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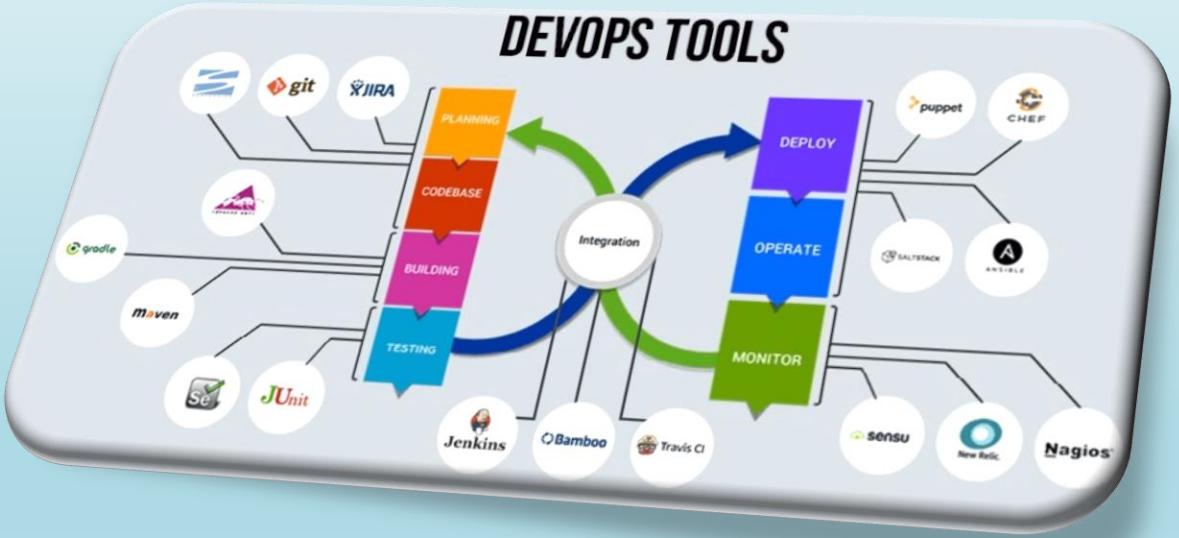
Continuous Integration[Jenkins]



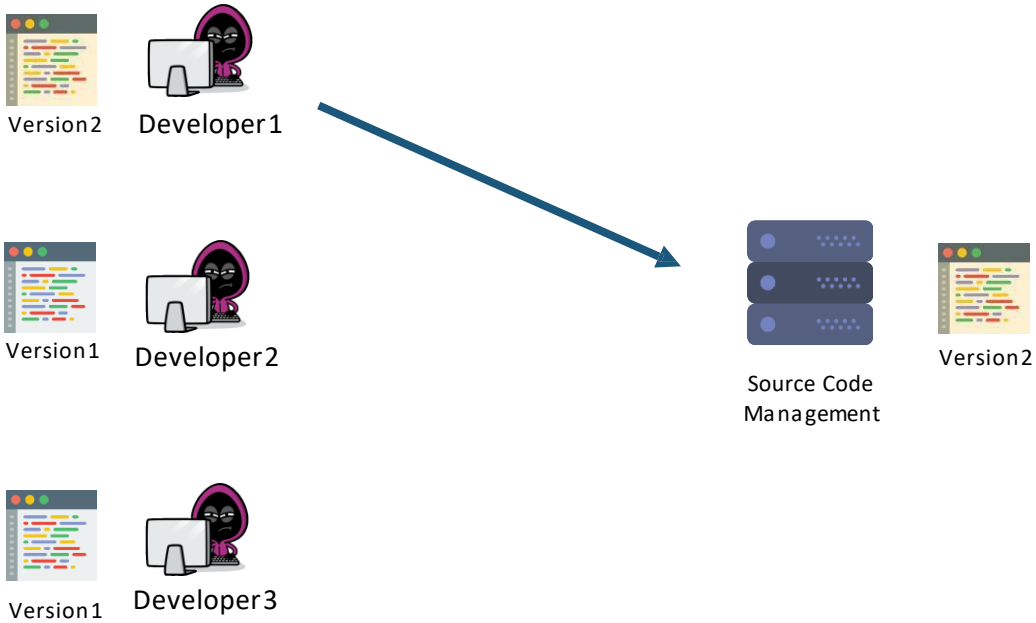
Agenda

- INTRODUCTION TO CONTINUOUS INTEGRATION
- WHAT IS JENKINS?
- INSTALLING JENKINS
- JENKINS ARCHITECTURE
- MANAGING NODES ON JENKINS
- JENKINS INTEGRATION WITH DEVOPS TOOLS
- UNDERSTANDING CI/CD PIPELINES
- CREATING AN END-TO-END AUTOMATED PIPELINE

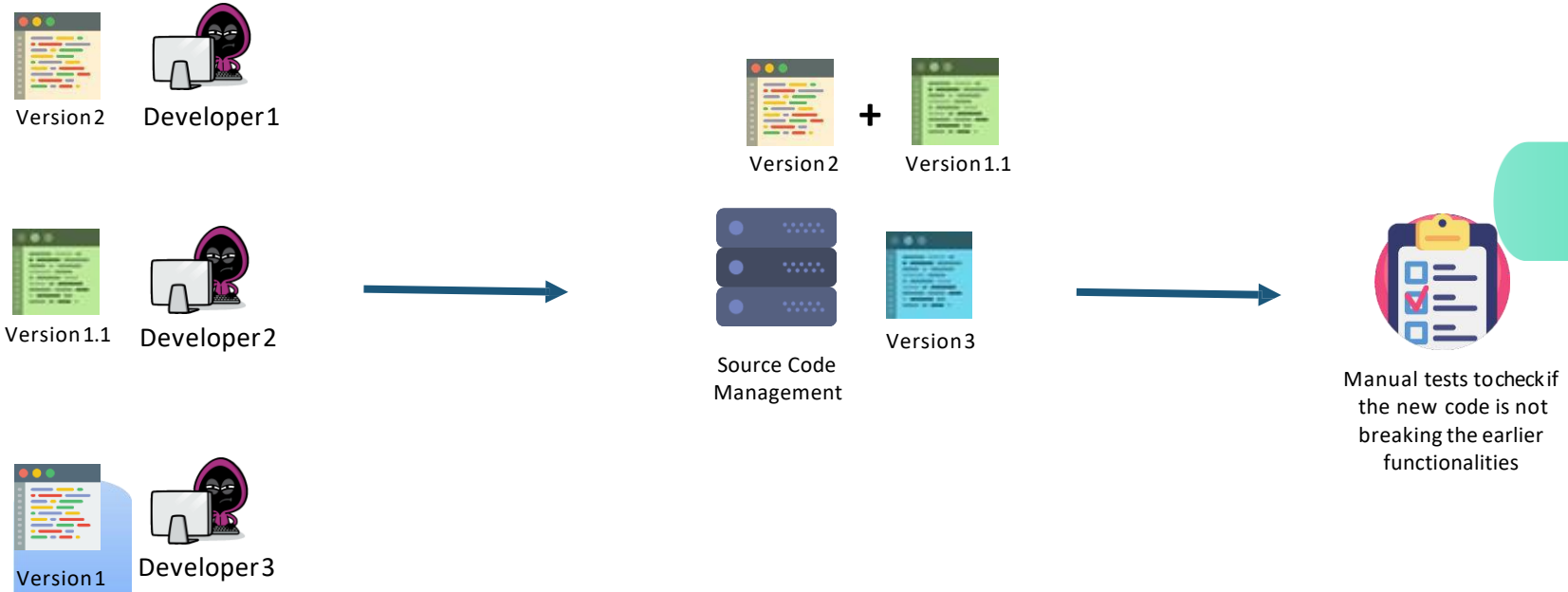
Why Continuous Integration?

Before Continuous Integration

Before Continuous Integration



Before Continuous Integration



Problems before Continuous Integration

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- Infrequent Commits lead to aggregate releases in one go leading to complex integration..
- Manual testing took a lot of time.
- Feedback took a lot of time to reach the developer.
- It involved high risk and uncertainty.

What is Continuous Integration?

What is Continuous Integration?

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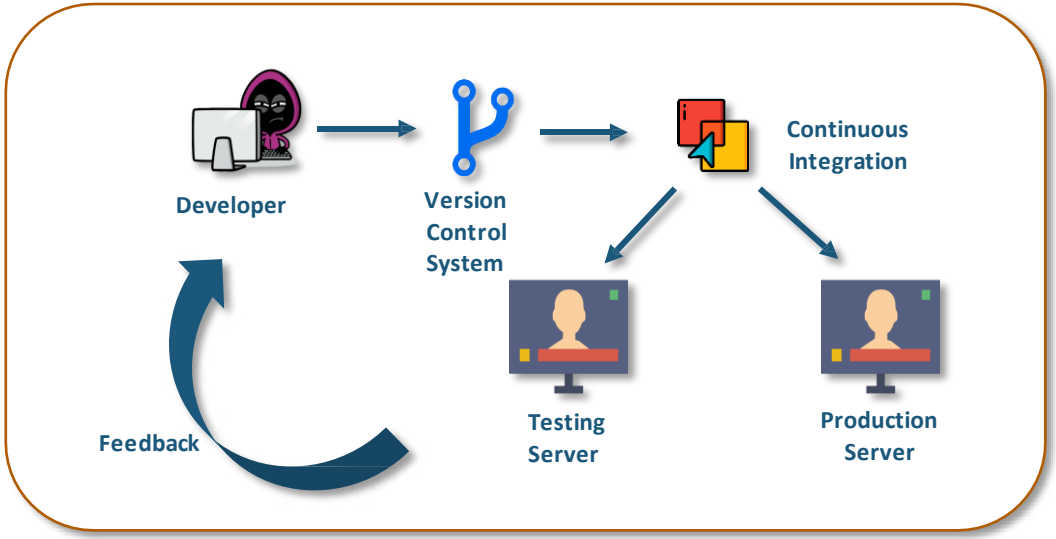
The process of having shorter release cycles (sometimes, several times a day), i.e., creating small features and integrating them to the source code and employing automated build and test processes for quicker feedback is called Continuous Integration.



Advantages of Continuous Integration

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- Frequent Commits, hence small feature release
- Automated Build and Testing
- Instant feedback to the developer
- Low risk and faster delivery

What is Jenkins?

What is Jenkins?

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Jenkins is an open-source automation server written in Java. Jenkins helps to automate the non-human part of the software development process, with continuous integration and facilitating technical aspects of continuous delivery.

Features of Jenkins

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Adoption: Jenkins is extremely popular among the open-source community; hence, there are more than 147,000 active installations throughout the world and 1 million people are using it.

Plugins Support: With an extremely active open-source community, Jenkins has around 1000 plugins that allow it to integrate with most of the development, testing and deployment tools.

Advantages of Jenkins

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Before Jenkins

- Locating and fixing bugs in the event of build and test failure was difficult and time consuming.
- Tests were triggered manually.
- No central place for triggering jobs on remote systems.

After Jenkins

- Smaller and automated continuous build and testing make the task accurate and faster.
- Developers have to just commit the code to the remote repository, build, test and deployment happen automatically.
- All builds or tests on multiple remote systems can be controlled from one place.

Installing Jenkins

Installing Jenkins

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1. Launch an Ubuntu Instance
2. Connect through SSH
3. Execute the following commands:

Jenkins Installation:

```
$ sudo apt-get update
$ sudo apt install openjdk-8-jdk
$ wget -q -O - https://pkg.jenkins.io/debian/jenkins.io.key | sudo apt-key add -
$ sudo sh -c 'echo deb http://pkg.jenkins.io/debian-stable binary/ >
/etc/apt/sources.list.d/jenkins.list'
$ sudo apt update
$ sudo apt install jenkins
```

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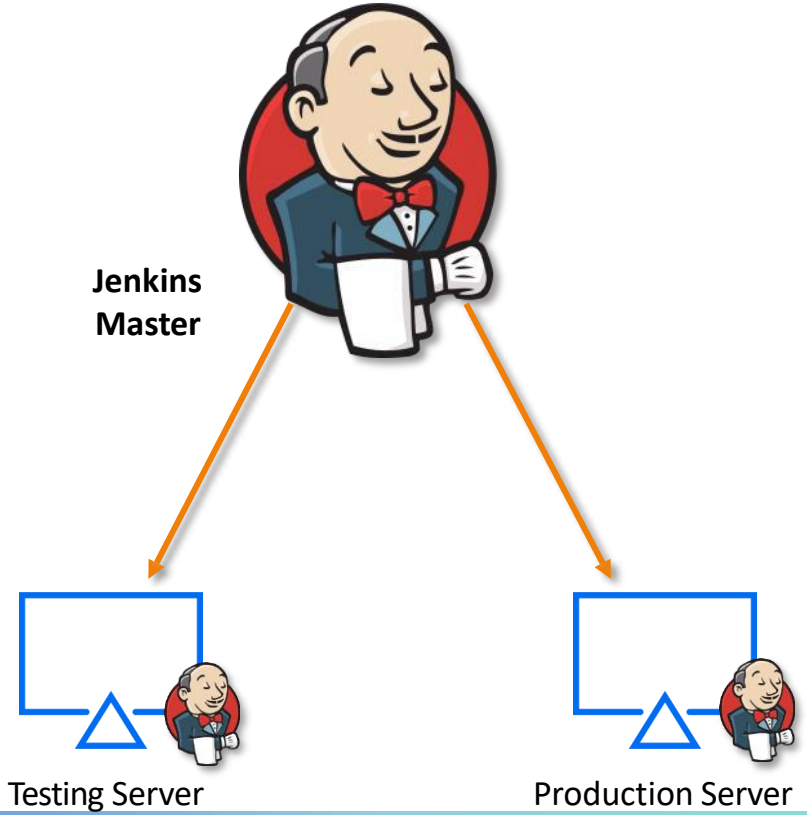
Jenkins Architecture

Jenkins Architecture

DevOps Tools

Jenkins Architecture



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Managing Nodes on Jenkins

Managing Nodes on Jenkins

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Add a slave node to Jenkins using JNLP(Java Network Launch Protocol) connection

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Jenkins Integration with DevOps Tools

Jenkins Integration with DevOps Tools

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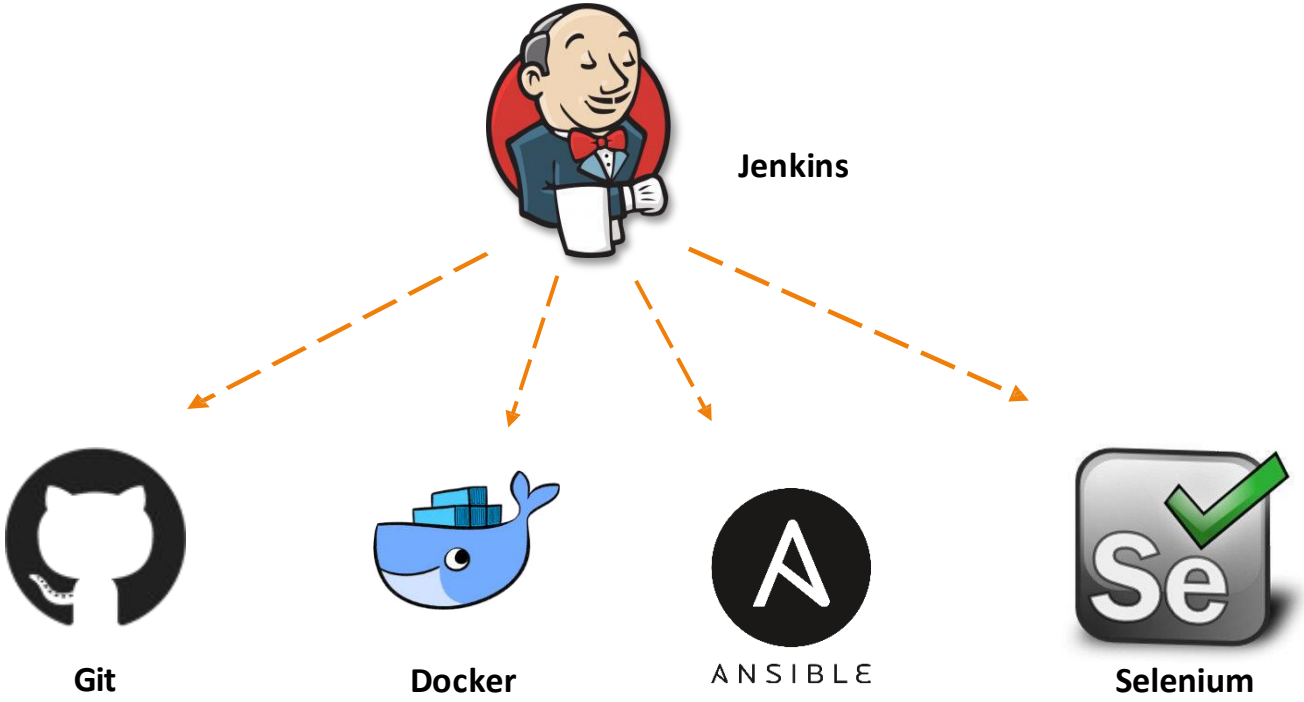

Jenkins Integration with DevOps Tools

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- Git
- Ansible
- Docker
- Selenium

Copy a Git repository to the slave's filesystem from Jenkins master

Jenkins Integration with DevOps Tools

CLOUD TRAIN
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Git

Ansible

Docker

Selenium

Configure the target machine with docker installations using Ansible to deploy containers using Jenkins

ANSIBLE

Jenkins Integration with DevOps Tools

CLOUD TRAIN
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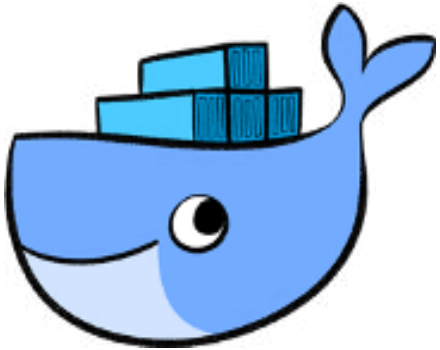
Git

Ansible

Docker

Selenium

Containerize the website in the previous step to a Docker Container using Jenkins



Jenkins Integration with DevOps Tools

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Git

Ansible

Docker

Selenium

Create a test case for the website in the previous step and execute the test on the slave using Jenkins

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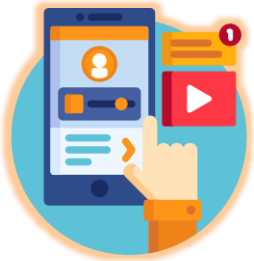
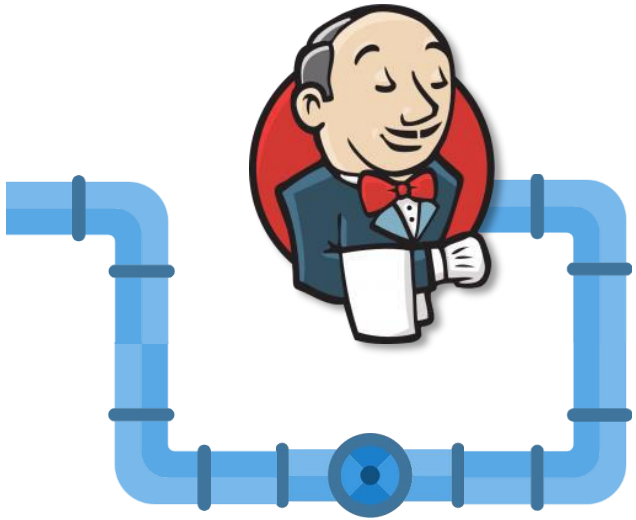
Understanding CI/CD Pipelines

What are CI/CD Pipelines?

CI/CD Pipelines, i.e., Continuous Integration, Continuous Delivery and Deployment pipelines, are a way of running Jenkins jobs in a sequence, which resembles a pipeline view.



Finished Application



What are CI/CD Pipelines?

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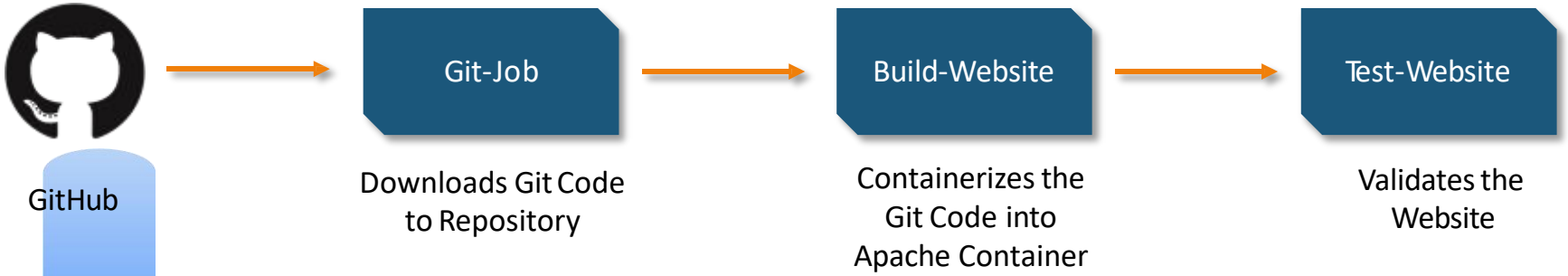
For Example:



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Creating Automated CI/CD Pipeline

Creating an Automated CI/CD Pipeline

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1. Initiate a Git Webhook for the Jenkin's git-job repository

2. Trigger the jobs after the completion of previous jobs with the following map: Git-Job → Build-Website → Website-Test

3. Install the plugin for the pipeline view

4. Make changes to the website and commit the job to changes

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Got queries or need more info?

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For questions and more details:

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