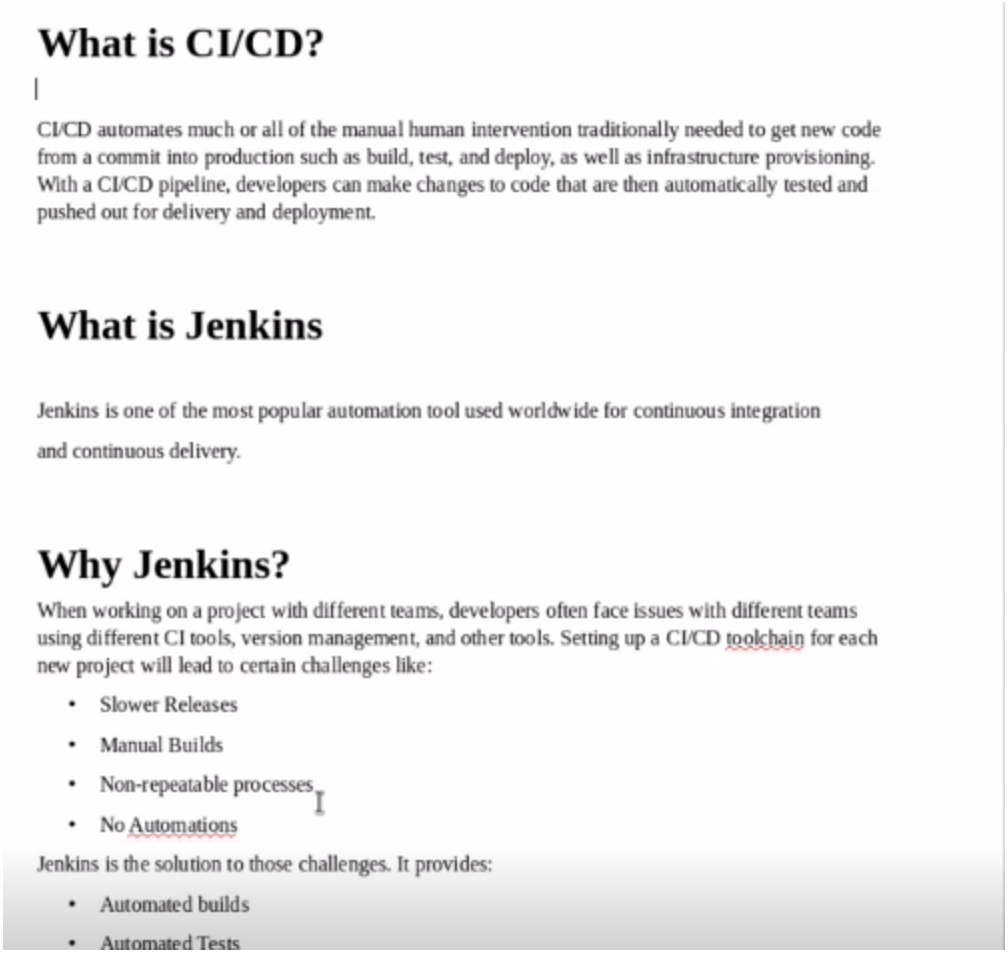
Jenkins



What is CI/CD?

CI/CD automates much or all of the manual human intervention traditionally needed to get new code from a commit into production such as build, test, and deploy, as well as infrastructure provisioning. With a CI/CD pipeline, developers can make changes to code that are then automatically tested and pushed out for delivery and deployment.

What is Jenkins

Jenkins is one of the most popular automation tool used worldwide for continuous integration and continuous delivery.

Why Jenkins?

When working on a project with different teams, developers often face issues with different teams using different CI tools, version management, and other tools. Setting up a CI/CD toolchain for each new project will lead to certain challenges like:

- Slower Releases
- Manual Builds
- Non-repeatable processes
- No Automations

Jenkins is the solution to those challenges. It provides:

- Automated builds
- Automated Tests

CI part includes running code test, check for security vulnerabilities, creating container/building the app.

Sanity checks for code are more about standard practises, performance testing as well can be done in CI.

Some industry grade security checkers:

clair-scanner for containers, layers of image if they have some issues/ vulnerablities.

wicked for npm packages

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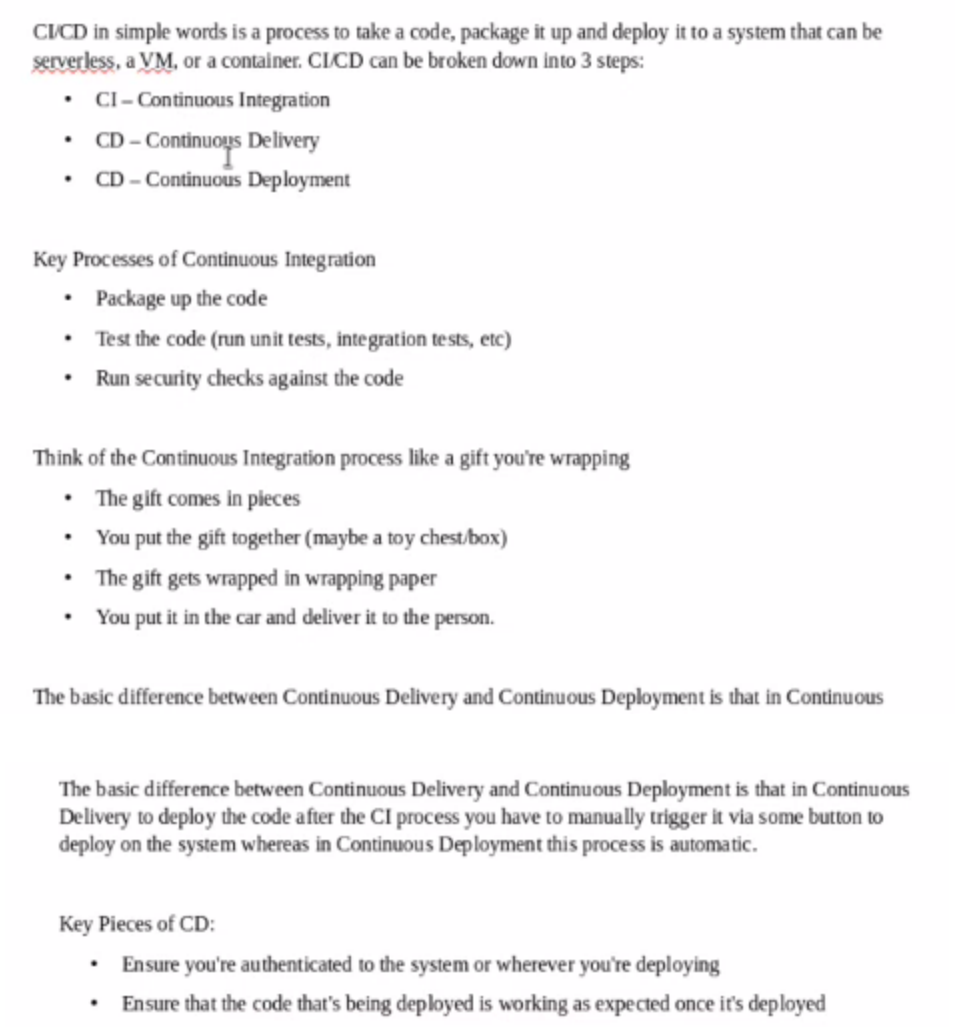
Jenkins is the solution to those challenges. It provides:

- Automated builds
- Automated Tests
- Automated CI/CD pipelines
- Automated deployments
- Ability to install Jenkins locally
- Jenkins support and Plugins

Jenkins is well tested and provide several integrations with 1800+ plugins to support build, deployment and automation for the project.

CI/CD in simple words is a process to take a code, package it up and deploy it to a system that can be serverless, a VM, or a container. CI/CD can be broken down into 3 steps:



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- CI – Continuous Integration
- CD – Continuous Delivery
- CD – Continuous Deployment

Key Processes of Continuous Integration

- Package up the code
- Test the code (run unit tests, integration tests, etc)
- Run security checks against the code

Think of the Continuous Integration process like a gift you're wrapping

- The gift comes in pieces
- You put the gift together (maybe a toy chest/box)
- The gift gets wrapped in wrapping paper
- You put it in the car and deliver it to the person.

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The basic difference between Continuous Delivery and Continuous Deployment is that in Continuous Delivery to deploy the code after the CI process you have to manually trigger it via some button to deploy on the system whereas in Continuous Deployment this process is automatic.

Key Pieces of CD:

- Ensure you're authenticated to the system or wherever you're deploying
- Ensure that the code that's being deployed is working as expected once it's deployed

Jenkins script

`agent any` is used to specify node on which we want to run jenkins script

```
pipeline {
    agent any

    stages {
        stage('Hello') {
            steps {
                echo 'Hello World'
            }
        }
    }
}
```

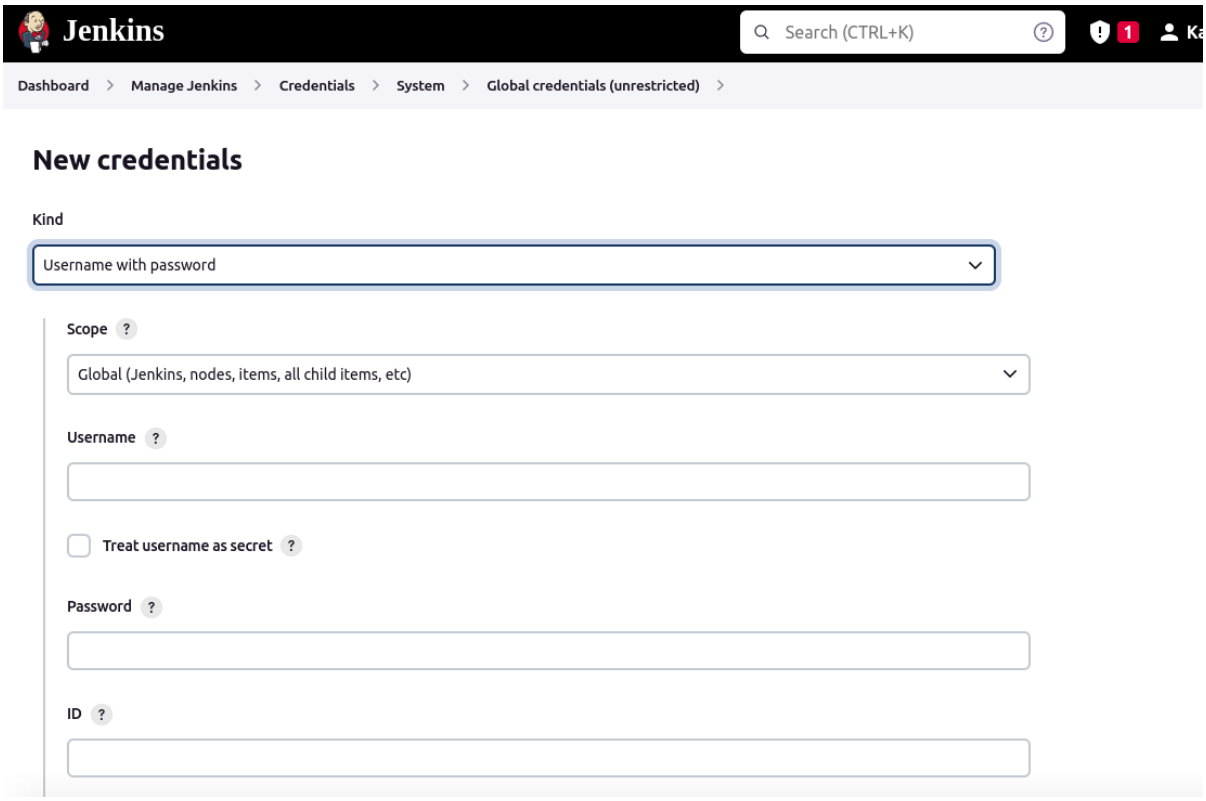
stage(<stage-name>)

> here stage name should be unique, you cannot have two stages having same names.

with jenkins, we can create build pipelines, and pipeline has stages, each stage has some steps, that are commands you have to run in that stage.

We can also have the script for pipeline inside a git repo, and then the file is called ***Jenkinsfile***

> you can add credentials in jenkins, by going to `manage jenkins→ manage credentials→ system→add credentials` and then credentials, once added use this credentials



Inside `manage jenkins->configure system`

`# of executors` is number of jobs that are run at a time

manage nodes