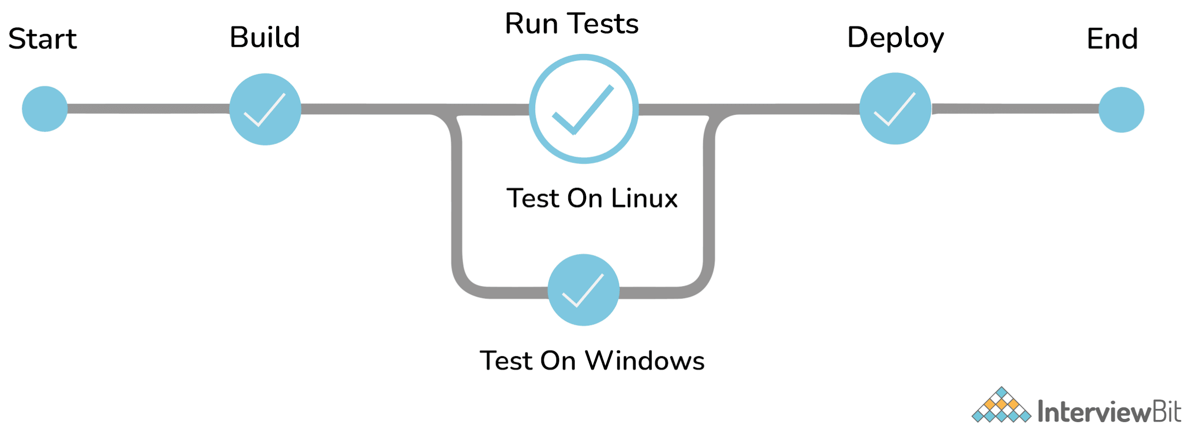
1. Native System Package Manager like - apt (Linux), brew (Mac), etc.
2. Docker (popular docker images for Jenkins is available for different platforms like Unix/Mac/Windows in the docker registry)
3. Kubernetes (available as a helm chart and can be installed on our Kubernetes clusters)
4. Standalone (on any machine with a Java Runtime Environment installed)
5.

5. What is a Jenkins job?

A Job/Project is the fundamental unit of a logical work (like a software build, an automation task, test execution, etc) using the Jenkins automation server and other required plugins, configurations & infrastructures.

Jobs can be of different types like - a freestyle project, a multi-configuration project, a pipeline project, a multi-branch project, etc.

6. What is a Jenkins Pipeline?



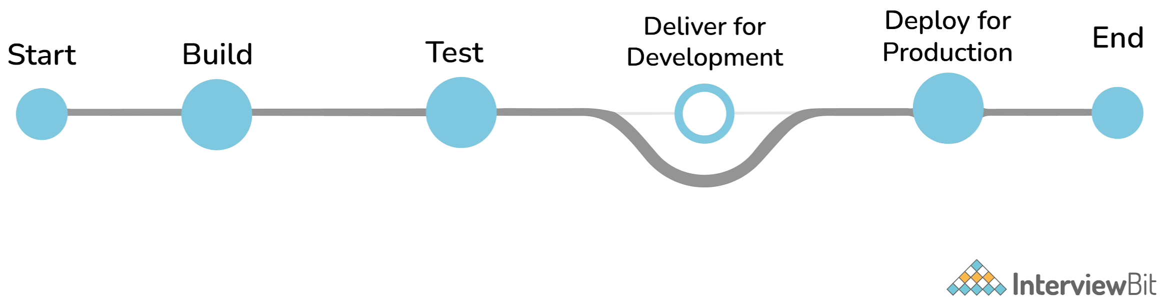
Jenkins Pipeline

The pipeline is a special type of Jenkins job - simply a sequence of steps controlled by a defined logic - which Orchestrates long-running activities that can span across multiple build agents. It is suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that cannot be easily achieved using a freestyle job.

7. What are the types of Jenkins pipelines?

Jenkins Pipelines can be either - a Declarative pipeline or a Scripted Pipeline. Declarative pipeline makes use of numerous, generic, predefined build steps/stages (i.e. code snippets) to build our job according to our build/automation needs whereas, with Scripted pipelines, the steps/stages can be custom-defined & used using a groovy syntax which provides better control & fine-tuned execution levels.

8. Explain Jenkins Multibranch Pipeline?



Jenkins Multibranch Pipeline

It is a pipeline job that can be configured to Create a set of Pipeline projects according to the detected branches in one SCM repository. This can be used to configure pipelines for all branches of a single repository e.g. if we maintain different branches (i.e. production code branches) for different configurations like locales, currencies, countries, etc.

9. How do you store credentials in Jenkins securely?

Credentials can be stored securely in Jenkins using the Credentials plugin, which stores different types of credentials like - Username with a password, SSH username with the private key, AWS Credentials, Jenkins Build Token, Secret File/Text, X509 & other certificates, Vault related credentials securely with proper encryption & decryption as and when required.

10. How can we stop a scheduled job from being executed temporarily?

Disable the job from the job details page to temporarily stop all scheduled executions & other factors/events from triggering the job and enable it back to resume the job schedules/triggers. If a job is not required permanently, we can delete the job from the jobs list view page.

Intermediate Questions

11. What are the ways to trigger a Jenkins Job/Pipeline?

There are many ways we can trigger a job in Jenkins. Some of the common ways are as below -

- Trigger an API (POST) request to the target job URL with the required data.
- Trigger it manually from the Jenkins web application.
- Trigger it using Jenkins CLI from the master/slave nodes.
- Time-based Scheduled Triggers like a cron job.
- Event-based Triggers like SCM Actions (Git Commit, Pull Requests), WebHooks, etc.
- Upstream/Downstream triggers by other Jenkins jobs.

12. What is Jenkins Build Cause?

Build Cause is a text attribute that represents what made a job's build to be triggered, say it could be a Jenkins User (from UI), Timer for Scheduled jobs, Upstream jobs for a job which was triggered by upstream job, etc. This is mainly used to identify the nature of the builds - be it nightly, manual, automated, etc.

13. How Jenkins knows when to execute a Scheduled job/pipeline and how it is triggered?

Jenkins master will have the cron entries set up for the jobs as per the scheduled Job's configurations. As and when the time for a particular job comes, it commands agents (based on the configuration of the job) to execute the job with required configurations.

14. What are the credential types supported by Jenkins?

In Jenkins, credentials are a set of information used for authentication with internal/external services to accomplish an action. Jenkins credentials are provisioned & managed by a built-in plugin called - Credentials Binding - plugin. Jenkins can handle different credentials as follows -

- Secret text - A token such as an API token, JSON token, etc.
- Username and password - Basic Authentication can be stored as a credential as well.
- Secret file - A secret file used to authenticate some secure data services & security handshakes.
- SSH Username with a private key - An SSH public/private key pair for Machine to Machine authentication.
- Certificate - a PKCS#12 certificate file and an optional password.
- Docker Host Certificate Authentication credentials.

And as we can guess, this can be extended to several other extensible credential types like - AWS credential, Azure secrets, etc. using commonly available plugins.

15. What are the Scopes of Jenkins Credentials?

Jenkins credentials can be of one of the two scopes - Global & System

Global - the credential will be usable across all the jobs configured in the Jenkins instance (i.e. for all jobs). This is more suited for user Jobs (i.e. for the freestyle, pipeline, or other jobs) to authenticate itself with target services/infrastructures to accomplish the purpose of the job)

System - This is a special scope that will allow the Jenkins itself (i.e. the core Jenkins functionalities & some installed plugins) to authenticate itself to external services/infrastructures to perform some defined tasks. E.g. sending emails, etc.

16. What is a Jenkins Shared Library and how it is useful?

As an organization starts using more and more pipeline jobs, there is a chance for more and more code being duplicated in every pipeline job, since a part of the build/automation processes will be the same for most of the jobs. In such a situation, every other new upcoming job should also duplicate the same piece of code. To avoid duplications, the Jenkins project brought in the concept of Shared Libraries, to code - DRY - Don't Repeat Yourself.

Shared libraries are a set of code that can be common for more than one pipeline job and can be maintained separately. Such libraries improve the maintenance, modularity & readability of the pipeline code. And it also speeds up the automation for new jobs.

17. How Jenkins jobs can be Triggered/Stopped/Controlled programmatically?

Jenkins Remote Access API can be used to do things like -

- Retrieving information about jobs, views, nodes, builds, etc. from Jenkins for programmatic consumption.
- Trigger a build (both parameterized & non-parameterized), stop/abort a build, enable/disable a Job, group/remove jobs into/from views, etc.
- Create/copy/modify/delete jobs.

and many other programming language-specific functionalities. It has wrappers for main programming languages like - Python, Ruby & Java. It can be triggered via CURL as below -

Jobs without parameters

Simply an HTTP POST on JENKINS_URL/job/JOBNAME/build.

Jobs with parameters

Simple example - sending "String Parameters":

```
curl JENKINS_URL/job/JOB_NAME/buildWithParameters  --user USER:TOKEN --data id=123 --data verbosity=high
```

18. How to get the Jenkins version programmatically in Jobs/Pipelines or nodes other than master?

To check the version of Jenkins, load the top-level page or any top-level Remote Access API path like the '.../api/*' page and then check for the 'X-Jenkins' response header.

This contains the version number of Jenkins, like "1.404". This is also a good way to check if an URL is a Jenkins URL.

19. What happens when a Jenkins agent is offline and what is the best practice in that situation?

When a job is tied to a specific agent on a specific node, the job can only be run on that agent and no other agents can fulfill the job request. If the target node is offline or all the agents on that particular node are busy building other jobs, then the triggered job has to wait until the node comes online or an agent from that node becomes available to execute the triggered build request.

As a result, a triggered job may sometimes wait indefinitely without knowing that the target node is offline. So, it is always the best practice to tie the jobs to a group of nodes & agents, referred to with a 'Label'. Once a job is tied to a Label, instead of a specific node/agent, any of the nodes/agents falling under the label can fulfill a build request, when a job is triggered. This way we can reduce the overall turn-around time of the builds.

Even then if a job is waiting for more time for the nodes/agents, then it is time to consider adding more nodes/agents.

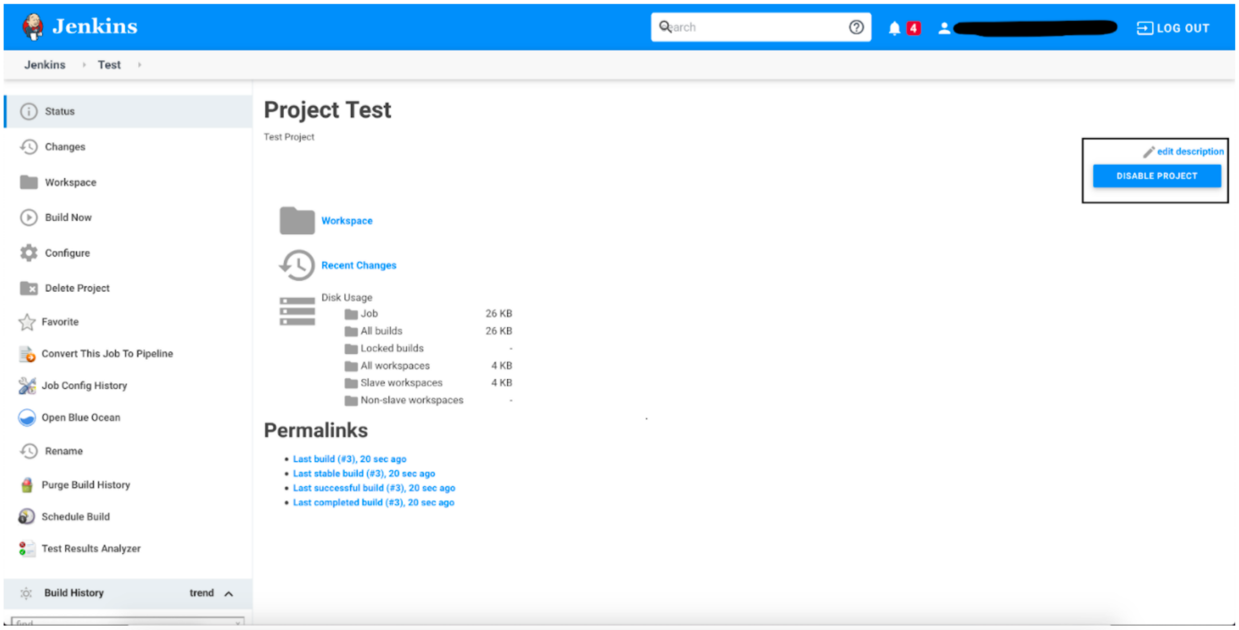
20. What is the Blue Ocean?

Blue Ocean is the redefined user experience for Jenkins. Designed from the ground up for Jenkins Pipeline, it is still compatible with freestyle jobs, Blue Ocean reduces clutter and increases clarity. Blue Ocean’s main features include -

- Sophisticated visualizations of continuous delivery (CD) Pipelines, allowing for fast and intuitive comprehension of your Pipeline’s status.
- Pipeline editor - makes the creation of Pipelines approachable by guiding the user through an intuitive and visual process to create a Pipeline.
- Personalization to suit the role-based needs of each member of the team.

- Pinpoint precision when intervention is needed and/or issues arise. Blue Ocean shows where in the pipeline attention is needed, facilitating exception handling and increasing productivity.
- Native integration for branch and pull requests, enables maximum developer productivity when collaborating on code with others in GitHub, Bitbucket, etc.

Conventional UI - Job Details Page



Project Test

Test Project

Disk Usage

Job	26 KB
All builds	26 KB
Locked builds	-
All workspaces	4 KB
Slave workspaces	4 KB
Non-slave workspaces	-

Permalinks

- Last build (#3), 20 sec ago
- Last stable build (#3), 20 sec ago
- Last successful build (#3), 20 sec ago
- Last completed build (#3), 20 sec ago

Conventional UI Jenkins

21. What is the Jenkins User Content service?

Jenkins has a mechanism known as "User Content", where administrators can place files inside the $JENKINS_HOME/userContent folder and these files are served from yourhost/jenkins/userContent.

This can be thought of as a mini HTTP server to serve images, stylesheets, and other static resources that you can use from various description fields inside Jenkins.

Advanced Interview Questions

22. How is continuous integration achieved using Jenkins?

Continuous integration is a process where a developer’s code changes are constantly integrated into the main code and the same will be tested automatically and the results of the tests will decide whether the change is ready for deployment. In this process -

- Developer Makes a change - commit/pull_request - in feature/dev branch
- Source Control Management system generates appropriate events
- SCM Specific Jenkins Plugins like Git/SVN will detect those events from the configured repositories and these events will be used to Trigger - build/dependent/test - jobs on Jenkins
- After the Test/Dependent jobs are completed, the change/patch will be labeled according to the status of the test job
- Based on the Status (i.e. readiness of a change to be merged with the main branch), the Continuous Delivery or Continuous Deployment strategy/tool will take it forward.

23. What is Artifact Archival & how to do it in Pipelines?

Artifacts are the exportable/storable/archivable results of a specific job build. This can be configured using a plugin called - Copy artifact Plugin. Based on the configured pattern, the files/directories matching the configured patterns will be archived for a Jenkins build, which can be used for future references. In the pipeline, it can be configured as follows -

```
archiveArtifacts artifacts: 'output/**/*'
```

24. How to configure inclusions & exclusions in Artifacts Archival?

Artifact archival takes in a pattern for matching target files. Similarly, it also takes in a pattern (ANT build system pattern for matching files) for exclusion as well which will be ignored while selecting the files for archival.

For e.g.

```
archiveArtifacts artifacts: 'output/*.txt', excludes: 'output/specific_file.txt'
```

The above command will archive all the text files from the output folder except specific_file.txt

25. How can we share information between different build steps or stages in a Jenkins Job?

Every build step or stage will be running in its process and hence sharing information between two different build steps is not so direct. We can use either a File, a Database Entry, an Environment Variable, etc. to share info from one build step to another or a post-build action.

26. How code coverage is measured/tracked using Jenkins in a CI environment?

Using language-specific code coverage plugins like JaCoCo, CodeCov, etc or generic tools/plugins like Sonarqube which will add the code coverage data to builds with some minor tweaks in the code and the same can be displayed as a graph in Jenkins.

27. Default Environment Variables by Jenkins & How to introduce custom environment variables?

Jenkins provides several environment variables by default like - BRANCH_NAME, BUILD_NUMBER, BUILD_TAG, WORKSPACE, etc.

28. How can a job configuration be reset to an earlier version/state?

From the Job details page, we can use Job Config History to - See diff, Review & Revert the Job configs from the history of changes we have made to a particular job. This will be super useful when a job is misconfigured by someone by mistake, it can be reviewed and reverted easily to any of its earlier states.

29. How to do Global Tools Configuration in Jenkins?

Global Tools are tools that need to be installed outside the Jenkins environment and need to be controlled from within the Jenkins environment. Hence it needs its corresponding Jenkins plugin as well. Steps to using a Global Tool generally include -

- Install the tool Plugin into the Jenkins instance, to include the global tool into a list of global tools used by Jenkins.
- Install the tool in the Jenkins instance or provide away (maybe a command to download and) install the tool during runtime.
- Go to Manage Jenkins -> Global Tools Configuration and Scroll through the tool list and configure the global tool-specific configurations.
- Make use of the installed global Tool in your job/pipeline.

30. How to create & use a Shared Library in Jenkins?

Basic requirements for a Jenkins shared library to be used in a Pipeline Code are -

- A Repository with pipeline shared library code in SCM.
- An appropriate SCM Plugin configuration for the Jenkins instance.
- Global Shared Library should be configured in Jenkins Global configuration.
- Include the Shared Library in the Pipeline Code and use the methods defined in the Jenkins Shared Library.

E.g.

```
#!/urs/bin/env groovy
```

@Library('fs_jenkins_shared_library@v2.0.7')_

31. How to install a Custom Jenkins Plugin or a Version of Plugin Not available in Jenkins Update Center?

Generally, it is the best practice to use the latest version of a plugin. But there are ways to install custom plugins or outdated versions of a published plugin. Jenkins Plugins are exported using a .hpi file and the same can be installed in multiple ways -

Using the Jenkins CLI

```
java -jar jenkins-cli.jar -s http://localhost:8080/ install-plugin SOURCE ... [-deploy] [-name VAL] [-restart]
```

The above command Installs a plugin either from a file, an URL or from the update center.

- SOURCE: If this points to a local file, that file will be installed. If this is an URL, Jenkins downloads the URL and installs that as a plugin. Otherwise, the name is assumed to be the short name of the plugin in the existing update center (like "findbugs") and the plugin will be installed from the update center.
- -deploy: Deploy plugins right away without postponing them until the reboot.
- -name VAL: If specified, the plugin will be installed as this short name (whereas normally the name is inferred from the source name automatically).
- -restart: Restart Jenkins upon successful installation.

Advanced Installation - via - Web UI

Assuming a .hpi file has been downloaded, a logged-in Jenkins administrator may upload the file from within the web UI:

- Navigate to the Manage Jenkins > Manage Plugins page in the web UI.
- Click on the Advanced tab.
- Choose the .hpi file under the Upload Plugin section.
- Upload the plugin file.
- Restart the Jenkins instance

Advanced Installation - via - On the master

Assuming a .hpi file has been explicitly downloaded by a systems administrator, the administrator can manually place the .hpi file in a specific location on the file system.

Copy the downloaded .hpi file into the JENKINS_HOME/plugins directory on the Jenkins controller (for example, on Debian systems JENKINS_HOME is generally /var/lib/jenkins).

The master will need to be restarted before the plugin is loaded and made available in the Jenkins environment.

32. How to download the Console log for a particular Jenkins build programmatically?

Using the Jenkins CLI - console - command

```
java -jar jenkins-cli.jar console JOB [BUILD] [-f] [-n N]
```

Produces the console output of a specific build to stdout, as if you are doing 'cat build.log'

- JOB: Name of the job
- BUILD: Build number or permalink to point to the build. Defaults to the last build
- -f: If the build is in progress, append console output as it comes, like tail -f

- -n N: Display the last N lines.

E.g.

```
ssh -l <ssh_username> -p <port_no> <Jenkins_URL> console <JOB_NAME>
```

33. What is Jenkins Remote Access API?

Jenkins provides remote access API to most of its functionalities (though some functionalities are programming language-dependent). Currently, it comes in three flavors -

- XML
- JSON with JSONP support
- Python

Remote access API is offered in a REST-like style. That is, there is no single entry point for all features, and instead, they are available under the ".../api/" URL where the "..." portion is the data that it acts on.

For example, if your Jenkins installation sits at interviewbit.com, visiting /api/ will show just the top-level API features available – primarily a listing of the configured jobs for this Jenkins instance.

Or if we want to access information about a particular build, e.g. https://ci.jenkins.io/job/Infra/job/jenkins.io/job/master/lastSuccessfulBuild/, then go to https://ci.jenkins.io/job/Infra/job/jenkins.io/job/master/lastSuccessfulBuild/api/ and you'll see the list of functionalities for that build.

34. What is In-process Script Approval and how it works?

Jenkins, and several plugins, allow users to execute Groovy scripts in Jenkins. To protect Jenkins from the execution of malicious scripts, these plugins execute user-provided scripts in a Groovy Sandbox that limits what internal APIs are accessible.

This protection is provided by the Script Security plugin. As soon as an unsafe method is used in any of the scripts, the "In-process Script Approval" action should appear in "Manage Jenkins" to allow Administrators to make a decision about which unsafe methods, if any, should be allowed in the Jenkins environment.

This in-process script approval inherently improves the security of the overall Jenkins ecosystem.

35. Can we monitor Jenkins using common Observability tools?

Common monitoring platforms like DataDog, Prometheus, JavaMelody & few others - have their corresponding Jenkins plugin, which when configured, sends Metrics to the corresponding Monitoring platform, which can then be Observed with the latest tools & technologies. The same can be configured with Alarms & Notifications for immediate attention when something goes wrong.

36. What is a Ping Thread in Jenkins and how it works?

Jenkins installs "ping thread" on every remote connection, such as Controller/Agent connections, regardless of its transport mechanism (such as SSH, JNLP, etc.). The lower level of the Jenkins Remoting Protocol is a message-oriented protocol, and a ping thread periodically sends a ping message that the receiving end will reply to. The ping thread measures the time it takes for the reply to arrive, and if it’s taking excessive time (currently 4 minutes and configurable), then it assumes that the connection was lost and initiates the formal close down.

This is to avoid an infinite hang, as some of the failure modes in the network cannot be detected otherwise. The timeout is also set to a long enough value so that a temporary surge in the load or a long garbage collection pause will not trip off the close-down.

Ping thread is installed on both controller & agent; each side pings the other and tries to detect the problem from their sides.

The ping thread time out is reported through java.util.logging. Besides, the controller will also report this exception in the agent launch log. Note that some agent launchers, most notably SSH agents, writes all stdout/stderr outputs from the agent JVM into this same log file, so you need to be careful.

SECOND SET OF JENKINS INTERVIEW QUESTIONS.

1. What is Jenkins?

Jenkins is an open-source free automation tool used to build and test software projects. The tool makes it painless for developers to integrate changes to the project. Jenkins' primary focus is to keep track of the version control system and initiate and monitor a build system if there are any changes. It keeps an eye on the entire process and provides reports and notifications to alert.

Some typical reasons as to why Jenkins is so widely used are:

- Developers and testers use Jenkins to detect defects in the software development lifecycle and automate the testing of builds.
- They use it to continuously monitor the code in real-time and integrate changes into the build.
- Jenkins as it turns out, is a great fit for building a CI/CD pipeline because of its plugin-capabilities, and simple-to-use nature.

2. What are the features of Jenkins?

Some of the crucial features of Jenkins are the following:

- It is a free and open-source automation tool.
- Jenkins provides a vast number of plugins.
- It is easy to set up and install on multiple operating systems.
- Provides pipeline support.
- Fast release cycles .
- Easy upgrades.

3. What is Groovy in Jenkins?

- Apache Groovy is a dynamic object-oriented programming language used as a scripting language for Java platforms.
- Groovy is used to orchestrate the Jenkins pipeline and enables different teams to contribute to the work in different languages.
- Groovy's syntax is very similar to that of Java, making it more seamless with the Java interface.
- The language has several features like Java compatibility and Development support.

4. How do you install Jenkins?

Follow the steps mentioned below to install Jenkins:

- Install Java .
- Install Apache Tomcat Server.
- Download Jenkins war File.
- Deploy Jenkins war File.

5. Which commands can be used to begin Jenkins?

Here are the commands used to start Jenkins:

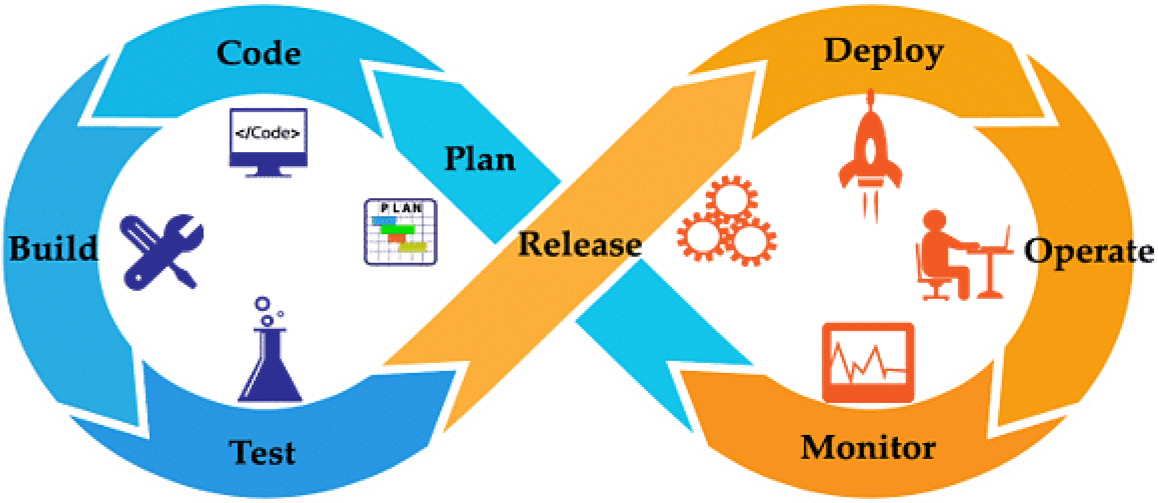
- Open the command prompt.

- After the command prompt opens, browse to the directory where Jenkins war is present.
- Then run the following command:

```
D:\>Java -jar Jenkins.war
```

6. What is "Continuous Integration" with reference to Jenkins?

- Continuous Integration is a development practice where the codes can be integrated into a shared repository.
- The practice uses automated verifications for the early detection of code problems.
- Continuous Integration triggers the build to find and identify bugs present in the code.
- It adds consistency to the build process.
- It's a means to build things faster and prevents broken code.



7. What are the differences between Continuous Integration, Continuous Delivery, and Continuous Deployment?

Continuous Integration	Continuous Delivery	Continuous Deployment
Continuous Integration (CI) is a DevOps software development practice that permits developers to combine/merge the changes to their code in the central repository to run automated builds and tests.	Continuous Delivery (CD) refers to the building, testing, and delivering improvements to the software code. The most critical part of the CD is that the code is always in a deployable state.	Continuous Deployment (CD) is the ultimate stage in the DevOps pipeline. It refers to automatic release of any developer changes from the repository to the production stage.

8. What is a CI/CD pipeline?

CI/CD Pipeline or Continuous Integration/ Continuous Delivery is considered the DevOps approach's backbone. The pipeline is responsible for building codes, running tests, and deploying new software versions.

9. What is a Jenkins pipeline?

- The pipeline represents the continuous delivery and continuous integration of all the jobs in the SDLC and DevOps life cycle.
- The Jenkins pipeline is a set of plugins that support implementation and integration of continuous delivery pipelines into Jenkins. It connects this pipeline in a particular format by Jenkins.

- The Jenkins pipeline solves several problems like the maintenance of thousands of jobs and maintaining deployment with needing to resort to other powerful methods.

10. Name the three different types of pipelines in Jenkins?

The three different types of Jenkins pipelines are:

- CI/CD pipeline .
- Scripted pipeline.
- Declarative pipeline.

11. How can you set up a Jenkins job?

To set up a Jenkins job, you may follow these steps:

- Select New item from the menu.
- Next, enter a name for the job and select a free-style job.
- Click on OK to create a new job.
- Hence, the next page that appears will allow you to configure your job.

12. What are the requirements for using Jenkins?

To use Jenkins, you require the following:

- A source code repository that can be accessed, for example, a Git repository.
- A build script, for example, a Maven script.

13. Name the two components that Jenkins is mostly integrated with.

Jenkins is typically integrated with these two components:

1. Version Control systems like Git and SVN (Apache Subversion).
2. Build tools like Maven .

14. Name some of the useful plugins in Jenkins.

Some of the plugins in Jenkins include:

- Maven 2 project.
- Amazon EC2.
- Copy artifact.
- Join.
- HTML publisher.
- Green Balls.

15. How can you create a backup and copy files in Jenkins?

- Jenkins stores all the settings, builds scripts, and logs in the home directory.
- Then, if you want to create a backup of this Jenkins set up all you have to do is copy this directory.
- The job directory may also be copied to clone a job or rename the directory.

Intermediate Level Jenkins Interview Questions

16. How can you deploy a custom build of a core plugin?

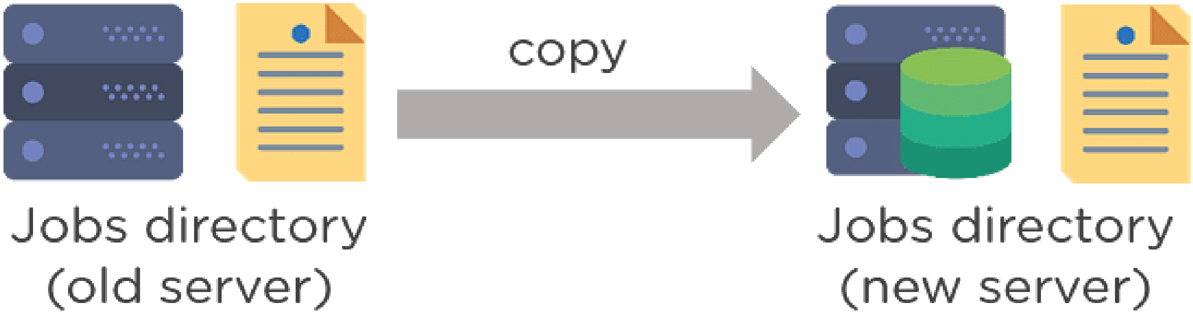
If you wish to deploy a custom build of a core plugin, you follow the following steps:

- Stop Jenkins.
- Then copy the custom HPI to $Jenkins_Home/plugins.
- After that, delete the previously expanded plugin directory.
- Next, make an empty file called <plugin>.hpi.pinned.
- Finally, start Jenkins.

17. What could be the steps to move or copy Jenkins from one server to another?

There are multiple ways to move or copy Jenkins from one server to another:

- You may move a job from one Jenkins installation to another just by copying the corresponding job directory.
- You may make a copy of an already existing job by making a clone of the job directory with an uncommon name.
- You may also just rename a current job by renaming a directory.



18. Name some more continuous Integration tools other than Jenkins.

Some of the top continuous integration tools other than Jenkins are:

- TeamCity.
- Travis CI.
- Go CD.
- Bamboo.
- GitLab CI.
- CircleCI.
- Codeship.

19. Assume that you have a pipeline. The first job that you performed was successful, but the second one failed. What would you do now?

You don't have to worry, and you just have to restart the pipeline from the point where it failed by doing 'restart from stage.'

20. Explain the process in which Jenkins works?

Here’s the process in which Jenkins works:

- Jenkins checks changes in repositories regularly, and developers must secure their code regularly.
- Once the changes are defined, Jenkins detects them and uses them to prepare a new build.
- After that, Jenkins will transverse through various stages in its usual pipeline. As one stage completes, the process will move further on to the next stage.
- If a stage fails, the Jenkins build will stop there, and the software will email the team using it. When completed successfully, the code implements itself in the proper server so that testing begins.
- After the successful testing phase, Jenkins shares the results with the team using it.

21. What is Jenkinsfile?

Jenkins file is a text file that has a definition of a Jenkins pipeline and is checked into the source control repository. It enables code review and iteration on the pipeline. It also permits an audit trail for the pipeline.

22. Differentiate between Maven, Ant, and Jenkins.

Maven	ANT	Jenkins
1. Build tool. 2. Perform build operations .	1. Build tool. 2. Perform build operations .	1. Continuous Integration tool. 2. Jenkins may run unit tests and deploy applications.

23. Differentiate between Bamboo and Jenkins?

S.no	Bamboo.	Jenkins.
1	Commercial tool.	Open-source tool.
2	Dedicated development team.	Huge global community
3	Comparatively more user friendly .	Less user-friendly .
4	Many built-in features and plugins are available in the Atlassian marketplace.	Many plugins to perform different functions.

24. What is the difference between Jenkins and Hudson?

S.no	Jenkins.	Hudson.
1	Jenkins is a free open-source Continuous Integration server.	Hudson is an extensible Continuous Integration server.
2	Forked by Hudson.	Continuous Integration tool.
3	Used by companies like Netflix, Facebook, eBay, Instacart, LinkedIn, etc.	Used by companies like Logo Yazilim, TableAir UAB and OptoSweden AB.
4	Jenkins supports a lot of plugins.	Hudson supports a lesser number of plugins.

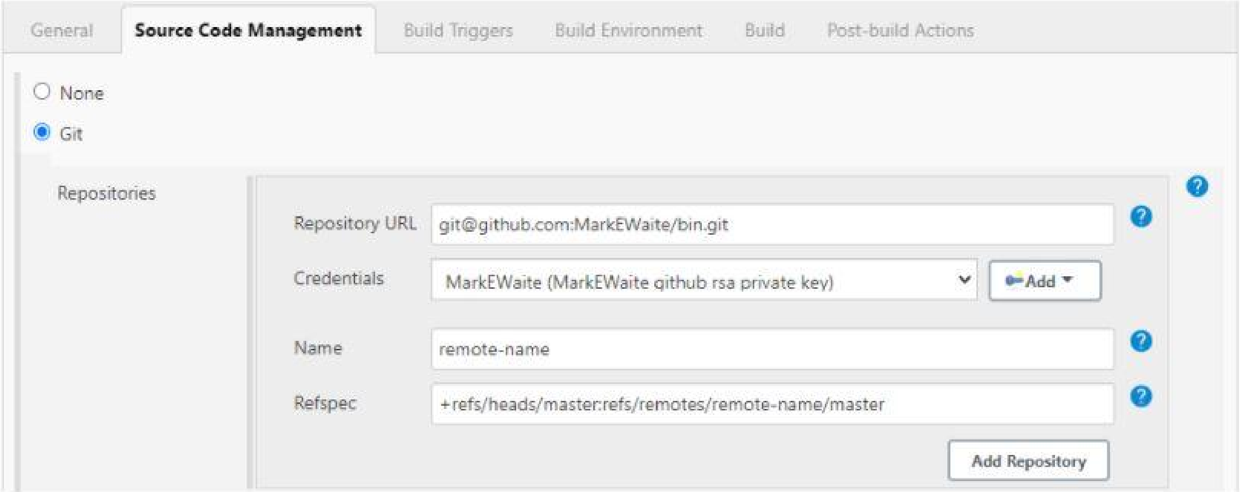
25. Why is Jenkins used with Selenium?

Using Selenium allows Jenkins's testing whenever there are any software changes or any changes in the environment. When the Selenium test suite is integrated with Jenkins, the testing part is also automated as part of the build process.

26. What is the process to integrate Git with Jenkins?

To integrate Git with Jenkins, you can follow the following steps:

- First, create a new Jenkins job and open the Jenkins dashboard.
- Now, enter the desired project name and select the job type.
- Click on OK.
- Then enter the project information.
- After that, visit the 'Source Code Management' tab.



○ None
● Git

Repositories

Repository URL: git@github.com:MarkEWaite/bin.git

Credentials: MarkEWaite (MarkEWaite github rsa private key)

Name: remote-name

Refspec: +refs/heads/master:refs/remotes/remote-name/master

.

- If the Git plugin is pre-installed in Jenkins, there will be 'Git'.
- If it is not installed, you must reinstall the plugins (GitHub plugin, GitHub Branch Source plugin, GitHub API plugin, Git client plugin, etc.).
- After we install the plugins, restart Jenkins.
- To check if Git is installed, you can go to Command Prompt and type Git, and you would see various options like usage, version, help, etc.

27. Explain Kubernetes, and how can you integrate Jenkins with Kubernetes?

- Kubernetes is a portable and open-source platform that is used for managing workloads and services that are containerized.
- With the help of Kubernetes, the group of hosts running the Linux containers can be easily and efficiently managed.
- To manage a Continuous Delivery (CD) pipeline, the most efficient way is to deploy Jenkins with Kubernetes Engine.
- Kubernetes enables the creation of multiple container instances to satisfy more fault tolerance.
- Kubernetes deploy plug may be used with Jenkins for Continuous Deployment.

28. What is DSL Jenkins?

DSL stands for Domain Specific Language. Jenkins job DSL is a plugin that allows us to define jobs in the programmatic form with minimal effort. You can describe your jobs in Jenkins using a Groovy Based Language. They designed Jenkins job DSL plugin to create versions of the job, manage the records

29. What is the process to configure Third-party tools in Jenkins?

The process to configure Third-party tools in Jenkins can be seen in four significant steps:

- Install the third-party software.
- Then install a Jenkins plugin supporting the third-party tool.
- Now, configure the tool from the Manage Jenkins section.
- Finally, your plugin is ready to be used.

30. What are some of the default environmental variables in Jenkins?

Some of the Jenkins environmental variables are:

- $JOB_NAME - The name that you give your job when it is first set up.

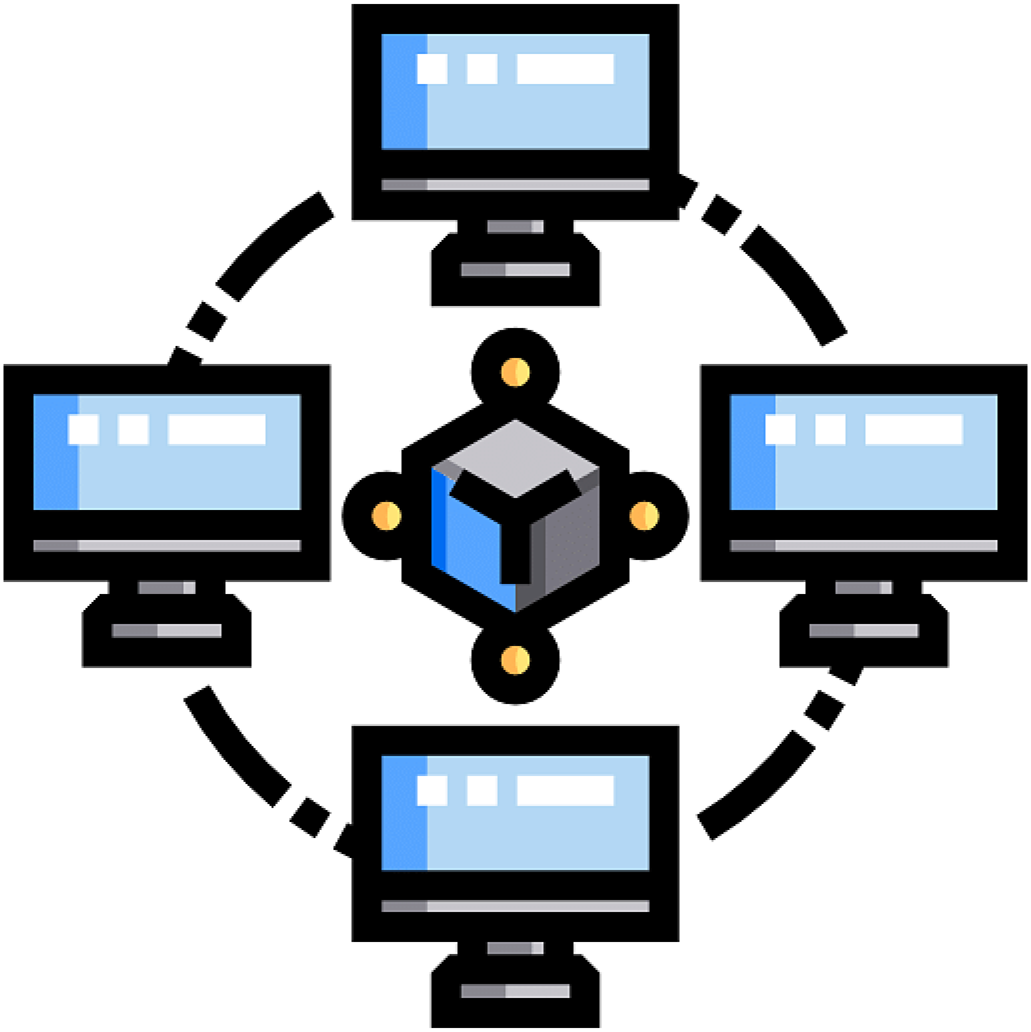
- $NODE_NAME - This is the name of the node on which the current build is running.
- $WORKSPACE - Refers to the path of the workspace.
- $BUILD_URL - Indicates the URL where the results of the builds can be found.
- $JENKINS_URL - This is set to the URL of the Jenkins master that is responsible for running the build.

Advance Level Jenkins Interview Questions

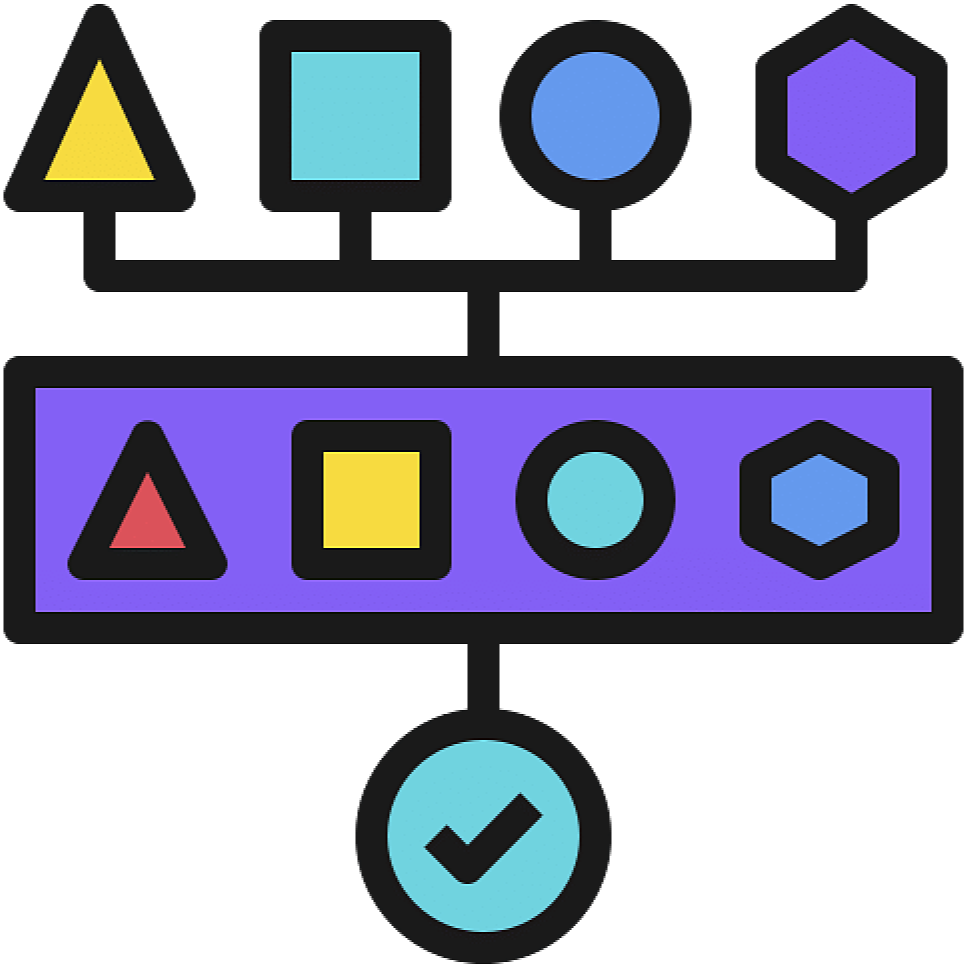
31. What are some of the critical aspects of the Jenkins pipeline?

Some of the Jenkins Pipeline key aspects are:

- Pipeline: User-defined model of a CD pipeline. Pipeline's code takes the role of defining the entire build process, including building, testing, and delivering an application.
- Node: A machine as a part of the Jenkins environment which is capable of executing a pipeline.



- Step: An individual task that communicates to Jenkins about what to do at a particular point in time.
- Stage: This defines distinct subset of tasks that are conceptually unique and performed through the pipeline (build, test, deploy stages).



32. Let's say there is a broken build in the Jenkins project, then what can be done?

Initially, you will have to open the console output where the broken builds are created and then figure out if there are any file changes that were missed. In case there are no issues found there, then you will need to update your local workspace, replicate the problem, and then try to solve it.

33. How to deploy a custom build of a core plugin?

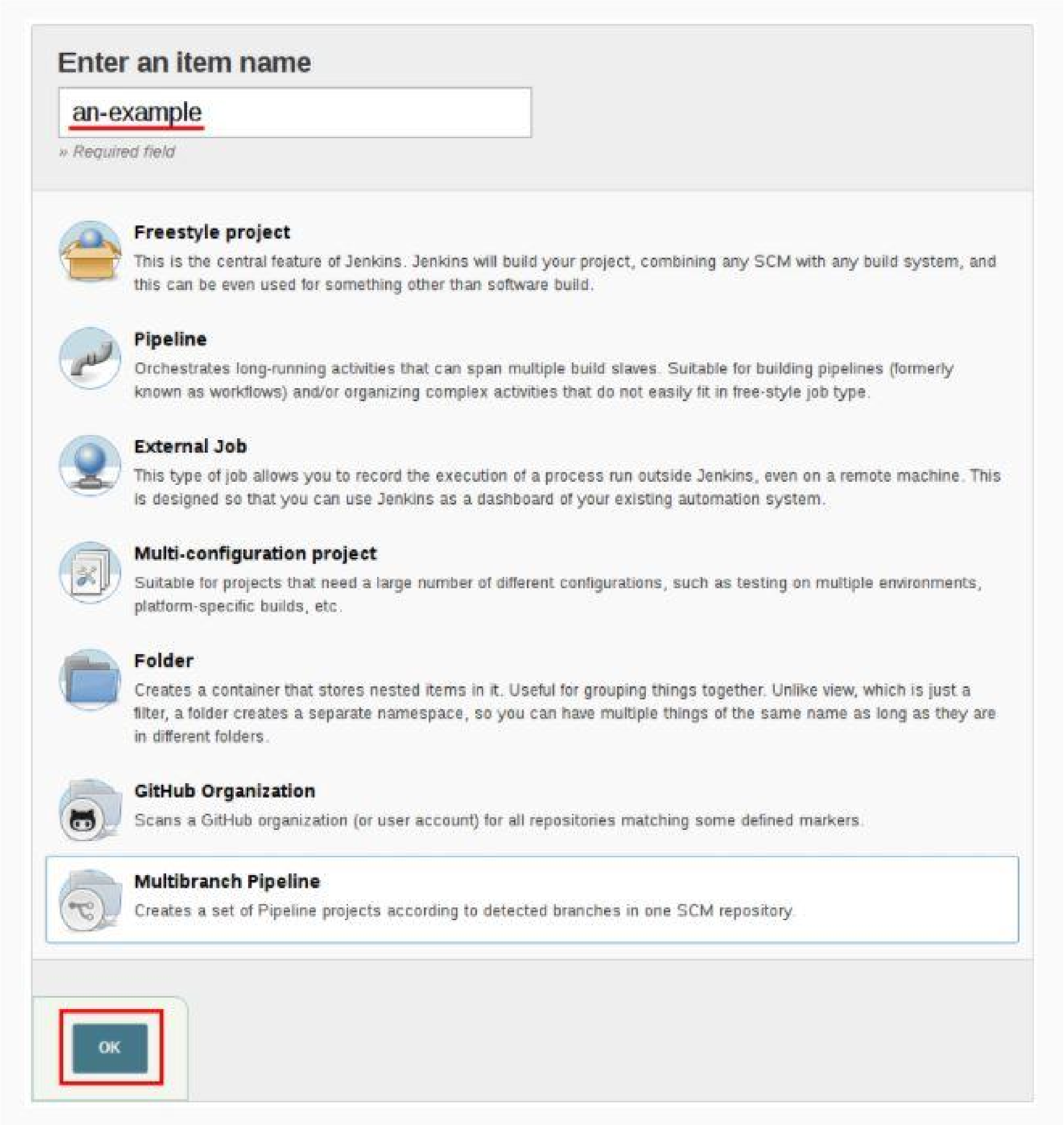
The steps to deploy a custom build of a core plugin are:

- First, copy the .hpi file to $JENKINS_HOME/plugins.
- Then remove the plugin's development directory.
- Next, create an empty file called <plugin>.hpi.pinned.
- Finally, restart Jenkins and use your custom build of a core plugin.

34. What is the process of making a Multibranch Pipeline in Jenkins?

To create a Multibranch Pipeline in Jenkins, follow the following steps:

- Open the Jenkins dashboard and create a new item by clicking on 'new item'.
- Enter the project name and, from the options, select 'Multibranch pipeline'.
- Click on OK.



Enter an item name

an-example

» 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 slaves. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

External Job
This type of job allows you to record the execution of a process run outside Jenkins, even on a remote machine. This is designed so that you can use Jenkins as a dashboard of your existing automation system.

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.

GitHub Organization
Scans a GitHub organization (or user account) for all repositories matching some defined markers.

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

Source: https://www.jenkins.io/doc/book/pipeline/multibranch/

- Then select the repository location, branch source (GitHub/Bitbucket), and add the branch source credentials.
- Save the project.
- Now, Jenkins automatically creates new Multibranch Pipelines for repositories.
- Then to connect to the GitHub repo, we need the HookURL.

- To get this URL from the repository settings, add this HookURL to the Webhooks section.
- Once the jobs are created, Jenkins will automatically trigger the build.

35. How can the parameters be defined in Jenkins?

In Jenkins, a build can take many input parameters to execute.

- To define parameters for the job, select the “this project is parameterized” box.
- The drop down “Add Parameter” is enabled with the parameter types list. Any number of parameters may be added in the list.

There are several parameter types provided in the list.

36. Explain the ways to configure Jenkins node agent to communicate with Jenkins master?

There are two ways to configure Jenkins node agent to communicate with Jenkins master:

1. Browser–If we launch the Jenkins node agent from a browser, a Java Web Start or JNLP file is downloaded. The downloaded file launches a new process on the client machine to run jobs.
2. Command-line–If you want to start the node agent using the command line, you need the executable agent.jar file. When this file runs, it launches a client's process to communicate with the Jenkins master to run build jobs.

37. What is the use of the JENKINS_HOME directory?

- JENKINS_HOME directory is the place where all the settings, logs, and configurations are stored. It stores all this information in XML files.
- The directory contains a subdirectory for every Jenkins build job being operated.
- Every directory has two subdirectories: builds and workspace., and some other files as well.

- These sub directories are important, as the workspace directory is located at the place where Jenkins is building the project, and it contains the source code.
- The builds directory stores the history of all the builds performed for this job.

contains a file
JENKINS_HOME folder
Config.xml

38. Explain a backup plugin and its uses.

It includes job configs, plugins, logs, plugin configuration, etc. Jenkins provides a backup plugin which can be used to get critical backup configuration. This is most important when there is a failure; it prevents the loss of any settings.

39. What do you understand by a trigger concerning a pipeline?

A trigger is something that defines when and how the pipelines should be executed. There may be several triggers like a pull request trigger that is used to deploy a pull request, or there may be a stage trigger that is used in configuring how each stage in the release will be triggered.

40. What are the three security mechanisms Jenkins uses to authenticate users?

The three mechanisms are as follows:

- Jenkins uses an internal database to store user data and credentials.
- Jenkins can use a lightweight Directory Access Protocol (LDAP) server to authenticate users.
- We can configure Jenkins to employ the application server's authentication mechanism upon which we deploy it.