

CI and CD



Jenkins



Somkiat Puisungnoen

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CI and CD



Jenkins



Agenda

Concept of Continuous Integration
Concept of Continuous Delivery
Build pipeline



Agenda

All about Jenkins

Installation and configuration

Using plugins

Setup build pipeline with Jenkins

Build and deploy with Jenkins

Perform testing with Jenkins

Using metrics to improve quality



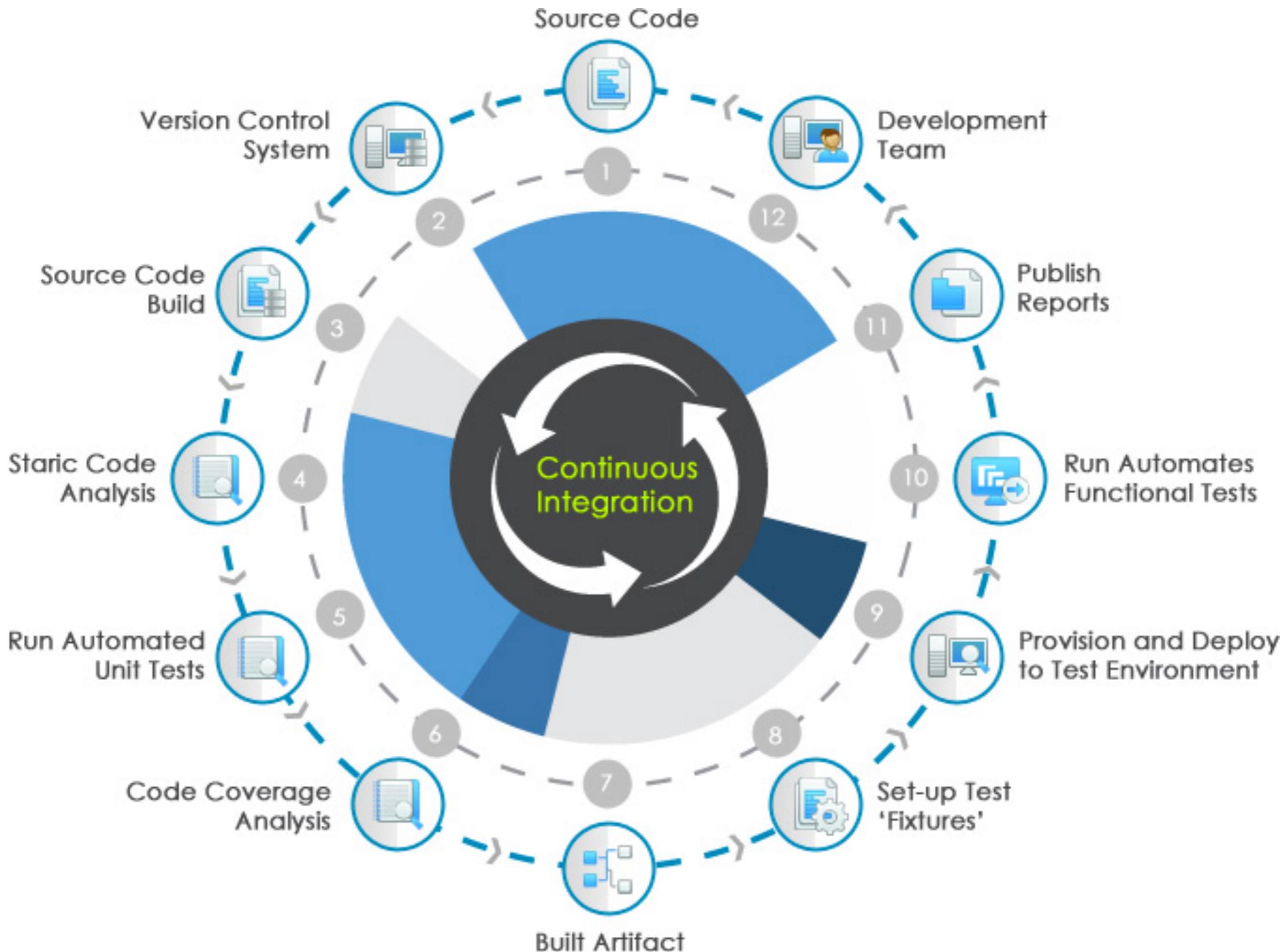
Agenda

Backup and Restore data
Understand the Master/Slave



Continuous Integration







Jenkins

Bamboo



TeamCity

> go™



Hudson





Jenkins

Bamboo

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



Hudson



CI is a practice

Discipline to integrate frequently



CI is a practice

Strive to make small change

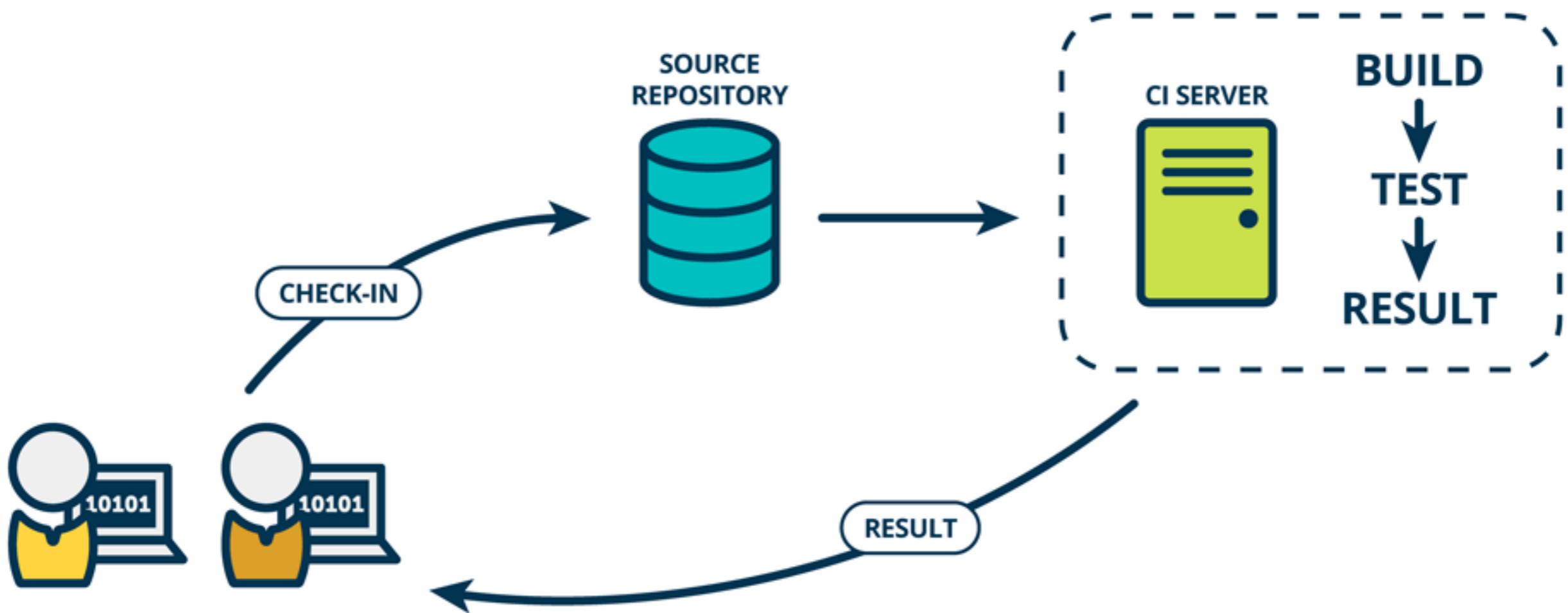


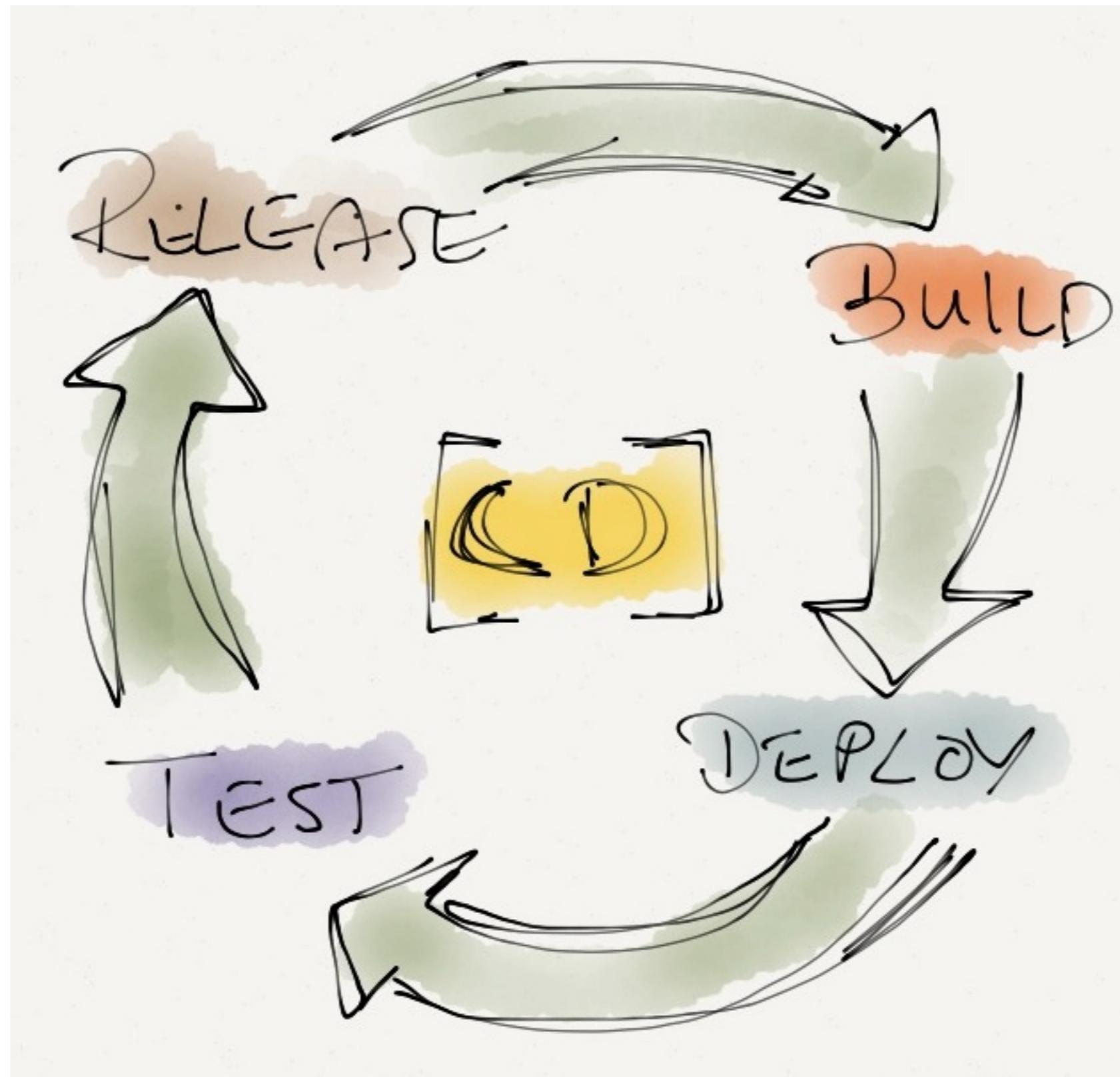
CI is a practice

Strive for **fast feedback**



Continuous Integration





CONTINUOUS DELIVERY



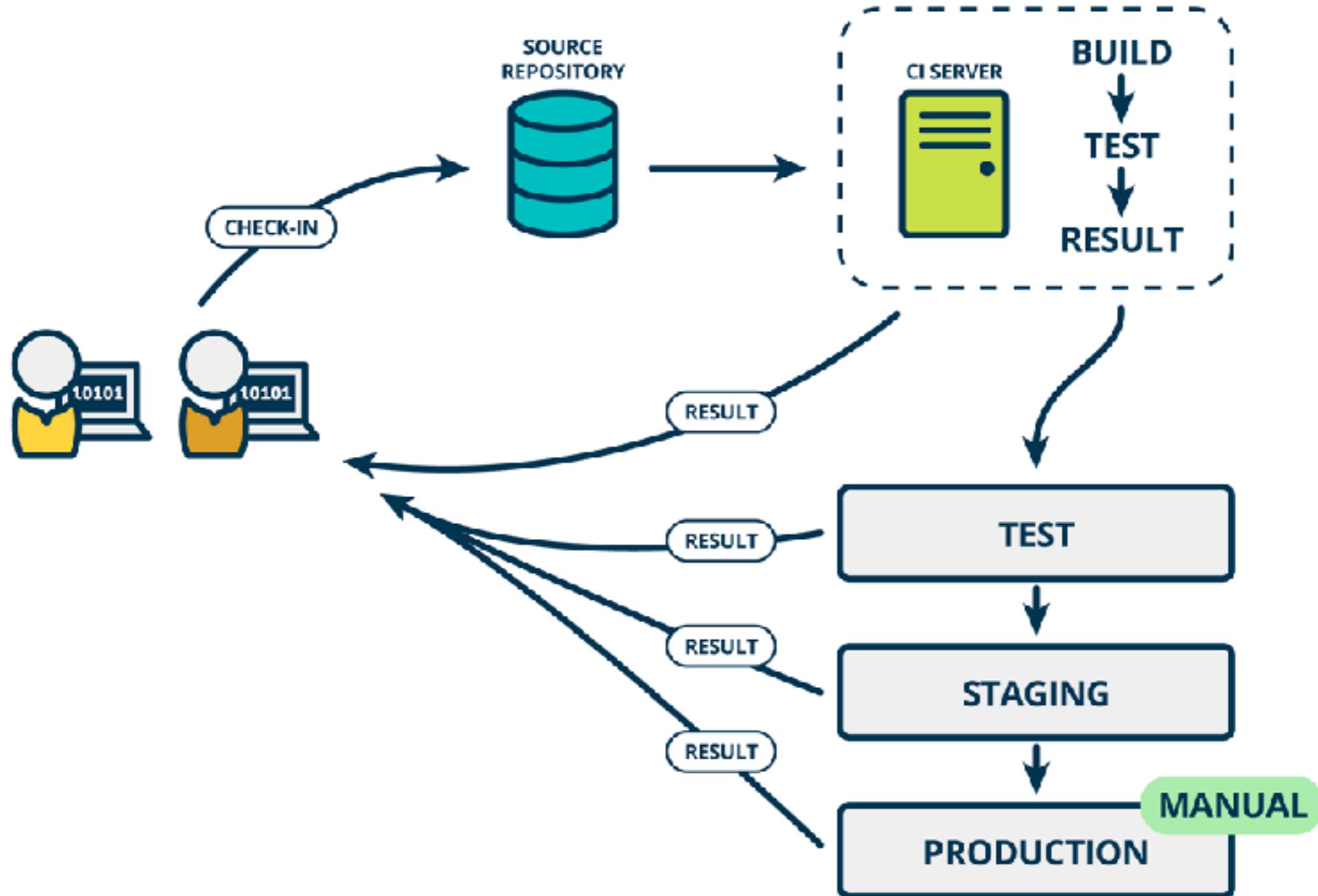
CONTINUOUS DEPLOYMENT



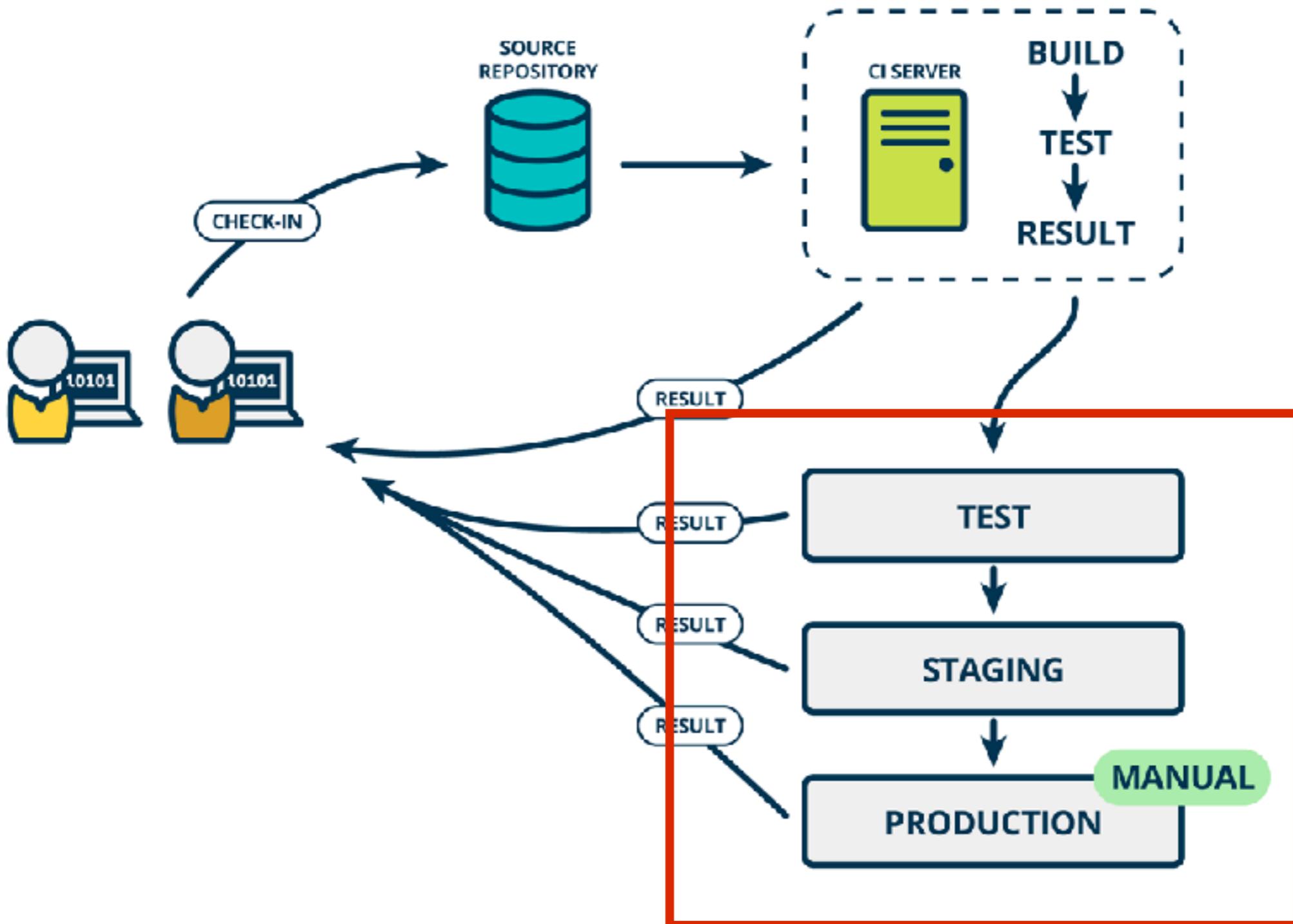
<http://blog.crisp.se/2013/02/05/yassalsundman/continuous-delivery-vs-continuous-deployment>



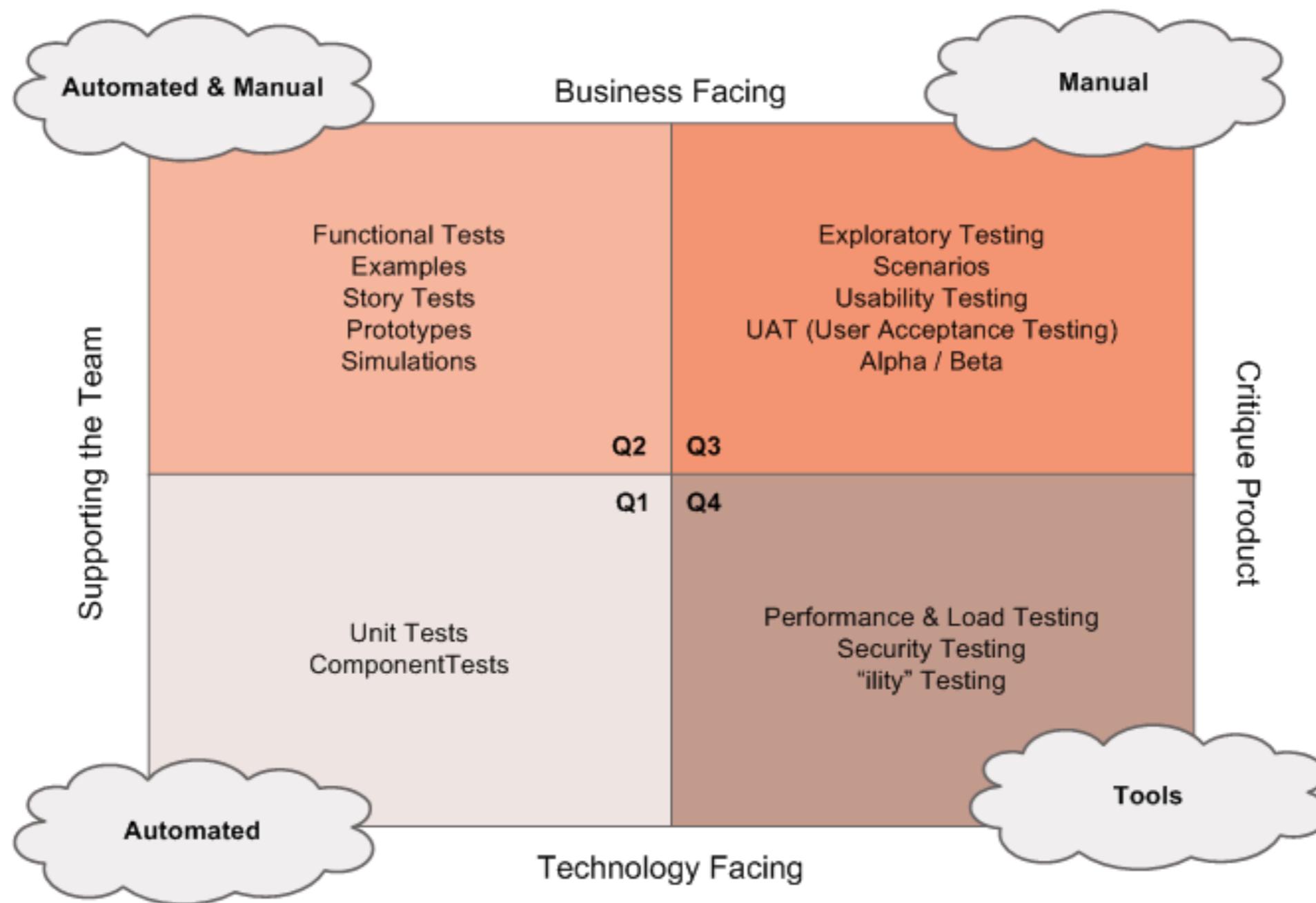
Continuous Delivery



Rising of DevOps



Agile Testing Quadrants



Are you too busy to improve?



Continuous Integration

is a software development practices



1. Maintain a Single Source Repository



2. Automate the Build



3. Make your build Self-Testing



**4. Everyone commit change
to the mainline everyday**



5. Every commit should Build on an Integration Machine



6. Keep the build fast



7. Testing in a clone of the production environment



**8. Make it easy for everyone
to get the latest executable**



9. Everyone can see what's happening



10. Automate Deployment



Good habits with CI



**Developer should work in
the private workspace**



Rebase frequently from the mainline



Check-in/push frequently



Frequent build



**Automate the testing
as much as possible**



**Don't check-in/push
when the build is broken**



Automate the deployment



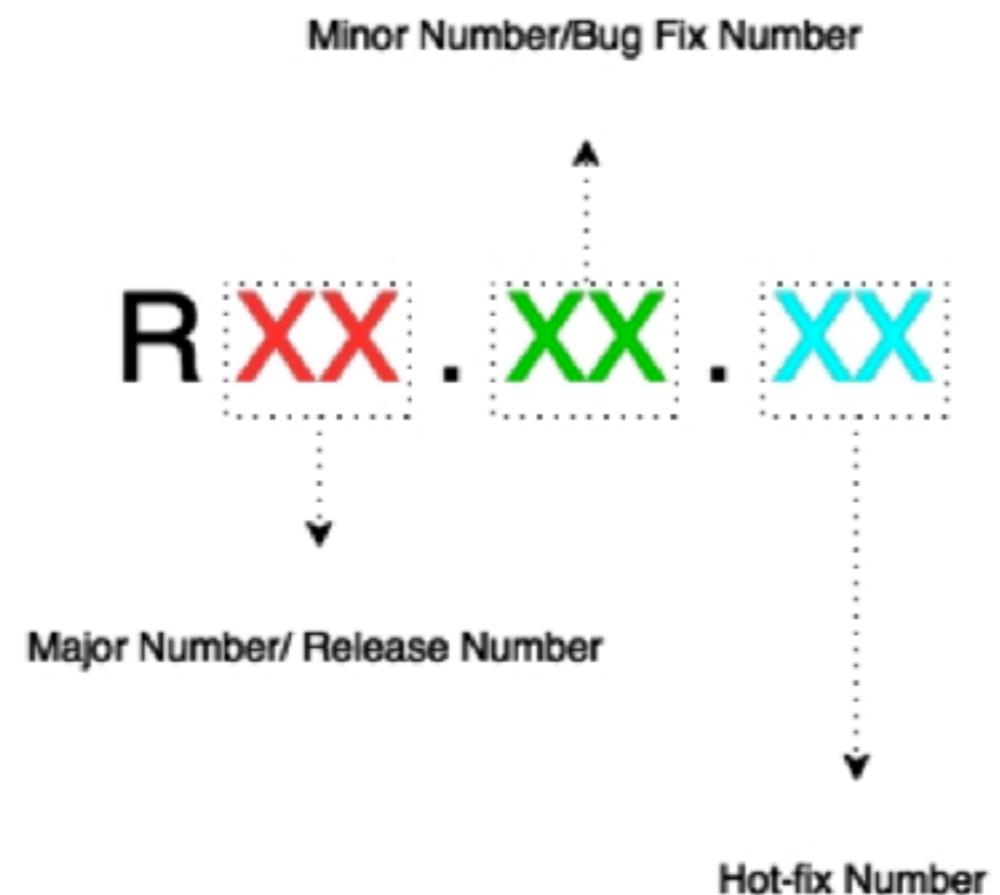
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Have a labeling strategy fore releases



Instant notification





How to achieve CI ?

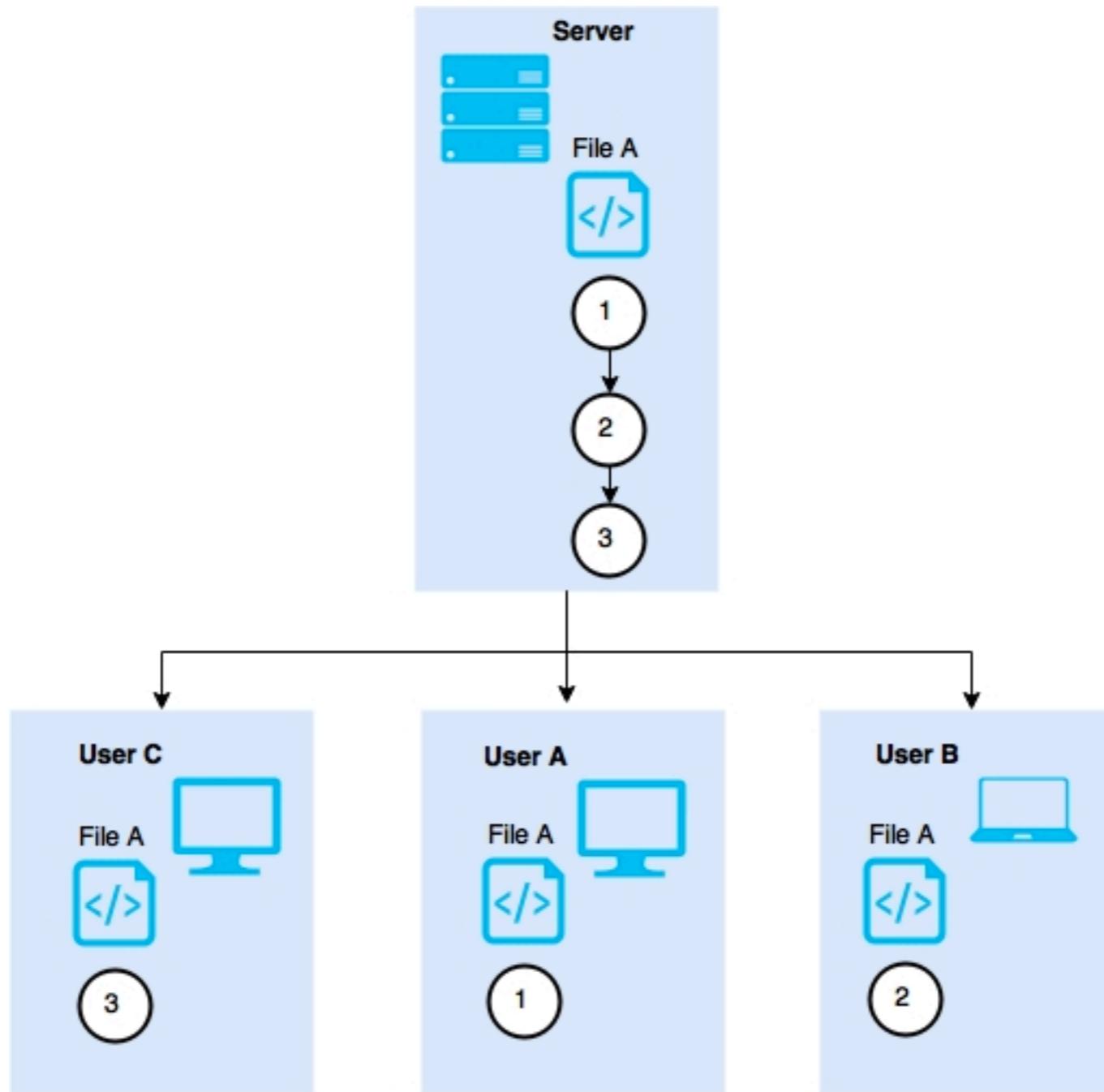


1. Use version control system

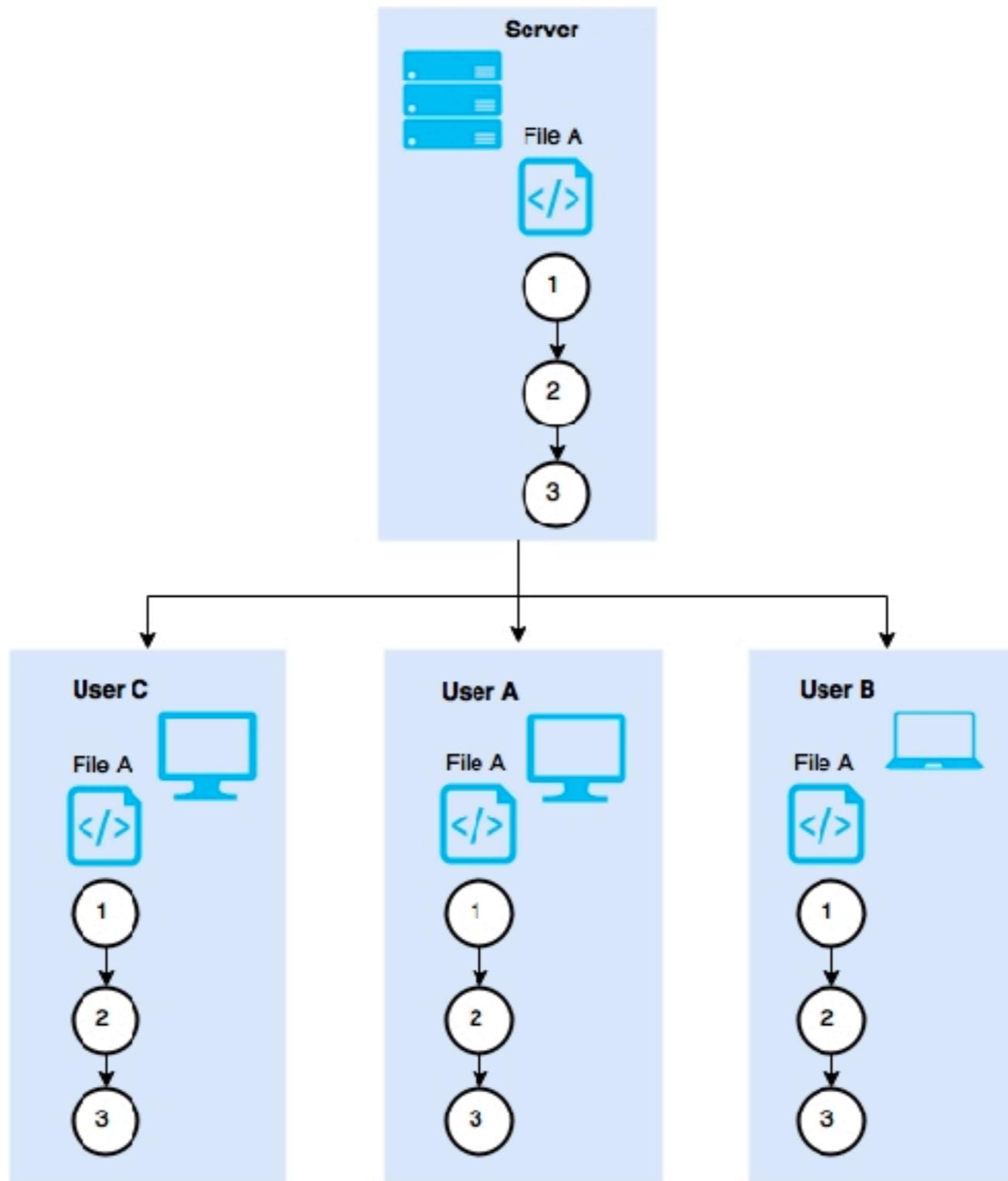
Local
Centralize
Distributed



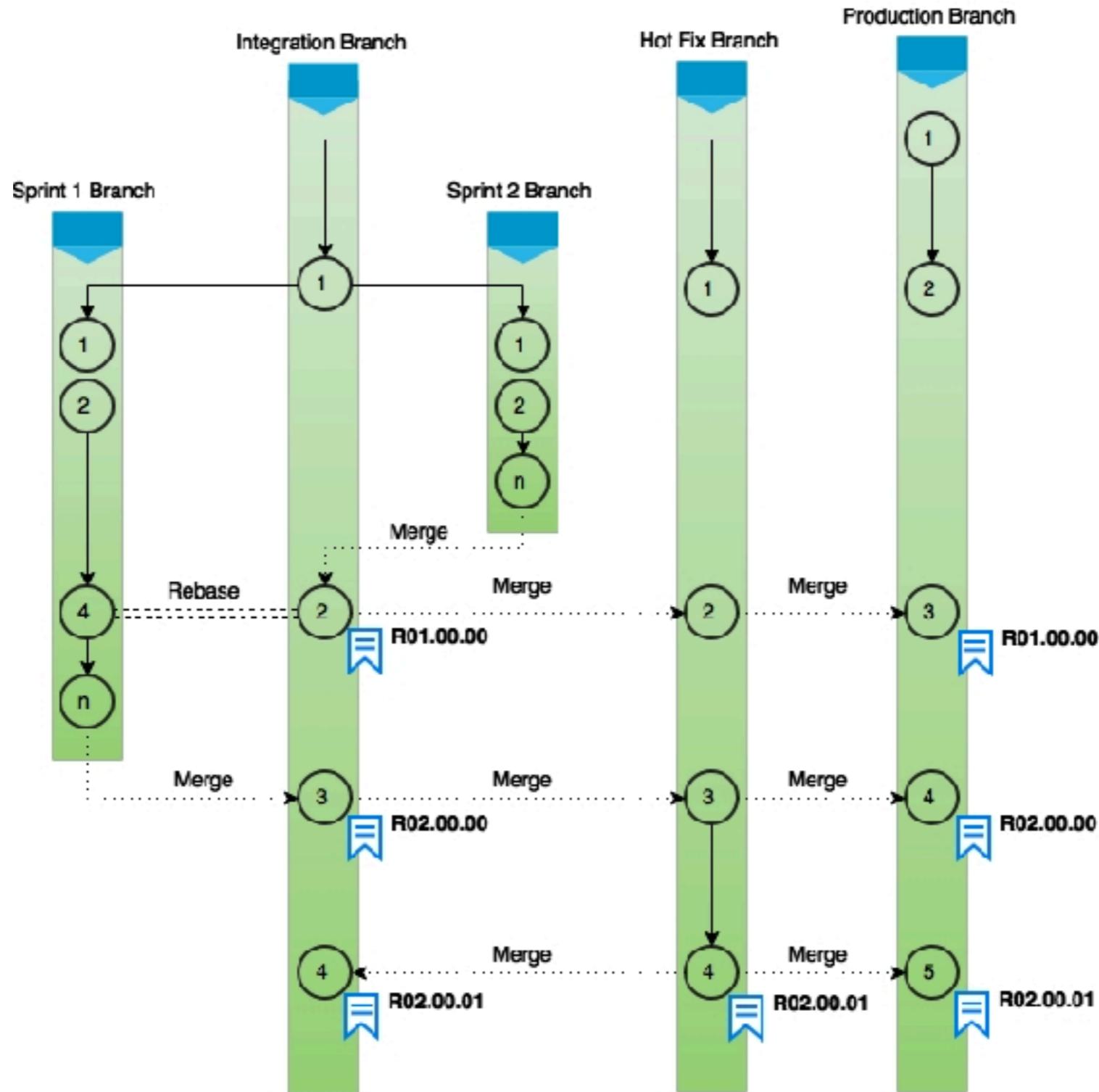
Centralize version control



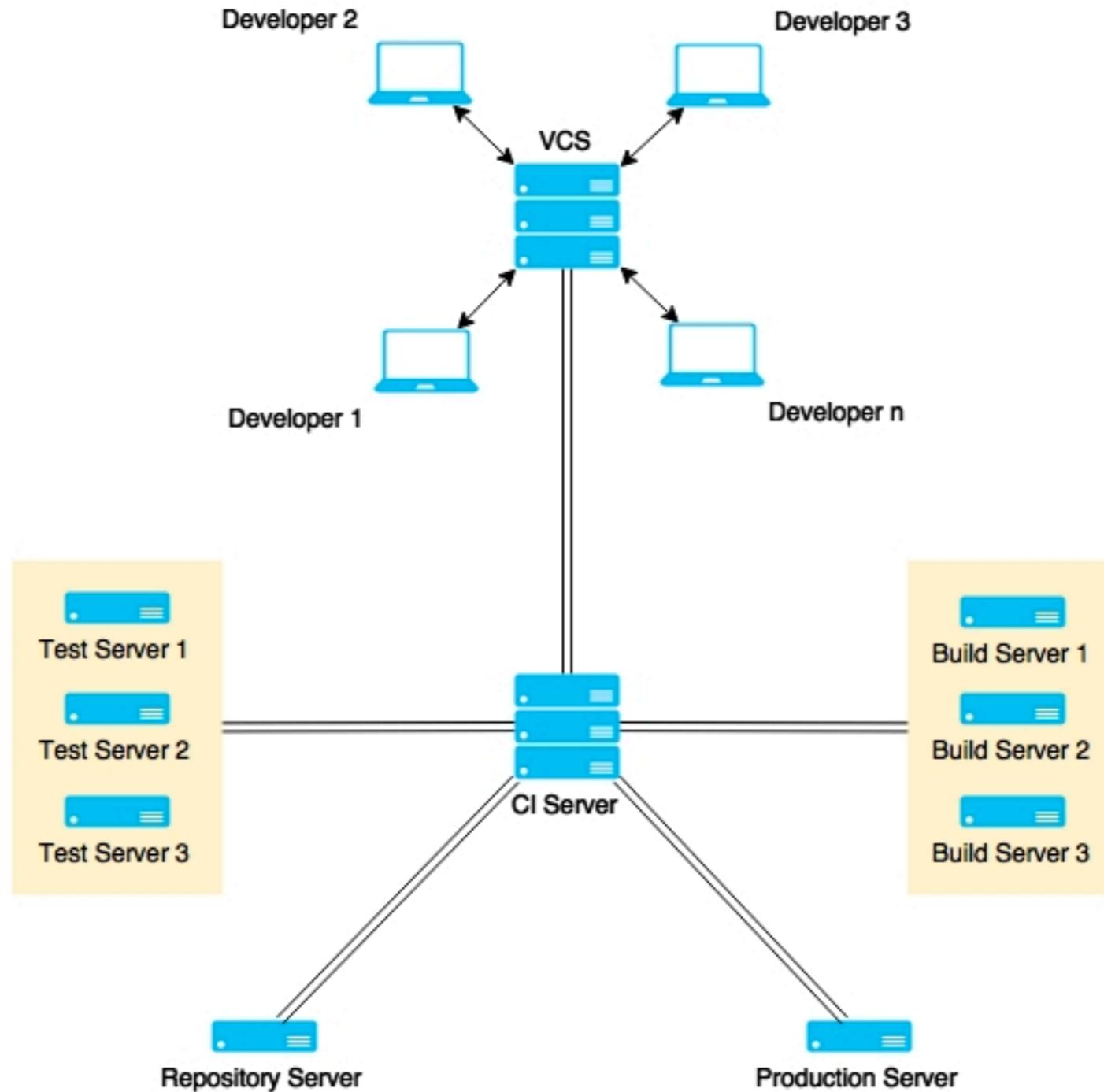
Distributed version control



Branch strategies

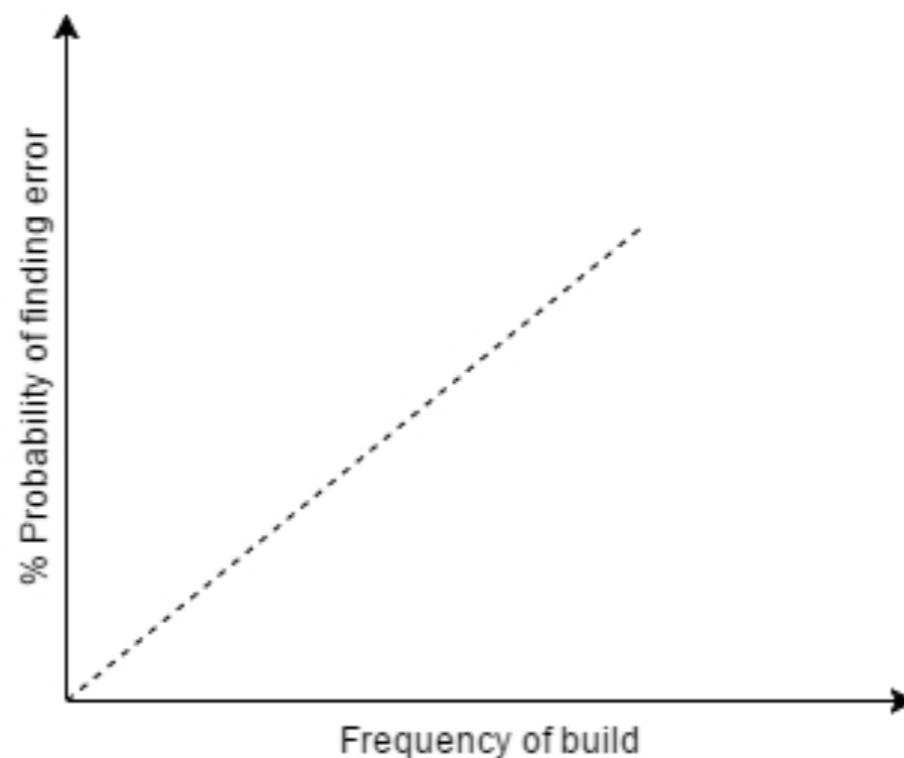


2. Use CI tool

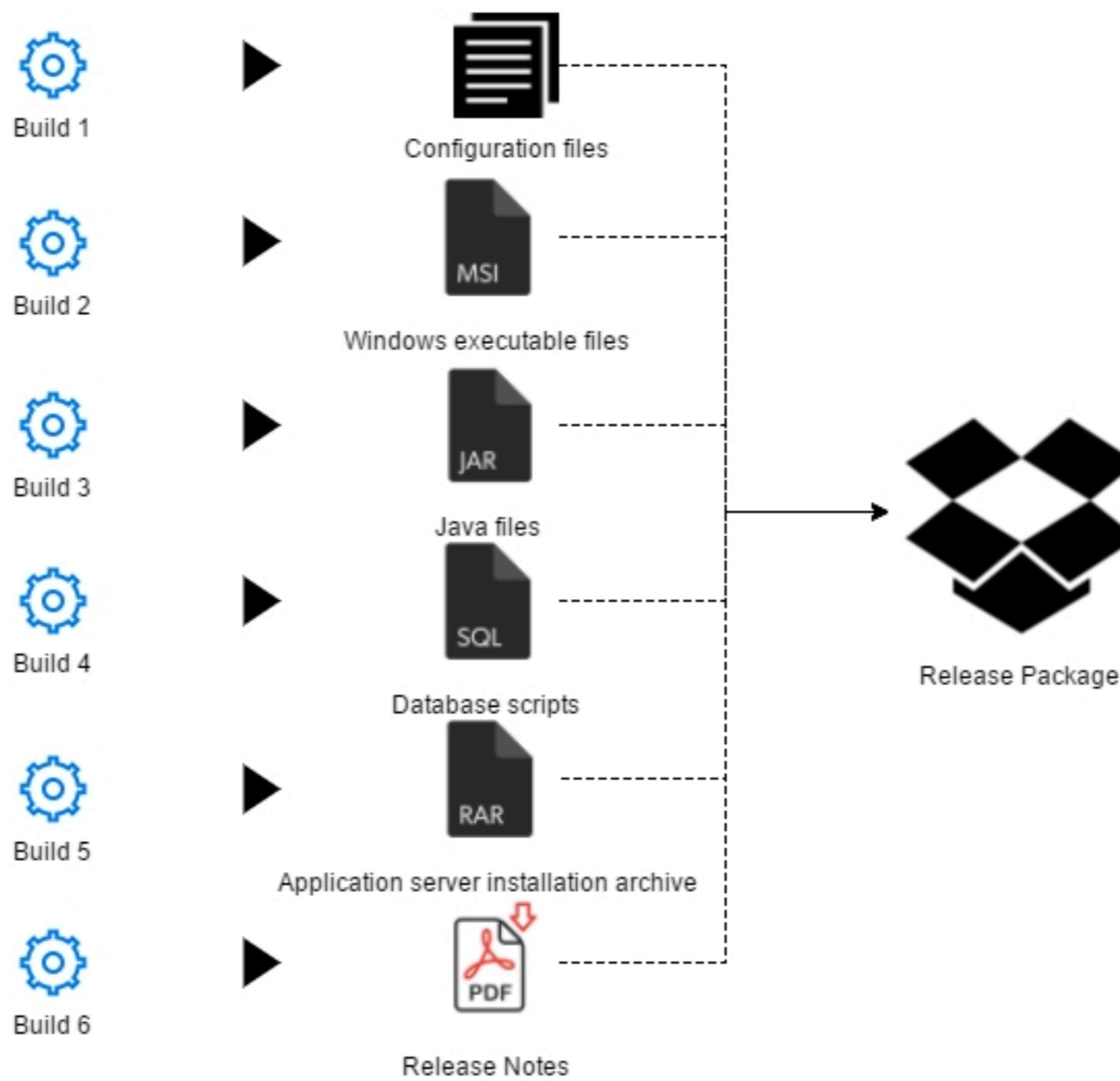


3. Create self-trigger build

Speed
Catching issues as early as possible



4. Automate the packing



5. Using build tools

- Javascript
 - Gulp, Grunt, Brocolli



- C#/.NET
 - Nant, MSBuild



- Java/JVM
 - Ant, Maven, Gradle, SBT, Leiningen



Use static code analysis



**Use static code analysis
Automate testing**



Use static code analysis
Automate testing
Automate deployment



Use static code analysis
Automate testing
Automate deployment
Backward traceability



Use static code analysis
Automate testing
Automate deployment
Backward traceability
Use defect tracking tool



"Behind every successful agile project,
there is a **Continuous Integration** server."



Let's start with Jenkins



What is Jenkins ?

Application and framework
manage and monitor
the execution of repeated tasks



Why Jenkins ?

Easy !!

Extensible

Scalable

Flexible

Open source

Community support

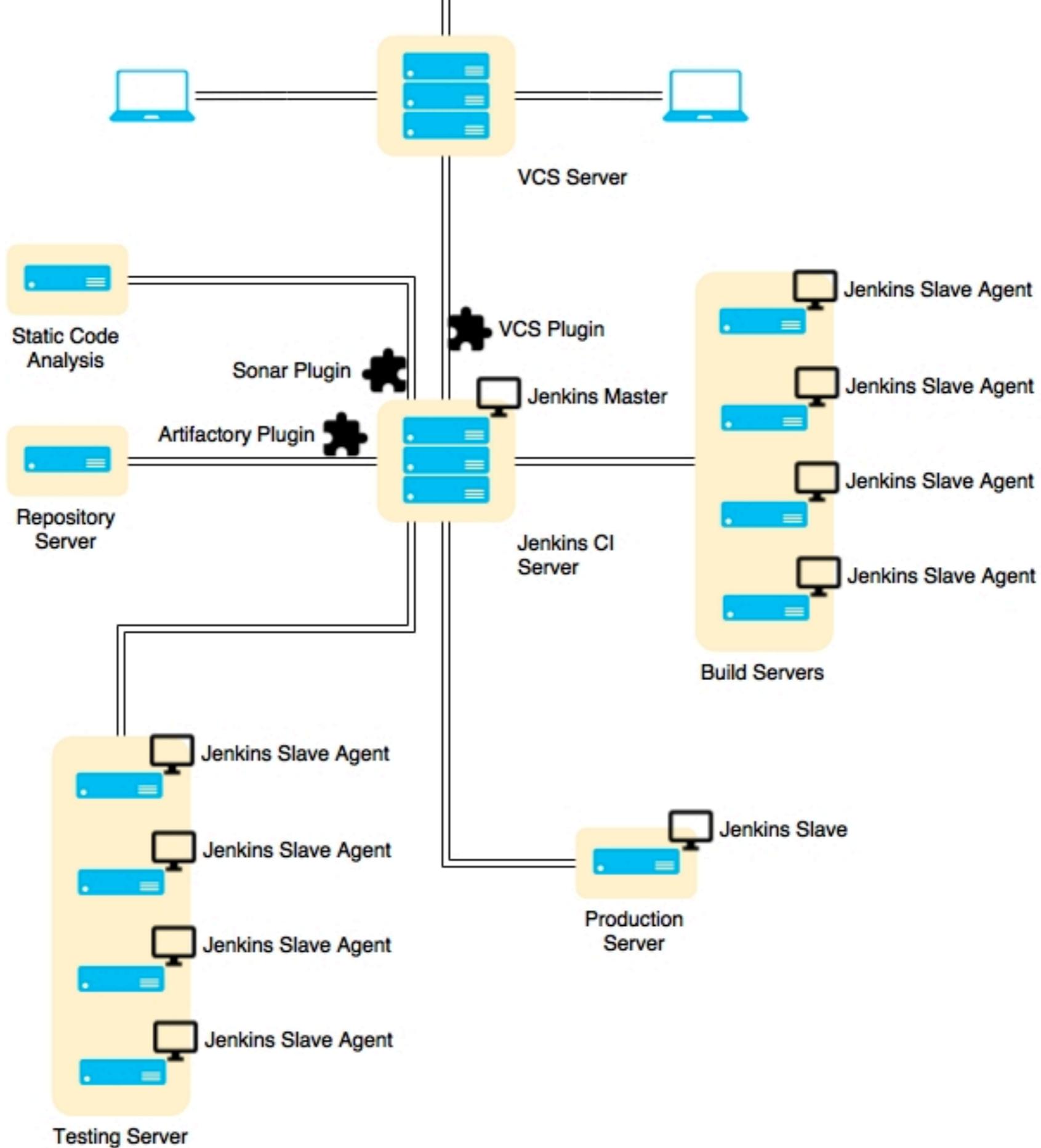
Lots of plugins

Cloud support



Jenkins => Centralize CI Server





Hardware requirements

Jenkins master server

RAM +2GB and up to +60GB

More CPU

More disk space for job running

Jenkins slave server

More RAM for connect to master server



Setting up Jenkins



Jenkins in container

Apache Tomcat

JBoss

Jetty

WebLogic

IBM Websphere

Glassfish



Download



The Jenkins logo is a cartoon character with a large, round head and a small body. It has a smiling face with simple features. It is wearing a blue suit jacket over a white shirt with a red bow tie. It is holding a white coffee cup in its right hand.

Jenkins

Build great things at any scale

The leading open source automation server, Jenkins provides hundreds of plugins to support building, deploying and automating any project.

[Documentation](#) [Download](#)

<https://jenkins.io/index.html>



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Use Long-term support (LTS)

Getting started with Jenkins

The Jenkins project produces two release lines, LTS and weekly. Depending on your organization's needs, one may be preferred over the other.

Both release lines are distributed as `.war` files, native packages, installers, and Docker containers.

Long-term Support (LTS)

LTS (Long-Term Support) releases are chosen every 12 weeks from the stream of regular releases as the stable release for that time period. [Learn more...](#)

[Changelog](#) | [Upgrade Guide](#) | [Past Releases](#)

[Deploy Jenkins 2.46.3](#)

 [Deploy to Azure](#)

[Download Jenkins 2.46.3 for:](#)

Docker

FreeBSD

Weekly

A new release is produced weekly to deliver bug fixes and features to users and plugin developers.

[Changelog](#) | [Past Releases](#)

[Download Jenkins 2.65 for:](#)

Arch Linux

Docker

FreeBSD

Gentoo



Start Jenkins

```
$java -jar jenkins.war
```



Change Port of Jenkins (8080)

```
$java -jar jenkins.war --httpPort=<port>
```



Change Jenkins's Home

For Windows

```
$set JENKINS_HOME=<your path>
```

For UNIX/MAC

```
$export JENKINS_HOME=<your path>
```



Open in browser

http://localhost:8080

The screenshot shows the Jenkins 'Unlock Jenkins' setup page. At the top left, there is a 'Getting Started' link. The main title 'Unlock Jenkins' is displayed prominently. Below it, a text block explains that a password has been written to the log and a specific file on the server. A red box highlights the 'Administrator password' input field, which is currently empty. A 'Continue' button is located at the bottom right.

Getting Started

Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log (not sure where to find it?) and this file on the server:

/Users/somkiat/data/slide/ci-cd/swpark/software/keep/secrets/initialAdminPassword

Please copy the password from either location and paste it below.

Administrator password

Continue



Copy password from console

```
*****  
*****  
*****
```

Jenkins initial setup is required. An admin user has been created.

Please use the following password to proceed to installation:

a4b3a5231b8048419192d0c5afd3fce8

This may also be found at: /Users/somkiat/data/slide/ci-cd/swpa/initialAdminPassword

```
*****  
*****  
*****
```



Custom your plug-ins

Getting Started X

Customize Jenkins

Plugins extend Jenkins with additional features to support many different needs.

Install suggested plugins

Install plugins the Jenkins community finds most useful.

Select plugins to install

Select and install plugins most suitable for your needs.

Jenkins 2.46.3



Waiting ...

Getting Started

Getting Started

<input type="radio"/> Folders Plugin	<input type="radio"/> OWASP Markup Formatter Plugin	<input type="radio"/> build timeout plugin	<input type="radio"/> Credentials Binding Plugin
<input type="radio"/> Timestamper	<input type="radio"/> Workspace Cleanup Plugin	<input type="radio"/> Ant Plugin	<input type="radio"/> Gradle Plugin
<input type="radio"/> Pipeline	<input type="radio"/> GitHub Organization Folder Plugin	<input type="radio"/> Pipeline: Stage View Plugin	<input type="radio"/> Git plugin
<input type="radio"/> Subversion Plug-in	<input type="radio"/> SSH Slaves plugin	<input type="radio"/> Matrix Authorization Strategy Plugin	<input type="radio"/> PAM Authentication plugin
<input type="radio"/> LDAP Plugin	<input type="radio"/> Email Extension Plugin	<input type="radio"/> Mailer Plugin	

** - required dependency

Jenkins 2.46.3



Success

Getting Started

Installation Failures

Some plugins failed to install properly, you may retry installing them or continue with

✓ Folders Plugin	✓ OWASP Markup Formatter Plugin	✓ build timeout plugin	✓ Credentials Binding Plugin
✓ Timestamper	✓ Workspace Cleanup Plugin	✓ Ant Plugin	✓ Gradle Plugin
✓ Pipeline	✓ GitHub Organization Folder Plugin	✓ Pipeline: Stage View Plugin	✓ Git plugin
✓ Subversion Plug-in	✓ SSH Slaves plugin	✓ Matrix Authorization Strategy Plugin	✓ PAM Authentication plugin
✓ LDAP Plugin	✓ Email Extension Plugin	✓ Mailer Plugin	

Jenkins 2.46.3

[Continue](#)

[Retry](#)



Create new user

Getting Started

Create First Admin User

Username:

Password:

Confirm password:

Full name:

E-mail address:

Jenkins 2.46.3

[Continue as admin](#)

[Save and Finish](#)



Ready !!!

Getting Started

Jenkins is ready!

Your Jenkins setup is complete.

[Start using Jenkins](#)

Jenkins 2.46.3



Welcome to Jenkins

The screenshot shows the Jenkins dashboard. At the top, there is a navigation bar with the Jenkins logo, a search bar, and user information for 'somkiat'. Below the navigation bar, the main content area features a large 'Welcome to Jenkins!' message and a button to 'create new jobs'. On the left side, there is a sidebar with links for 'New Item', 'People', 'Build History', 'Manage Jenkins', 'My Views', and 'Credentials'. Below the sidebar, there are two collapsed sections: 'Build Queue' (showing 'No builds in the queue.') and 'Build Executor Status' (showing '1 Idle' and '2 Idle'). At the bottom of the page, there is a footer with the text 'Page generated: Jun 14, 2017 2:08:57 PM ICT REST API Jenkins ver. 2.46.3'.

