



GitLab

GitLab CI/CD

# A Complete DevOps Platform Delivered as a Single Application



Manage



Plan



Create



Verify



Package



Secure



Release



Configure



Monitor



Defend

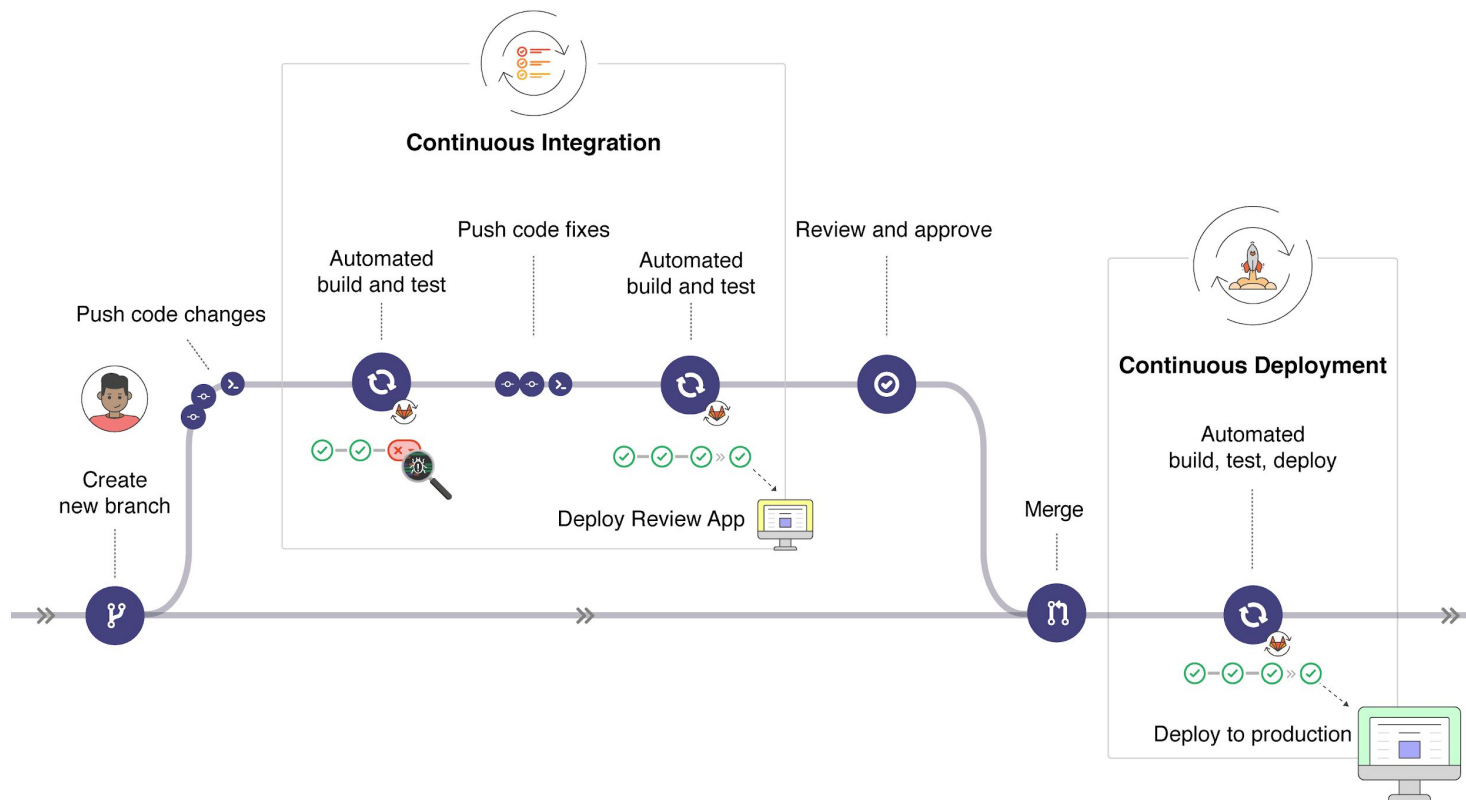
Single Conversation  
Single Data Store  
Single Permission Model  
Single Interface  
Governance & Security  
Team Collaboration  
Lifecycle Analytics



**“Cycle time compression  
may be the most  
underestimated force in  
determining winners &  
losers in tech.”**

— Marc Andreessen

# “Shifting Left” is Key



# YAML Configuration



The screenshot displays the GitLab web interface for a repository named 'busy'. The left sidebar contains navigation links for Project, Repository, Files, Commits, Branches, Tags, Contributors, Graph, Compare, Charts, Locked Files, Issues (22), Merge Requests (2), CI / CD, Operations, Registry, and a Collapse sidebar button. The main content area shows the 'Repository' view for the 'busy' project, specifically the '.gitlab-ci.yml' file. A notification indicates that the GitLab CI configuration is valid. The file content is as follows:

```
1 include:
2   template: SAST.gitlab-ci.yml
3
4 stages:
5   - test
6   - build
7   - publish
8
9 Test:
10  image: python
11  script: "make test"
12
13 Test Coverage:
14  image: python
15  script: "make cover"
16  before_script:
17    - "pip3 install coverage"
18  coverage: '/TOTAL +\d+ +\d+ +(\d+)\%$/'
19
20 Style Check:
21  image: python
22  script: "make style"
23  before_script:
24    - "pip3 install pycodestyle"
```





Which Stage

Build Package:

stage: build

image: python

script: "make build"

only:

variables:

- \$CI\_COMMIT\_TAG =~ /^v\d+\.\d+\.\d+\$/

artifacts:

paths:

- dist/

Conditions to Run

Artifacts to  
Generate



Define Your Stages

```
stages:  
  - test  
  - build  
  - publish
```



# Include other CI Configurations



```
include:  
  template: SAST.gitlab-ci.yml
```

GitLab's standard  
SAST job  
(Ultimate tier)

# CI/CD Pipeline



GitLab Projects Groups Activity Milestones Snippets

fpotter > tour > panda > Pipelines > #66796601

passed Pipeline #66796601 triggered 1 minute ago by Francis Potter

## Labore tempora sed voluptatem eius est ut

11 jobs for 36-labore-tempora-sed-voluptatem-eius-est-ut (queued for 2 seconds)

latest Auto DevOps

48aa31ec

Pipeline Jobs 11

Build Test Review Dast Performance

build code\_quality container\_scan... dependency\_sc... license\_manag... sast test review dast performance

# YAML Templates



GitLab.org · GitLab Community Edition · Repository

master / gitlab-ce / lib / gitlab / ci / templates / +

Lock History Find file Web IDE

Merge branch 'bump-auto-devops-helm-2-14-0' into 'master' 4c27abb4  
Mayra Cabrera authored 6 hours ago

Name	Last commit	Last update
..		
Jobs	add postgres version to subsequent helm deploys	1 week ago
Pages	Merge branch '58748-update-nodejs-to-10.15.3' ...	1 month ago
Security	Disable proxy in container scanning template	6 days ago
Android-Fastlane.gitlab-ci.yml	Merge branch 'require-all-templates-to-include-...	1 month ago
Android.gitlab-ci.yml	Merge branch 'require-all-templates-to-include-...	1 month ago
Auto-DevOps.gitlab-ci.yml	Bump Helm version in Auto-DevOps.gitlab-ci.yml	20 hours ago
Bash.gitlab-ci.yml	Tidy up CI templates	2 months ago
C++ .gitlab-ci.yml	Tidy up CI templates	2 months ago
Chef.gitlab-ci.yml	Merge branch 'require-all-templates-to-include-...	1 month ago
Clojure.gitlab-ci.yml	Tidy up CI templates	2 months ago
Code-Quality.gitlab-ci.yml	Move gitlab-ci.yml	1 month ago
Crystal.gitlab-ci.yml	Resolve "Un-vendor CI templates"	8 months ago
Django.gitlab-ci.yml	Tidy up CI templates	1 month ago
Docker.gitlab-ci.yml	Jobs should be	2 months ago
Elixir.gitlab-ci.yml	Resolve "Un-vendor CI templates"	2 months ago
Go.gitlab-ci.yml	Merge branch 'require-all-templates-to-include-...	8 months ago
Gradle.gitlab-ci.yml	Tidy up CI templates	8 months ago
Grails.gitlab-ci.yml	Tidy up CI templates	1 month ago
Julia.gitlab-ci.yml	Tidy up CI templates	1 month ago
LaTeX.gitlab-ci.yml	Resolve "Un-vendor CI templates"	1 month ago
Laravel.gitlab-ci.yml	Tidy up CI templates	2 weeks ago
Maven.gitlab-ci.yml	Clarify error message	2 months ago
Mono.gitlab-ci.yml	Merge branch 'require-all-templates-to-include-...	1 month ago
NodeJS.gitlab-ci.yml	Resolve "Un-vendor CI templates"	1 month ago
OpenShift.gitlab-ci.yml	Merge branch 'require-all-templates-to-include-...	1 month ago
PHP.gitlab-ci.yml	Resolve "Un-vendor CI templates"	8 months ago
Packer.gitlab-ci.yml	Merge branch 'require-all-templates-to-include-...	1 month ago
Python.gitlab-ci.yml	Tidy up CI templates	2 months ago
Ruby.gitlab-ci.yml	Tidy up CI templates	2 months ago
Rust.gitlab-ci.yml	Resolve "Un-vendor CI templates"	8 months ago
Scala.gitlab-ci.yml	Resolve "Un-vendor CI templates"	8 months ago
Serverless.gitlab-ci.yml	Merge branch 'require-all-templates-to-include-...	1 month ago
Swift.gitlab-ci.yml	Merge branch 'require-all-templates-to-include-...	1 month ago
Terraform.gitlab-ci.yml	Merge branch 'require-all-templates-to-include-...	1 month ago
dotNET-Core.yml	Edit comments in CI template	2 weeks ago
dotNET.gitlab-ci.yml	Tidy up CI templates	2 months ago
IOS-Fastlane.gitlab-ci.yml	Merge branch 'require-all-templates-to-include-...	1 month ago

# Merge Requests



The screenshot shows a GitLab interface with a dark blue header. The main content area displays a Merge Request (MR) titled "WIP: Resolve 'Labore tempora sed voluptatem eius est ut'". The MR is in the "Open" state, opened 1 hour ago by Francis Potter. The left sidebar shows the user's profile and navigation links. The right sidebar contains a "Todo" section with various settings like Assignee, Milestone, Time tracking, Labels, Lock merge request, and Notifications. The main content area includes a "Request to merge" section with buttons for "Open in Web IDE", "Check out branch", and "Close merge request". Below this is a "Pipeline" section showing a successful build for the MR. The "Deployed" section shows the MR is deployed to a review environment. The "No approval required" section is also visible. The "Security scanning" section shows 87 new and 51 fixed vulnerabilities. The "License management" section shows no new licenses detected.

GitLab Projects Groups Activity Milestones Snippets

Search or jump to...

panda

Project Repository Issues 27 Merge Requests 9 CI / CD Operations Registry Packages Wiki Snippets Settings

fpotter > tour > panda > Merge Requests > 120

Open Opened 1 hour ago by Francis Potter Edit Close merge request

### WIP: Resolve "Labore tempora sed voluptatem eius est ut"

Closes #36

Edited just now by Francis Potter

Request to merge 36-labore-tempora-s... into master Open in Web IDE Check out branch

Pipeline #66796601 passed for 48aa31ec on 36-labore-tempora-s... View app

Deployed to review/36-labore-tempo... 1 hour ago View app

No approval required

No changes to code quality

Security scanning detected 87 new, and 51 fixed vulnerabilities View full report Expand

License management detected no new licenses Manage licenses View full report

Todo Add todo

Assignee Francis Potter @francispotter Edit

Milestone 3.6.4 Edit

Time tracking Spent: 4h

Labels In Progress Tour Edit

Lock merge request Unlocked Edit

1 participant

Notifications

Reference: fpotter/tour/panda!

# Deployment Environments are First-Class Citizens



GitLab Projects Groups More

Search or jump to...

chipmunk

Project overview

Repository

Issues 36

Merge Requests 8

CI / CD

Security & Compliance

Operations

Metrics

Tracing

Environments

Error Tracking

Serverless

Pod logs

fpotter > tour > chipmunk > Environments

Available 8 Stopped 7

New environment

Environment	Deployment	Job	Commit	Updated	Auto stop in
> review 6					
staging	#57 by [user]	staging #39504...	master - 9af71d0a Merge branch '13-temp...	1 month ago	[Actions]
100% Complete Instance (1) Succeeded Running Failed Pending Unknown Canary					
production	#47 by [user]	rollout 100% #35...	master - 36cf9b6e Merge branch '5-neque...	2 months ...	[Actions]
100% Complete Instance (1) Succeeded Running Failed Pending Unknown Canary					

# Pipelines List



Status	Pipeline	Triggerer	Commit	Stages
failed	#112964640 detached	[user]	[23210] -> 447e7fa0 Apply suggestion to d...	00:04:26 13 minutes ago
canceled	#112957353 detached	[user]	[23458] -> d339af97 Cache merged branch...	00:11:26 26 minutes ago
failed	#112952059 detached	[user]	[21453] -> fa23bb5c Merge branch 'master'...	00:04:48 37 minutes ago
failed	#112945220 detached	[user]	[23832] -> 6fba2814 Update test description	00:50:56 12 seconds ago
failed	#112936137 detached	[user]	[23862] -> 23fc8fe5 Add job-execution-tim...	01:20:30 6 minutes ago
passed	#112935325	[user]	[master] -> 07e579ce Merge branch 'mattkas...	01:16:23 12 minutes ago
failed	#112933010 detached	[user]	[23458] -> 1bb652c2 Re-add line 1 accidenta...	01:08:43 27 minutes ago
failed	#112930595 detached	[user]	[23861] -> dcf35018 First pass updating MR...	00:04:44 1 hour ago

(Project) CI/CD → Pipelines

# Operations Dashboard



The screenshot displays the GitLab Operations Dashboard. At the top, there's a navigation bar with 'GitLab', 'Projects', 'Groups', and 'More'. A search bar and user avatars are also present. The main section is titled 'Operations Dashboard' and includes a green 'Add projects' button. The dashboard is organized into a grid of project cards, each showing a project name, a recent commit, its age, alert status, and a build status bar.

Project	Commit	Age	Alerts	Status
The Atomic Lab / The Quark 4pp	master -> f071f0da Update with alpine image	3 months ago	0 Alerts	failed
The Atomic Lab / The Quantum App	master -> e42f0a14 Update README.md	3 months ago	0 Alerts	passed
The Atomic Lab / The Neutrino App	master -> ce8bbcb9 Update README.md	3 months ago	0 Alerts	passed
The Atomic Lab / The Quark App	Release_1.0 -> b8a54bfd Merge branch '3-reset-demo-e...	4 months ago	0 Alerts	passed
Joel Krooswyk / SpringSample	master -> 07de7ce0 Merge branch '150-finally-an-u...		0 Alerts	@ blocked
GitLab.org / GitLab	master -> 4ffc1a8b Merge branch 'add-annotation...		0 Alerts	running
GitLab.org / gitlab-runner	master -> 2de51da1 Merge branch 'docs-onivek-git...	14 minutes ago	0 Alerts	failed
GitLab.org / GitLab FOSS	master -> fedf978f Add latest changes from gitlab...		0 Alerts	running

More (top) → Operations

*Note: Configured by each User*



GitLab Projects Groups More

Applications

Install applications on your Kubernetes cluster. Read more about [installing applications](#)

Helm Tiller	Helm streamlines installing and managing Kubernetes applications. Tiller runs inside of your Kubernetes Cluster, and manages releases of your charts.	Installed
Ingress	Ingress gives you a way to route requests to services based on the request host or path, centralizing a number of services into a single endpoint. <b>Ingress IP Address</b> 35.184.119.234 Point a wildcard DNS to this generated IP address in order to access your application after it has been deployed. <a href="#">More information</a>	Installed
Prometheus	Prometheus is an open-source monitoring system with <a href="#">GitLab Integration</a> to monitor deployed applications.	Manage Installed
GitLab Runner	GitLab Runner connects to this project's repository and executes CI/CD jobs, pushing results back and deploying, applications to production.	Installing





## Step 1: Configure Kubernetes integration



### Integrate Kubernetes cluster automation

Kubernetes clusters allow you to use review apps, deploy your applications, run your pipelines, and much more in an easy way. Adding an integration to your group will share the cluster across all your projects. [Learn more about group Kubernetes clusters](#)

Add Kubernetes cluster

## Step 2: Turn on Auto DevOps

### Auto DevOps

Auto DevOps will automatically build, test, and deploy your application based on a predefined Continuous Integration and Delivery configuration. [Learn more about Auto DevOps](#)

#### ☒ Default to Auto DevOps pipeline

The Auto DevOps pipeline will run if no alternative CI configuration file is found. [More information](#)

#### Deployment strategy

- ☐ Continuous deployment to production
- ☐ Continuous deployment to production using timed incremental rollout
- ☒ Automatic deployment to staging, manual deployment to production

Save changes

## Step 3: Let GitLab do everything

1. **Build the Docker container**
  - Detects the language/platform of the code (if no Dockerfile provided)
  - Performs normal build steps for that language/platform
  - Adds Docker image to container registry
2. **Run your unit tests and integration tests**
3. **Run static scans and reports to MR**
  - Code Quality Scan
  - Static Application Security Scan
  - Dependency Scan
  - Container Scan
  - Licence Management Scan
4. **Deploy to review app with hostname and SSL**
5. **Run review app scans and reports to MR**
  - Dynamic Application Security Scan
  - Browser Performance Tests
6. **Deploy to Staging using Helm Chart**
  - Only after merge
  - Runs post-deployment steps e.g. database migrations
7. **Deploy to Production on command**
  - Supports Canary deployment option
  - Supports incremental rollout option
8. **Instrument for monitoring using Prometheus**
9. **Record all deployments on the Deploy Board for the project**



# GitLab

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Lab



## Release Stage CI/CD

### Lab Assignment

**Scenario:** Create a `.gitlab-ci.yml` file to see CI in action

1. In the project that you created earlier, add a new file.
  - **Repository -> Files**
  - Click **+**, **New File**
  - Select **.gitlab-ci.yml**
  - Apply Template **Bash**
  - **Commit**
  - Review the file
2. Click **CI/CD**
  - View the Pipeline that's running
  - View the job output from the pipeline
3. Echo contents of README file
  - Edit **.gitlab-ci.yml**
  - Copy and Paste existing stage

```
test3:
  stage: test
  script:
    - cat README.md
```

4. View the job output, verify README contents