

3 POLA DEPLOY APP CEPAT DENGAN GITLAB CI/CD

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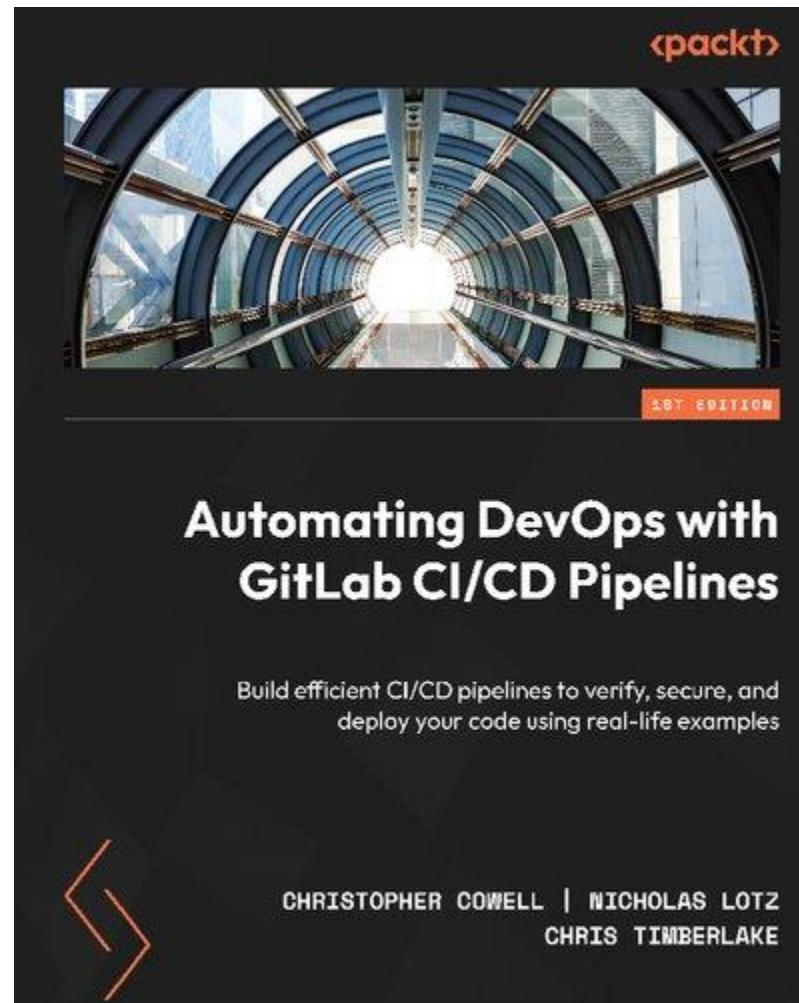


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Textbooks



COURSE OUTLINE

1. PENGANTAR GIT DAN GITLAB

- [1.1 APA ITU GIT](#)
- [1.2 APA ITU GITLAB](#)

2. CI/CD PIPELINE

- [2.1 MENGAPA PERLU CI/CD](#)
- [2.2 PIPELINES & CI/CD](#)
- [2.3 GITLAB RUNNERS](#)

3. IMPLEMENTASI GITLAB CI/CD

- [3.1 IMPLEMENTASI CI/CD PADA GITLAB](#)
- [3.2 SUMMARY](#)

1. PENGANTAR **GIT** DAN **GITLAB**

1.1 APA ITU **GIT**

1.2 APA ITU **GITLAB**





1.1 APA ITU GIT







Version Control System (**VCS**)

VCS is a **tool** designed to make it easier for one or more **developers** to work with a set of files.

VCS have some features to offer

- Provides backups of files in case current versions are lost or accidentally overwritten.
- Shows how a file's contents have changed over time.
- Shows who made which changes to which files, and when
- Allow developers to work with the same file



What is Git?

Git is a **Version Control System** for:

1. A way to manage files and directories
2. Track changes over time
3. Recall previous versions
4. “Source control” is a subset of a VCS

! note: Git tracks changes, not versions

How to use Git?

3. Commit changes with
a message



Repository

2. Add changes



Staging index

1. Make changes



Working

commit

add

1.2 APA ITU GITLAB

What is Gitlab?

<https://gitlab.com/>

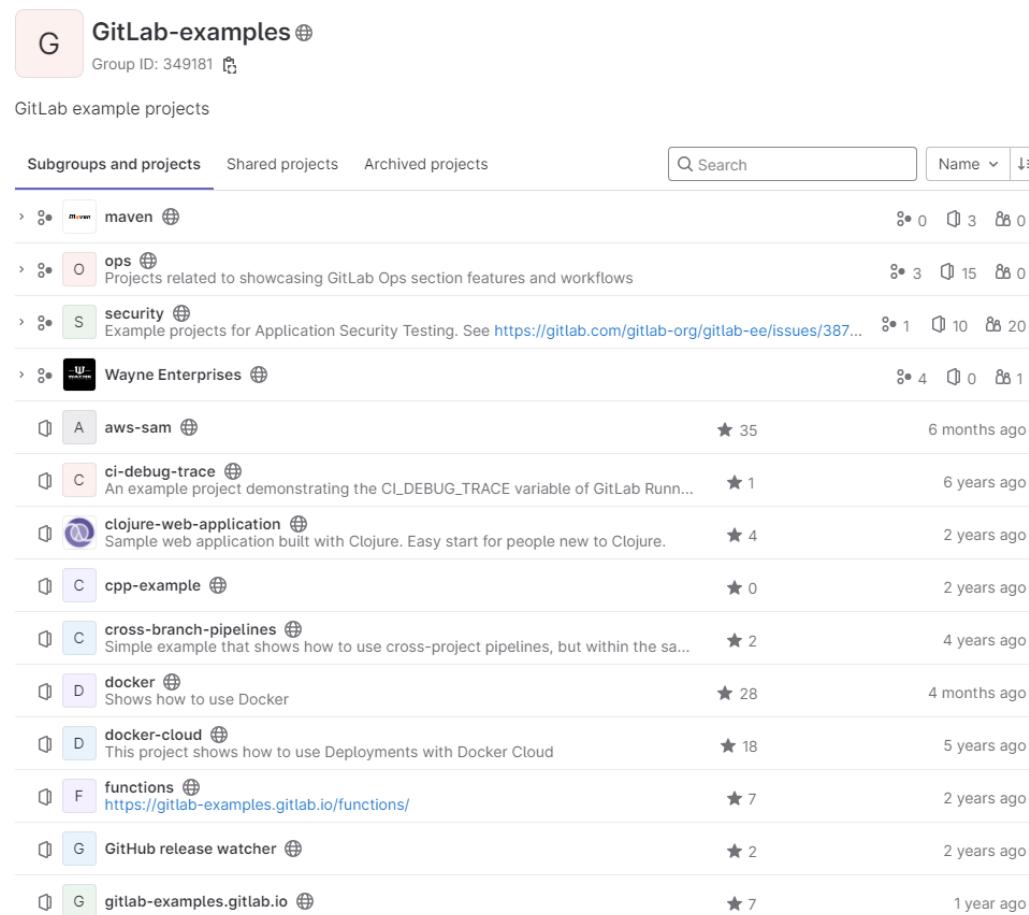
The screenshot shows the GitLab homepage. On the left is a sidebar with links like Project information, Repository, Issues (48,888), Merge requests (1,530), CI/CD, Deployments, Packages and registries, Monitor, Analytics, and Snippets. The main area shows a summary: 329,272 Commits, 13,821 Branches, 2,148 Tags, 51.9 TB Project Storage, 133 Releases, and 3,998 Environments. Below this is a topic section with hacktoberfest, Ruby, Vue.js, and +1 more. A brief description states: "GitLab is an open source end-to-end software development platform with built-in version control, issue tracking, code review, CI/CD, and more. Self-host GitLab on your own servers, in a container, or on a cloud provider." A progress bar indicates pipeline status: running (67.36%). A recent commit from Sinchol (David) Kim is shown: "Merge branch 'expire-environment-etag-cache-when-deployment-approved' into 'master'". Below the commit is a file browser for master with README, MIT License, CHANGELOG, and CONTRIBUTING files. At the bottom is a table of repository files with columns: Name, Last commit, and Last update.

Name	Last commit	Last update
github	Rename GitLab CE to FOSS in GitHub issue t...	3 years ago
gitlab	Merge branch 'tchu-change-search-tests-ci-...	19 hours ago
lefthook/pre-push	Change shebang to bash	3 months ago
.rubocop_todo	Update feature_category for spec/workers	13 hours ago
:theia	Revert "Move host authorization to to gitpo...	2 years ago
.vscode	Add GitLab Workflow as recommended VS C...	1 year ago
app	Merge branch '258835-Add-job-and-deploy...	1 hour ago
bin	Add option to create MR in secpick	2 months ago

“Whether you're working on a small team or managing a large-scale project, GitLab makes it easy to collaborate on code, manage workflows, and streamline your development process.”

Organizing Projects with Gitlab

With **gitlab** it's easier to **work** or **manage** multiple projects on a **team**



The screenshot shows the GitLab web interface for a group named "GitLab-examples". The group ID is 349181. The interface includes a search bar and filters for "Subgroups and projects", "Shared projects", and "Archived projects". The main list displays various projects, each with a thumbnail, name, star rating, and last updated time.

Project	Rating	Last Updated
maven	0 stars	3 days ago
ops	3 stars	15 days ago
security	1 star	10 days ago
Wayne Enterprises	4 stars	0 days ago
aws-sam	35 stars	6 months ago
ci-debug-trace	1 star	6 years ago
closure-web-application	4 stars	2 years ago
cpp-example	0 stars	2 years ago
cross-branch-pipelines	2 stars	4 years ago
docker	28 stars	4 months ago
docker-cloud	18 stars	5 years ago
functions	7 stars	2 years ago
GitHub release watcher	2 stars	2 years ago
gitlab-examples.gitlab.io	7 stars	1 year ago

Gitlab Features

Gitlab offers a lot **features** for managing projects in a team



Plan



Create



Verify



Package



Secure



Deploy



Monitor



Govern

<https://about.gitlab.com/features/>

2. CI/CD PIPELINE

2.1 MENGAPA PERLU CI/CD

2.2 PIPELINE & CI/CD

2.3 GITLAB RUNNERS





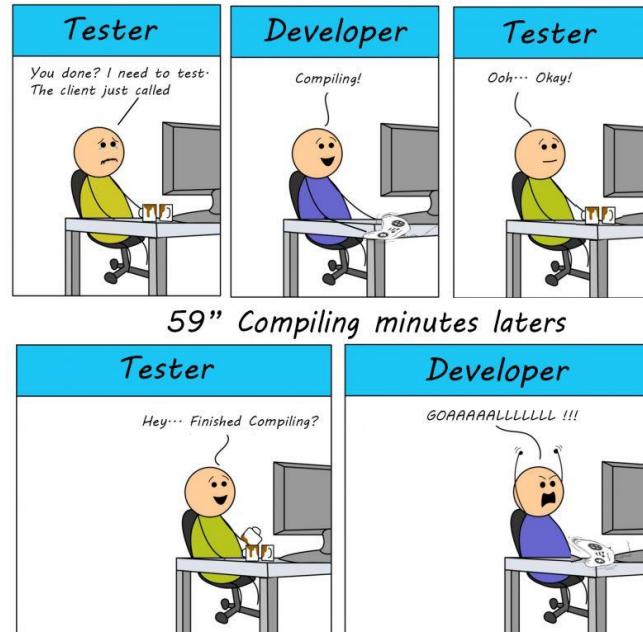
2.1 MENGAPA PERLU CI/CD



Building and verifying code manually

Before **CI/CD**, we needed to **build** and **verify** code **manually**.

This was often a terrible, soul-crushing experience.

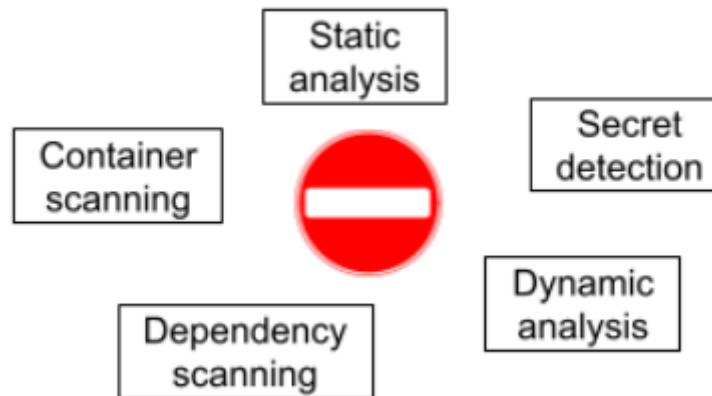


"CI/CD offers a solution to test automatically."

Security-testing code manually

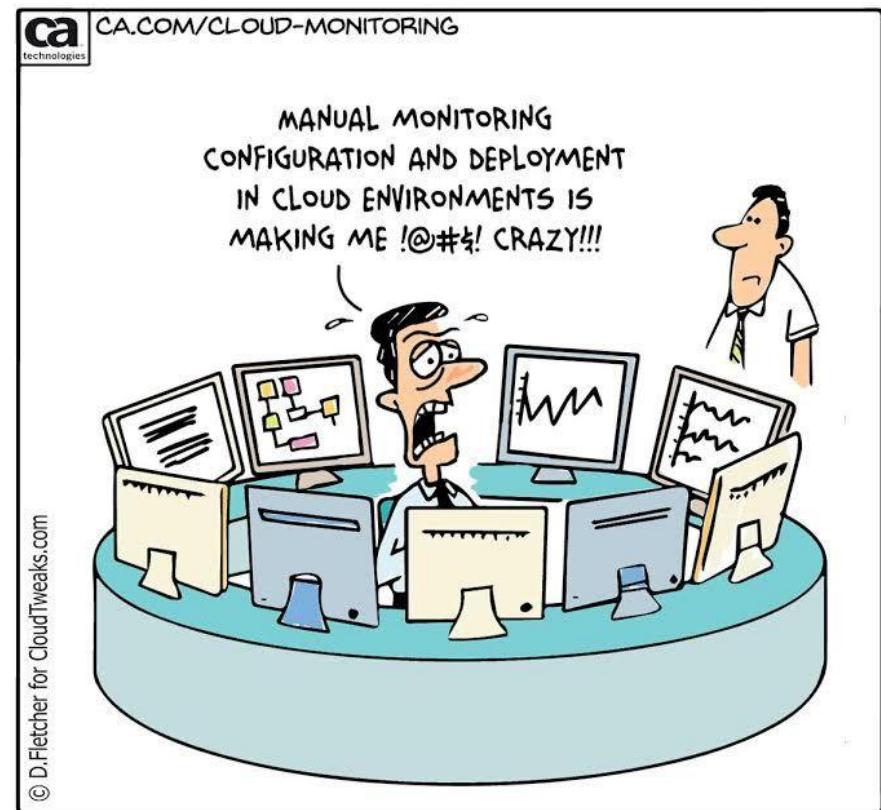
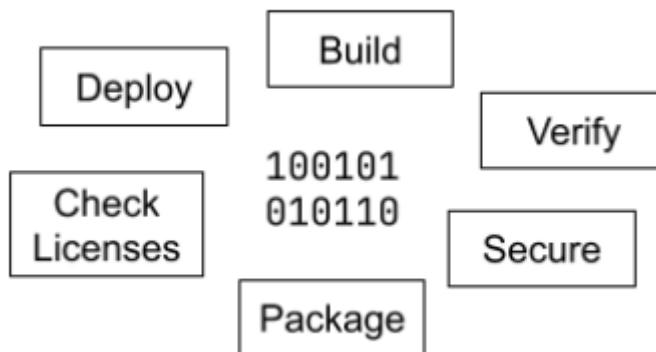
Some of **security test** must be performed **manually**.
Even **automated** tests are still **burdensome**:

- Install security testing tools or framework
- Configure testing tools
- Update test frameworks and dependencies
- Message and display reports



Packaging and deploying code manually

After the **software** has been **built**, it's time to **deploy**. This **process** can be an annoying burden and **time-consuming** when done **manually**.





Solution

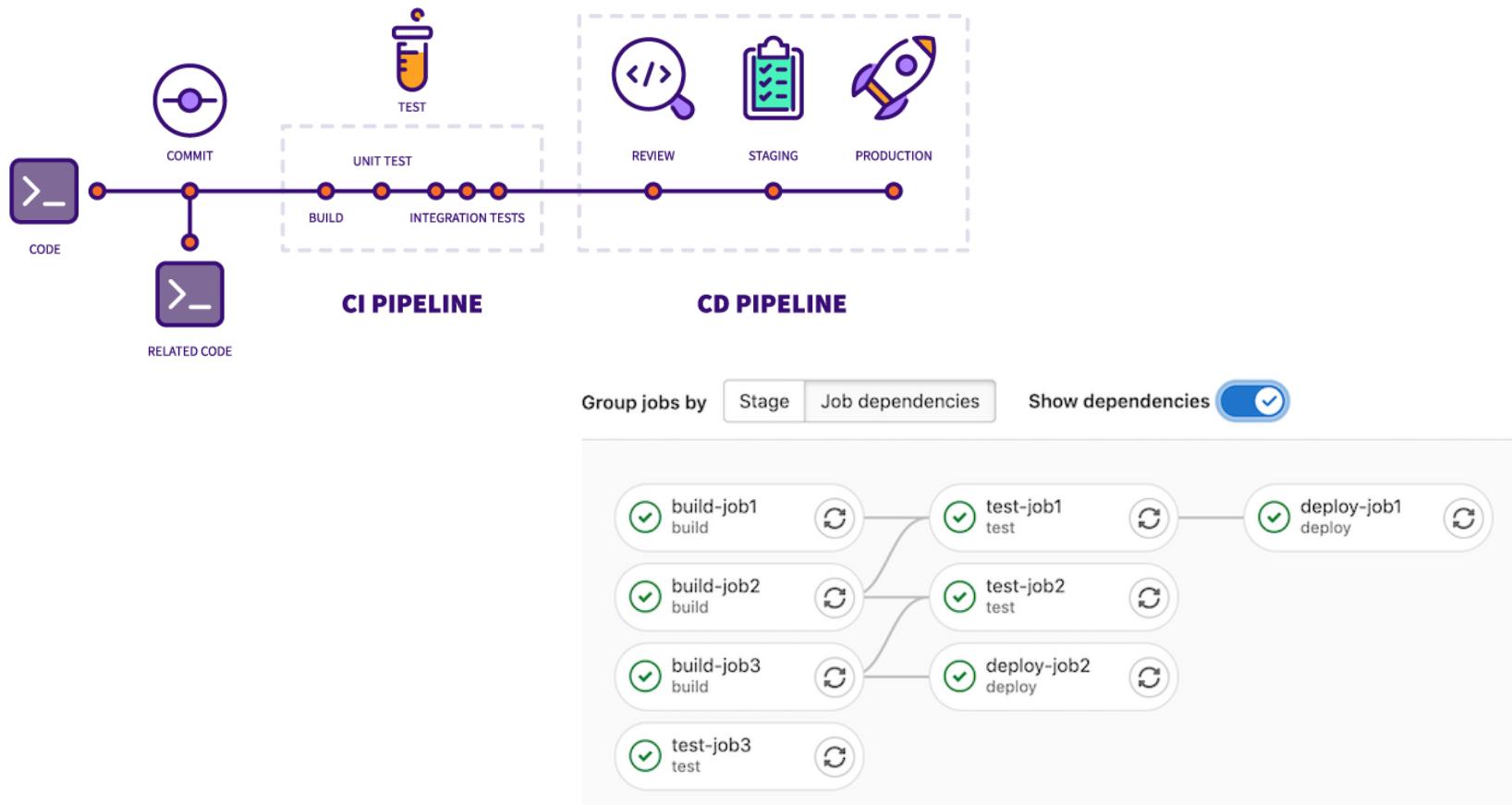
With **CI/CD** we can **automate**,
collaborate, have **faster feedback**,
and make **iterative improvement**.



2.2 PIPELINE & CI/CD

What is Gitlab Pipeline?

GitLab CI/CD pipeline runs a set of actions on your files after each commit to the repository.





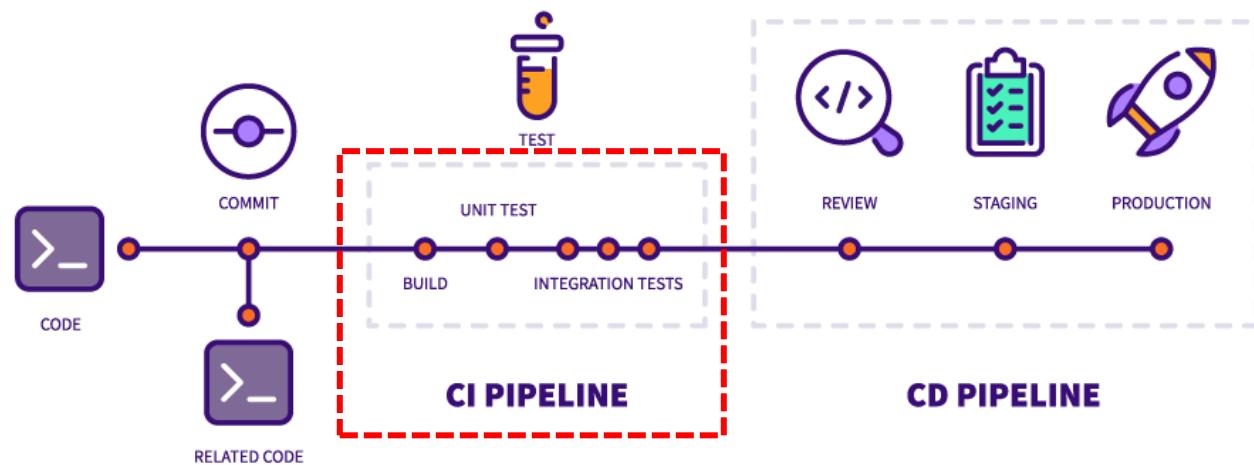
What is CI?

CI stands for continuous integration

*“A **development** practice that involves regularly **building**, **testing**, and **integrating** code changes to ensure smooth and **efficient** development.”*

What can I do with CI?

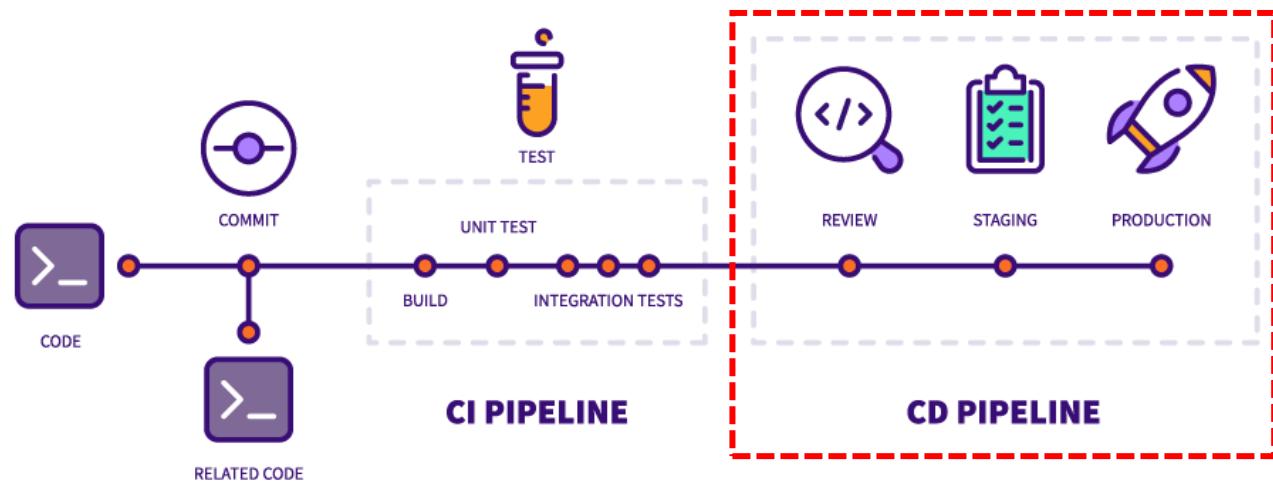
- Functional Test
- Security scans
- Code quality scans
- Performance tests
- Fuzz/stress testing



What is CD?

CD stands for continuous delivery or continuous deployment

“An automated process of deploying code changes to production servers.”





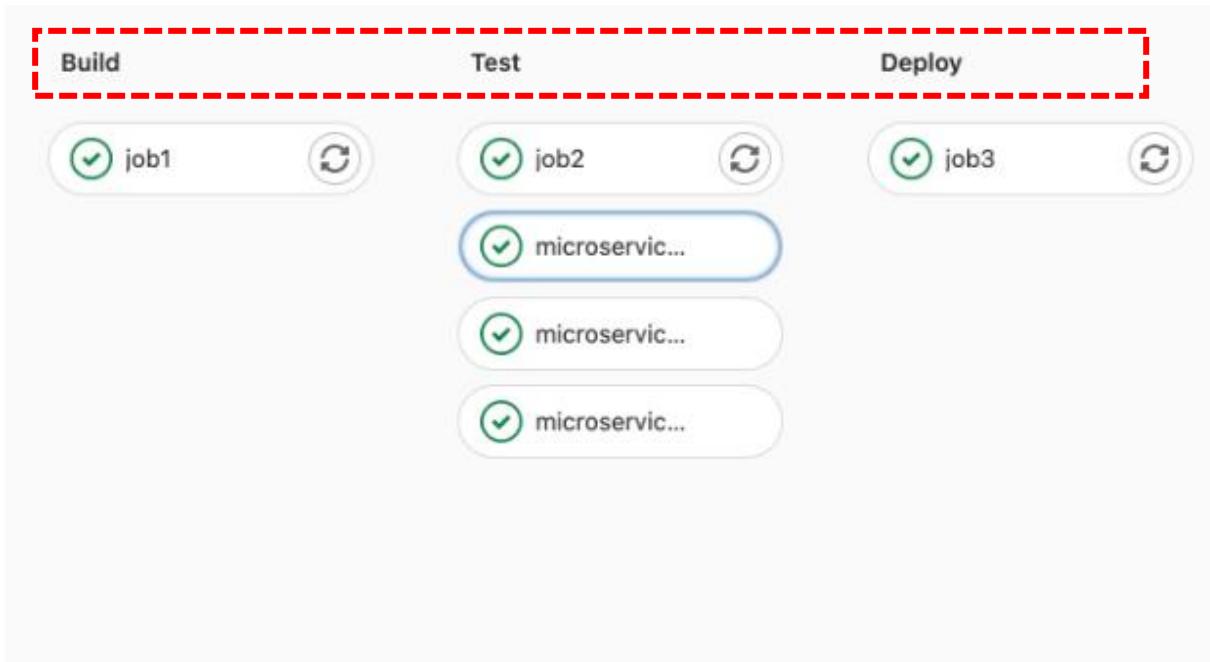
Benefits of CD

- Easier to **deploy** code to review, staging, or **production** environment
- Release code more **frequently**
- Developers aren't **fixing** things, they're **writing** code
- Developers more focused on **solving** problem

CD making it **easier** and **faster** for **developers** to deliver **updates** to **production** servers without the risk of errors.

Pipeline Stages

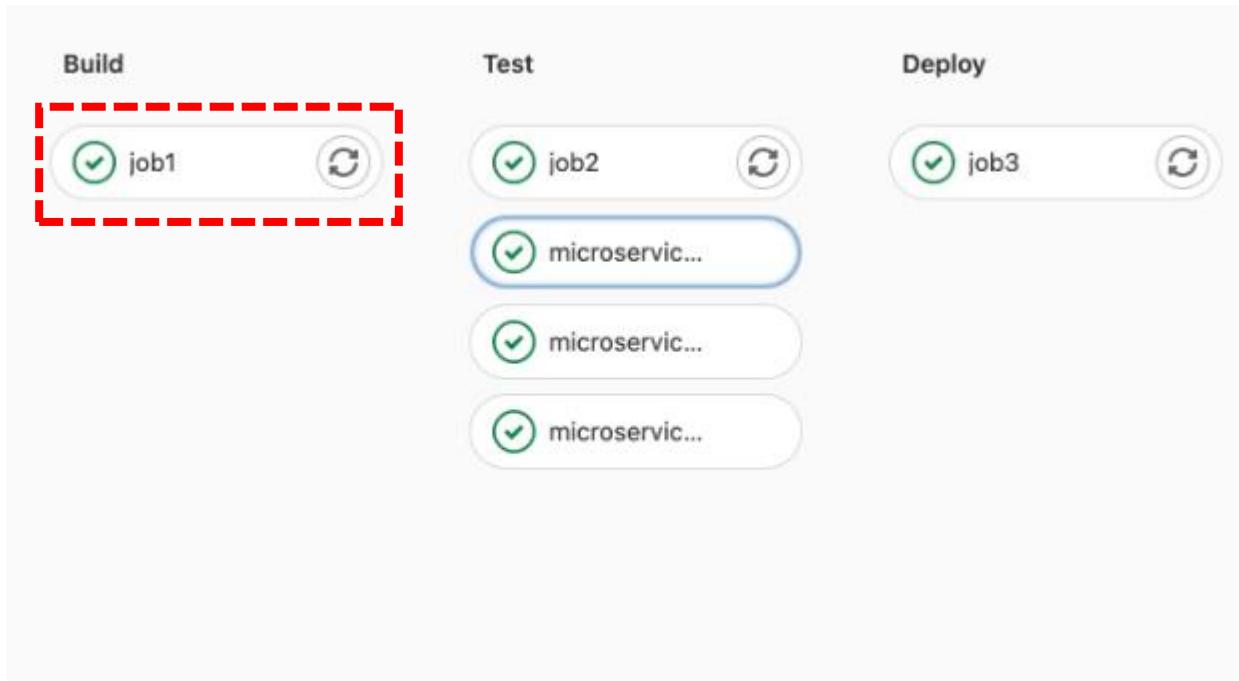
A **stage** is a **collection** of pipeline **tasks** that are thematically **related**.



“You can define stages with anything, as long as you understand it.”

Pipeline Jobs

In short **jobs** are the “**tasks**” that happen within a **pipeline**





Pipeline Commands

Each **job** contains one or more **commands** that let the job **do something**.

Example:

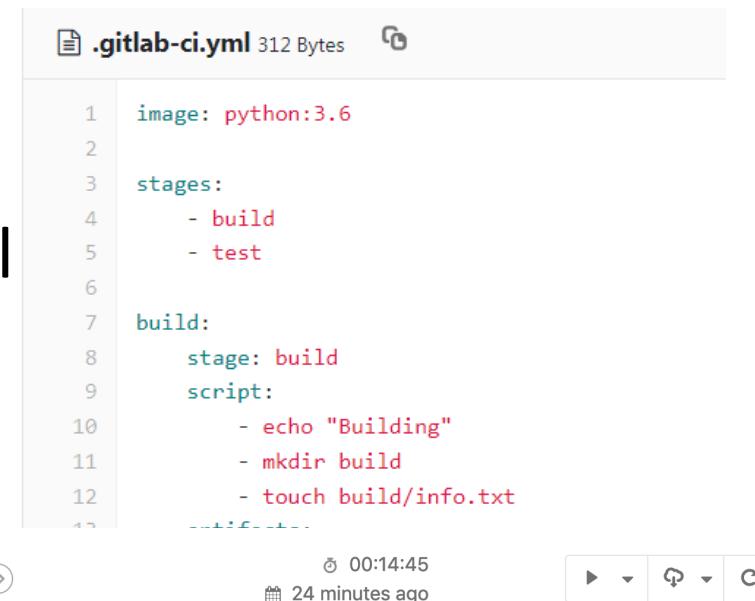
- `javac *.java` command to compile Java classes
- `docker build --tag my_app:1.2` command to create a Docker image
- `mvn test` command to use the Maven build tool to trigger automated Java unit tests

Gitlab CI/CD Configuration File

.gitlab-ci.yml contains the CI/CD configuration.

In this file we can define:

- Scripts to run
- Configuration files and template include
- Dependencies and caches



```
image: python:3.6

stages:
  - build
  - test

build:
  stage: build
  script:
    - echo "Building"
    - mkdir build
    - touch build/info.txt
```

failed	#49651920 by 	use-fallbac... -o 3c50e19e  Use encrypted runner tokens		⌚ 00:14:45 ⌚ 24 minutes ago	
running	#49649365 by 	feature/add... -o fef3c0a8  Fix RuboCop offense			
passed	#49647437 by 	master -o 40ec172f  Merge branch 'web-ide-defa...		⌚ 00:54:04 ⌚ 18 minutes ago	

[.gitlab-ci.yml Documentation](#)

Gitlab CI/CD Templates

Gitlab provide a lot of templates ready to be used.

CI/CD templates

Get started with GitLab CI/CD and your favorite programming language or framework by using a `.gitlab-ci.yml` template.

When you create a `.gitlab-ci.yml` file in the UI, you can choose one of these templates:

- [Android \(`Android.gitlab-ci.yml`\)](#)
- [Android with fastlane \(`Android-Fastlane.gitlab-ci.yml`\)](#)
- [Bash \(`Bash.gitlab-ci.yml`\)](#)
- [C++ \(`C++.gitlab-ci.yml`\)](#)
- [Chef \(`Chef.gitlab-ci.yml`\)](#)
- [Clojure \(`Clojure.gitlab-ci.yml`\)](#)
- [Composer \(`Composer.gitlab-ci.yml`\)](#)
- [Crystal \(`Crystal.gitlab-ci.yml`\)](#)
- [Dart \(`Dart.gitlab-ci.yml`\)](#)
- [Django \(`Django.gitlab-ci.yml`\)](#)
- [Docker \(`Docker.gitlab-ci.yml`\)](#)
- [dotNET \(`dotNET.gitlab-ci.yml`\)](#)

[Documentation](#)

[Repository](#)



2.3 GITLAB RUNNERS

What is Gitlab Runner?

GitLab **Runner** is a small **program** that is sent commands to **execute** by the GitLab instance.



How Gitlab Runner works?

GitLab CI/CD pipelines runs command from `.gitlab-ci.yml`

The jobs in `.gitlab-ci.yml` will be scheduled to run following the order and logic specified in the configuration

```
gitlab-ci.yml 312 Bytes
```

```
1  image: python:3.6
2
3  stages:
4    - build
5    - test
6
7  build:
8    stage: build
9    script:
10      - echo "Building"
11      - mkdir build
12      - touch build/info.txt
13    artifacts:
14      paths:
15        - build/
16
17  test:
18    stage: test
19    script:
20      - echo "Testing"
21      - test -f "build/info.txt"
```



Installing Gitlab Runner

- Tambah repository Gitlab Runner

```
$ curl -L  
  "https://packages.gitlab.com/install/repositories/runner  
  /gitlab-runner/script.deb.sh" | sudo bash
```

- Install Gitlab Runner

```
$ sudo apt install gitlab-runner
```

- Cek Gitlab Runner

```
$ sudo gitlab-runner -version
```

Register Gitlab Runner

- Open Project Repository > Settings > CI/CD > Runners

Specific runners

These runners are specific to this project.

Set up a specific runner for a project

1. [Install GitLab Runner and ensure it's running.](#)
2. Register the runner with this URL:
<https://gitlab.com/> 

And this registration token:

GR1348941ntsPJRHsPLIvyJ7FVyD7 

[Reset registration token](#)

[Show runner installation instructions](#)

- Register on server

```
$ sudo gitlab-runner register
```

Register Gitlab Runner

- Enter Gitlab URL

```
Enter the GitLab instance URL (for example, https://gitlab.com):  
https://gitlab.com
```

- Enter Registration Code from repository

```
Enter the registration token:  
GR1348941Xi_koNdj8AjJMjSzQyYY
```

- Enter machine information

```
Enter a description for the runner:  
[localhost] Linux dev server
```

- Enter machine tags

```
Enter tags for the runner (comma-separated):  
dev,rhel
```

3. IMPLEMENTASI CI/CD PADA GITLAB

3.1 IMPLEMENTASI CI/CD

3.2 SUMMARY



3.1 IMPLEMENTASI CI/CD



Implementasi CI/CD dengan Project Laravel

The screenshot shows a GitHub repository page for a project named "Laravel Demo". The repository has 104 commits, 3 branches, 13 tags, and 3.7 MB of project storage. It has 434 downloads. The repository is pre-configured with Laravel 9, Laravel Sanctum for SPA Auth, React 18, Redux, React Router, Route-Level Code-Splitting, Axios, Ant Design, Redux Saga, Sass, ESLint, and Preconfigured redux store, actions and saga. The last commit was made 47 minutes ago. The repository includes files like README and MIT License.

Name	Last commit	Last update
.github	[FIX]	2 hours ago
app	upgraded to laravel 9 and react 18	8 months ago
bootstrap	Initial commit	2 years ago
config	Initial commit	2 years ago
database	Initial commit	2 years ago
public	[ADD] Git Ignore	55 minutes ago
resources	[CHANGE] Button Color	47 minutes ago
routes	Make some changes	2 years ago

Repository



Setup Local Environment

Recommended Software:

- Laragon – portable development environment
- Composer – PHP dependency manager
- Node – JavaScript runtime environment
- Yarn – JavaScript package manager

Setup Local Environment - Repository

- Clone Gitlab repository

<https://gitlab.com/eurecha/laravel-demo.git>

Create new project

Create blank pro
Create a blank project plan your work, and cc among other things.

Import project
Migrate your data from like GitHub, Bitbucket, or GitLab.

Git repository URL

Mirror repository
Automatically update this project's branches and tags from the upstream repository. [How does pull mirroring work?](#)
Mirroring will only be available if the feature is included in the plan of the selected group or user.

Username (optional)

Password (optional)

Project name

Must start with a lowercase or uppercase letter, digit, emoji, or underscore. Can also contain dots, pluses, dashes, or spaces.

Project URL
 / Project slug

Want to organize several dependent projects under the same namespace? [Create a group.](#)

Project description (optional)

Visibility Level [?](#)
 Private
Project access must be granted explicitly to each user. If this project is part of a group, access is granted to members of the group.
 Public
The project can be accessed without any authentication.

[Create project](#) [Cancel](#)

Laravel Install

- Follow the steps in README.md

```
1. Clone this Repo  
2. cd laravel-react-boilerplate  
3. Create a .env by copying .env.example and Update the required fields.  
4. Run composer install  
5. Run php artisan key:gen  
6. Run yarn install  
7. Create a Database  
8. Update the Database credential to .env file  
9. Run php artisan migrate -> To create needed tables.  
10. Run php artisan db:seed -> To seed some fake users.  
11. Run yarn run dev  
12. Update API HOST_URL in resources/js/config/constant.js file
```



Setup Development Environment

- Ubuntu 22.04
- Nginx
- PHP 8.1 and Extensions
- MariaDB / MySQL
- Composer
- Node
- Yarn
- Gitlab Runner

Gitlab Runner Config

If needed, you can change gitlab-runner user

- Check gitlab-runner user

```
$ ps aux | grep gitlab
/usr/bin/gitlab-ci-multi-runner run --working-directory /home/gitlab-runner --config
/etc/gitlab-runner/config.toml --service gitlab-runner --syslog --user gitlab-runner
```

- Uninstall gitlab-runner

```
$ sudo gitlab-runner uninstall
```

- Change gitlab-runner user to ubuntu

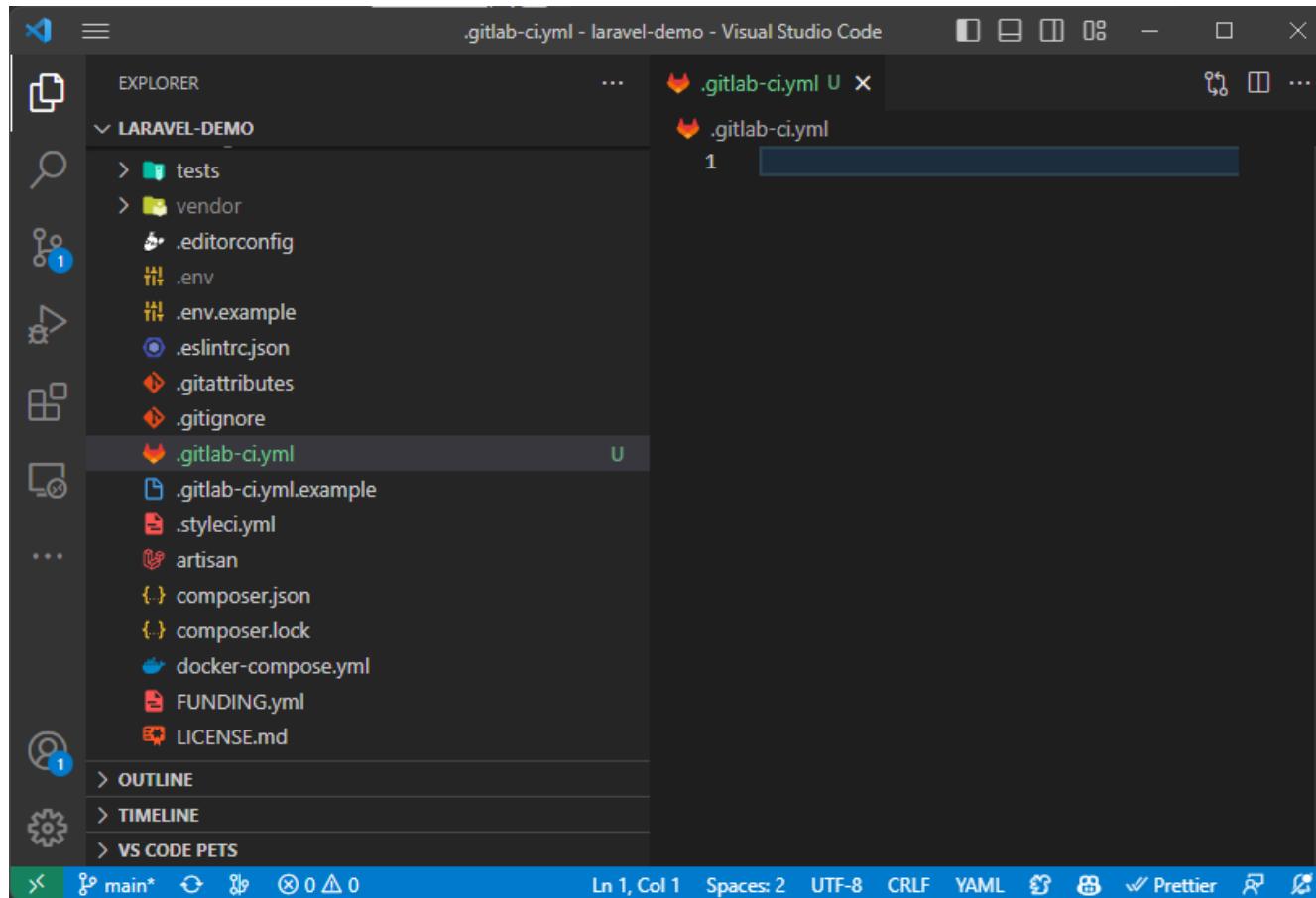
```
$ sudo gitlab-runner install --working-directory /home/ubuntu --user ubuntu
```

- Restart gitlab-runner service

```
$ sudo service gitlab-runner restart
```

Creating Gitlab CI Configuration

- Create `.gitlab-ci.yml` file on project root





Gitlab CI Configuration - Defining Stages

As an example in this project we will define 2 stages for each environment:

- Build – Runs job to make the server is uptodate
- Deploy – Installing and compile packages

```
stages:  
  - dev-build  
  - dev-deploy  
  - production-build  
  - production-deploy
```

Gitlab CI Configuration – Jobs & Commands

- dev-build

```
build_dev:  
  stage: dev-build  
  script:  
    - cd /var/www/projects/laravel-demo  
    - git reset --hard origin/main  
    - git pull  
    - sudo chmod -R 775 storage bootstrap  
    - sudo chown -R $USER:www-data .  
  only:  
    - main  
tags:  
  - dev
```

Tags are list that are used to select a runner

```
Enter tags for the runner (comma-separated):  
dev,rhel
```



Gitlab CI Configuration – Jobs & Commands

- dev-deploy

```
deploy_dev:  
  stage: dev-deploy  
  script:  
    - cd /var/www/projects/laravel-demo  
    - composer install  
    - composer dump-autoload  
    - php artisan migrate  
    - yarn install  
    - yarn run dev  
  only:  
    - main  
  tags:  
    - dev
```

Gitlab CI Configuration – Jobs & Commands

- build-production

```
build_production:  
  stage: production-build  
  script:  
    - cd /var/www/projects/laravel-demo  
    - git reset --hard origin/main  
    - git pull  
    - sudo chmod -R 775 storage bootstrap  
    - sudo chown -R $USER:www-data .  
  rules:  
    - if: $CI_COMMIT_TAG != null && $CI_COMMIT_TAG =~ ^v*/  
  tags:  
    - production
```

Rules are conditions to evaluate and determine whether or not it's created

```
if: $CI_COMMIT_TAG != null && $CI_COMMIT_TAG =~ ^v*/
```

Gitlab CI Configuration – Jobs & Commands

- Condition

```
if: $CI_COMMIT_TAG != null && $CI_COMMIT_TAG =~ /^v*/
```

If user make a tag commit, run this stage

New Tag

Do you want to create a release with the new tag? You can do that in the [New release page](#).

Tag name

Create from

Existing branch name, tag, or commit SHA

Message

Optionally, add a message to the tag. Leaving this blank creates a [lightweight tag](#).

Testing Gitlab CI Configuration

- Make a new **commit** to **main** branch

[CHANGE] Button Color

The screenshot shows a GitLab commit page for a 'Button Color' change. At the top, it displays a green checkmark indicating a successful pipeline. Below that, there's a message about no related merge requests found. The main content area shows a diff view of the file 'resources/js/components/LoginPage.js'. The diff highlights changes in line 86, where the 'type' attribute was changed from 'primary' to 'danger'. The commit message at the top also includes this information: 'Pipeline #810235623 passed with stages in 40 seconds'.

Changes 1 Pipelines 1

Showing 1 changed file with 1 addition and 1 deletion

Hide whitespace changes Inline Side-by-side

resources/js/components/LoginPage.js

...	...	@@ -83,7 +83,7 @@ function LoginPage() {
83	83	<Form.Item>
84	84	<Button
85	85	loading={loader}
86	-	type="primary"
	+	type="danger"
87	87	htmlType="submit"
88	88	className="login-form-button"
89	89	size="large"
...

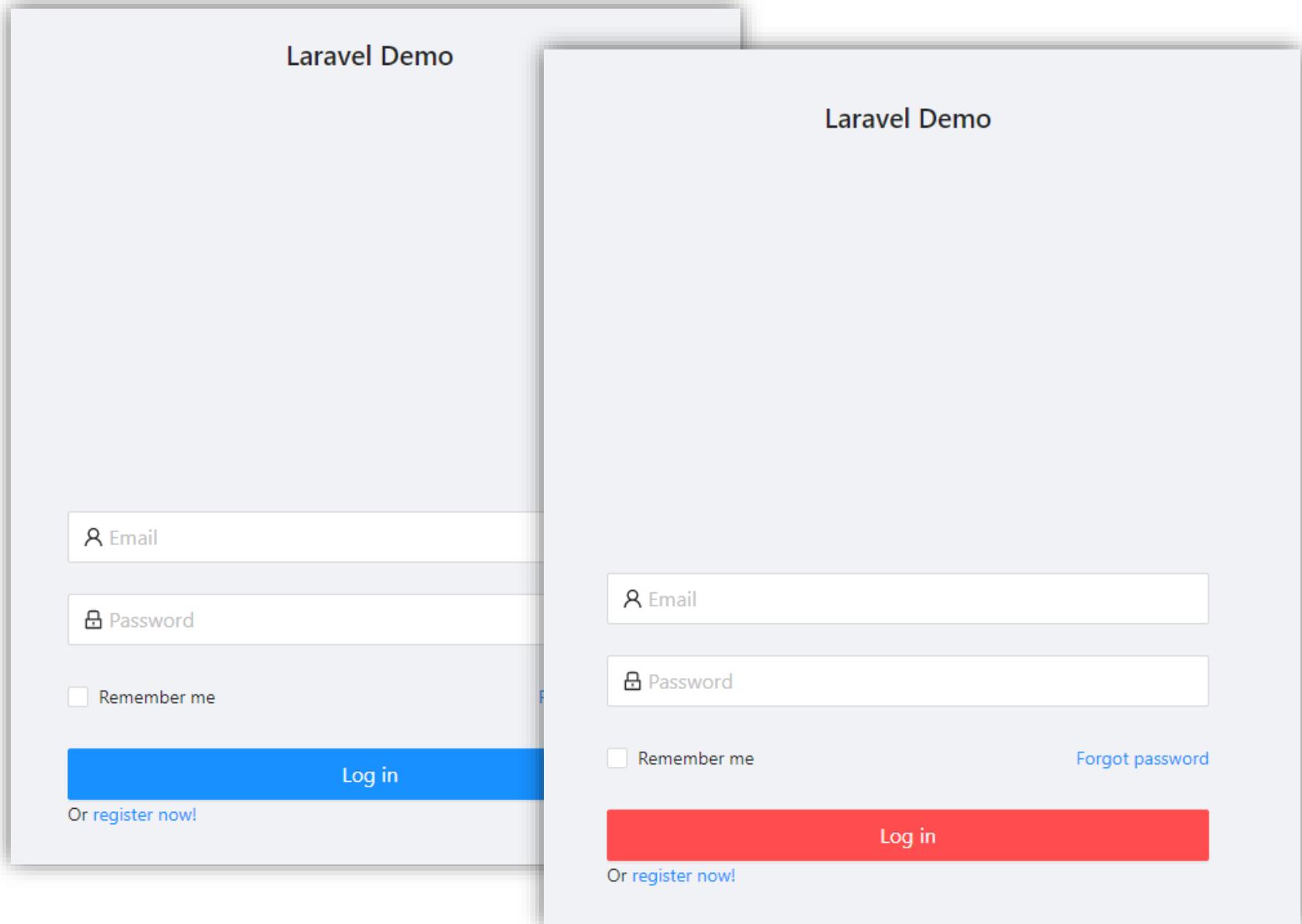
Testing Gitlab CI Configuration

- Check jobs progress on pipeline

The screenshot shows two parallel GitLab CI job logs. The top log is for a successful job named 'build_dev' triggered 1 hour ago by Eurecha Sherij Anakimesta. The bottom log is for a failed job named 'Job build_dev' triggered 2 hours ago by the same user. Both logs show the execution of various stages: preparing the executor, environment, fetching changes, getting source from Git repository, executing step scripts, and cleaning up. The failed job log includes a red 'failed' badge and ends with an error message at step 24.

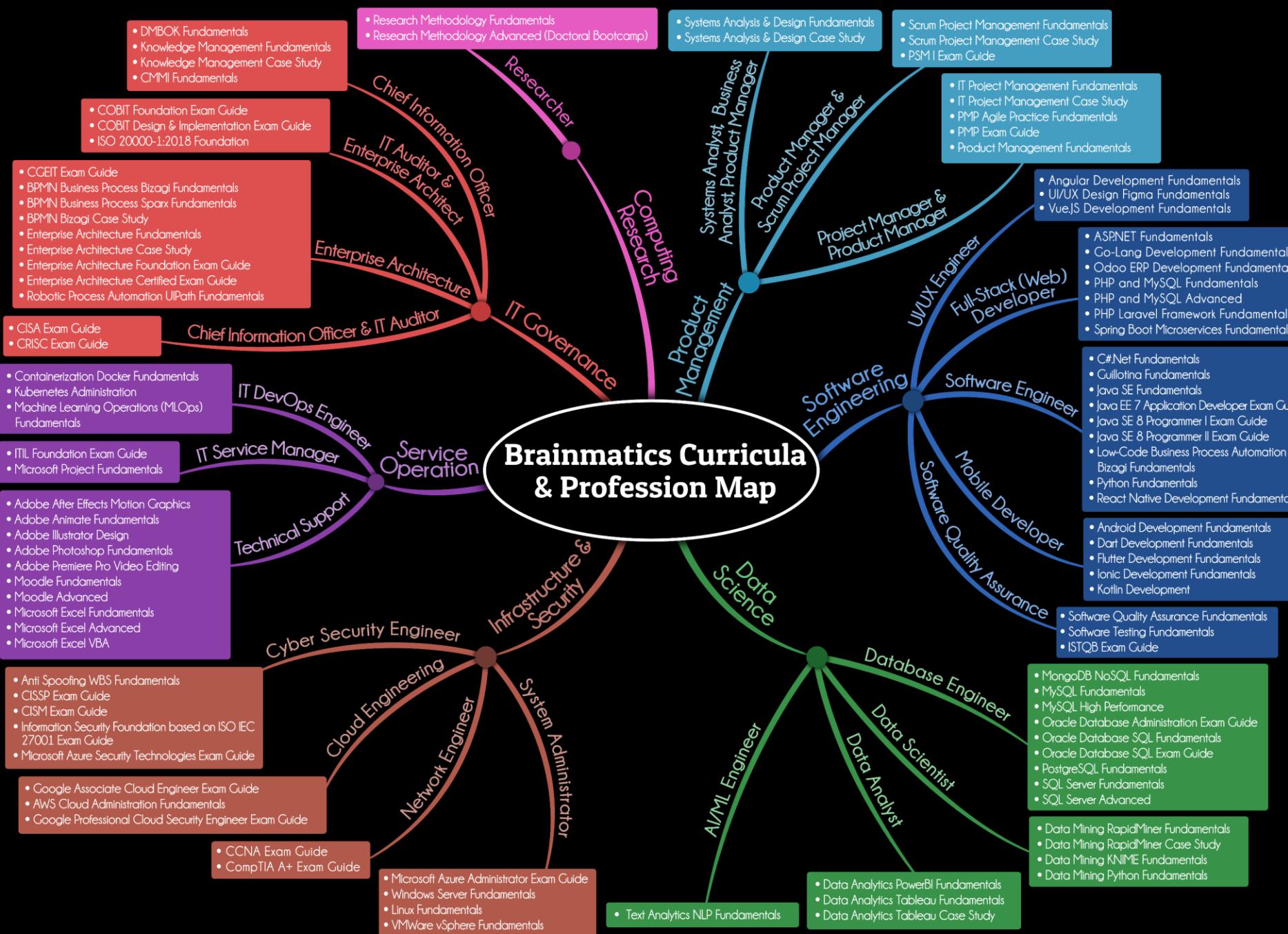
```
1 Running with gitlab-runner 15.9.1 (d540b510)
2 on dev-server eP8UNAdX, system ID: s_a36c4a4ed163
3 Preparing the "shell" executor
4 Using Shell (bash) executor...
5 Preparing environment
6 Running on re-battlenet...
7 Getting source from Git repository
8 Fetching changes with git depth set to 20...
9 Reinitialized existing Git repository in /home/gitlab-runner/builds/eP8UNAdX/0/eurecha/laravel-demo/.git/
10 Checking out af92feid as detached HEAD (ref is main)...
11 Skipping Git submodules setup
12 Executing "step_script" stage of the job script
13 $ cd /var/www/projects/laravel-demo
14 $ git reset --hard origin/main
15 HEAD is now at 637dbc6 [ADD] Git Ignore Config React
16 $ git pull
17 error: cannot open .git/FETCH_HEAD: Permission denied
18 Cleaning up project directory and file based variables
19 ERROR: Job failed: exit status 1
```

Checking on Website





3.2 SUMMARY



The School of Computing

Setiap Sabtu & Minggu, 09.00 WIB

1H Online Training Schedule

Industrialized Customizable Curricula for Scaling Up the Enterprise Human Capital



Romi



Karno



Risa



Aditya



Ariyanto



Suharyanto



Mulyana



Haris



Eurecha



Wahyu



Januar



Adi Zidan

Satria Wahono Nur Cahyo

Dhani H. P.

Prayoga

Adi Nugroho

Dermawan

Sherij A.

Utomo

Sapareza

Fathunudin

No	Schedule	Course	Registration	Instructor
1	Sabtu, 4 Februari 2023	3 Paradigm Shift Karir & Profesi Bidang Teknologi Informasi	profesi1h.brainmatics.com	Romi
2	Minggu, 5 Februari 2023	5 Tren Serangan Aplikasi Web	serangan1h.brainmatics.com	Karno
3	Sabtu, 11 Februari 2023	3 Tahap Analisis Beban Kerja Pegawai dengan Simulasi Proses Bisnis	probis1h.brainmatics.com	Risa
4	Minggu, 12 Februari 2023	3 Pola Penerapan Git dan GitHub	git1h.brainmatics.com	Aditya
5	Sabtu, 4 Maret 2023	5 Delusi Penyebab Enterprise Architecture Tidak Dibutuhkan Lagi	eath.brainmatics.com	Romi
6	Minggu, 5 Maret 2023	5 Kiat Mempercepat Query Database	query1h.brainmatics.com	Karno
7	Sabtu, 11 Maret 2023	3 Myths Penyebab Kegagalan Penerapan Scrum	scrum1h.brainmatics.com	Wahyu
8	Minggu, 12 Maret 2023	5 Langkah Membuat High Fidelity Application Prototype dengan Figma	figma1h.brainmatics.com	Ariyanto
9	Sabtu, 18 Maret 2023	3 Alasan Dunia Tidak Butuh Software Testing	testing1h.brainmatics.com	Haris
10	Minggu, 19 Maret 2023	3 Pola Deploy App Cepat dengan Gitlab CI/CD	cicd1h.brainmatics.com	Eurecha
11	Minggu, 26 Maret 2023	5 Faktor Kegagalan Penerapan PMBOK	pmbok1h.brainmatics.com	Suharyanto
12	Minggu, 2 April 2023	3 Pola Penerapan Data Science di Organisasi	polads1h.brainmatics.com	Romi
13	Minggu, 9 April 2023	3 Pola Penerapan Auto Scaling pada Linux Server	linux1h.brainmatics.com	Karno
14	Sabtu, 6 Mei 2023	6 Prinsip Tata Kelola IT Kelas Dunia	tatakelola1h.brainmatics.com	Ariyanto
15	Minggu, 7 Mei 2023	5 Kesalahan Penyebab Dashboard Informasi Tidak Lagi Digunakan	dashboard1h.brainmatics.com	Mulyana
16	Minggu, 14 Mei 2023	5 Miskonsepsi Penyebab Publikasi Paper Kita Ditolak Jurnal Terindeks	paper1h.brainmatics.com	Romi
17	Minggu, 21 Mei 2023	3 Pola DevSecOps untuk Pengembangan Aplikasi yang Cepat & Aman	dev1h.brainmatics.com	Haris
18	Minggu, 28 Mei 2023	5 Paradigm Shift Penyebab SOP Tidak Lagi Dibutuhkan Organisasi	sop1h.brainmatics.com	Romi
19	Minggu, 11 Juni 2023	6 Langkah Mudah Melakukan Otomatisasi Proses Bisnis dengan UiPath	uiopath1h.brainmatics.com	Januar
20	Minggu, 25 Juni 2023	Low-Code Programming untuk Pengembangan Aplikasi Cepat dengan Bizagi	lowcode1h.brainmatics.com	Adi Zidan
21	Minggu, 2 Juli 2023	5 Miskonsepsi Data Science	ds1h.brainmatics.com	Romi
22	Minggu, 16 Juli 2023	5 Faktor Kegagalan Penerapan DMBOK	dmbock1h.brainmatics.com	Mulyana
23	Sabtu, 5 Agustus 2023	3 Paradigm Shift Knowledge Management	km1h.brainmatics.com	Romi
24	Minggu, 20 Agustus 2023	3 Miskonsepsi Unified Modeling Language (UML)	uml1h.brainmatics.com	Adi Zidan

- Product Management

- Software Engineering

- IT Governance

- Data Science

- Infrastructure & Security

- Computing Research

- Service Operation

Bidakara Campus

Brainmatics Indonesia Cendekia
Menara Bidakara 1 Lantai 2
Jl. Gatot Subroto Kav. 71-73 Pancoran
Jakarta Selatan 12870

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Ulma 081182289701 | Nadila 081182289702

Cibubur Campus

Romi Satria Wahono Institute
Kota Wisata Cibubur, Boulevard Florida O 10 No. 9
Ciangsana, Gunung Putri, Kab. Bogor
Jawa Barat 16968

The School of Computing

09.00-17.00 WIB

Regular Training Schedule

Industrialized Customizable Curricula for Scaling Up the Enterprise Human Capital

Romi
Satria WahonoWahyu
UtomoKarno
Nur CahyoJanuar
Sapareza

Mulyana



Suharyanto

Adi
Zidan F.Haris
DermawaniRisa
Dhani H. P.Ariyanto
Adi Nugroho

No	Course	Duration	Registration	Schedule											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	IT Project Management Fundamentals	4 Days	itpm.brainmatrics.com	16-19				22-25				11-14			
2	PMP Exam Guide	4 Days	pmp.brainmatrics.com		27-2					3-6			23-26		
3	Scrum Project Management Fundamentals	3 Days	scrum.brainmatrics.com			27-1				31-2			20-22		
4	Systems Analysis and Design Fundamentals	4 Days	sad.brainmatrics.com				13-16			24-27			13-16		
5	ISTQB Exam Guide	4 Days	istqb.brainmatrics.com					8-11			28-31			18-21	
6	Low-Code Business Process Automation Bizagi Fundamentals	4 Days	lowcode.brainmatrics.com							3-6				11-14	
7	PHP Laravel Framework Fundamentals	4 Days	laravel.brainmatrics.com		6-9					17-21			6-9		
8	Robotic Process Automation UIPath Fundamentals	4 Days	uiopath.brainmatrics.com						19-22				4-7		
9	Software Testing Fundamentals	4 Days	testing.brainmatrics.com				10-13				21-24			11-14	
10	BPMN Business Process Bizagi Fundamentals	3 Days	bizagi.brainmatrics.com			6-8		29-31				18-20			
11	BPMN Business Process Sparx Fundamentals	3 Days	spinx.brainmatrics.com					15-17				4-6		26-28	
12	CISA Exam Guide	5 Days	cisa.brainmatrics.com					8-12			28-1			18-22	
13	COBIT Foundation Exam Guide	3 Days	cobit.brainmatrics.com					22-24			14-16			4-6	
14	DMBOK Fundamentals	3 Days	dmboek.brainmatrics.com		13-15				5-7				16-18		
15	Enterprise Architecture Fundamentals	4 Days	ea.brainmatrics.com			27-30					7-10			27-30	
16	Enterprise Architecture TOGAF Foundation Exam Guide	3 Days	togaf.brainmatrics.com						19-21					11-13	
17	Data Analytics Tableau Fundamentals	3 Days	tableau.brainmatrics.com			6-8			19-21				9-11		
18	Data Mining KNIME Fundamentals	4 Days	dm.brainmatrics.com							10-13				13-16	
19	Data Mining RapidMiner Fundamentals	4 Days	mysql.brainmatrics.com		20-23				12-15				2-5		
20	ITIL Foundation Exam Guide	3 Days	itil.brainmatrics.com							10-12			30-1		
21	Microsoft Excel Advanced	2 Days	exceladv.brainmatrics.com				3-4		26-27			25-26			

Certification Academy

Product Management

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