

Jenkins Pipeline

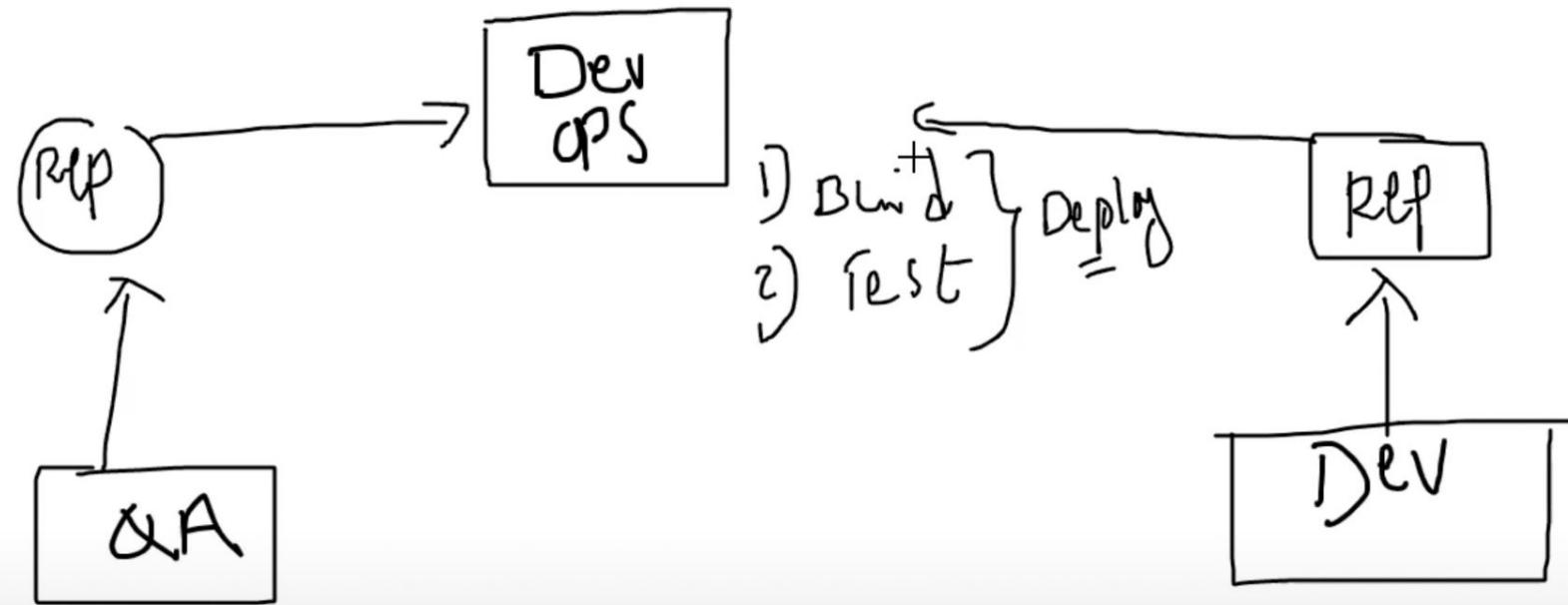
Overview on Continuous Integration (CI) & Continuous Deployment (CD)

What is Jenkins Pipeline

Jenkins Pipeline Jobs

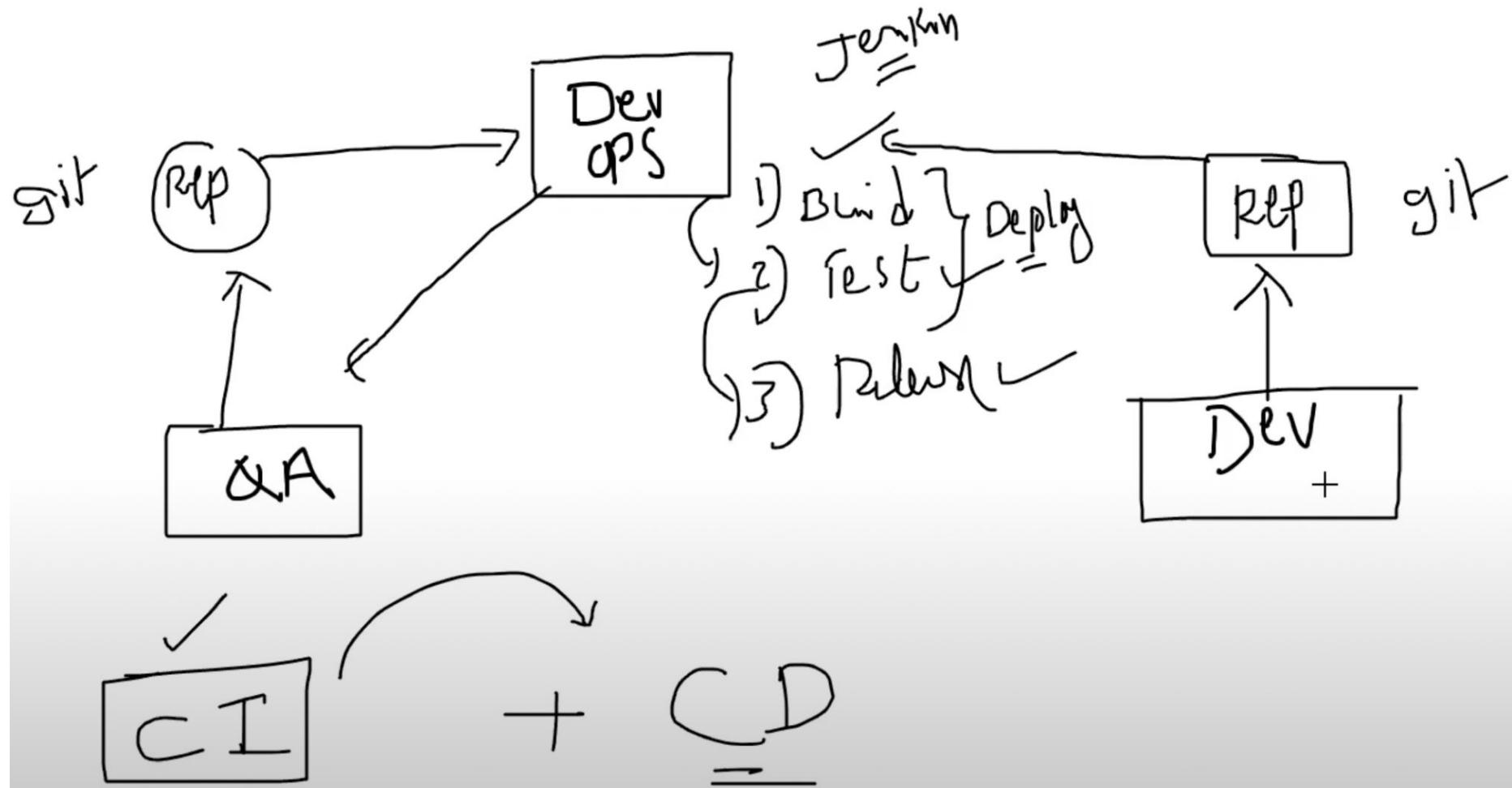
How to Create Pipeline in Jenkins

How to View Pipeline

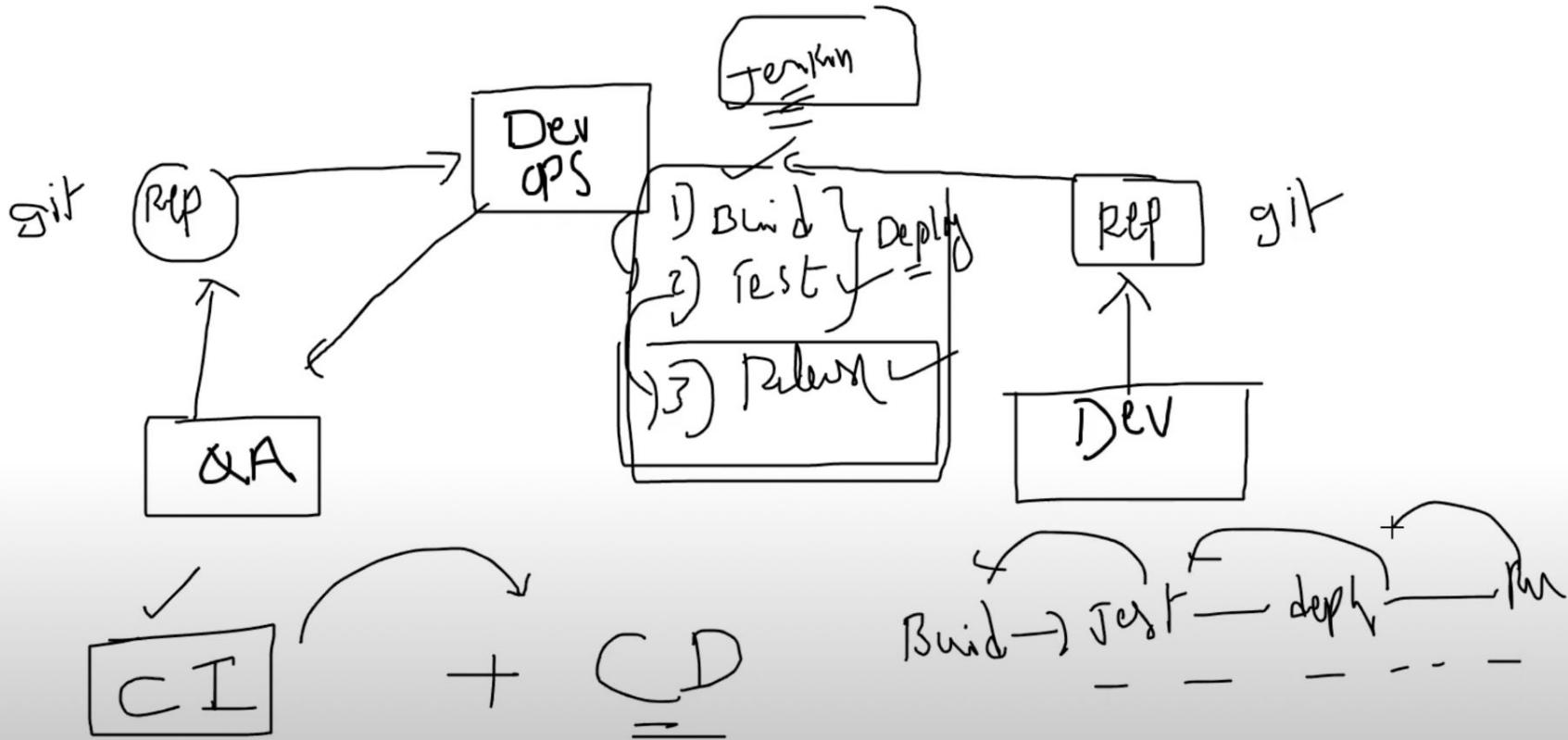


Continuous Integration

1. Developing the code [developers give the programs at the end of the day]
2. Build and test will happen next day build will be ready
3. Build will be ready and deployment will happen to qa environment
4. This process continuously called continuous integration
5. We will get the code from common repository



1. To do above task they use the certain tool called jenkins
2. Build will include certain activity include lot of jobs
3. Test will be include certain number of jobs
4. Deployment will include certain number of jenkins jobs
5. Release will include certain number of jobs
6. Using jenkins we can automate CI and CD Process

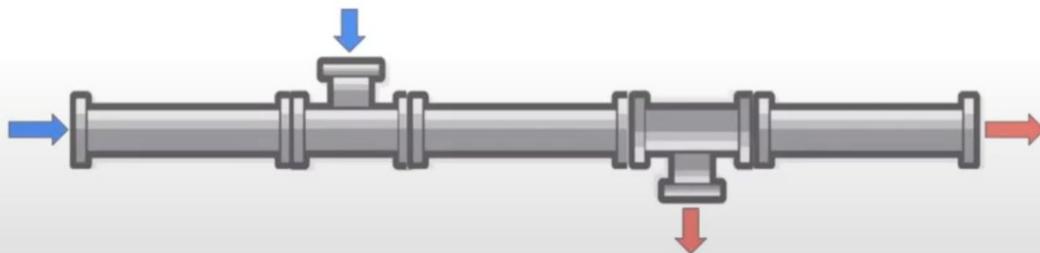


What is Pipeline?

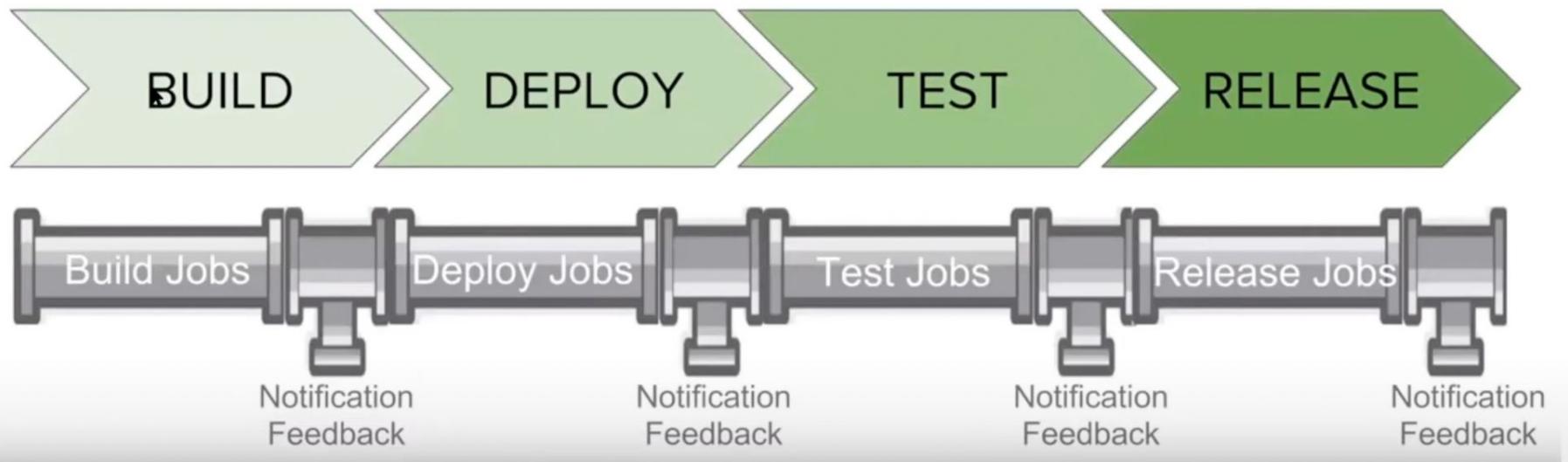
- In Jenkins, a pipeline is a group of events or jobs which are interlinked with one another in a sequence.



Pipe

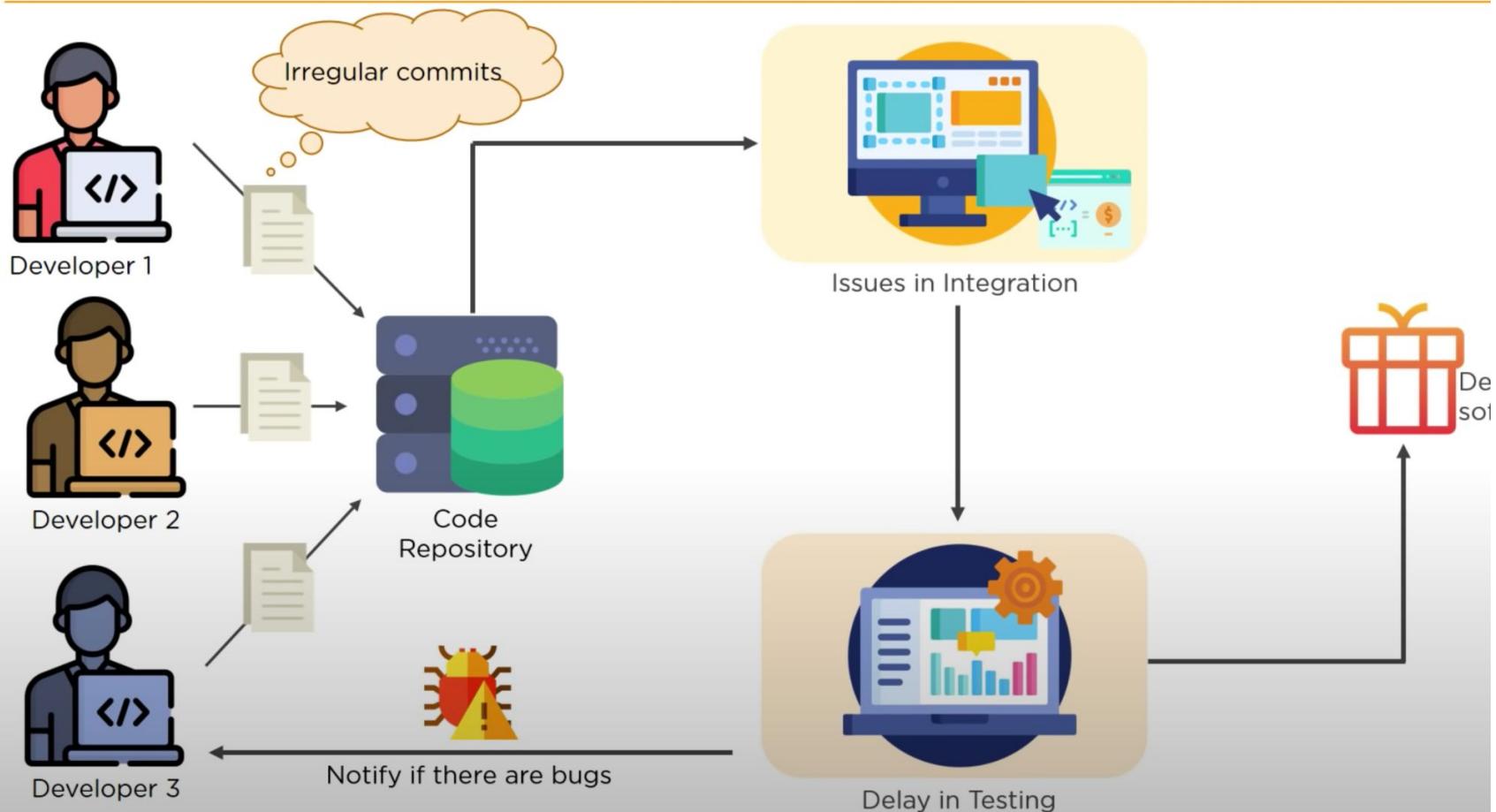


Pipeline



1. From the development they will get the code
2. Deployment
3. Test
4. Release-will release software to customers

Before Jenkins

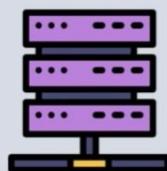


What is Jenkins?

Jenkins is a Continuous Integration tool that allows continuous development, test and deployment of newly created codes



All the codes will be pulled only at night



All the changes made to the code are build together



Commit changes to the source code

Nightly build and integration



Code is pulled whenever there is a commit made to the source code

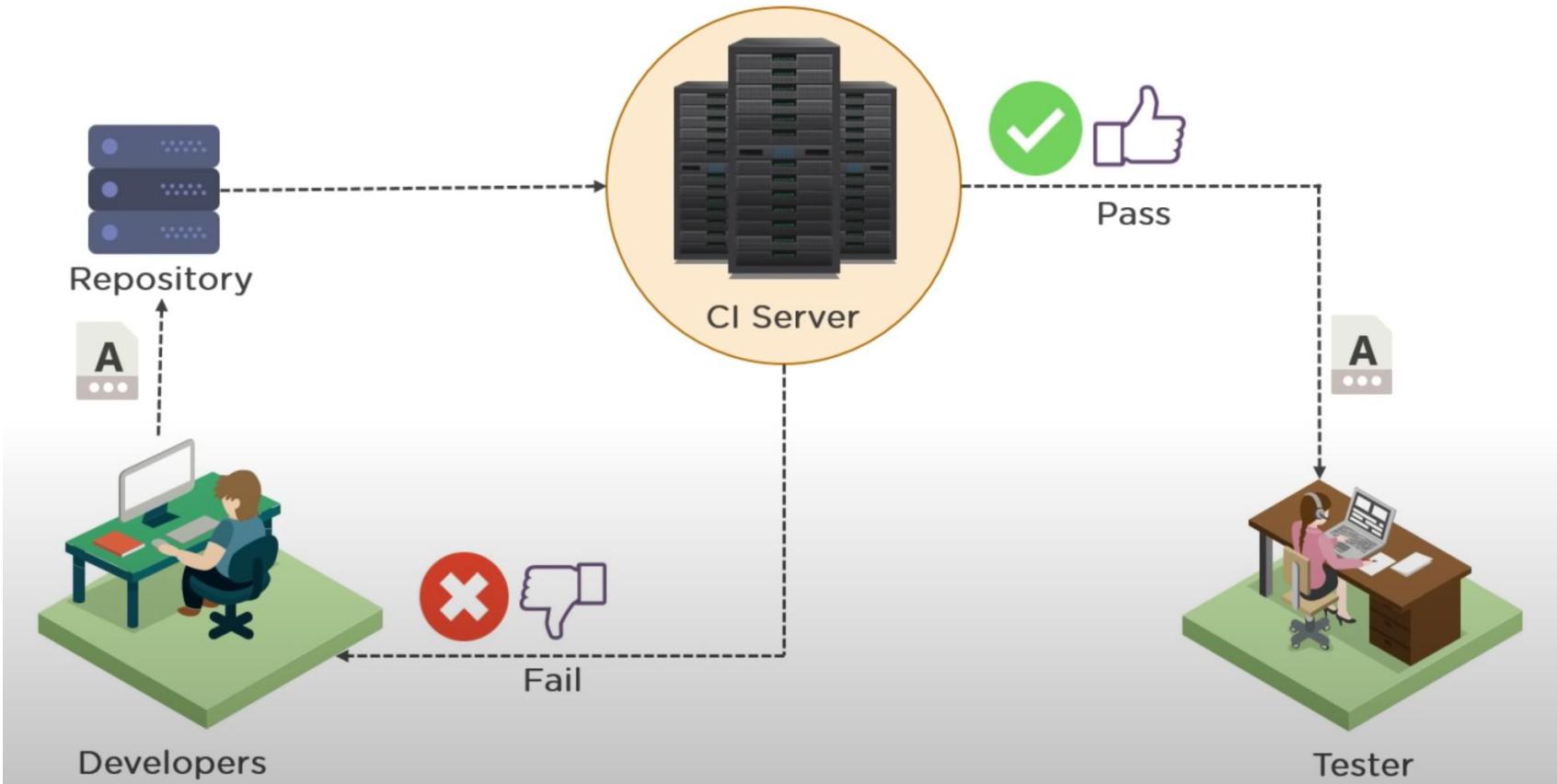


All the changes made to the source code is build continuously

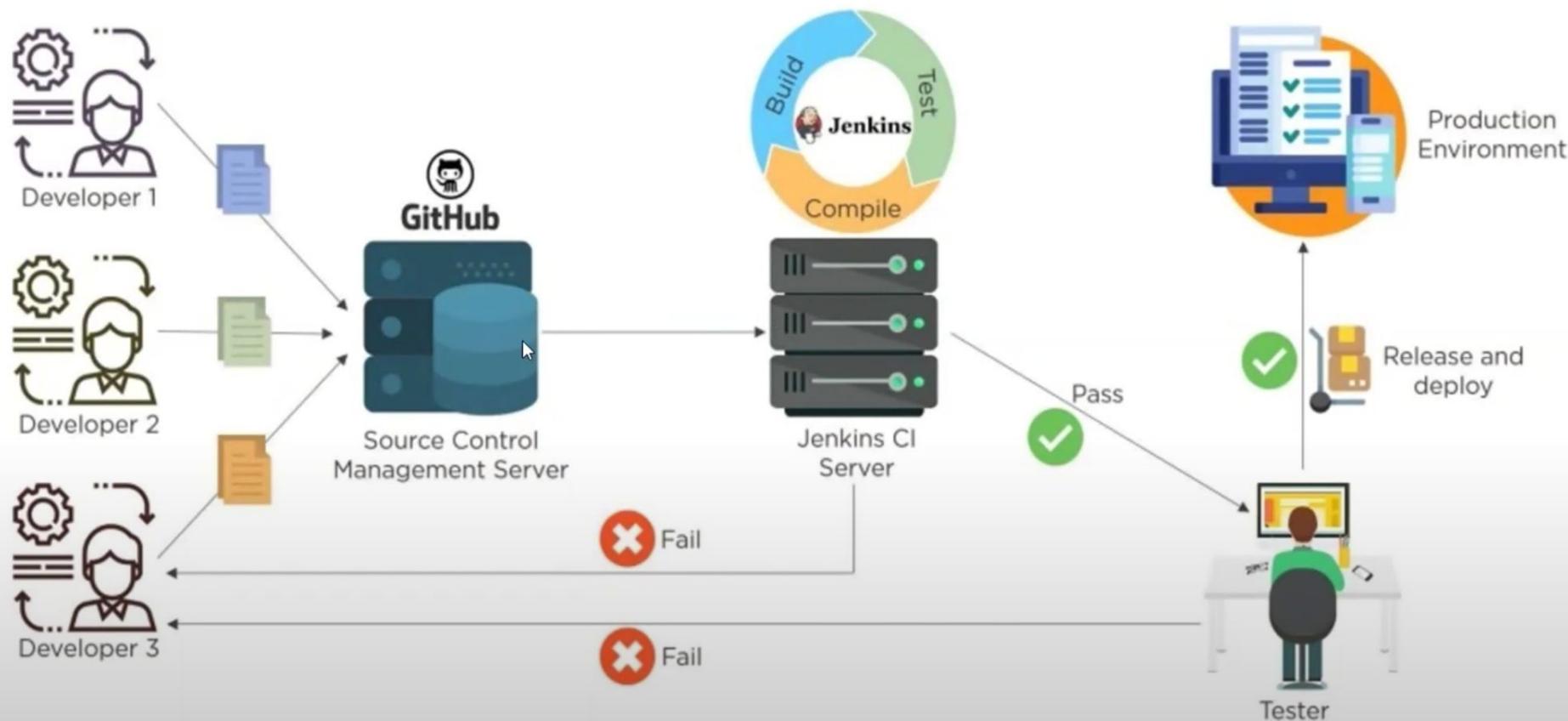


Continuous build and Integration

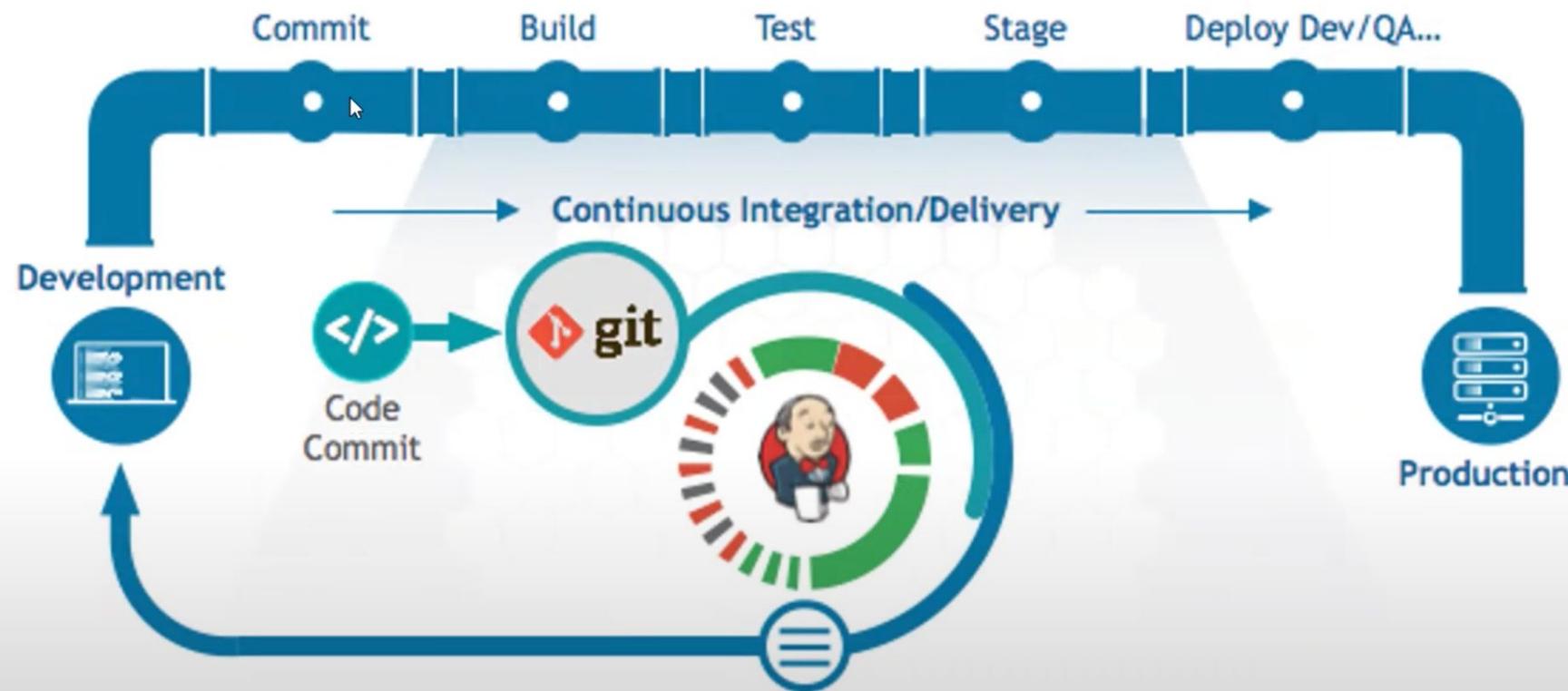
What is Continuous Integration?



CI & CD



Jenkins Pipeline



How many Ways we can create Pipeline

- We can Create Jenkins Pipeline in 2 Ways
- 1) Using **Build And Delivery Pipeline Plugins**
- 2) Using **Groovy Script on the Fly**(Here we use Jenkins file)
 - Scripted
 - Declarative

We will get one job in each and every section

Enter an item name
SampleBuildJob » 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.

 **Maven project**
Build a maven project. Jenkins takes advantage of your POM files and drastically reduces the configuration.

 **Pipeline**
Orchestrates long-running activities that can span multiple build agents. 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.

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

If or to create a new item from other existing, you can use this option:

- GitHub Branches
- GitHub Pull Requests
- GitHub hook trigger for GITScm polling
- Poll SCM



Build Environment

- Create Delivery Pipeline version
- With Ant



Build

Execute shell

Command

```
<input type="text" value="" style="width: 100%; height: 150px; border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"/>

See the list of available environment variables


```



- Build after other projects are built 
- Build periodically 
- GitHub Branches 
- GitHub Pull Requests 
- GitHub hook trigger for GITScm polling 
- Poll SCM 

Build Environment

- Create Delivery Pipeline version 
- With Ant 

Build

 Execute shell X 

Command `date
echo "Build process successfully done"`

See [the list of available environment variables](#)

Advanced...

Subversion



Build Triggers

- Build after other projects are built
- Build periodically
- GitHub Branches
- GitHub Pull Requests
- GitHub hook trigger for GITScm polling
- Poll SCM



Build Environment

- Create Delivery Pipeline version
- With Ant



Build

Execute shell



Command

```
date  
echo "Deploy job Successfully executed...."
```

See [the list of available environment variables](#)

[Advanced...](#)

Subversion

Build Triggers

- Build after other projects are built
- Build periodically
- GitHub Branches
- GitHub Pull Requests
- GitHub hook trigger for GITScm polling
- Poll SCM



Build Environment

- Create Delivery Pipeline version
- With Ant



Build

Execute shell

Command
`date
echo "Test| job Successfully executed....."`



See [the list of available environment variables](#)

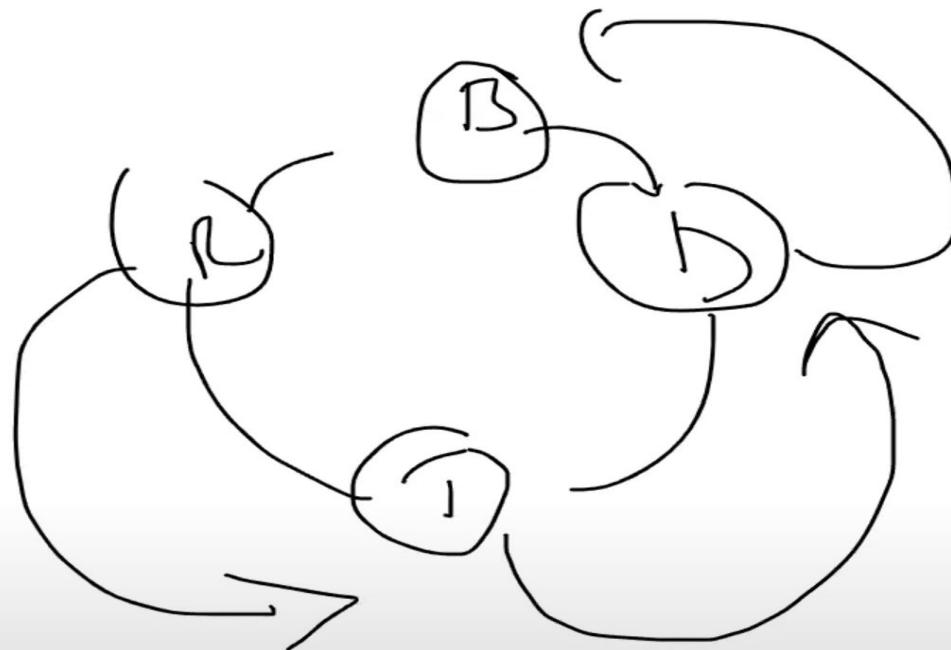
Advanced...

Build Queue						
		Name ↓	Last Success	Last Failure	Last Duration	
		CucumberProject	1 mo 9 days - #1	N/A	4 min 32 sec	
		Docker_Selenium_Grid_Project	3 days 2 hr - #3	3 days 2 hr - #2	1 min 20 sec	
		nopCommerce_maven_project	4 mo 20 days - #1	N/A	1 min 17 sec	
		nopCommerce_V001_Cucumber	1 mo 6 days - #1	N/A	3 min 24 sec	
		nopCommerce_V002_Github	N/A	1 mo 22 days - #2	13 sec	
		nopcommerce_v002_MavenProject_June_20	1 mo 22 days - #21	1 mo 22 days - #23	50 sec	
		nopCommerceV002_FreeStyleProjec_20_June	1 mo 23 days - #2	N/A	55 sec	
		nopCommerceV1_python_github	N/A	4 mo 14 days - #1	2.2 sec	
		phonselenium	4 mo 14 days - #2	N/A	49 sec	
		RestAssyred	N/A	3 mo 0 days - #1	34 sec	
		SampleBuildJob	N/A	N/A	N/A	
		SampleDeployJob ▾	N/A	N/A	N/A	
		SampleReleaseJob	N/A	N/A	N/A	
		SampleTestJob	N/A	N/A	N/A	

Icon:

Legend RSS for all RSS for failures RSS for just latest builds

Upstream and Downstream Job



General

Source Code Management

Build Triggers

Build Environment

Build

Post-build Actions

 Disable this project Execute concurrent builds if necessary[Advanced...](#)**Source Code Management** None Git Subversion**Build Triggers** Build after other projects are builtProjects to watch **No such project 'Sampl'. Did you mean 'SampleTestJob'?** Trigger only if build is stable Trigger even if the build is unstable Trigger even if the build fails Build periodically GitHub Branches GitHub Pull Requests GitHub hook trigger for GITScm polling Poll SCM**Build Environment** Create Delivery Pipeline version

With Ant

**Save****Apply**

 Back to Dashboard

 Status

 Changes

 Workspace

 Build Now

 Delete Project

 Configure

 Rename

 Build History trend =

X

 #1 X
(pending—Finished waiting)

 RSS for all  RSS for failures

Project SampleDeployJob



[Workspace](#)



[Recent Changes](#)

Upstream Projects

 [SampleBuildJob](#)

Downstream Projects

 [SampleTestJob](#)

Permalinks



How to setup BUILD PIPELINE in Jenkins

Step1: Chain required jobs in sequence Add upstream/downstream jobs

Step2: Install *Build Pipeline Plugin*

Step3: Add

 Build Pipeline View

 Configure the view Step

Step4: Run and Validate

Enabled	Name ↓	Version	Previously installed version	Uninstall
<input checked="" type="checkbox"/>	Ant Adds Apache Ant support to Jenkins	1.7		Uninstall
<input checked="" type="checkbox"/>	Apache HttpComponents Client 4.x API Plugin Bundles Apache HttpComponents Client 4.x and allows it to be used by Jenkins plugins.	4.5.5-3.0	Downgrade to 4.5.3-2.1	Uninstall
<input checked="" type="checkbox"/>	bouncycastle API This plugin provides an stable API to Bouncy Castle related tasks.	2.16.2		Uninstall
<input checked="" type="checkbox"/>	Branch API This plugin provides an API for multiple branch based projects.	2.5.2		Uninstall
<input checked="" type="checkbox"/>	Build Pipeline Plugin This plugin renders upstream and downstream connected jobs that typically form a build pipeline. In addition, it offers the ability to define manual triggers for jobs that require intervention prior to execution, e.g. an approval process outside of Jenkins.	1.5.8		Uninstall
<input checked="" type="checkbox"/>	Command Agent Launcher Allows agents to be launched using a specified command.	1.2		Uninstall
<input checked="" type="checkbox"/>	Conditional BuildStep A buildstep wrapping any number of other buildsteps, controlling their execution based on a defined condition (e.g. BuildParameter).	1.3.6		Uninstall
<input checked="" type="checkbox"/>	Credentials This plugin allows you to store credentials in Jenkins.	2.1.18	Downgrade to 2.1.16	Uninstall
<input checked="" type="checkbox"/>	Delivery Pipeline Plugin This plugin visualize Delivery Pipelines (Jobs with upstream/downstream dependencies)	1.4.0		Uninstall
<input checked="" type="checkbox"/>	Display URL API Provides the DisplayURLProvider extension point to provide alternate URLs for use in notifications	2.2.0		Uninstall
<input checked="" type="checkbox"/>	Durable Task Plugin Library offering an extension point for processes which can run outside of Jenkins yet be monitored.	1.30		Uninstall
<input checked="" type="checkbox"/>	Email Extension Plugin This plugin is a replacement for Jenkins's email publisher. It allows to configure every aspect of email notifications: when an email is sent, who should receive it and what the email says.	2.66	Downgrade to 2.66	Uninstall

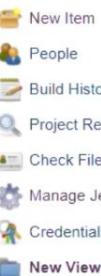
	Updates	Available	Installed	Advanced			
Enabled			Name ↓		Version	Previously installed version	Uninstall
<input checked="" type="checkbox"/>			Ant	Adds Apache Ant support to Jenkins	1.7		Uninstall
<input checked="" type="checkbox"/>			Apache HttpComponents Client 4.x API Plugin	Bundles Apache HttpComponents Client 4.x and allows it to be used by Jenkins plugins.	4.5.5-3.0	Downgrade to 4.5.3-2.1	Uninstall
<input checked="" type="checkbox"/>			bouncycastle API	This plugin provides an stable API to Bouncy Castle related tasks.	2.16.2		Uninstall
<input checked="" type="checkbox"/>			Branch API	This plugin provides an API for multiple branch based projects.	2.5.2		Uninstall
<input checked="" type="checkbox"/>			Build Pipeline Plugin	This plugin renders upstream and downstream connected jobs that typically form a build pipeline. In addition, it offers the ability to define manual triggers for jobs that require intervention prior to execution, e.g. an approval process outside of Jenkins.	1.5.8		Uninstall
<input checked="" type="checkbox"/>			Command Agent Launcher	Allows agents to be launched using a specified command.	1.2		Uninstall
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What is the reason for creating multiple users?

In large organization there are multiple team to manage Jenkins, run jobs, monitor jobs and configure jobs. So to manage these without proper permissions and assigned roles would be very difficult in Jenkins.

Role Strategy Plugin help in assign roles to different users.



View name

Tel

Build Pipeline View

Shows the jobs in a build pipeline view. The complete pipeline of jobs that a version propagates through are shown as a row in the view.

Delivery Pipeline View

Continuous Delivery pipelines, perfect for visualization on information radiators. Shows one or more delivery pipeline instances, based on traditional Jenkins jobs with upstream/downstream dependencies.

Delivery Pipeline View for Jenkins Pipelines

Continuous Delivery pipelines, perfect for visualization on information radiators. Shows one or more delivery pipeline instances, based on Jenkins pipelines (created using the Pipeline or Workflow plugin).

List View

Shows items in a simple list format. You can choose which jobs are to be displayed in which view.

OK

Build Queue

No builds in the queue.

Build Executor Status

1 Idle
2 Idle

Queue

Jobs in the queue.

Executor Status**Layout****Based on upstream/downstream relationship**

This layout mode derives the pipeline structure based on the upstream/downstream trigger relationship between jobs. This is the only out-of-the-box supported layout mode, but is open for extension.

Upstream / downstream config

Select Initial Job

SampleBuildJob

Trigger Options**Build Cards****Standard build card**

Use the default build cards

Restrict triggers to most recent successful builds Yes NoAlways allow manual trigger on pipeline steps Yes No**Display Options****No Of Displayed Builds**

1
1
2
3
5
10
20
50
100
200
500

Row Headers**Column Headers****Refresh frequency (in seconds)****URL for custom CSS files****Console Output Link Style**

Lightbox

OK**Apply**

Build Queue

No builds in the queue.

Build Executor Status

1 Idle

2 Idle

**Manage Nodes and Clouds**

Add, remove, control and monitor the various nodes that Jenkins runs jobs on.

Security

**Configure Global Security**

Secure Jenkins; define who is allowed to access/use the system.

**Manage Credentials**

Configure credentials

**Configure Credential Providers**

Configure the credential providers and types

**Manage Users**

Create/delete/modify users that can log in to this Jenkins

**In-process Script Approval**

Allows a Jenkins administrator to review proposed scripts (written e.g. in Groovy) which run inside the Jenkins process and so could bypass security restrictions.

 Back to Dashboard Manage Jenkins Create User

Create User

Username:

Password:

kkjava

Confirm password:

user

Full name:

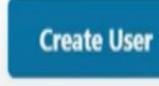
blah

E-mail address:

foo

kishan.javatrainer@gmail.com

kishan.cs2018@gmail.com

 Create User

None

Authorization

Strategy

Authorization

Anyone can do anything

?

Legacy mode

?

Logged-in users can do anything

?

Matrix-based security

?

Project-based Matrix Authorization Strategy

?

Role-Based Strategy

?



Reload Configuration from Disk

Discard all the loaded data in memory and reload everything from file system. Useful when you modified config files directly on disk.



Jenkins CLI

Access/manage Jenkins from your shell, or from your script.



Script Console

Executes arbitrary script for administration/troubleshooting/diagnostics.



Prepare for Shutdown

Stops executing new builds, so that the system can be eventually shut down safely.

Uncategorized



Manage and Assign Roles

Handle permissions by creating roles and assigning them to users/groups



Managed files

e.g. settings.xml for maven, central managed scripts, custom files, ...



Editable Email Notification Templates

Configure global templates for Editable Email Notification Plugin

- New Item
- People
- Build History
- Project Relationship
- Check File Fingerprint
- Manage Jenkins
- My Views
- Lockable Resources
- New View

Build Queue

No builds in the queue.

Build Executor Status

1 Idle
2 Idle



Assign Roles

Global roles

User/group	admin
Raj Sharma	<input checked="" type="checkbox"/>
Anonymous	<input type="checkbox"/>

User/group to add

Add

Item roles

User/group
Anonymous

User/group to add

Add

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

**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.

This plugin is up for adoption! We are looking for new maintainers. Visit our [Adopt a Plugin](#) initiative for more information.

Parameterized Trigger

[Build Tools](#) [Build Triggers](#)

The Jenkins Plugins Parent POM Project

2.41 4 mo 17 days ago

This plugin is up for adoption! We are looking for new maintainers. Visit our [Adopt a Plugin](#) initiative for more information.

Handy Uri Templates 2.x API

[api-plugin](#)

2.1.8-1.0 2 yr 0 mo ago

Bundles Handy Uri Templates 2.x and allows it to be used by Jenkins plugins

JAXB

[api-plugin](#)

2.3.0.1 2 yr 7 mo ago

JAXB packaging for more transparent Java 9+ compatibility

Role-based Authorization Strategy

[Security](#) [Authentication and User Management](#)

3.2.0 2 mo 22 days ago

Enables user authorization using a Role-Based strategy. Roles can be defined globally or for particular jobs or nodes selected by regular expressions.

Favorite

[Edit view columns](#) [Miscellaneous](#) [User Interface](#) [Authentication and User Management](#)

2.2.2 8 mo 7 days ago

<https://plugins.jenkins.io/role-strategy/>

Dashboard > Configure Global Security

Security Realm

- Delegate to servlet container
- Jenkins' own user database
 - Allow users to sign up
- LDAP
- None

Authorization

- Anyone can do anything
- Legacy mode
- Logged-in users can do anything
- Matrix-based security
- Project-based Matrix Authorization Strategy
- Role-Based Strategy

Markup Formatter

Markup Formatter

- Plain text

Treats all input as plain text. HTML unsafe characters like < and & are escaped to their respective character entities.

Agents

Users

These users can log into Jenkins. This is a sub set of [this list](#) which also contains auto-created users who **really** just made some commits on some **projects** and have no **direct** Jenkins access.

User ID	Name	
 admin2	admin2	
 dev	dev	
 tester 	tester	

 John Doe
Project Manager

Manage Roles

Global roles

Role to add

tester

Add

Item roles

Role	Pattern	Credentials	Job	Run	SCM	Lockable Resources
		Create Delete ManageDomains Update View Build Cancel Configure	Create Delete Discover Move Read Workspace Delete Replay Update Tag Reserve Unlock View			

General **Source Code Management** Build Triggers Build Environment Build Post-build Actions

Repository URL ?

Credentials ?

- none - Add ▾

Advanced...

Add Repository

Branches to build ?

Branch Specifier (blank for 'any') X ?

Add Branch

Repository browser ?

Additional Behaviours

Add ▾

Build Triggers



(Auto)



Additional Behaviours

 Check out to a sub-directoryLocal subdirectory for repo [?](#)

D:\Learning\localgitrepo

[Add ▾](#)

Build Triggers

- Trigger builds remotely (e.g., from scripts) [?](#)
- Build after other projects are built [?](#)
- Build periodically [?](#)
- GitHub hook trigger for GITScm polling [?](#)
- Poll SCM [?](#)

Build Environment

- Delete workspace before build starts [?](#)
- Use secret text(s) or file(s) [?](#)
- Abort the build if it's stuck [?](#)
- Add timestamps to the Console Output [?](#)
- Inspect build log for published Gradle build scans [?](#)
- With Ant [?](#)

Build



Manage Roles

Global roles

Role	Overall				Credentials				Agent								Job								Run		View	
	Administer	Read	Create	Delete	ManageDomains	Update	View	Build	Configure	Connect	Create	Delete	Disconnect	Provision	Build	Cancel	Configure	Create	Delete	Discover	Move	Read	Workspace	Delete	Replay	Update	Configure	Create
admin	<input checked="" type="checkbox"/>																											
developer	<input type="checkbox"/>																											
tester	<input type="checkbox"/>																											
read user	<input type="checkbox"/>																											

Role to add

read user

Add

Item roles

Role Pattern	Credentials	Job	Run	SCM	Lockable Resources
--------------	-------------	-----	-----	-----	--------------------



Assign Roles

Global roles

User/group	admin	developer	read user	tester	
admin2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Anonymous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
dev	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
tester	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
read	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Role : developer
User : dev

User/group to add

read



Add

Item roles

User/group
 Anonymous

User/group to add



Add

Node roles

User/group
 Anonymous

[Plain text] [Preview](#)

- Discard old builds ?
- GitHub project ?
- This build requires lockable resources ?
- This project is parameterised ?
- Throttle builds ?
- Disable this project ?
- Execute concurrent builds if necessary ?

[Advanced...](#)

Source Code Management

None

Git ?

Repositories ?

Repository URL

✖ Please enter Git repository.

Credentials

- NONE -

[+ Add +](#)

[Advanced...](#)

[Add Repository](#)

Use default maven global settings

JDK

JDK installations

Add JDK

List of JDK installations on this system

Git

Git installations



Name

Default

Path to Git executable [?](#)

git.exe

There's no such executable git.exe in PATH: C:/Program Files/Microsoft/jdk-11.0.12.7-hotspot/bin, C:/Windows/system32, C:/Windows, C:/Windows/System32/Wbem, C:/Windows/System32/WindowsPowerShell/v1.0/, C:/Windows/System32/OpenSSH/, C:/Program Files/nodejs/, C:/Program Files/PuTTY/, C:/Users/india/AppData/Local/Microsoft/WindowsApps, C:/Users/india/AppData/Local/Programs/Microsoft VS Code/bin, C:/Users/india/AppData/Roaming/npm, C:/Program Files/heroku/bin.

Install automatically [?](#)

Delete Git