

CI CD with Jenkins Workshop





Somkiat Puisungnoen

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Update Info 1

View Activity Log 10+

...
Timeline About Friends 3,138 Photos More

When did you work at Opendream?
... 22 Pending Items

Post Photo/Video Live Video Life Event

What's on your mind?

Public Post

Intro
Software Craftsmanship

Software Practitioner at สยามชัมนาภิกิจ พ.ศ. 2556

Agile Practitioner and Technical at SPRINT3r

Somkiat Puisungnoen 15 mins · Bangkok · ⚙️

Java and Bigdata



Facebook somkiat.cc

Page Messages Notifications 3 Insights Publishing Tools Settings Help ▾

somkiat.cc
@somkiat.cc

Home Posts Videos Photos

Liked Following Share ... + Add a Button



**[https://github.com/up1/
workshop-ci-cd-with-jenkins](https://github.com/up1/workshop-ci-cd-with-jenkins)**



Continuous Integration

Continuous Delivery/Deployment



Why CI/CD ?



Pipeline with Jenkins 101

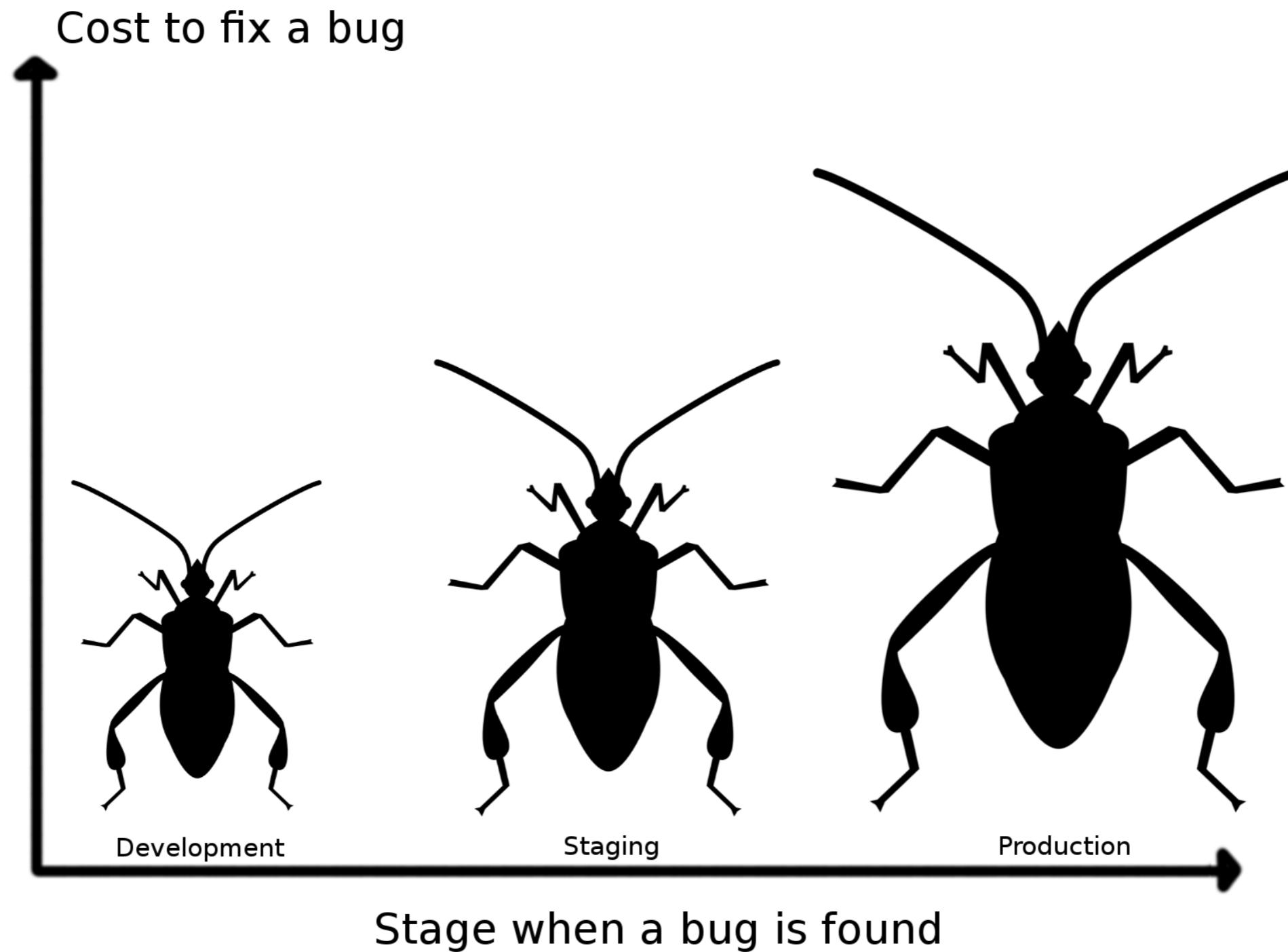


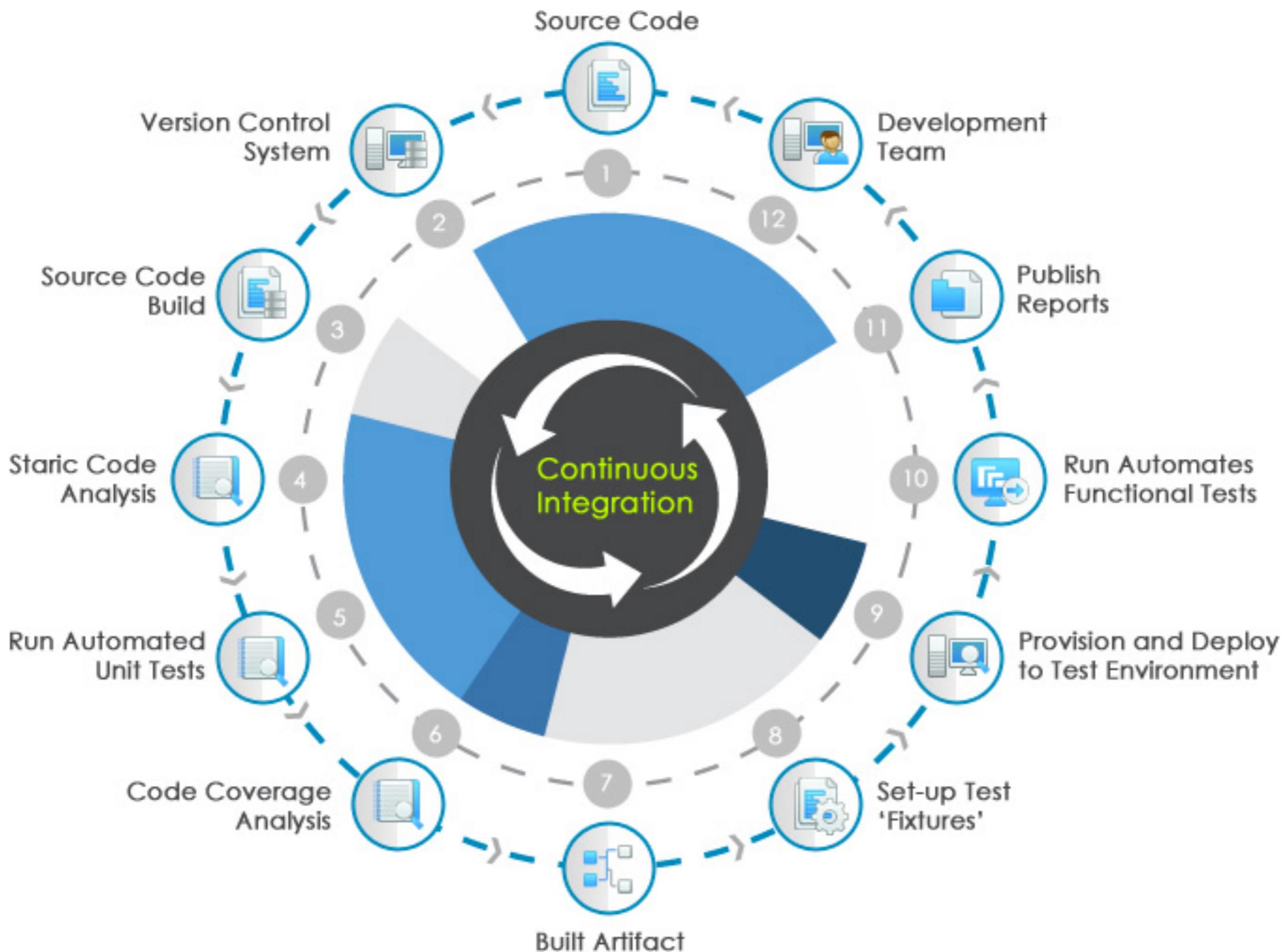
The cost of integration

1. Merging the code
2. Duplicate changes
3. Test again again !!
4. Fixing bugs
5. Impact on stability



The cost of integration







Jenkins

Bamboo



TeamCity

> goTM



Hudson





Jenkins

Bamboo

CI is about what people do
not about what tools they use



Hudson



Continuous Integration

Discipline to integrate frequently



Continuous Integration

Strive to make **small change**



Continuous Integration

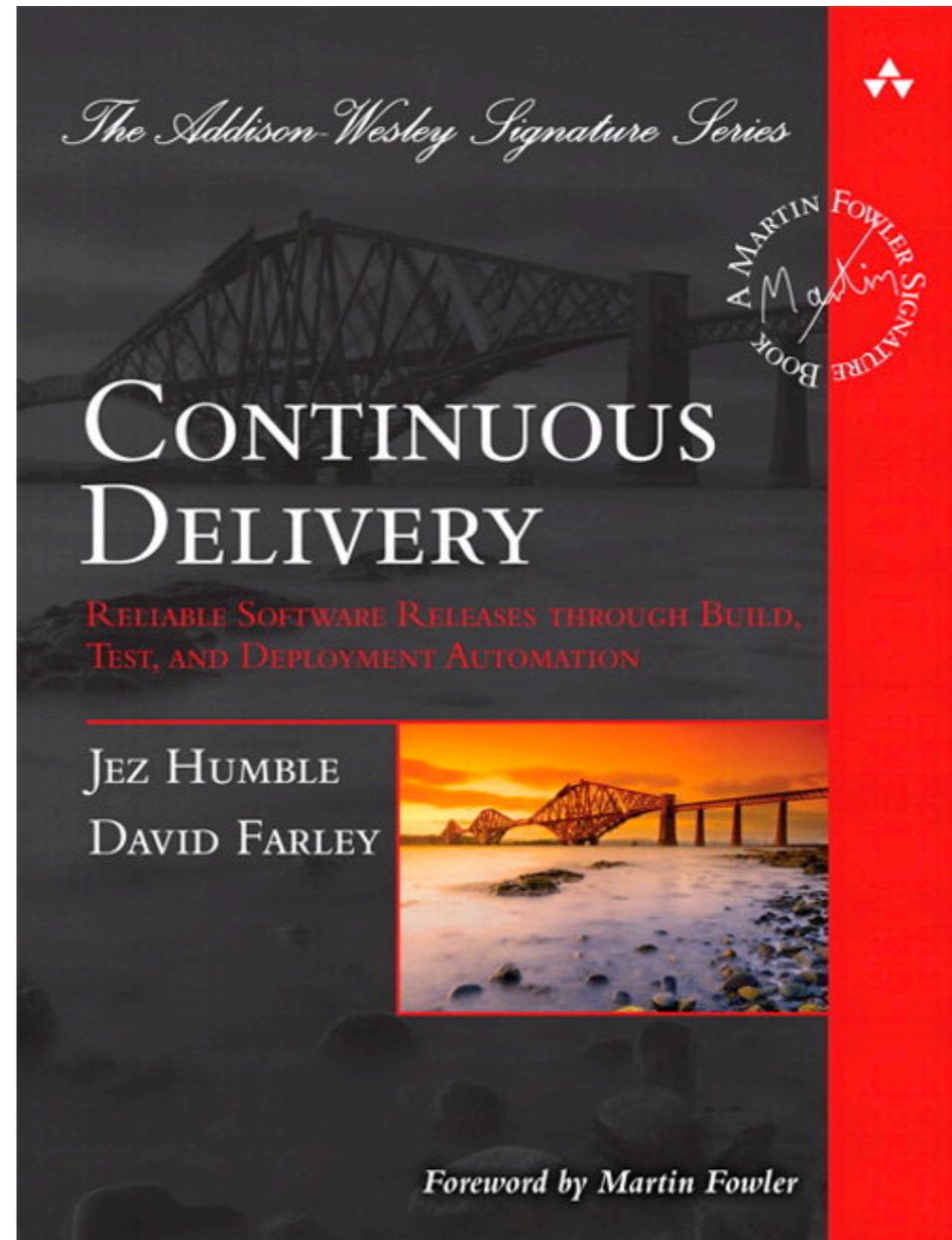
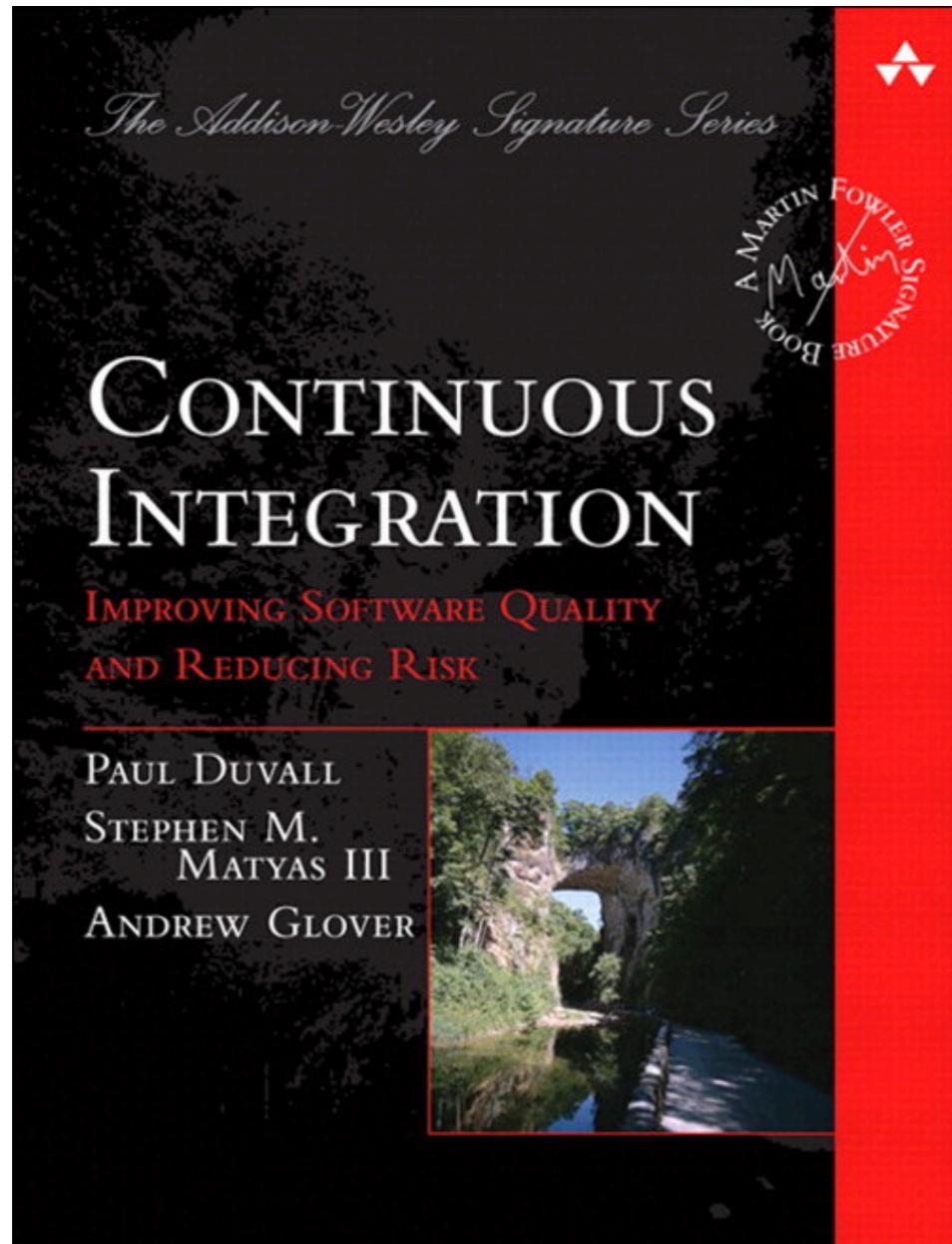
Strive for **fast feedback**



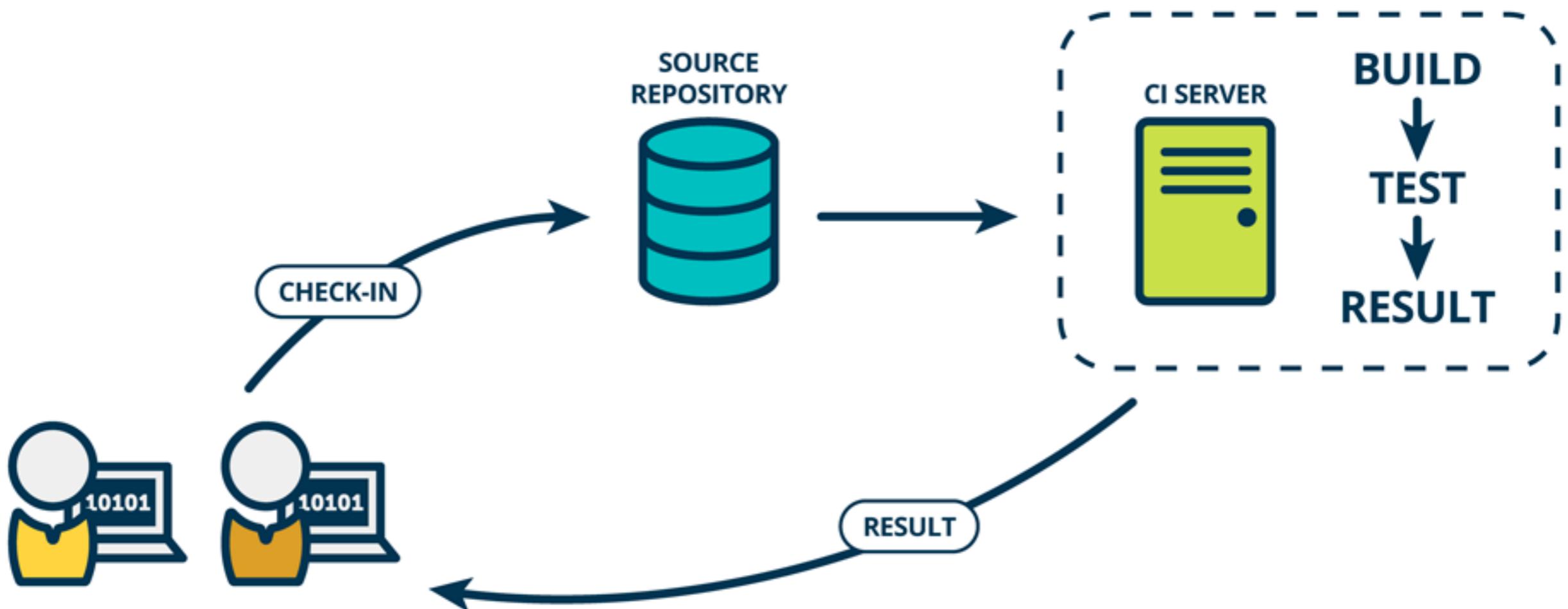
Practices of Continuous Integration



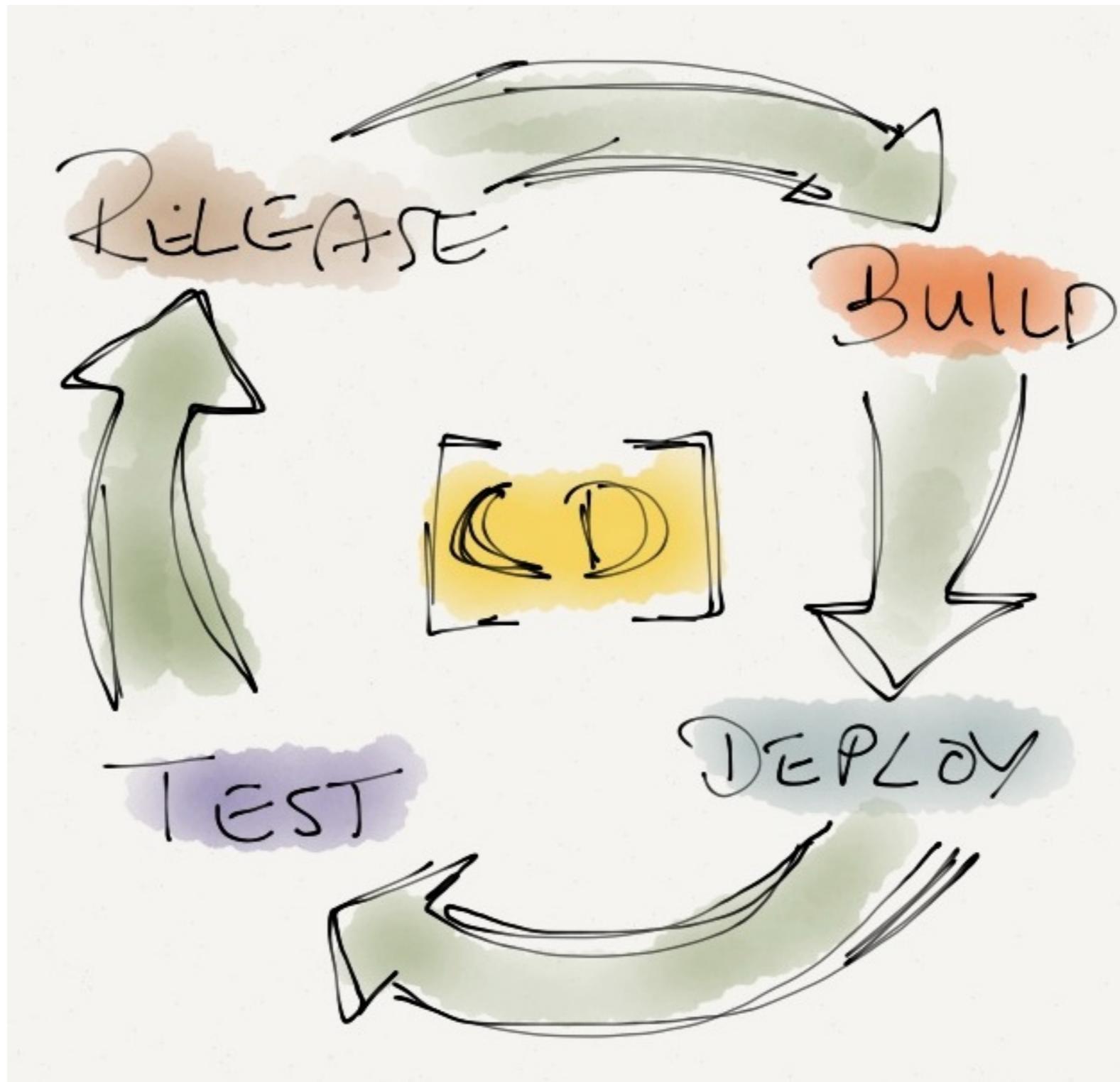
Improve quality and reduce risk



Continuous Integration



CD ?



CD ?

CONTINUOUS DELIVERY



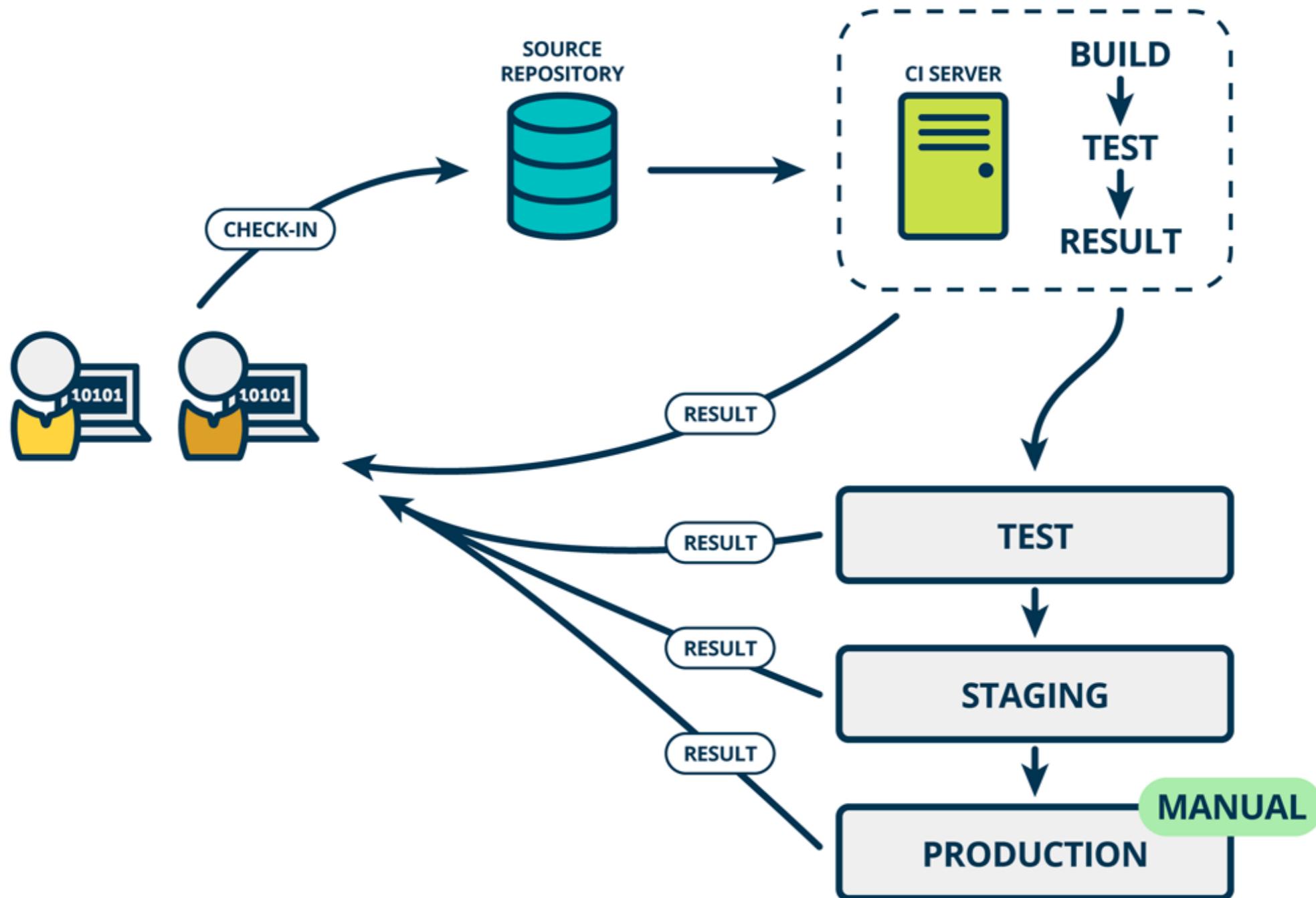
CONTINUOUS DEPLOYMENT



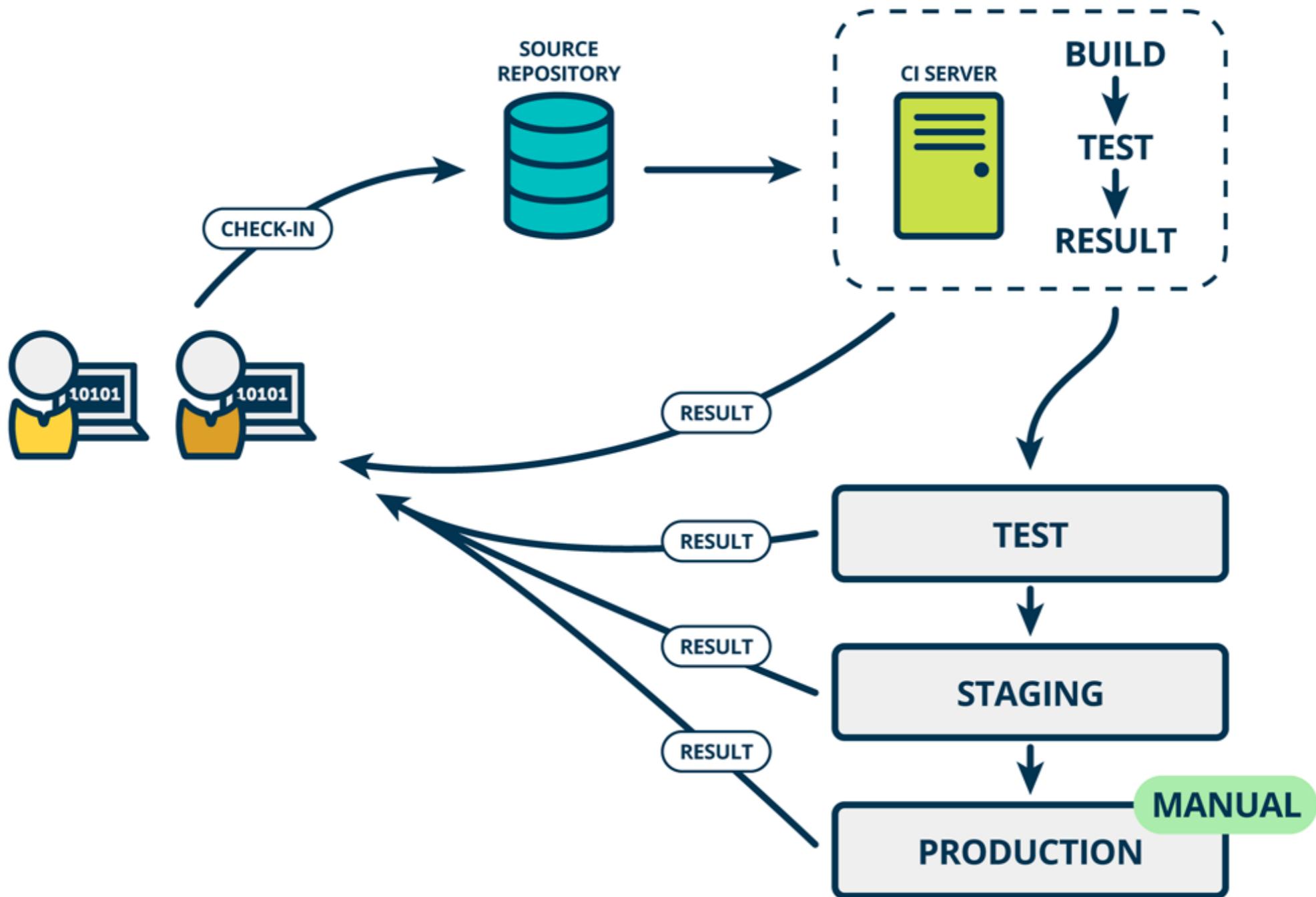
<http://blog.crisp.se/2013/02/05/yassalsundman/continuous-delivery-vs-continuous-deployment>



Continuous Delivery



Rise of DevOps



Continuous Integration

is a Software development practices



Practice 1

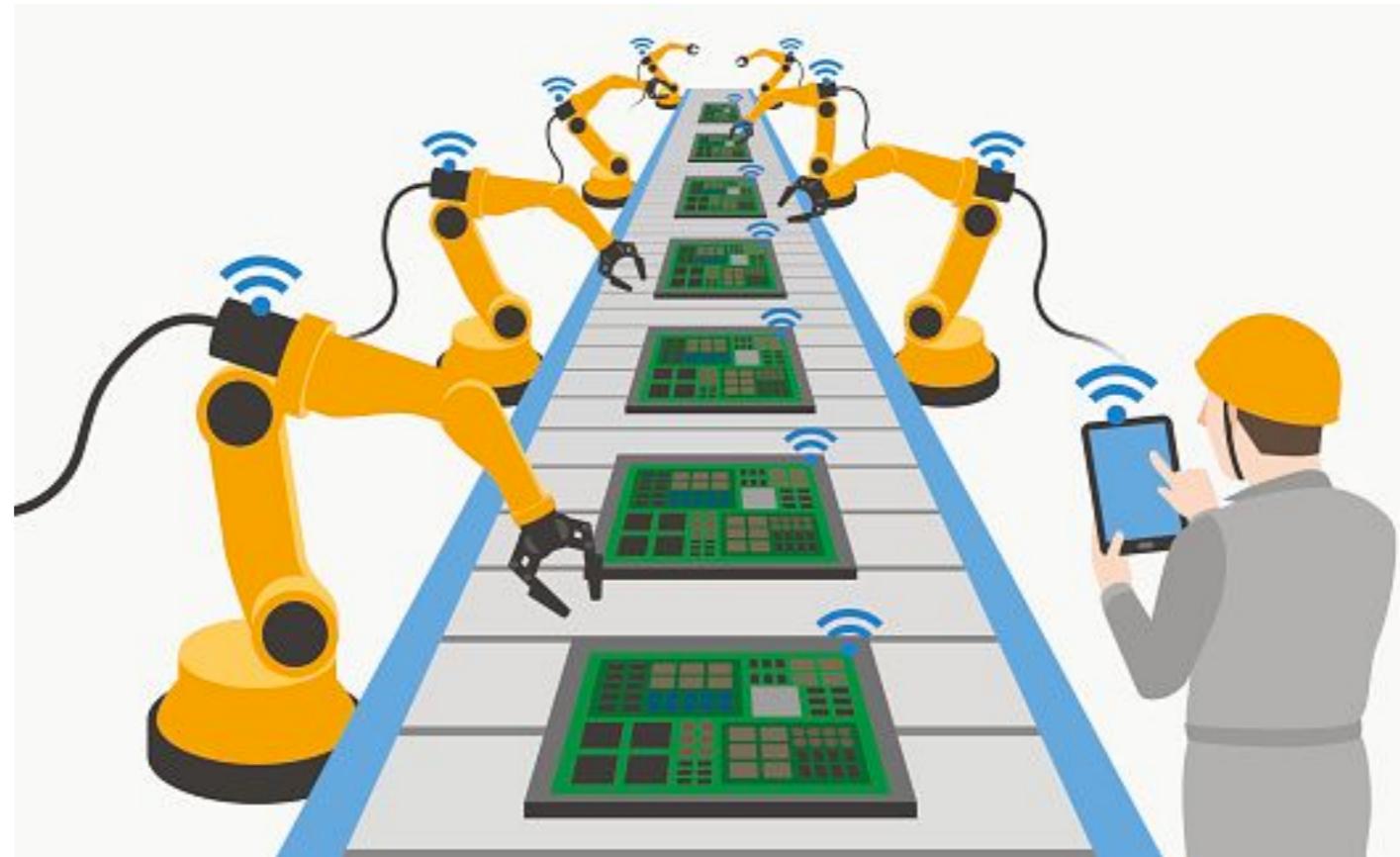
Maintain a single source repository

In general, you should store in source control
everything you need to build anything



Practice 2

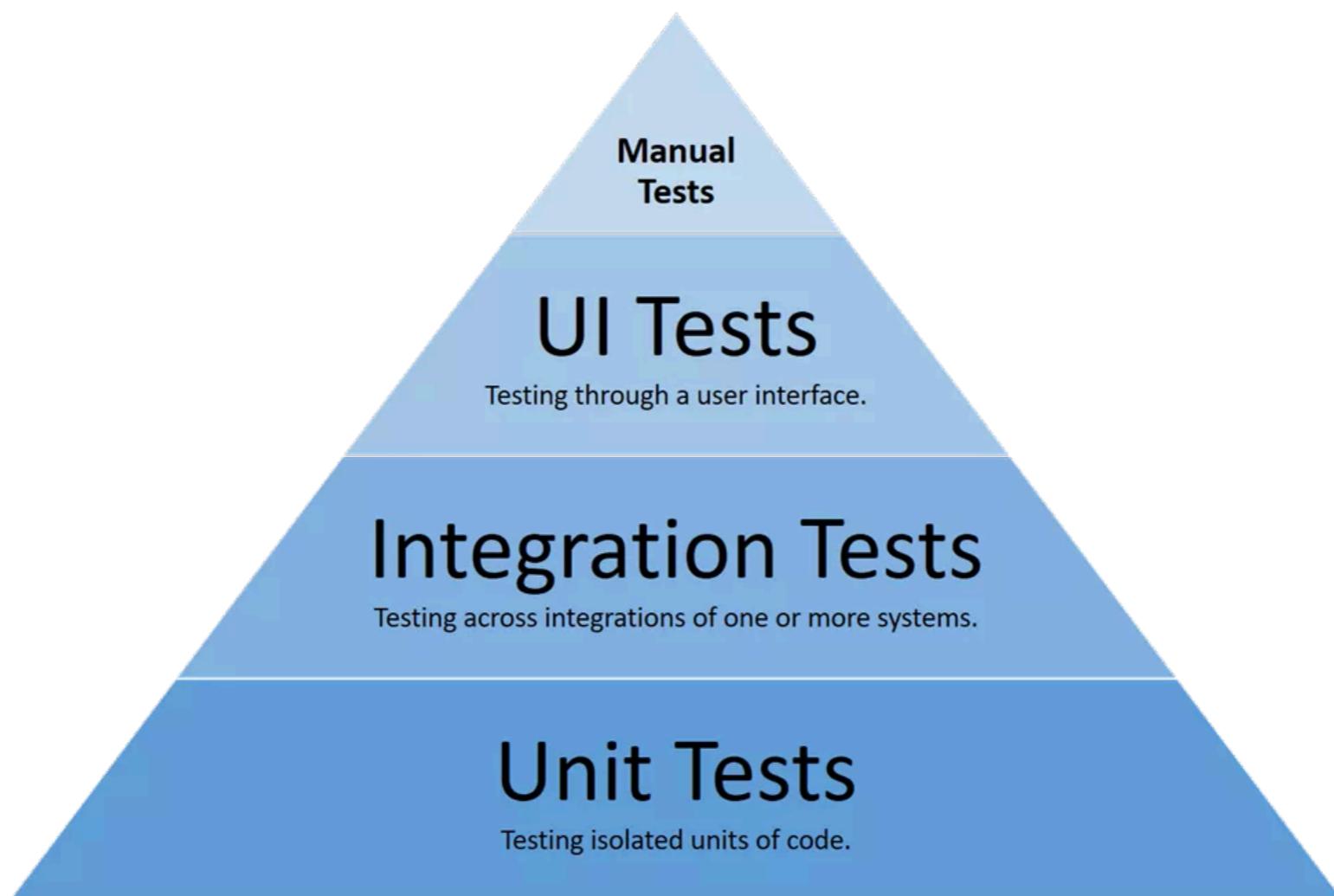
Automated the build
Automated environment for builds



Practice 3

Make your build **self-testing**

Build process => compile, linking and **testing**

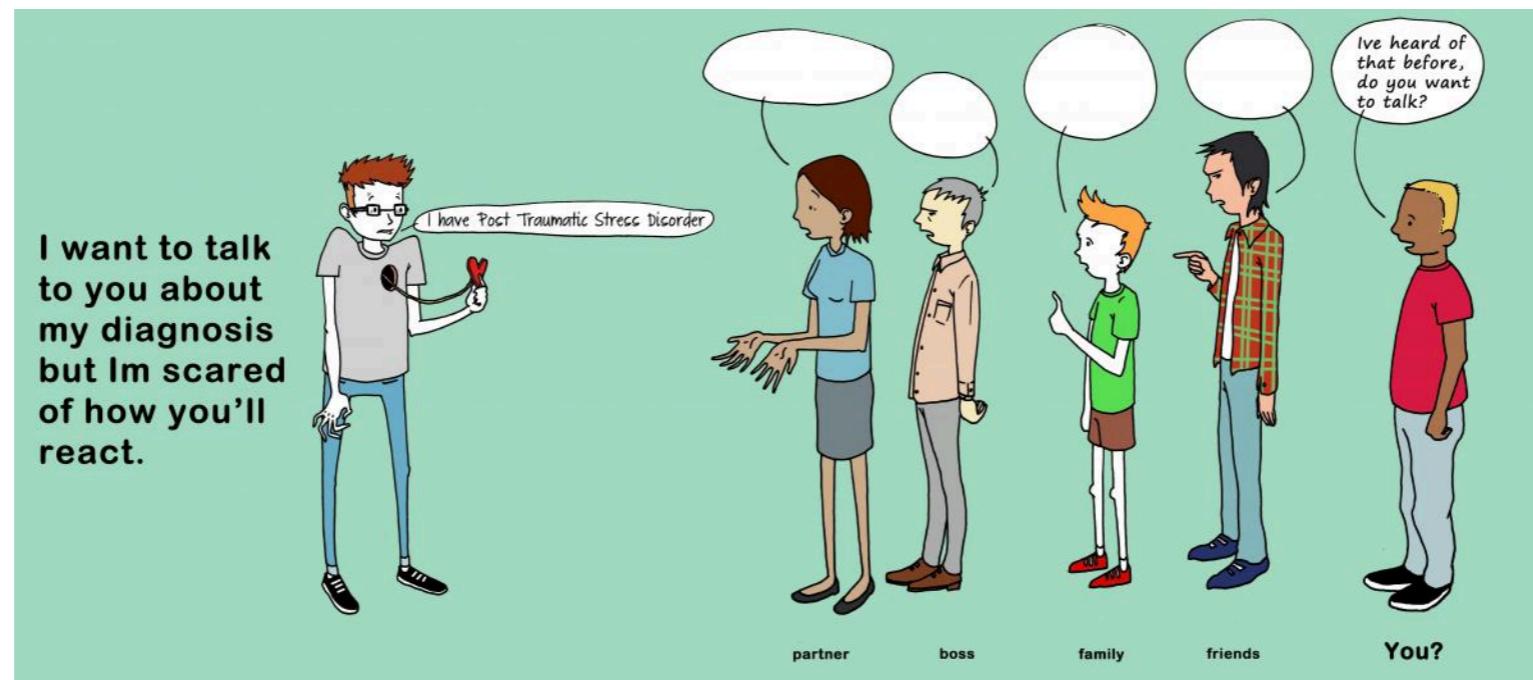


Practice 4

Everyone commits to the mainline everyday

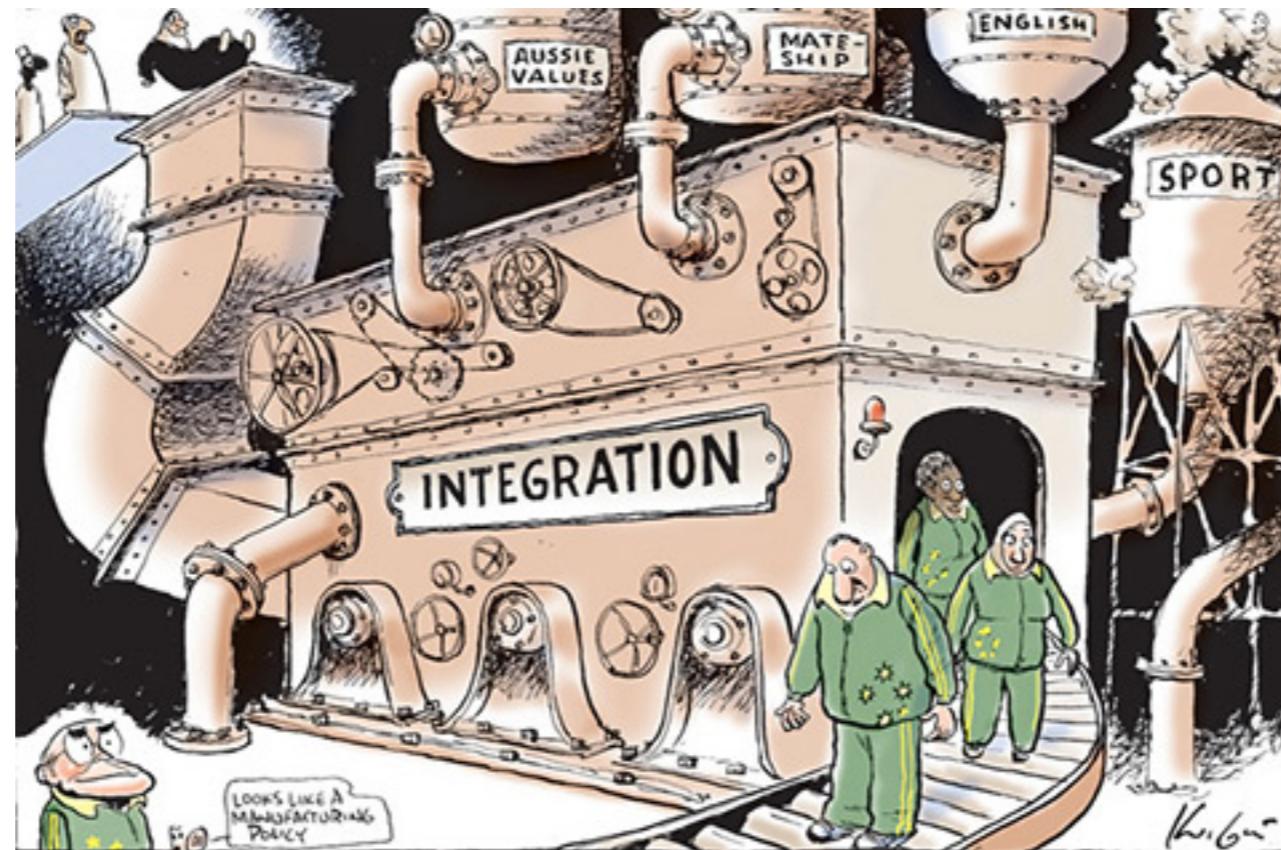
Integration is about communication

Integration allows developers to tell other developers



Practice 5

Every commits should build the mainline on an
Integration machine



Practice 6

Fix broken builds immediately

**“Nobody has a higher priority task than
fixing the build”**



Practice 7

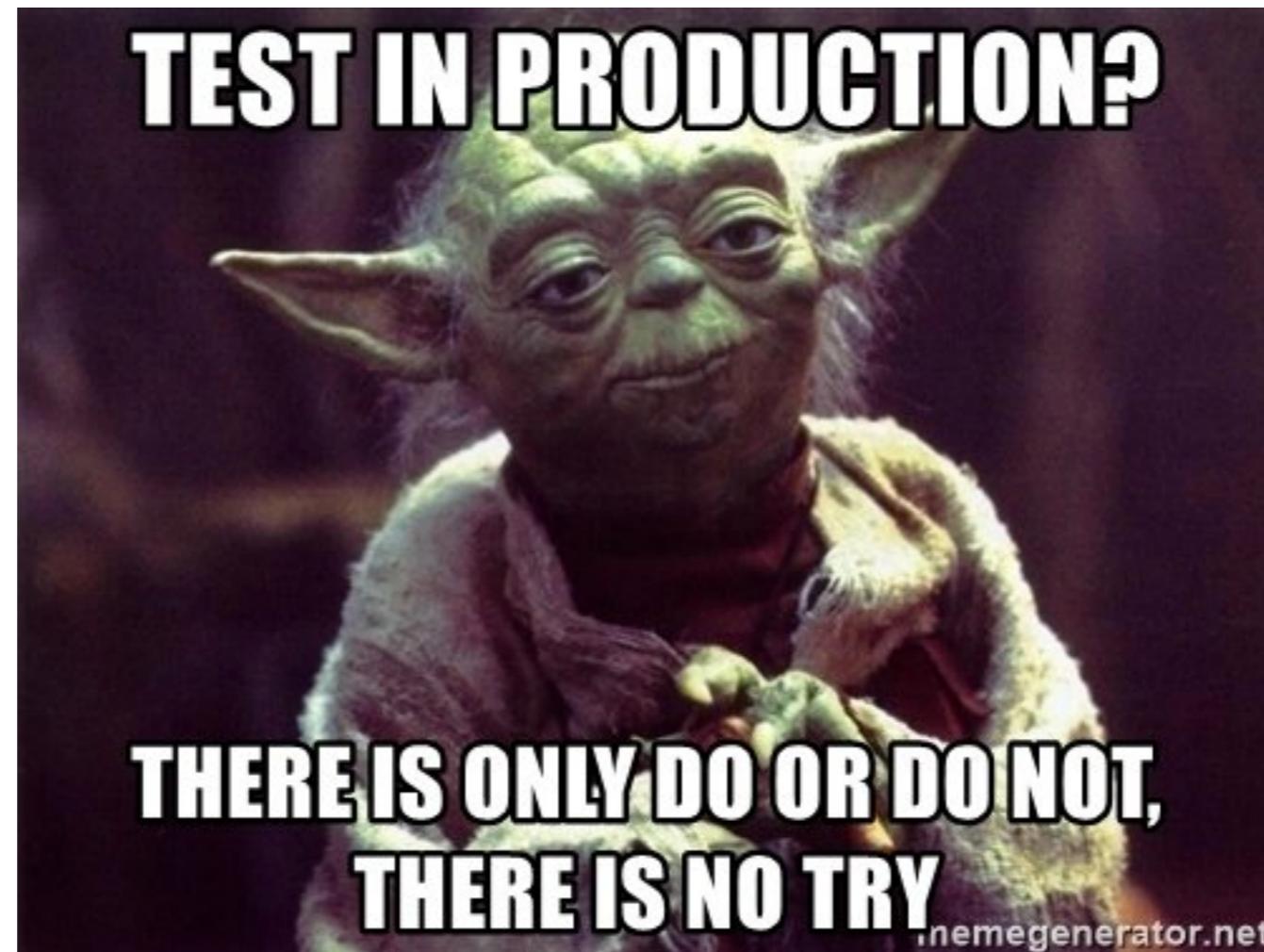
Keep the build **fast**

Continuous Integration is to provide rapid feedback



Practice 8

Test in clone of the **Production** environment



Practice 9

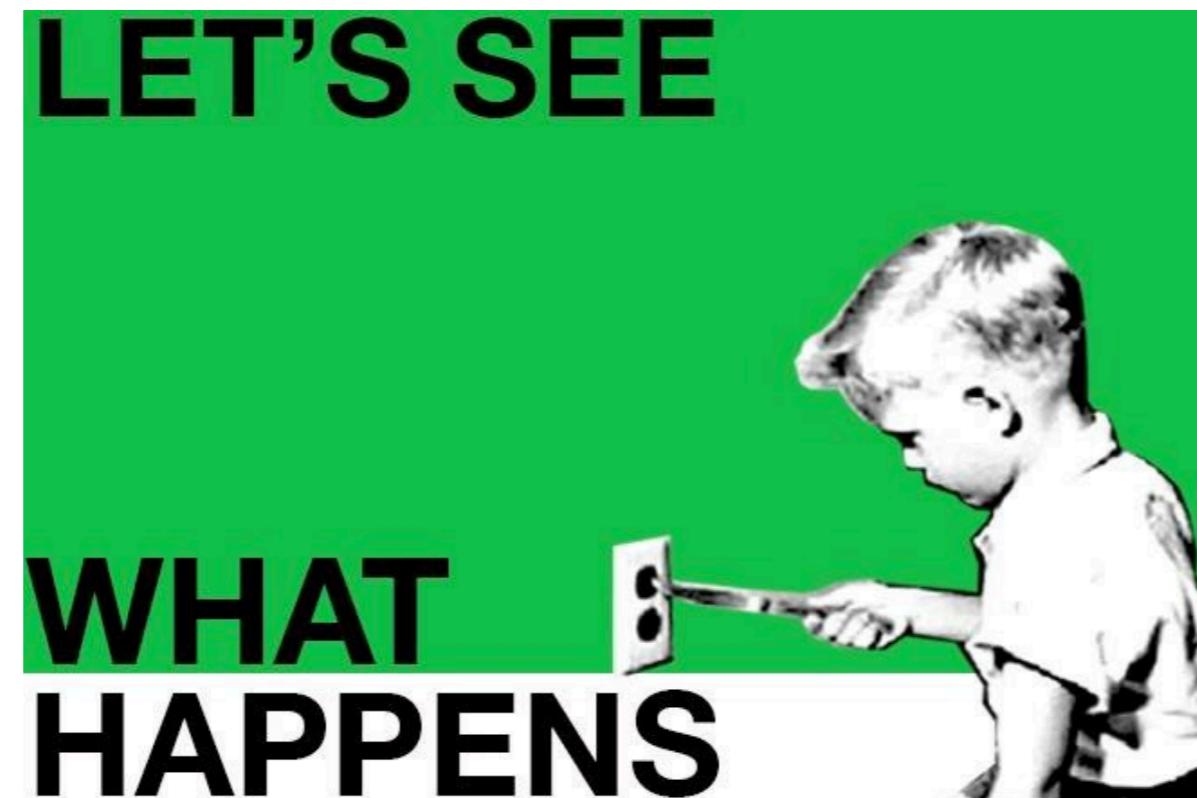
Make it easy for anyone to get
the latest executable

Make sure well known place where people can find



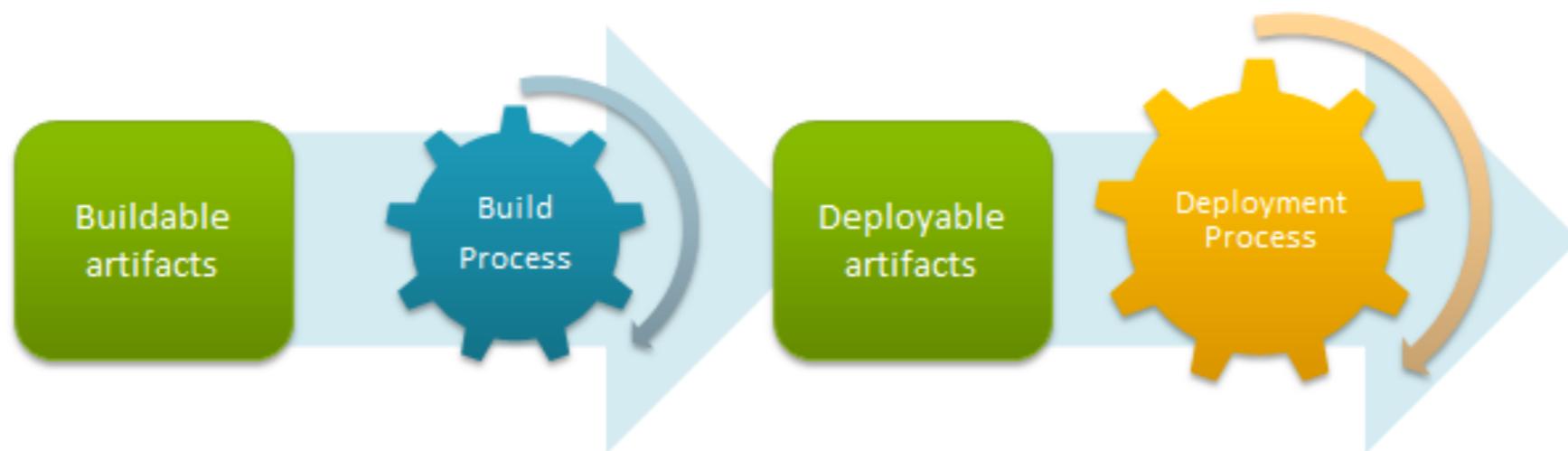
Practice 10

Everyone can see what's happening
Easier to see the state of the system and changes
Show the good information



Practice 11

Automated deployment



Continuous Delivery



Continuous Delivery

Use version control for all production artifacts

Automate your deployment process

Implement continuous integration (CI)

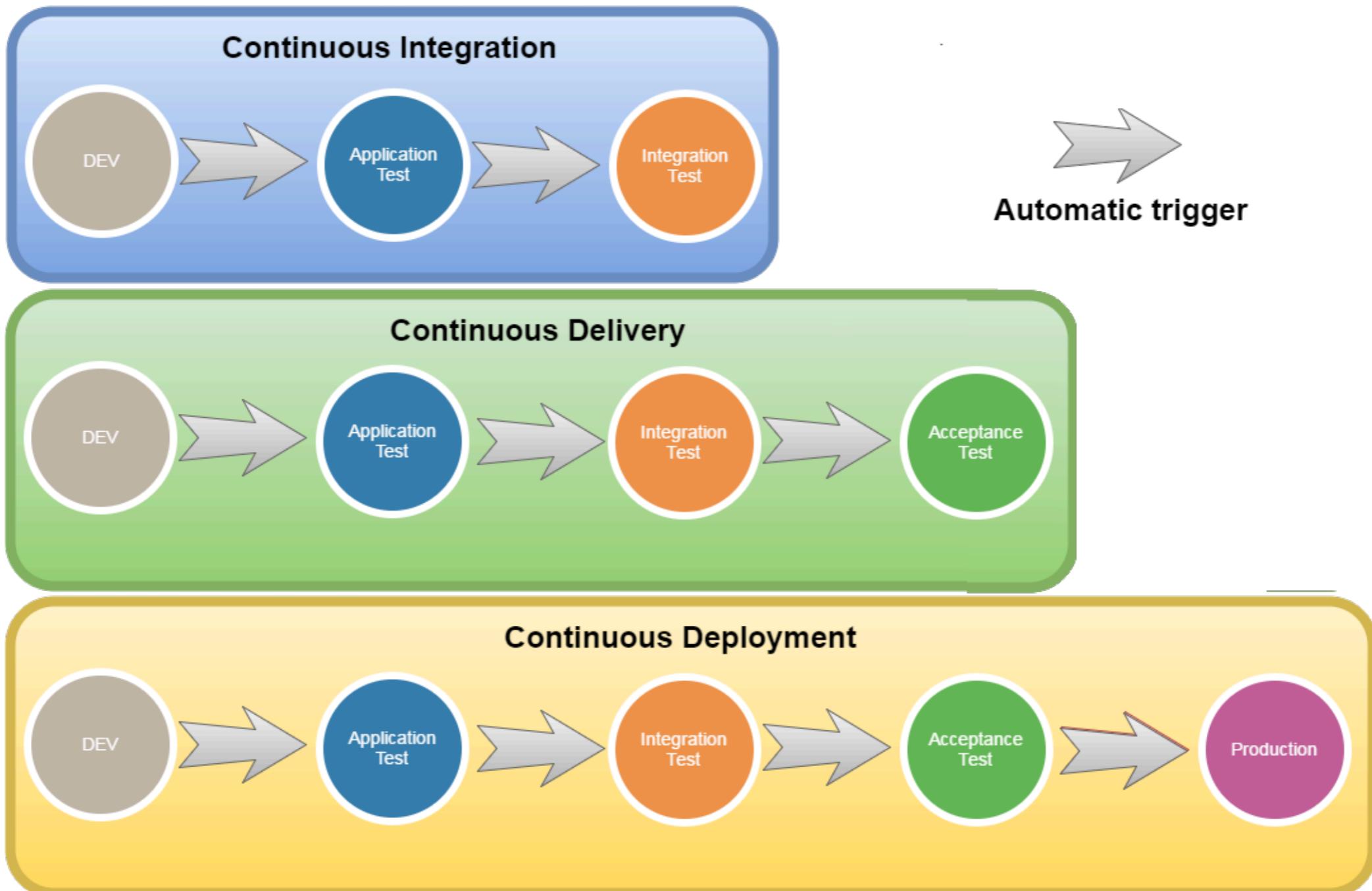
Use trunk-based development methods

Implement test automation

Support test data management

Integrate security into software development process





Let's start with Jenkins



Application and framework to manage and monitor
the executable of **repeated tasks**



Jenkins

<https://jenkins.io/>



Topics

Pipeline as a Code in Jenkins
Integration with GitLab
Scripted vs Declarative pipeline
Write and Run pipeline





Setup Jenkins



Working with Docker

Docker image

Blue Ocean plugins

Master and slave of Jenkins



Create first job



Create first job

Freestyle job Pipeline as a Code

Enter an item name

» This field cannot be empty, please enter a valid name

 **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.



Freestyle Job

Configure with web UI
Changes are not tracked
Separated jobs for each step in pipeline
Manual process



Pipeline as a Code

Configure with code

Changes are tracked by SCM

Easy to import/export

Parameterized and reuse

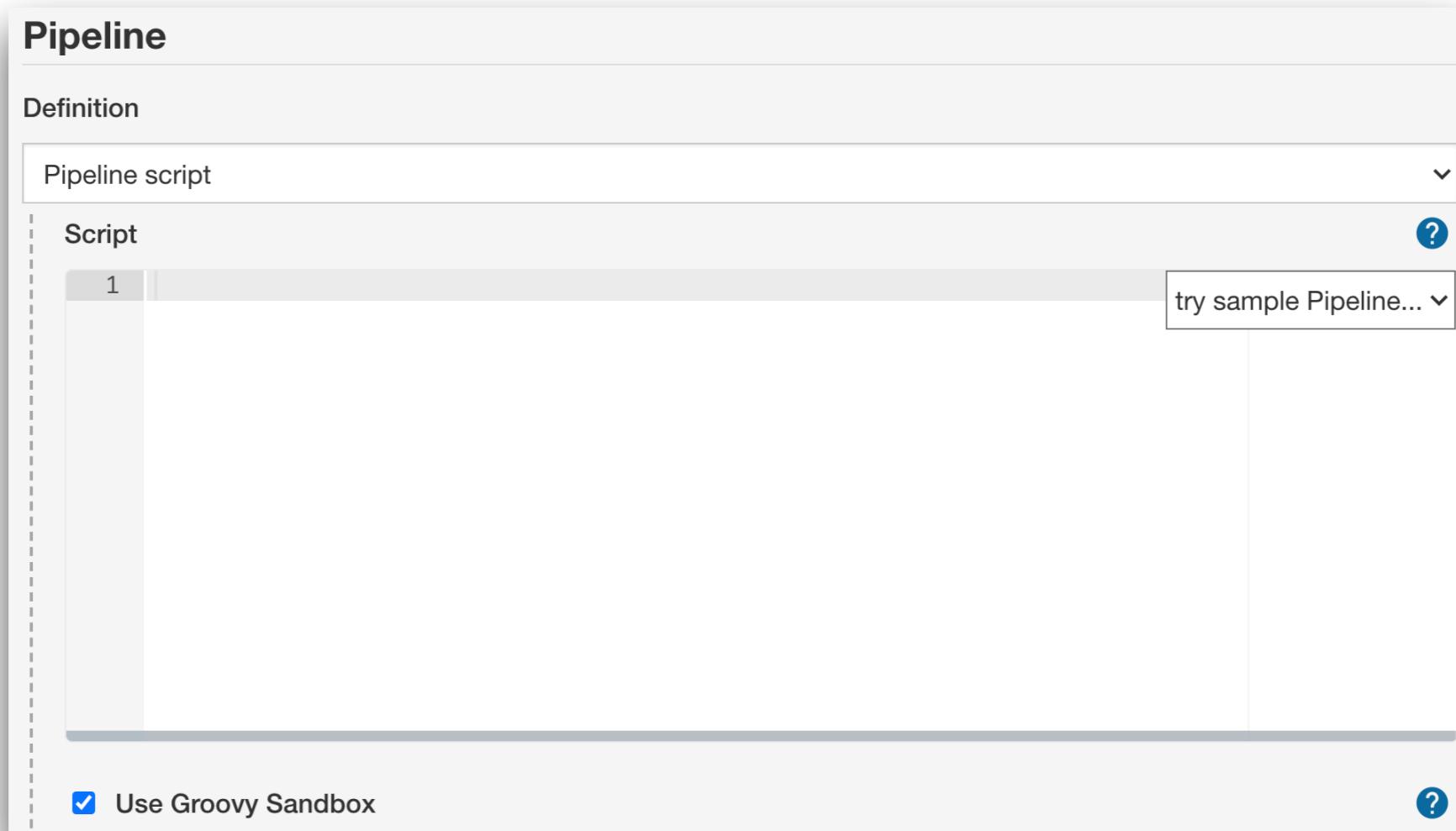
Auto generate

<https://www.jenkins.io/doc/book/pipeline/syntax/>



Types of pipeline as a code

Scripted pipeline (Groovy)
Declarative pipeline (New)



Scripted pipeline

```
node('worker_node1') {  
    stage('Source') {  
        git "  
    }  
    stage('Build') {  
        sh ""  
    }  
}
```

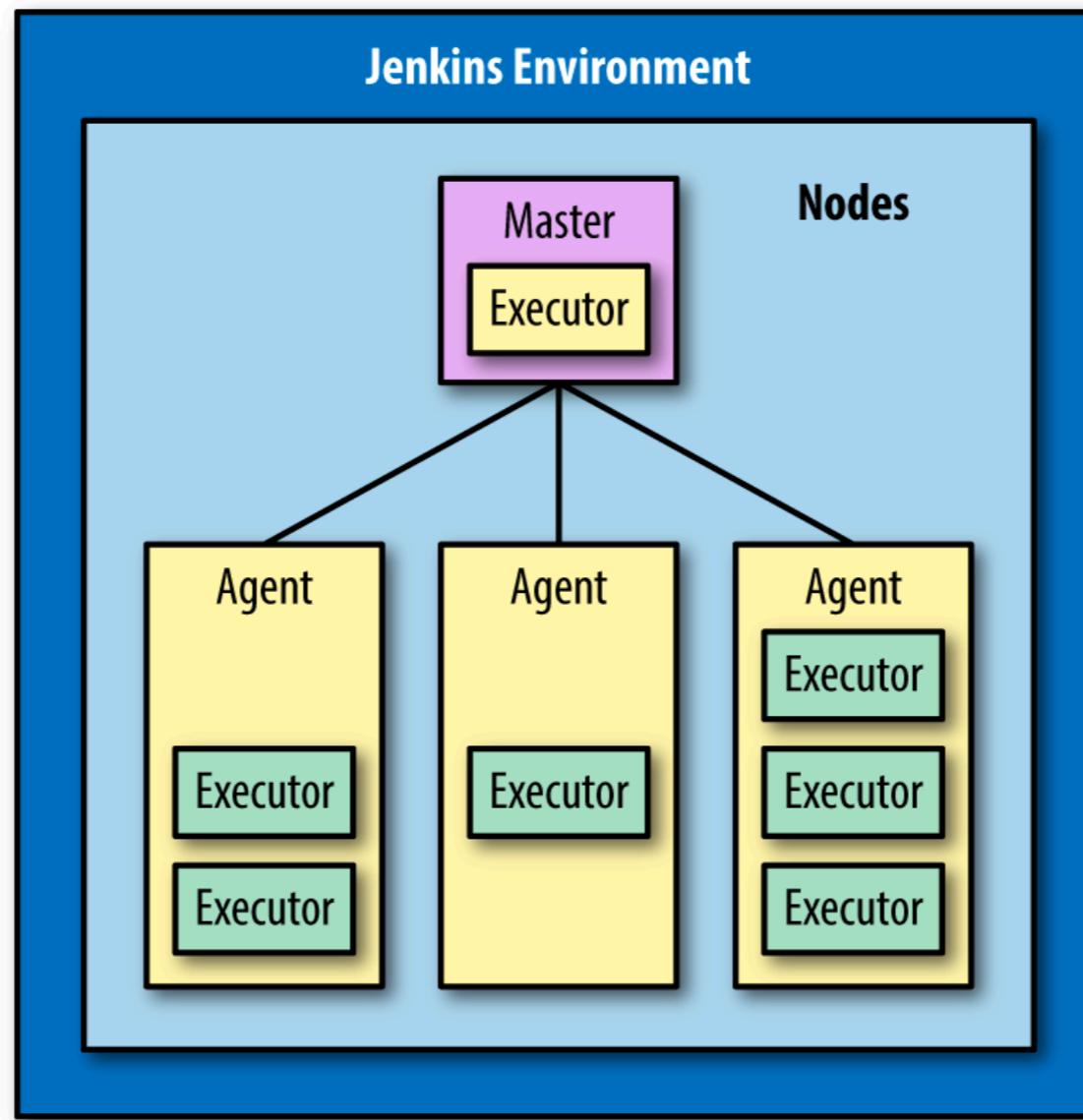
Declarative pipeline

```
pipeline {  
    agent {label 'worker_node1'}  
    stages {  
        stage('Source') {  
            steps {  
                git "  
            }  
        }  
        stage('Build') {  
            steps {  
                sh ""  
            }  
        }  
    }  
}
```



Basic of Jenkins

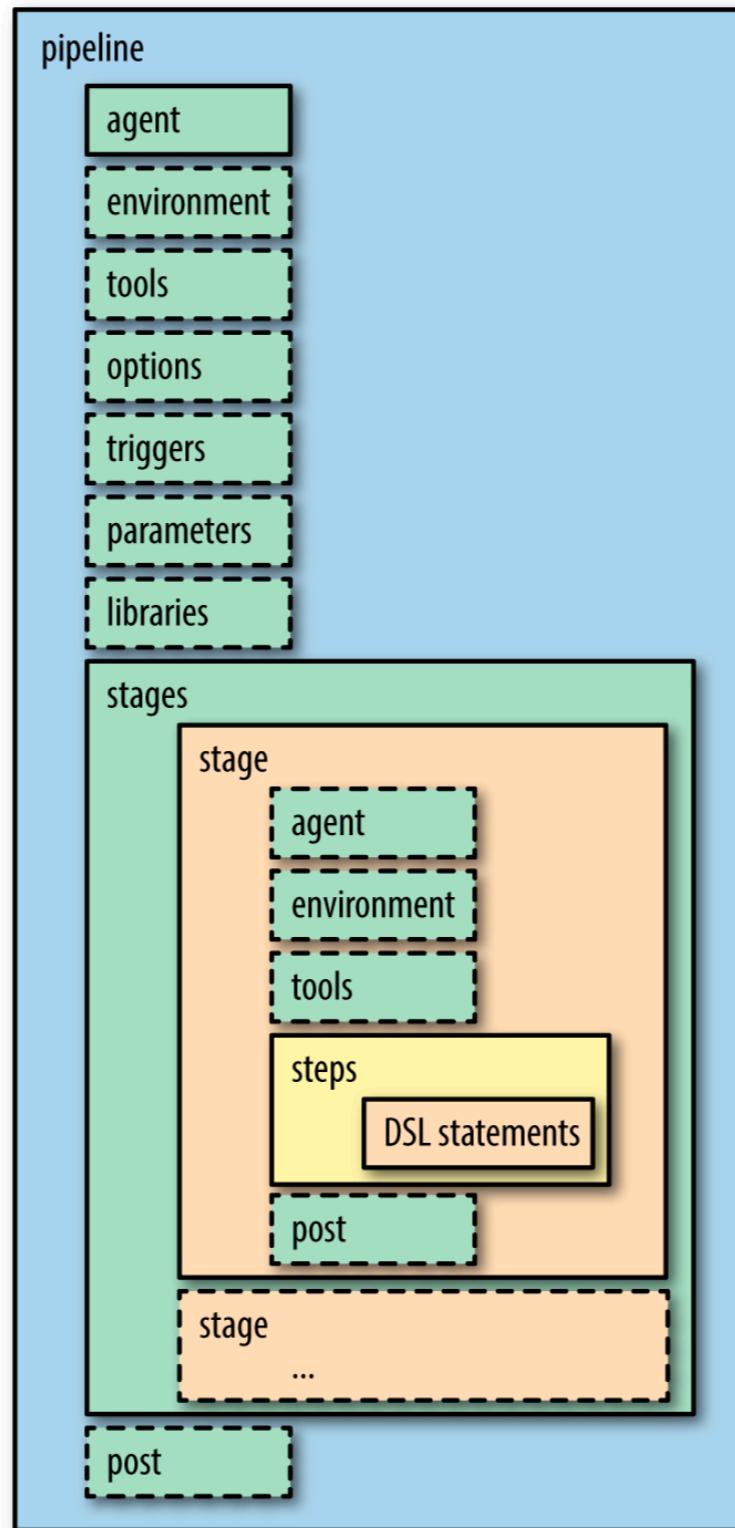
Master, Node, Agent and Executor



Create pipeline with Declarative pipeline



Declarative pipeline structure



Create Pipeline

Basic flow

Parallel pipeline

Alert and notification

Approve before deploy



Hello pipeline

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



Agent

```
pipeline {  
    agent any  
    Target of Node/Agent of Jenkins  
    stages {  
        stage('Hello') {  
            steps {  
                echo 'Hello World'  
            }  
        }  
    }  
}
```



Stages -> stage

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

Group of Works/Jobs



Steps

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

Lowest level of function in Jenkins DSL
Can be used with Groovy commands



Stages -> Steps -> Post

```
stages {  
    stage('name1') {  
        steps {  
            ...  
        }  
        post {  
            ...  
        }  
    }  
    post {  
        ...  
    }  
}
```



Stages -> Steps -> Post

```
stages {  
    stage('name1') {  
        steps {  
            ...  
        }  
        post {  
            ...  
        }  
    }  
}  


post {  
    ...  
}


```



Post-conditions

Always
Success
Changed
Aborted
Failure
Unstable

...

<https://www.jenkins.io/doc/book/pipeline/syntax/#post>



Post-conditions

Condition name	Description
always	Always execute the steps in the block
changed	If the current build's status is different from the previous build's status
success	If the current build was successful
failure	If the current build failed
unstable	If the current build's status was unstable (test failure)

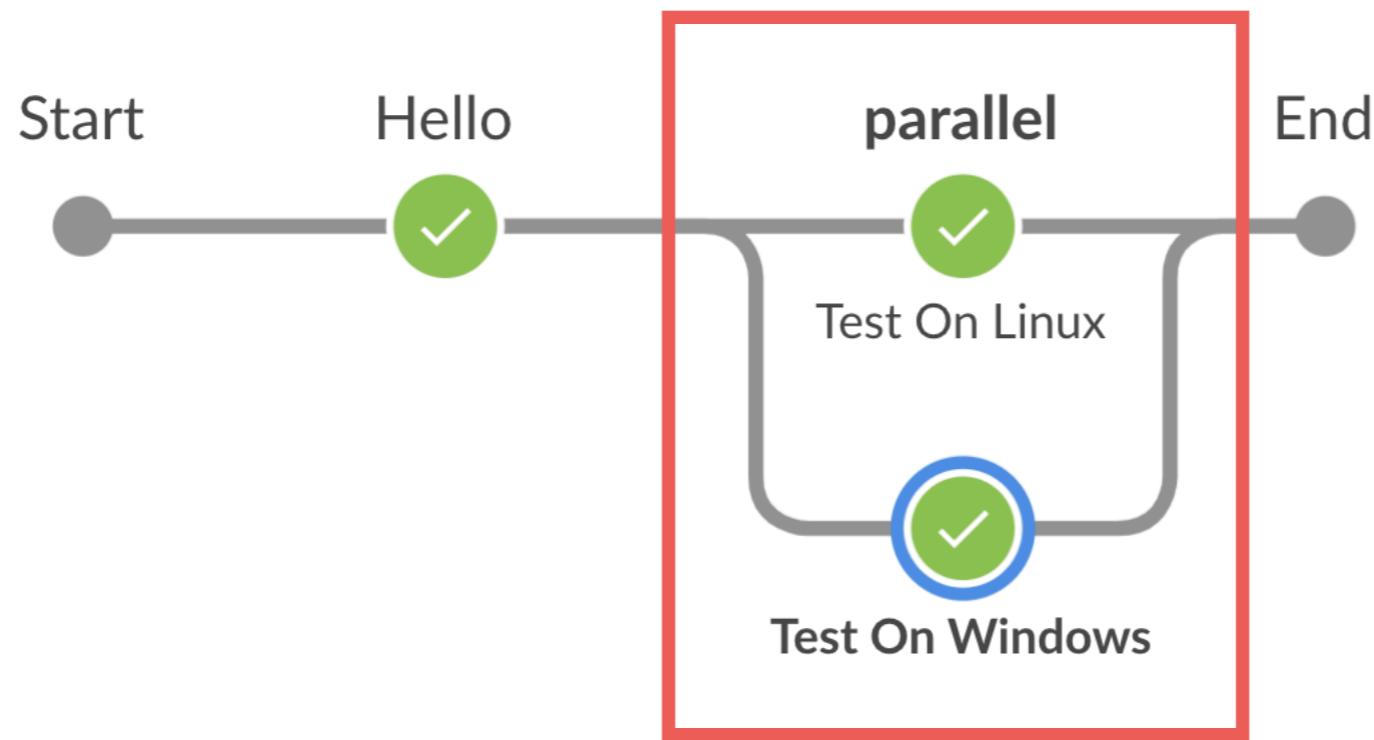
<https://www.jenkins.io/doc/book/pipeline/syntax/#post>



Parallel stages



Parallel stages

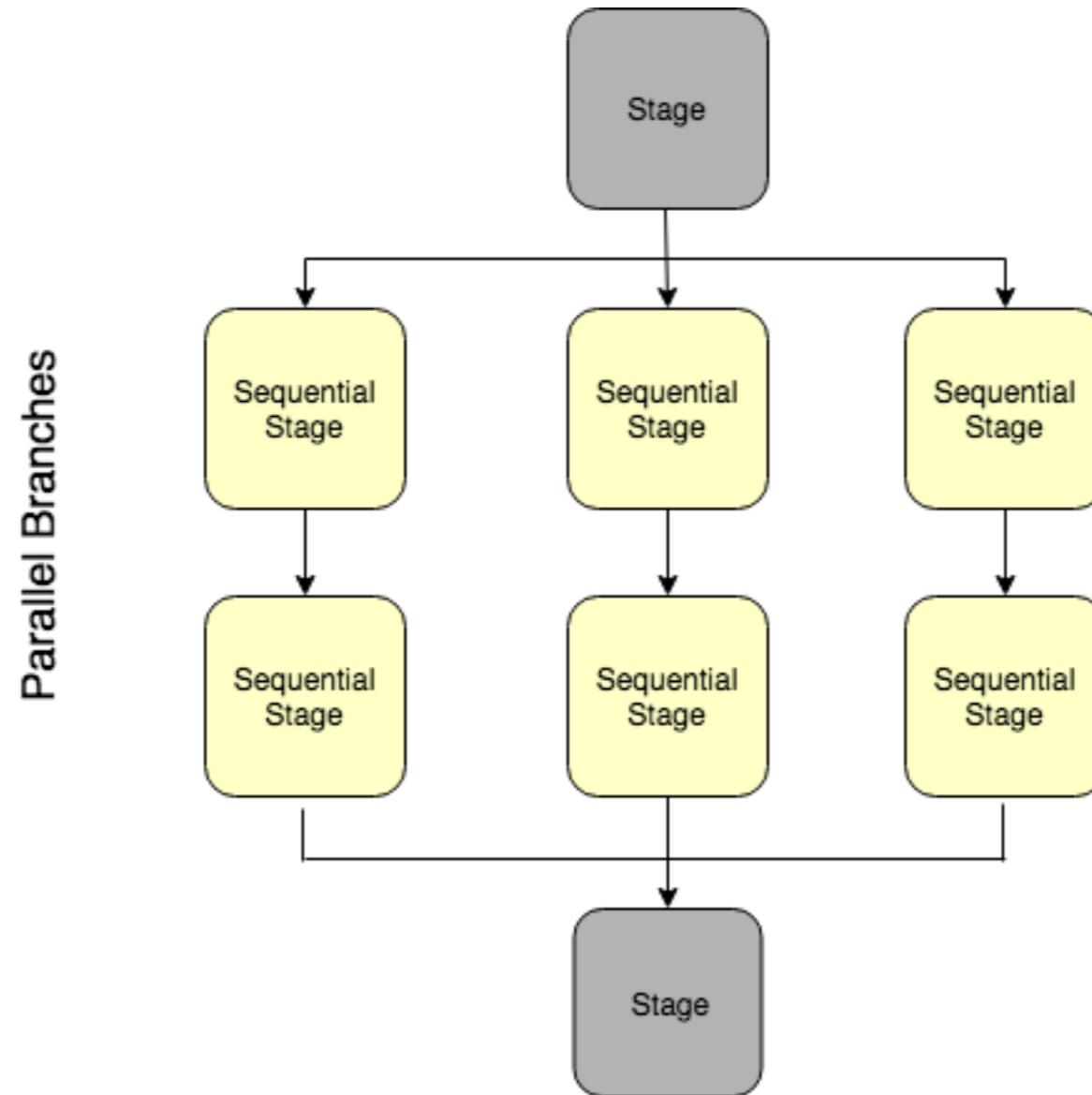


Parallel stages

```
stage('parallel') {  
    parallel {  
        stage('Test On Windows') {  
            steps {  
                echo "Test On Windows"  
            }  
        }  
        stage('Test On Linux') {  
            steps {  
                echo "Test On Linux"  
            }  
        }  
    }  
}
```



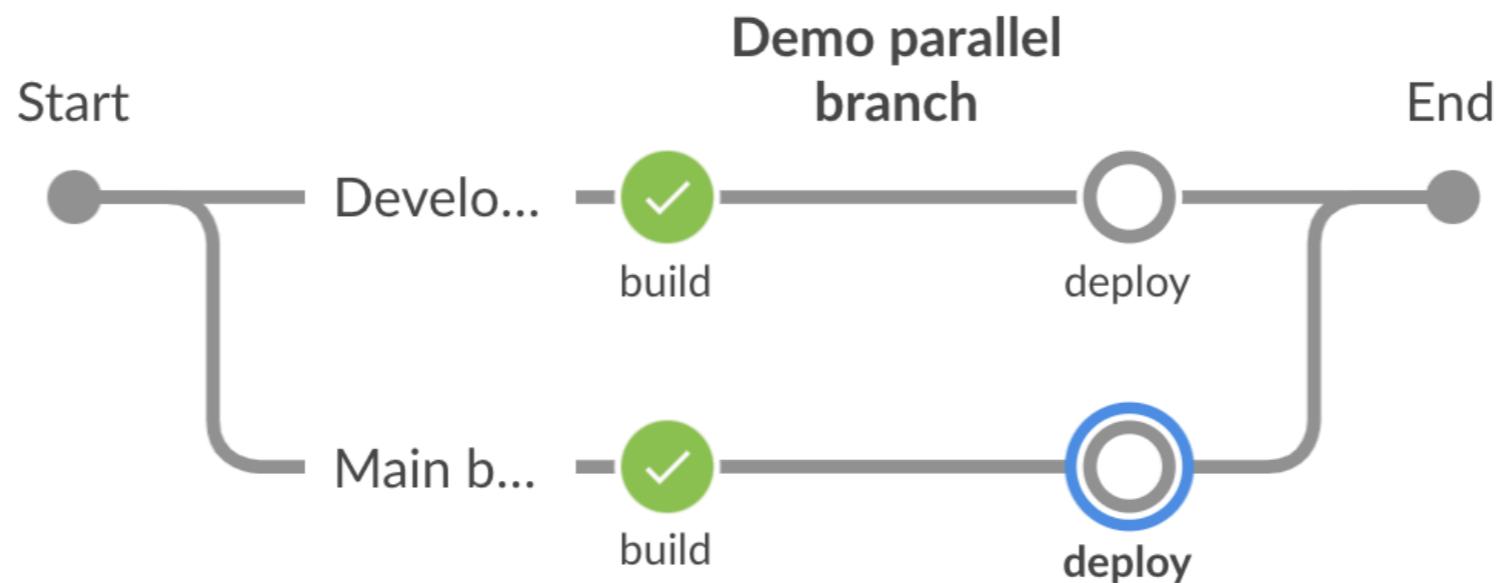
Parallel branches



<https://www.jenkins.io/blog/2018/07/02/whats-new-declarative-pipeline-13x-sequential-stages/>



Parallel branches



Parallel branches

```
pipeline {  
    agent none  
  
    stages {  
        stage("Demo parallel branch") {  
            parallel {  
                stage("Main branch") {  
                    ....  
                }  
                ....  
            }  
            stage("Develop branch") {  
                ....  
            }  
        }  
    }  
}
```

Pipeline for main branch



Parallel branches

```
pipeline {  
    agent none  
  
    stages {  
        stage("Demo parallel branch") {  
            parallel {  
                stage("Main branch") {  
                    ....  
                }  
                stage("Develop branch") {  
                    ....  
                }  
            }  
        }  
    }  
}
```

Pipeline for develop branch



Conditions with when

Branch
Environment
Equals
Expression
Tag

...

<https://www.jenkins.io/doc/book/pipeline/syntax/#when>



Conditionals :: main branch

```
stages {  
    stage("build") {  
        steps {  
            echo "build in main"  
        }  
    }  
    stage("deploy") {  
        when {  
            branch "main"  
        }  
        steps {  
            echo "deploy for master"  
        }  
    }  
}
```

Working with conditions



Working with Environment variables



Use environment variables

Define for all stages

Define for specific stages/steps

Support plain text, user/pass and credential

<https://www.jenkins.io/doc/book/pipeline/syntax/#environment>



Use environment variables

```
pipeline {  
    agent any  
  
    environment {  
        field = 'some'  
    }  
    stages {  
  
    }  
}
```

Global env for all



Use environment variables

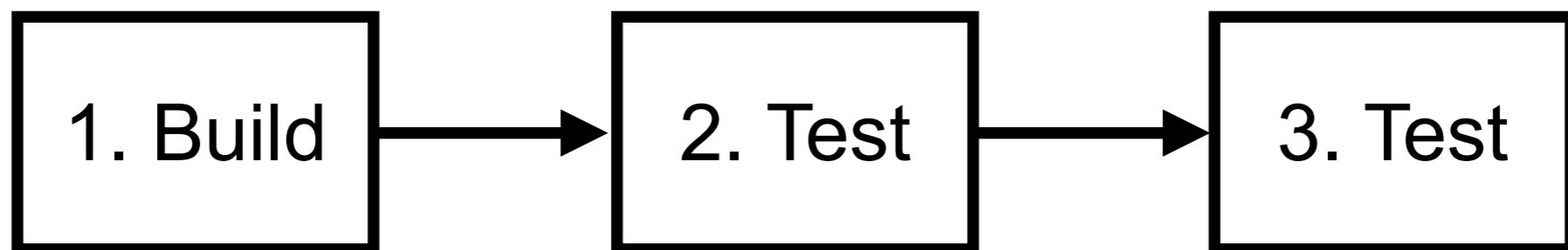
```
stages {  
    stage ('Preparation') {  
  
        environment {  
            JENKINS_PATH = sh(script: 'pwd', , returnStdout: true).trim()  
        }  
  
        steps {  
            echo "Hello world"  
            echo "PATH=${JENKINS_PATH}"  
            sh 'echo "JP=$JENKINS_PATH"'  
        }  
    }  
}
```



Pipeline parameters



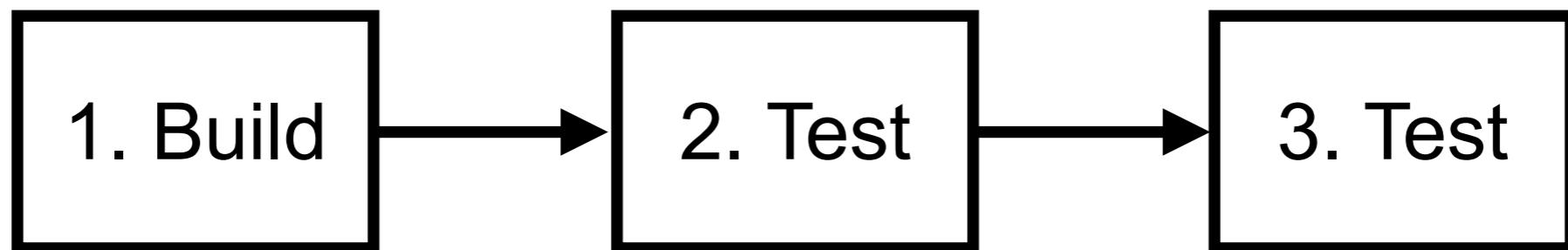
Parameters of pipeline



Branch ?

Tag ?

Version ?



Configure job/item in UI

This project is parameterized ?

String Parameter X ?

Name ?
PERSON

Default Value ?
Mr Jenkins

Description ?
Who should I say hello to?

[Plain text] [Preview](#)

Trim the string ?



Parameters directive

List of parameters that provide when trigger the pipeline

String, text (multiple line), boolean
Choice, password

...

<https://www.jenkins.io/doc/book/pipeline/syntax/#parameters>



Use parameters directive

```
pipeline {  
    agent any  
  
    parameters {  
        string(name: 'PERSON', defaultValue: 'Mr Jenkins', description: 'Who should I say hello to?')  
  
        booleanParam(name: 'TOGGLE', defaultValue: true, description: 'Toggle this value')  
  
        choice(name: 'CHOICE', choices: ['One', 'Two', 'Three'], description: 'Pick something')  
  
        password(name: 'PASSWORD', defaultValue: 'SECRET', description: 'Enter a password')  
    }  
}
```



Example

Dashboard > demo-param >

[Back to Dashboard](#)

[Status](#)

[Changes](#)

[Build with Parameters](#)

[Configure](#)

[Delete Pipeline](#)

[Full Stage View](#)

[Open Blue Ocean](#)

[Rename](#)

[Pipeline Syntax](#)

[Build History](#) trend ▲

find

#1 Aug 25, 2021, 9:51 AM

[Atom feed for all](#) [Atom feed for failures](#)

Pipeline demo-param

This build requires parameters:

PERSON

Mr Jenkins

Who should I say hello to?

BIOGRAPHY

Enter some information about the person

TOGGLE
Toggle this value

CHOICE

One

Pick something

PASSWORD

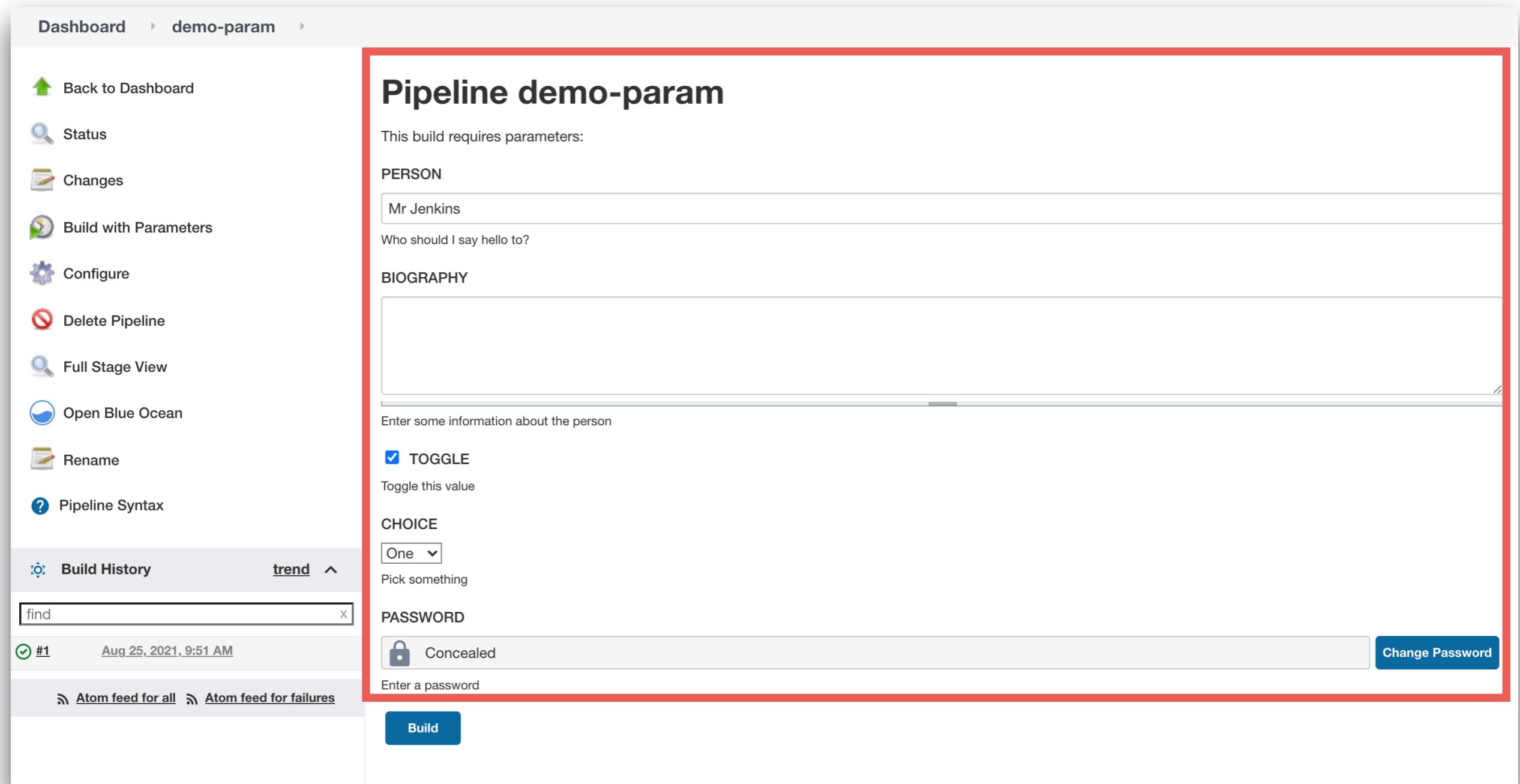
Concealed [Change Password](#)

Enter a password

[Build](#)



Example



The screenshot shows the Jenkins Pipeline configuration page for a pipeline named "demo-param". The left sidebar contains standard Jenkins navigation links: Back to Dashboard, Status, Changes, Build with Parameters, Configure, Delete Pipeline, Full Stage View, Open Blue Ocean, Rename, Pipeline Syntax, Build History (with a trend dropdown), and a search bar. Below the search bar is a list of recent builds: #1 (Aug 25, 2021, 9:51 AM). At the bottom of the sidebar are Atom feed links for all and failures.

The main content area is titled "Pipeline demo-param". It displays the following parameters:

- PERSON**: A text input field containing "Mr Jenkins". A placeholder question "Who should I say hello to?" is visible below it.
- BIOGRAPHY**: A large text area with a placeholder "Enter some information about the person".
- TOGGLE**: A checked checkbox labeled "Toggle this value".
- CHOICE**: A dropdown menu set to "One". A placeholder "Pick something" is visible below it.
- PASSWORD**: A password input field with a lock icon and the status "Concealed". A placeholder "Enter a password" is visible below it.

A red border highlights the parameter configuration section. At the bottom right of this section is a blue "Change Password" button. At the very bottom of the page is a blue "Build" button.



Git parameter plugin

Git Parameter

Documentation

Releases

Issues

Dependencies

Older versions of this plugin may not be safe to use. Please review the following warnings before using an older version:

- [Stored XSS vulnerability](#)
- [Multiple stored XSS vulnerabilities](#)

Adds ability to choose branches, tags or revisions from git repository configured in project.

Plugin Info

This plugin allows you to assign git branch, tag, pull request or revision number as parameter in your builds.

<https://plugins.jenkins.io/git-parameter/>



Notification in pipeline



Notification

Both success and failure

Email
LINE
Slack
Sound

...

<https://www.jenkins.io/doc/book/pipeline/syntax/#when>



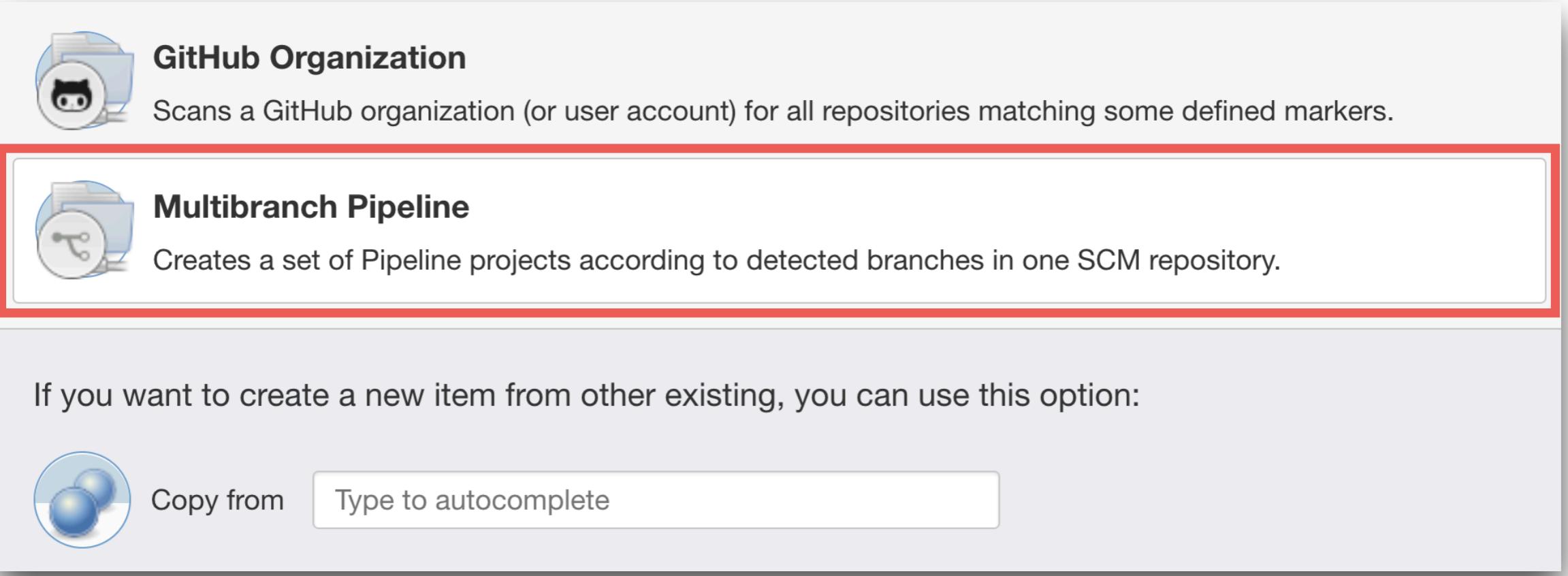
Multi-branch pipeline

<https://www.jenkins.io/doc/book/pipeline/multibranch/>



Multi-branches pipeline

Create new item/job



The screenshot shows the Jenkins 'New Item' creation interface. It lists several options:

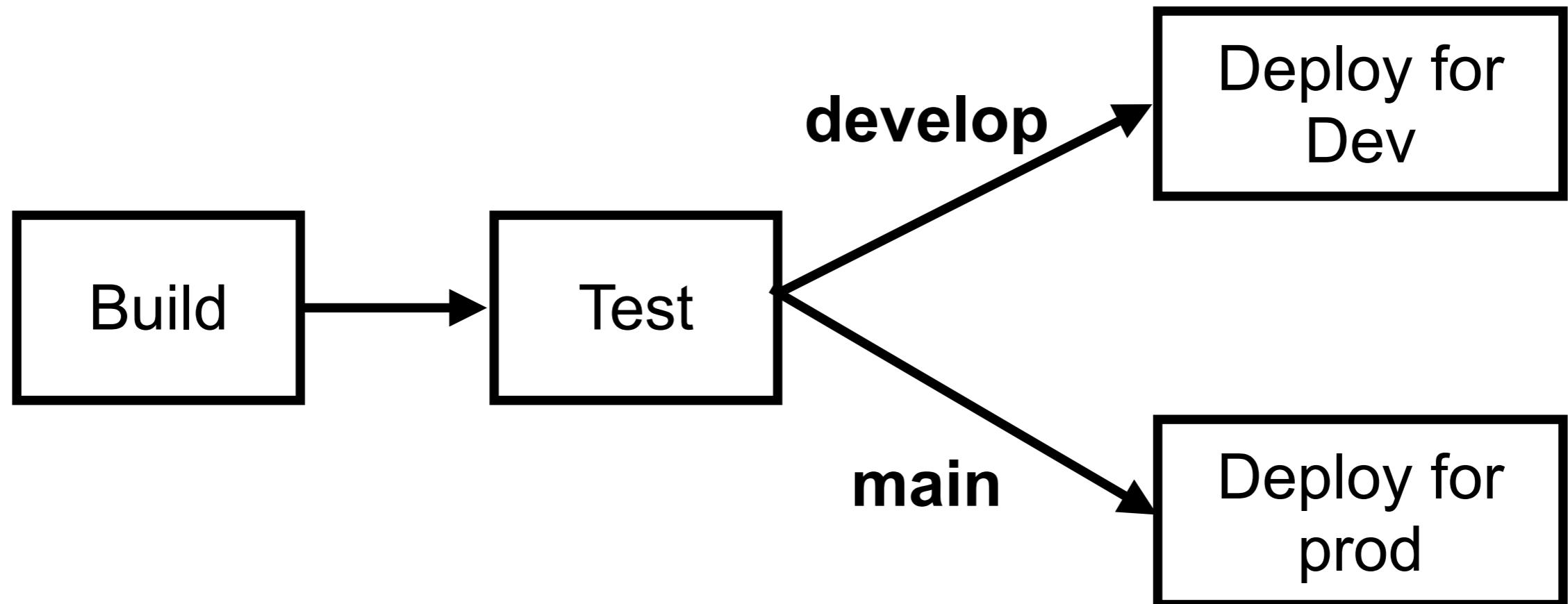
- GitHub Organization**: Scans a GitHub organization (or user account) for all repositories matching some defined markers.
- Multibranch Pipeline**: Creates a set of Pipeline projects according to detected branches in one SCM repository. This option is highlighted with a red border.

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

Copy from



Write pipeline with multi-branch



<https://www.jenkins.io/doc/tutorials/build-a-multibranch-pipeline-project/>



Write pipeline with multi-branch

```
stages {  
    stage("build") {  
        steps {  
            echo "build in main"  
        }  
    }  
}  
  
stage("deploy") {  
    when {  
        branch "main"  
    }  
    steps {  
        echo "deploy for master"  
    }  
}
```

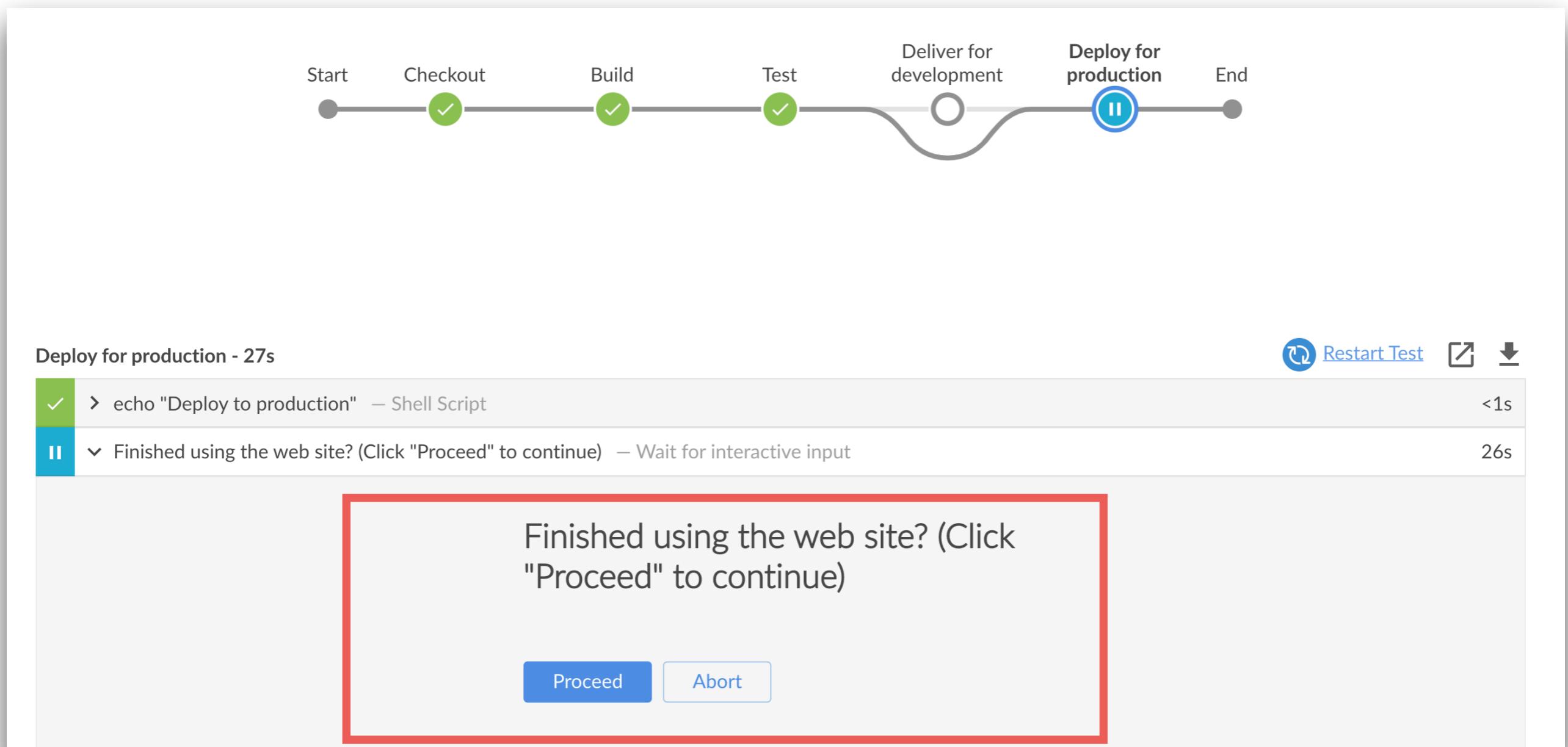
Execute when in main branch only



Approve or not ?



Approve or not ?



Approve or not ?

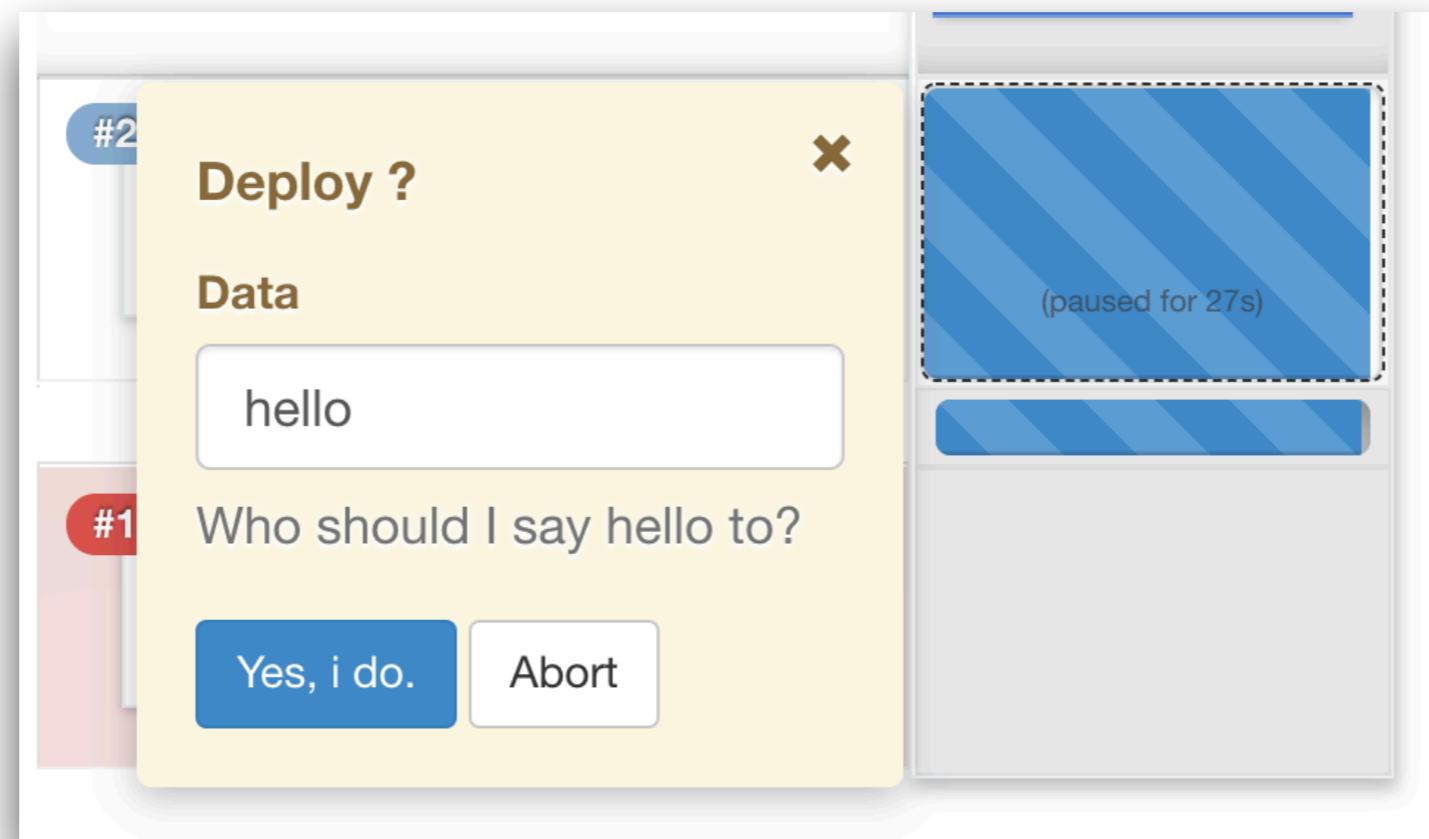
```
stage('Deliver for development') {  
    when {  
        branch 'develop'  
    }  
    steps {  
        sh 'echo "Deploy to development"  
  
        input message: 'Deploy ? (Click "Proceed" to continue')  
        sh 'echo "Deploy to development passed"'  
    }  
}
```

<https://www.jenkins.io/doc/book/pipeline/syntax/#input>



Working with input directive

Show prompt for input



<https://www.jenkins.io/doc/book/pipeline/syntax/#input>



Working with input directive

Show prompt for input

```
stage("build") {  
    input {  
        message "Deploy ?"  
        ok "Yes, i do."  
        submitter "Somkiat.p"  
        parameters {  
            string( name: 'Data', defaultValue: 'hello',  
                   description: 'Who should I say hello to?')  
        }  
    }  
    steps {  
        echo "Hello, ${Data}."  
    }  
}
```

<https://www.jenkins.io/doc/book/pipeline/syntax/#input>



Manage credential in Jenkins



Manage credential

Username and Password

Secret text

Secret file

SSH username with private key

Certificate

Docker host certificate authentication

<https://www.jenkins.io/doc/book/using/using-credentials/>



Manage credential

Manage Jenkins -> Manage Credentials

The screenshot shows the Jenkins 'Manage Jenkins' page. A red circle labeled '1' highlights the 'Manage Jenkins' menu item in the sidebar. A red box highlights the 'Manage Credentials' link under the 'Security' section. A red circle labeled '2' highlights this same 'Manage Credentials' link. The page also includes sections for 'Configure System', 'Global Tool Configuration', 'Manage Plugins', 'Manage Nodes and Clouds', 'Configure Global Security', 'Configure Credential Providers', and 'Manage Users'.

1

Manage Jenkins

My Views

Lockable Resources

Open Blue Ocean

New View

Build Queue

No builds in the queue.

Build Executor Status

1 Idle

Configure System

Configure global settings and paths.

Global Tool Configuration

Configure tools, their locations and automatic installers.

Manage Plugins

Add, remove, disable or enable plugins that can extend the functionality of Jenkins.

Manage Nodes and Clouds

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

Configure Global Security

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

Configure Credential Providers

Configure the credential providers and types

Manage Credentials

Configure credentials

Manage Users

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

Security

Manage Credentials



Create credentials

Global credential

By pipeline/job/item

By Jenkins's user

<https://www.jenkins.io/doc/book/using/using-credentials/>



Types of credential

The screenshot shows the Jenkins Global credentials configuration interface. The path in the top navigation bar is: Dashboard > Credentials > System > Global credentials (unrestricted). On the left sidebar, there are links for 'Back to credential domains' and 'Add Credentials'. The main content area displays a dropdown menu titled 'Kind' with several options: 'Username with password' (which is selected and highlighted in blue), 'GitHub App', 'SSH Username with private key', 'Secret file', 'Secret text', and 'Certificate'. Below the 'Kind' dropdown, there are fields for 'Username' (an empty input field), 'Password' (an empty input field), and 'ID' (an empty input field). A checkbox labeled 'Treat username as secret' is also present. At the bottom of the form is a blue 'OK' button. A red box highlights the 'Kind' dropdown and its contents.



Example of Docker login

```
$docker login -u <user> -p <password>
```

```
stages {  
    stage('Push to docker hub') {  
        steps {  
            withCredentials(  
                [usernamePassword(credentialsId: 'docker_login',  
                    passwordVariable: 'PASSWORD',  
                    usernameVariable: 'USERNAME')]) {  
  
                    sh 'echo "$PASSWORD" | docker login -u "$USERNAME" --password-stdin'  
                }  
            }  
        }  
    }  
}
```



Example of Docker login

```
$docker login -u <user> -p <password>
```

```
stages {  
    stage('Push to docker hub') {  
        steps {  
            withCredentials(  
                [usernamePassword(credentialsId: 'docker_login',  
                    passwordVariable: 'PASSWORD',  
                    usernameVariable: 'USERNAME')]) {  
  
                    sh 'echo "$PASSWORD" | docker login -u "$USERNAME" --password-stdin'  
                }  
            }  
        }  
    }  
}
```



Example of Git login

\$git pull origin main

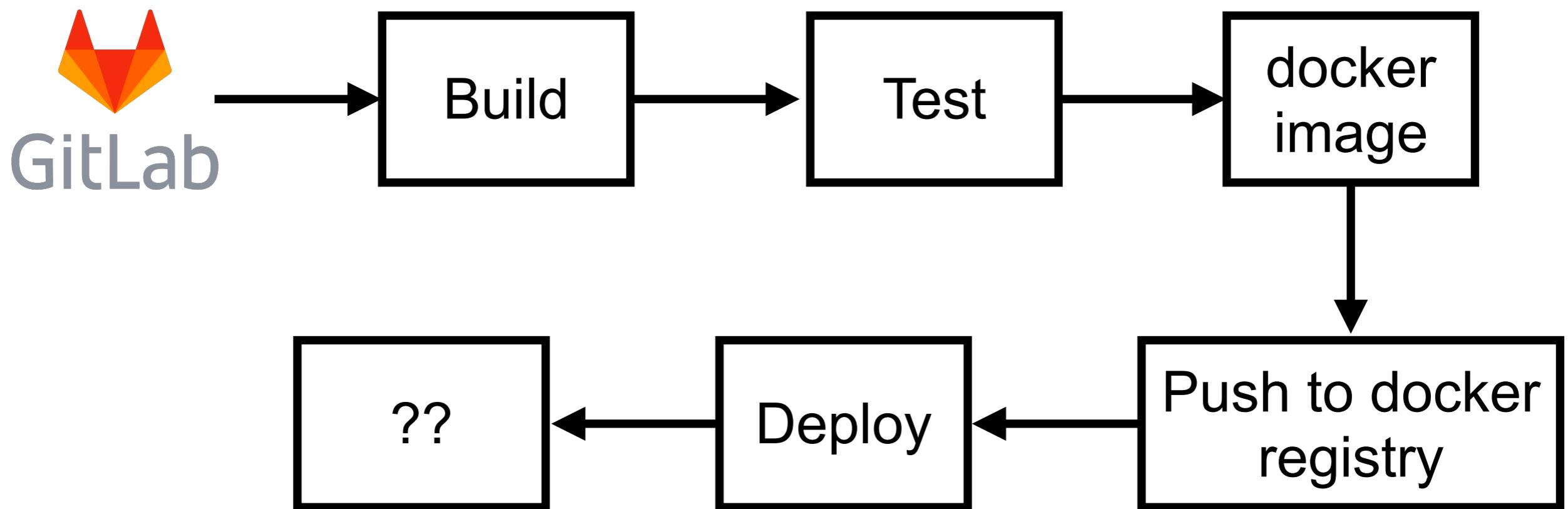
```
stages {  
    stage('Push to docker hub') {  
        steps {  
            withCredentials(  
                [usernamePassword(credentialsId: 'docker_login',  
                    passwordVariable: 'PASSWORD',  
                    usernameVariable: 'USERNAME')]) {  
  
                    sh 'echo "$PASSWORD" | docker login -u "$USERNAME" --password-stdin'  
                }  
            }  
        }  
    }  
}
```



Pipeline workshop



Pipeline workshop



Security in Jenkins



Security in Jenkins

Username/password

Access controls

Role-bases authorization

Other plugins

<https://www.jenkins.io/doc/book/security/>



Role-based Authorization Strategy

Role-based Authorization Strategy

Documentation [Releases](#) [Issues](#) [Dependencies](#)

[chat on gitter](#) [plugin v3.2.0](#) [changelog role-strategy-3.2.0](#) installs 70k

About this plugin

The Role Strategy plugin is meant to be used from [Jenkins](#) to add a new role-based mechanism to manage users' permissions. Supported features

- Creating **global roles**, such as admin, job creator, anonymous, etc., allowing to set Overall, Agent, Job, Run, View and SCM permissions on a global basis.
- Creating **project roles**, allowing to set only Job and Run permissions on a project basis.
- Creating **agent roles**, allowing to set node-related permissions.
- Assigning these roles to users and user groups
- Extending role and permissions matching via [Macro extensions](#)

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



Role-based Authorization Strategy

The screenshot shows the Jenkins plugin marketplace interface. At the top, there are four tabs: 'Updates' (selected), 'Available', 'Installed', and 'Advanced'. Below the tabs, there are two buttons: 'Install ↑' and 'Name'. The 'Name' button is highlighted in blue. The main content area displays the 'Role-based Authorization Strategy' plugin. It has a checkbox icon, a 'Security' category badge, and an 'Authentication and User Management' category badge. A brief description states: 'Enables user authorization using a Role-Based strategy. Roles can be defined glo...'. At the bottom, there are three buttons: 'Install without restart' (blue), 'Download now and install after restart' (blue), and 'Update information' (gray).

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



Role-based Authorization Strategy

Global roles

Project roles

Agent roles

Assign roles to users and groups

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



Role-based Authorization Strategy

Global roles

Project roles

Agent roles

Assign roles to users and groups

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



Working with Role-based

Manage Jenkins -> Configure global security

Authorization

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



Create a new user

Manage Jenkins -> Manage Users

Create User

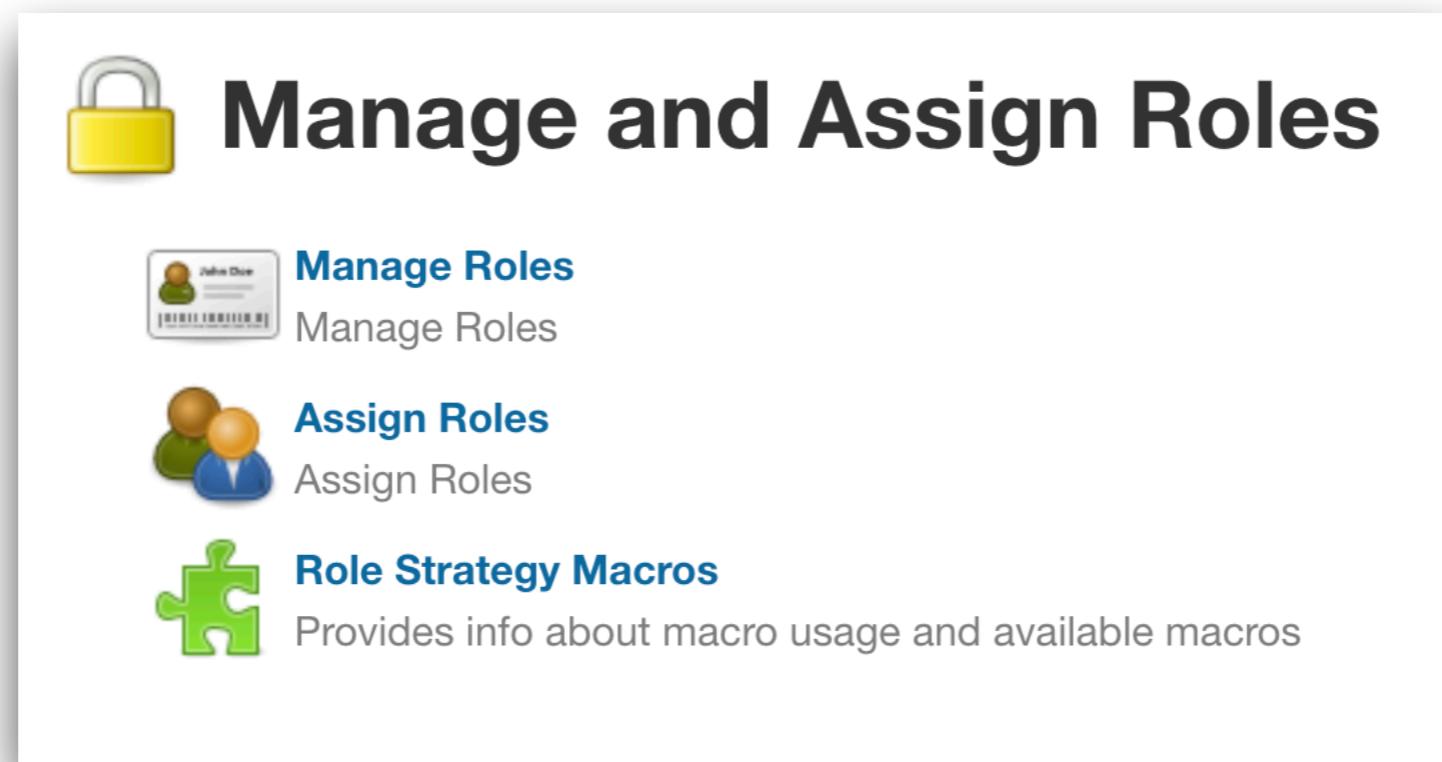
Username:	<input type="text" value="demo"/>
Password:	<input type="password" value="...."/>
Confirm password:	<input type="password" value="...."/>
Full name:	<input type="text" value="demo"/>
E-mail address:	<input type="text" value="admin@admin.com"/>

Create User



Create a new role

Manage Jenkins -> Manage and assign roles



Create a new role

Add new role = general



Manage Roles

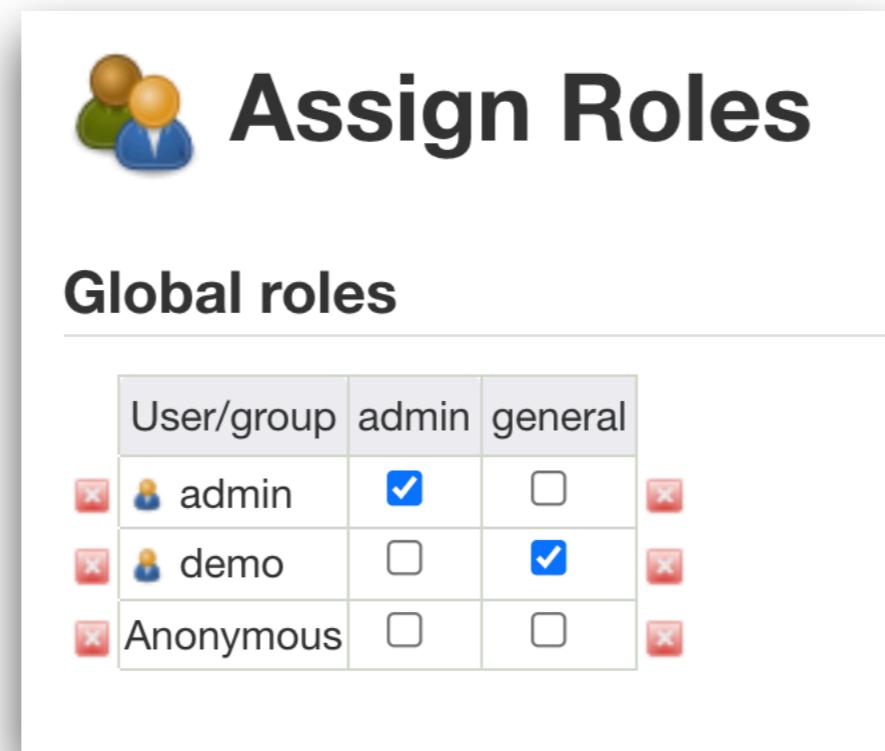
Global roles

Role	Overall		Credentials				Agent								Job											
	Administer	Read	Create	Delete	ManageDomains	Update	View	Build	Configure	Connect	Create	Delete	Disconnect	Provision	Build	Cancel	Configure	Create	Delete	Discover	Move	Read	Workspace	Do		
admin	<input checked="" type="checkbox"/>																									
general	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	



Assign roles to users

Add to global roles



The screenshot shows the Jenkins 'Assign Roles' configuration page. At the top, there's a logo of three stylized human figures and the title 'Assign Roles'. Below that, a section titled 'Global roles' contains a table for assigning roles to users and groups. The table has columns for 'User/group', 'admin', and 'general'. The rows are: 'admin' (checked under admin), 'demo' (checked under general), and 'Anonymous' (unchecked for both). Each row has a red delete icon on the right.

User/group	admin	general
admin	<input checked="" type="checkbox"/>	<input type="checkbox"/>
demo	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anonymous	<input type="checkbox"/>	<input type="checkbox"/>



**Log out
and Login with new user**



Gitlab Authentication plugin



Gitlab Authentication plugin

Gitlab Authentication

Documentation

Releases

Issues

Dependencies

The GitLab Authentication Plugin provides a means of using GitLab for authentication and authorization to secure Jenkins. GitLab Enterprise is also supported.

Setup

Before configuring the plugin you must create a GitLab application registration. In the Scopes section mark **api**.

the authorization callback URL takes a specific value. It must be <http://myserver.example.com:8080/securityRealm/finishLogin> where myserver.example.com:8080 is the location of the Jenkins server.

The Client ID and the Client Secret will be used to configure the Jenkins Security Realm. Keep the page open to the application registration so this information can be copied to your Jenkins configuration.

<https://plugins.jenkins.io/gitlab-oauth/>

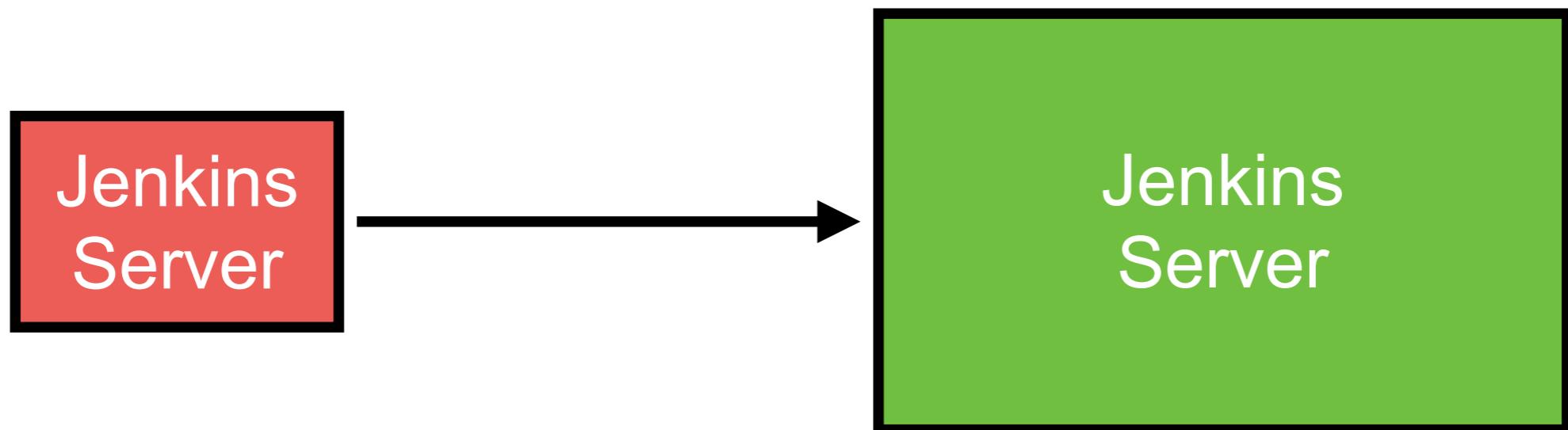


Scale Jenkins



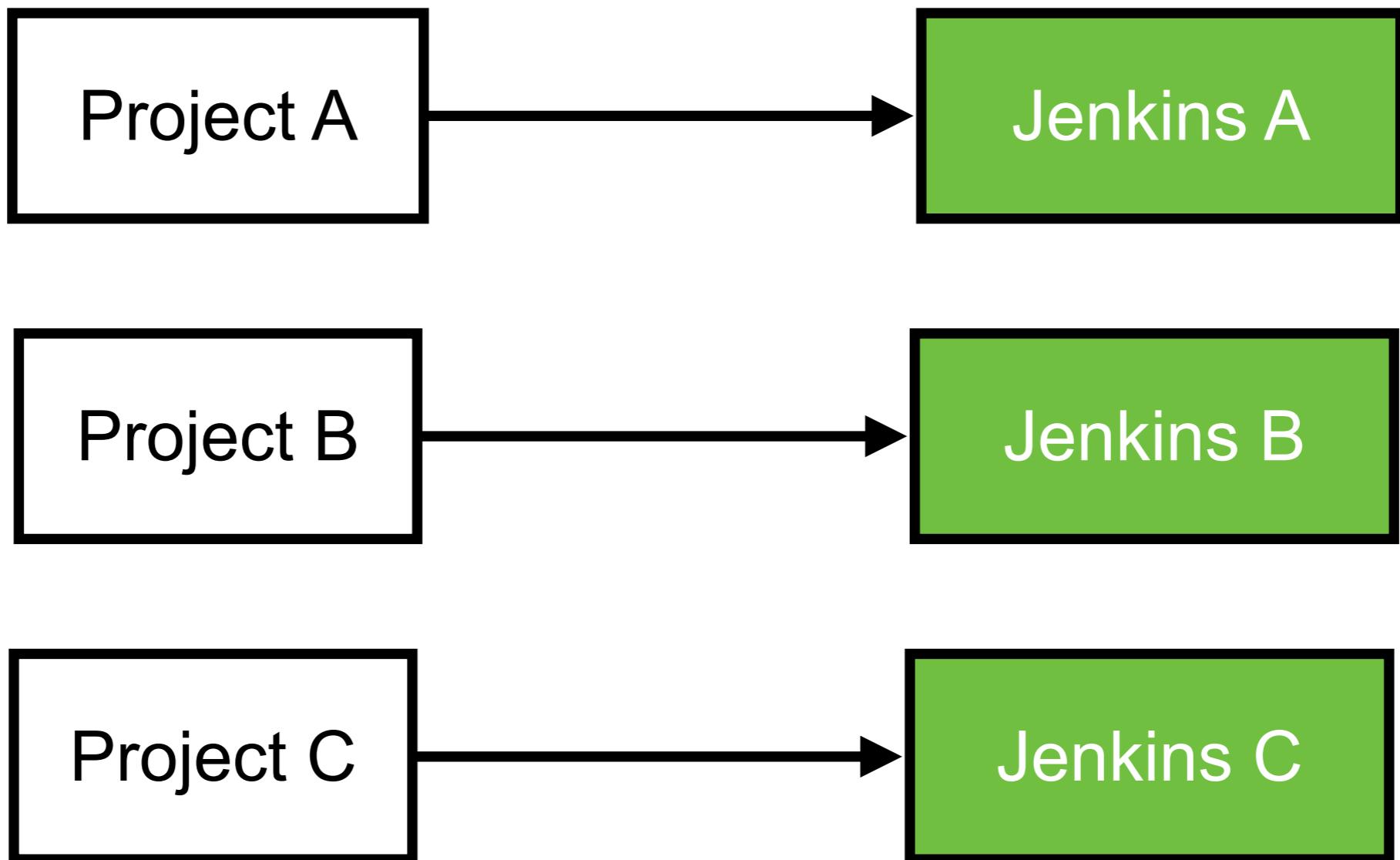
Scale Jenkins

Add more resources for all projects



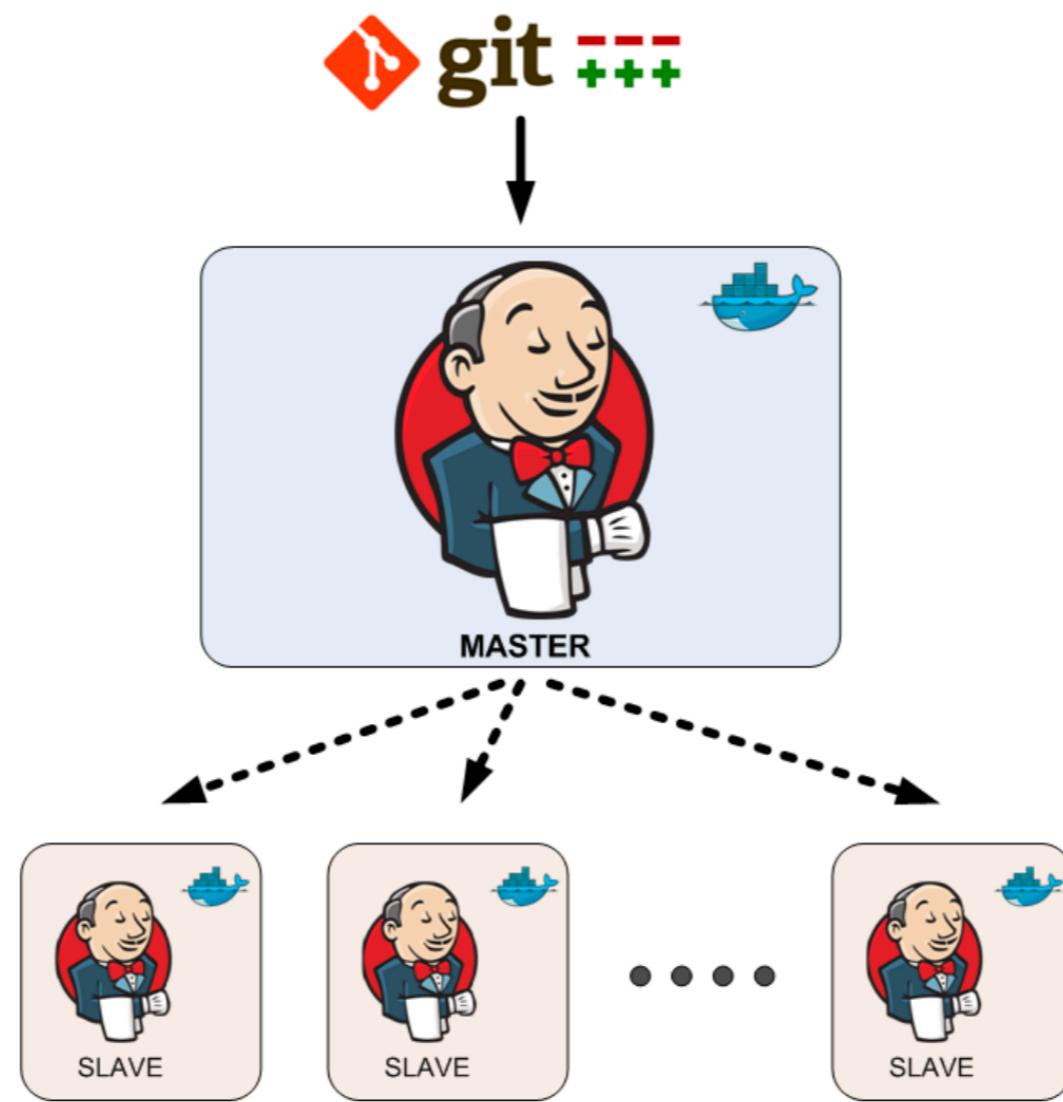
Scale Jenkins

Jenkins server per project



Scale Jenkins

Master and Slaves (Add more nodes)

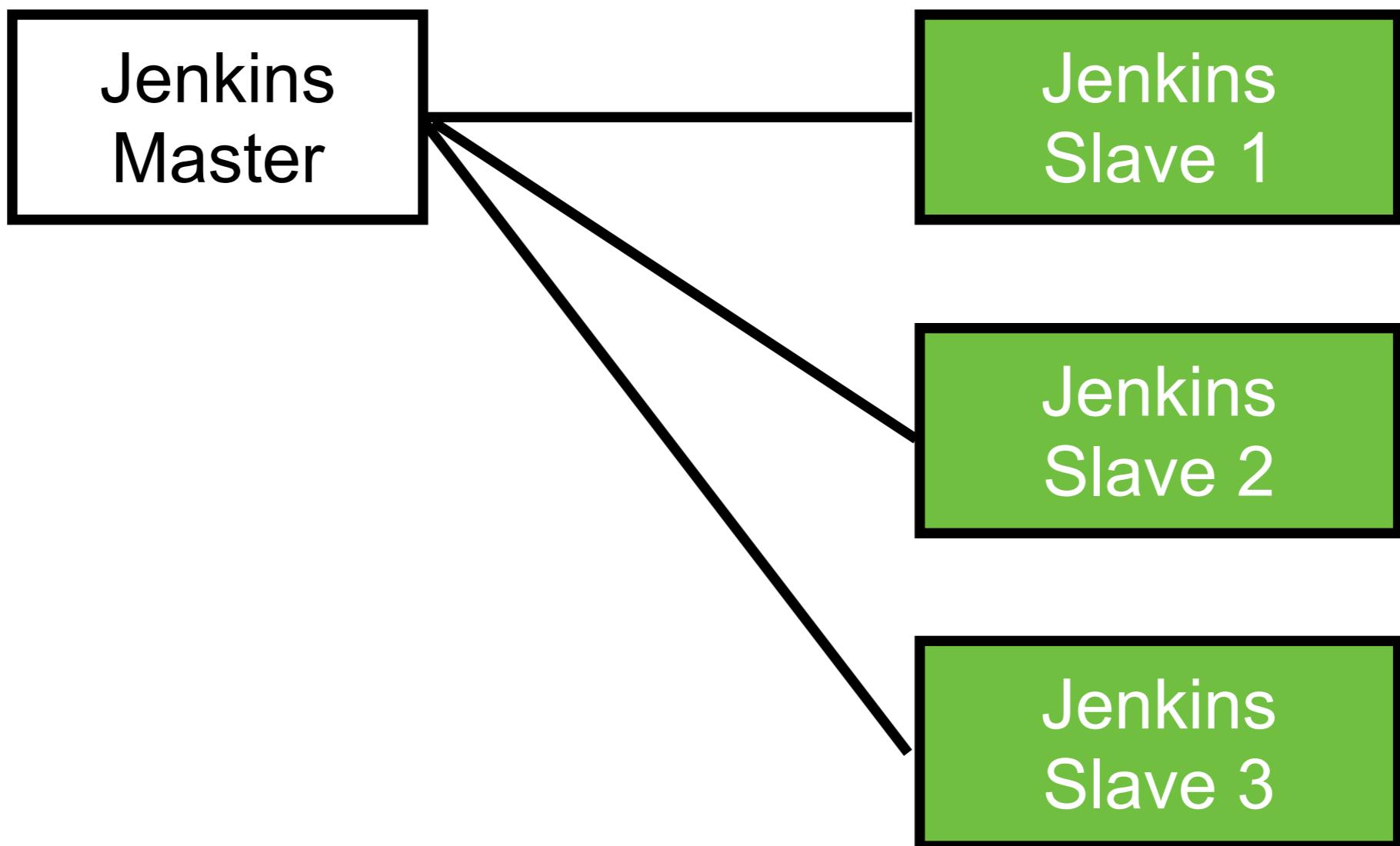


Add new nodes/agents



Scale Jenkins

Jenkins server per project



Create new node

Manage Jenkins -> Manage nodes and clouds

System Configuration

 **Configure System**
Configure global settings and paths.

 **Global Tool Configuration**
Configure tools, their locations and automatic installers.

 **Manage Plugins**
Add, remove, disable or enable plugins that can extend the functionality of Jenkins.
⚠ There are updates available

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

 **Manage Credentials**
Configure credentials

 **Configure Credential Providers**
Configure the credential providers and types



Create new node

Detail of new node

Name	<input type="text" value="worker01"/> worker01
Description	<input type="text"/>
Number of executors	<input type="text" value="1"/>
Remote root directory	<input type="text" value="/var/jenkins_home"/> /var/jenkins_home
Labels	<input type="text" value="worker01"/>



Launch methods

By agent from JNLP/SSH

Launch method

- Launch agent by connecting it to the master
 - Launch agent via execution of command on the master
 - Launch agents via SSH

Custom WorkDir path



Start node with JNLP

How to start a new agent/node ?



Agent worker01

Connect agent to Jenkins one of these ways:

- [Java Web Start is not available for the JVM version running Jenkins](#)
- Run from agent command line:

```
java -jar agent.jar -jnlpUrl http://165.22.244.58:8080/computer/worker01/jenkins-agent.jnlp -secret  
276c622e46b2b0cd0efd93c97b0e51b84b47b2e1c51f11858aae67b01bd68681 -workDir "/var/jenkins_home"
```

Run from agent command line, with the secret stored in a file:

```
echo 276c622e46b2b0cd0efd93c97b0e51b84b47b2e1c51f11858aae67b01bd68681 > secret-file  
java -jar agent.jar -jnlpUrl http://165.22.244.58:8080/computer/worker01/jenkins-agent.jnlp -secret @secre
```

Projects tied to worker01

None



Success with new node

S	Name ↓	Architecture	Clock Difference	Free Disk Space
	master	Linux (amd64)	In sync	51.29 GB
	worker01	Linux (amd64)	In sync	51.29 GB
	Data obtained	1 sec	0.98 sec	0.92 sec



Working with SonarQube



SonarQube

The screenshot shows the SonarQube homepage. At the top, there's a navigation bar with links for Product, What's New, Documentation, Community, and a prominent Download button. A banner at the top of the main content area says "SonarQube 8.9 LTS: Better than ever" with a "Discover Now" button. Below this, the tagline "Your teammate for Code Quality and Code Security" is displayed in large, bold letters. A sub-tagline below it reads "SonarQube empowers all developers to write cleaner and safer code. Join an Open Community of more than 200k dev teams." On the left, a code editor window shows Java code with several annotations. One annotation highlights a potential NullPointerException with the message "A 'NullPointerException' could be thrown; 'providedClass' is nullable here." It also indicates a Bug of Major severity. On the right, a summary card displays quality metrics: Reliability (0 Bugs, A grade), Security (0 Vulnerabilities, 1 Hotspots, A grade), and Maintainability (4.5 grade). A green box on the card states "Quality Gate Passed All conditions passed".

<https://www.sonarqube.org/>



SonarQube Community version

sonarqube Projects Issues Rules Quality Profiles Quality Gates Administration ? Search for projects... A

How do you want to create your project?

Are you just testing or have an advanced use-case? Create a project manually.

Do you want to benefit from all of SonarQube's features (like repository import and Pull Request decoration)? Create your project from your favorite DevOps platform.

i We recommend setting up a DevOps platform configuration so you and your team can benefit from more SonarQube features.



From Azure DevOps
Global configuration not set



From Bitbucket
Global configuration not set



From GitHub
Global configuration not set



From GitLab
Global configuration not set



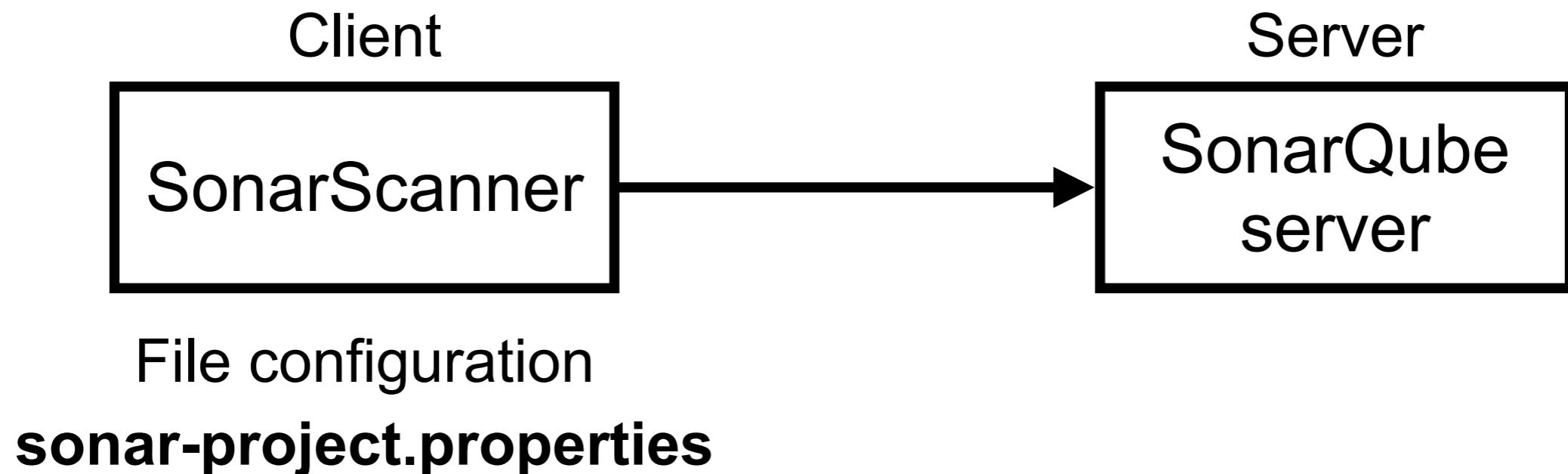
Manually

! Embedded database should be used for evaluation purposes only
The embedded database will not scale, it will not support upgrading to newer versions of SonarQube, and there is no support for migrating your data out of it into a different database engine.

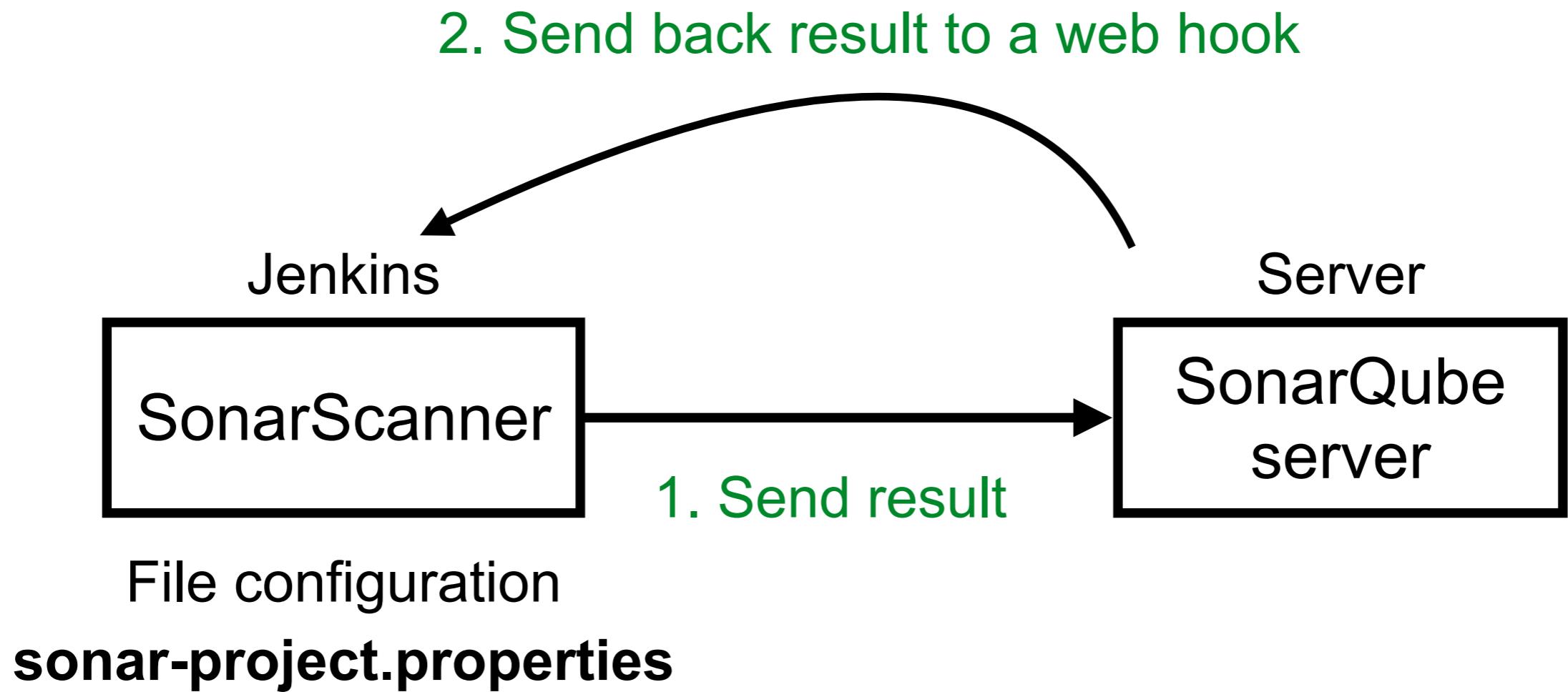
SonarQube™ technology is powered by SonarSource SA
Community Edition - Version 9.0.1 (build 46107) - LGPL v3 - Community - Documentation - Plugins - Web API - About



SonarQube and Scanner



Jenkins + SonarQube



SonarScanner

SonarScanner

By [SonarSource](#) | GNU LGPL 3 | [Issue Tracker](#)

4.6.2 [Show more versions](#)

2021-05-07

Update dependencies, bug fix

[Linux 64-bit](#) [Windows 64-bit](#) [Mac OS X 64-bit](#) [Docker](#)

[Any \(Requires a pre-installed JVM\)](#) [Release notes](#)

The SonarScanner is the scanner to use when there is no specific scanner for your build system.

<https://docs.sonarqube.org/latest/analysis/scan/sonarscanner/>



Generate secret token

User -> My Account -> Security

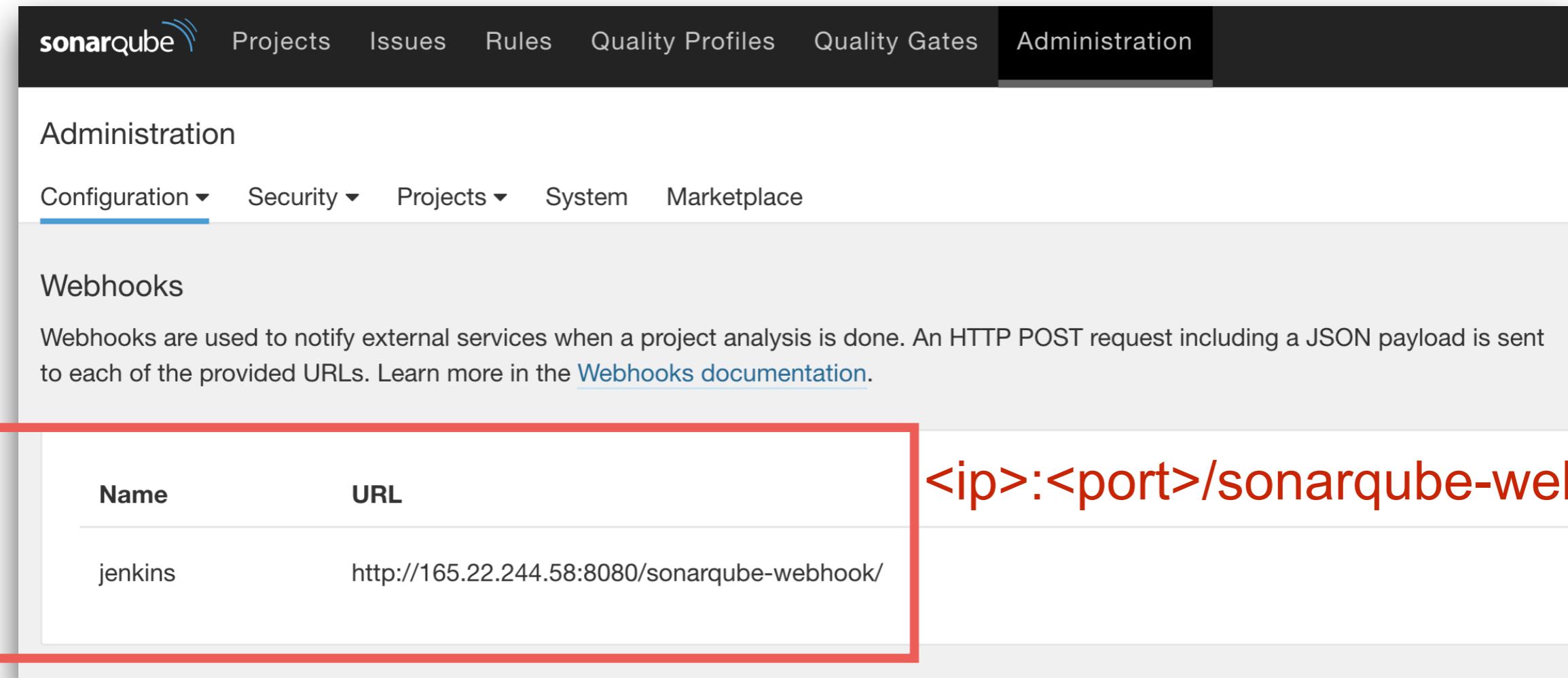
The screenshot shows the 'Tokens' section of the SonarQube 'Security' tab. A green button labeled 'A' is at the top left. The navigation bar includes 'Administrator', 'Profile', 'Security' (which is underlined), 'Notifications', and 'Projects'. The 'Tokens' section has a heading and a descriptive text about using tokens for security instead of user credentials. Below this is a 'Generate Tokens' form with an 'Enter Token Name' input field and a 'Generate' button. A success message box displays a warning icon and the text: 'New token "demo" has been created. Make sure you copy it now, you won't be able to see it again!'. It also shows a 'Copy' button next to the token ID '4f2dcaf29fb346a115bf22586b31b67615e0f080'. A table lists the token details: Name (demo), Last use (Never), Created (August 25, 2021), and a 'Revoke' button.

Name	Last use	Created	
demo	Never	August 25, 2021	Revoke



Create SonarQube Webhook

Administration -> Configuration -> Webhooks



The screenshot shows the SonarQube administration interface. The top navigation bar includes links for sonarqube, Projects, Issues, Rules, Quality Profiles, Quality Gates, and Administration. The Administration link is highlighted. Below the navigation, the Configuration tab is selected. The main content area is titled "Webhooks". It explains that webhooks are used to notify external services when a project analysis is done, using an HTTP POST request with a JSON payload. A link to the "Webhooks documentation" is provided. A table lists existing webhooks:

Name	URL
jenkins	http://165.22.244.58:8080/sonarqube-webhook/

A red box highlights the "jenkins" row in the table. To the right of the table, the URL "http://<ip>:<port>/sonarqube-webhook/" is displayed in red text.



SonarScanner for Jenkins

SonarScanner for Jenkins

By [SonarSource](#)

GNU LGPL 3

[Issue Tracker](#)

2.13.1

[Show more versions](#)

2021-04-30

Update dependencies

[Download](#) [Release notes](#)

This plugin lets you centralize the configuration of SonarQube server connection details in Jenkins global configuration.

Then you can trigger SonarQube analysis from Jenkins using standard Jenkins Build Steps or [Jenkins Pipeline DSL](#) to trigger analysis with:

- [SonarScanner](#)
- [SonarScanner for Maven](#)
- [SonarScanner for Gradle](#)
- [SonarScanner for .NET](#)

<https://docs.sonarqube.org/latest/analysis/scan/sonarscanner-for-jenkins/>



SonarScanner for Jenkins

SonarQube Scanner

Documentation

Releases

Issues

Dependencies

Older versions of this plugin may not be safe to use. Please review the following warnings before using an older version:

- Server authentication token stored in plain text

Documentation of SonarQube plugin available in SonarQube wiki

<http://redirect.sonarsource.com/plugins/jenkins.html>

Please don't use this page to ask questions or report bugs.

This plugin allow easy integration of **SonarQube™**, the open source platform for Continuous Inspection of code quality.

<https://plugins.jenkins.io/sonar/>



SonarScanner for Jenkins

SonarQube Scanner



External Site/Tool Integrations

Build Reports

2.13.1

This plugin allows an easy integration of **SonarQube**, the open source platform for Continuous Inspection of code quality.

Sonar Quality Gates

Fails the build whenever the Quality Gates criteria in the Sonar 5.6+ analysis aren't met (the project Quality Gates status is different than "Passed")



Warning: This plugin version may not be safe to use. Please review the following security notices:

1.3.1

- Credentials transmitted in plain text

<https://plugins.jenkins.io/sonar/>



Config SonarQube Server

Manage Jenkins -> Configure System

SonarQube servers

Environment variables Enable injection of SonarQube server configuration as build environment variables

If checked, job administrators will be able to inject a SonarQube server configuration as environment variables in the build.

SonarQube installations

Name

sonarqube

 **This property is mandatory.**

Server URL

Default is http://localhost:9000

Server authentication token

- none -    

SonarQube authentication token. Mandatory when anonymous access is disabled.



Config SonarQube Scanner

Manage Jenkins -> Global tool configuration

SonarQube Scanner

SonarQube Scanner installations

Add SonarQube Scanner

SonarQube Scanner

Name **scanner**

Required

Install automatically ?

Install from Maven Central

Version **SonarQube Scanner 4.6.2.2472**

Delete Installer

Add Installer ▾

Delete SonarQube Scanner



Pipeline in Jenkins

```
stage('Sonarqube') {
```

Reference to SonarQube Scanner

```
    environment {
        scannerHome = tool 'scanner'
    }
    steps {
        withSonarQubeEnv('sonarqube') {
            sh "${scannerHome}/bin/sonar-scanner"
        }
        timeout(time: 10, unit: 'MINUTES') {
            waitForQualityGate abortPipeline: true
        }
    }
}
```



Pipeline in Jenkins

```
stage('Sonarqube') {  
  
    environment {  
        scannerHome = tool 'scanner'  
    }  
    steps {  
        Use config of SonarQube Server  
        withSonarQubeEnv('sonarqube') {  
            sh "${scannerHome}/bin/sonar-scanner"  
        }  
        timeout(time: 10, unit: 'MINUTES') {  
            waitForQualityGate abortPipeline: true  
        }  
    }  
}
```



Pipeline in Jenkins

```
stage('Sonarqube') {  
  
    environment {  
        scannerHome = tool 'scanner'  
    }  
    steps {  
        withSonarQubeEnv('sonarqube') {  
            sh "${scannerHome}/bin/sonar-scanner"  
        }  
        timeout(time: 10, unit: 'MINUTES') {  
            waitForQualityGate abortPipeline: true  
        }  
    }  
}
```

**Waiting result from SonarQube Server
via webhook**



Result of SonarQube via webhook

SonarQube Quality Gate

demo01 Passed

server-side processing: Success

Permalinks

- [Last build \(#43\), 17 sec ago](#)
- [Last stable build \(#43\), 17 sec ago](#)
- [Last successful build \(#43\), 17 sec ago](#)
- [Last failed build \(#40\), 24 min ago](#)
- [Last unsuccessful build \(#42\), 6 min 27 sec ago](#)
- [Last completed build \(#43\), 17 sec ago](#)



Using Docker

```
docker container run \
    --rm \
    -e SONAR_HOST_URL="${SONAR_URL}" \
    -e SONAR_LOGIN="${SONAR_SECRET}" \
    -v ${SOURCE_PATH}:/usr/src \
    sonarsource/sonar-scanner-cli
```

<https://hub.docker.com/r/sonarsource/sonar-scanner-cli>

