**25/03/2025:**

**Jenkins:**

Jenkins is a automation tool, which is used to automate projects without any interference of humans

**Jenkins is also known as CI/CD tool**

Jenkins is a open source automation server. It helps automate the parts of software development related to building, testing and deploying, facilitating continuous integration and continuous deployment.

It is a server-based system that runs in servlet container such as tomcat

**CI-CD:**

CI-CD is a set of practices that automate the software development and deployment process. CI/CD is a key part of DevOps methodology, which aims to improve collaboration between development and operations team

It is an approach to software development that combines the practices of CI/CD to make developing applications faster and safer, efficient

**CI:**

Continuous integration is a software development practice that involves frequently merging code changes into a central repository and then running automated tests and builds

The goal of CI is to improve software quality, find and fix bugs faster and reduce the time if it takes to release new software updates

It is a process where you integrate a set of tools or set processes that you follow before delivering the application to the client

**Advantages of CI:**

* Early bug detection
* Improved code quality
* Faster development
* Reduced integration time
* Quick feedback

CD:

Cd stands for continuous Deployment (CD) or continuous Delivery(CD) both refer to automating the process of getting new changes into production, but they differ in their levels of automation

**Continuous Delivery:**

Code is automatically tested and ready to be deployed to production at any time. After a developer finishes the coding, the system automatically builds, tests, and prepare the code for release. However actual deployment to production still requires manual approval

**Continuous Deployment:**

Code is automatically deployed to production without any manual intervention

After code passes all tests, it is automatically pushed to production, no humans approval is needed.

It is a process where you deploy or deliver your application to your end user

**Advantages of CD:**

* Faster time to market
* Reduced risks
* Easier rollbacks
* Enhanced collaboration
* Continuous feedback

**Need for CI/CD**

* Jenkins port number 8080
* Jenkins overcomes the drawback of both agile and waterfall models
* Jenkins is the heart of DevOps
* We will integrate all the DevOps tools with Jenkins and deploy the applications onto the web server (tomcat)
* We will integrate git, maven, dokers, Kubernetes, ansible, terraform, sonarqube, nexus
* For deployment we use another separate instance (tomcat)
* In jenkins, inorder to CI/CD, we need to create jobs/projects first
* Running the jobs/projects is known as “build”
* Build or deployment both are same
* In Jenkins, we have 2 types of jobs

1. Free style job:- by clicking in dashboard of Jenkins
2. Pipeline jobs:- Jenkins dashboard🡪 groovy scripts & GitHub🡪Jenkins file GitHub🡪executing then

* Jenkins: we will create parameterized jobs
* We have both sequential (downstream and up stream) and parallel jobs
* Jenkins have master/slave architecture or Master/node architecture
* Master will be 1
* Nodes/slaves will be many
* In Jenkins we can take backup
* Jenkins also provide high security
* We can upgrade in Jenkins
* Jenkins will be automated with the help of created jobs/projects

Jenkins important Configuration files

* Jenkins home directory: /var/lib/jenkins
* Installed plugins: /var/lib/Jenkins/plugins
* Created jobs list: /var/lib/jenkins/workspace
* Nodes info: /var/lib/jenkins/nodes
* Jenkins log info: /var/lib/Jenkins/log
* List of jobs: /var/lib/jenkins/jobs
* Created users lists: /var/lib/Jenkins/users

In real time we have various environments

1. Development: develop code🡪GitHub🡪success
2. QA: quality assurance🡪 success
3. UAT: User acceptance testing🡪success
4. Production: complete software or application will be developed 🡪 handover to client🡪 once production got success it means that the product/ project is handing over to client

Need of environments:

* To ensure an error free application
* Productivity needs to be improved
* Customer satisfaction
* To deliver the application in time

**Jenkins Installation steps:**

**Step1:** install java (sudo yum install -y java-17-amazon-corretto)

**Step2:** check java version(java –version)

**Step3**:install git(sudo yum install git)

**Step4:** check git version(git –version)

**Step5:**install maven

**Step6:**add Jenkins repository

sudo wget -O /etc/yum.repos.d/jenkins.repo \

<https://pkg.jenkins.io/redhat-stable/jenkins.repo>

**step7:** import GPG key

sudo rpm --import <https://pkg.jenkins.io/redhat-stable/jenkins.io.key>

**step8:** install Jenkins

sudo yum install -y Jenkins

**step9:** start and enable Jenkins

sudo systemctl enable jenkins

sudo systemctl start Jenkins

**step10:**check status(sudo systemctl status Jenkins)

**step11:**get the initial admin password

sudo cat /var/lib/jenkins/secrets/initialAdminPassword

copy the password

**step12:** check the security group in ec2 instance

**step13:** access Jenkins in browser

ip address:8080

**step14:** paste the password in Jenkins and click save and continue

**step15:** install the plugins

**step16:** set the user name and password and save

username: Vijaya\_Bhavani

password: Vijju@2807

**step17:** browser displays the Jenkins dashboard