CI/CD at LIPN

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Journée Respire
April 1, 2025

Hello!

I'm Jaime Arias

- CNRS Research Engineer @ LIPN
- Responsible of the development team @ LIPN
- Member @ Software/Source Codes College
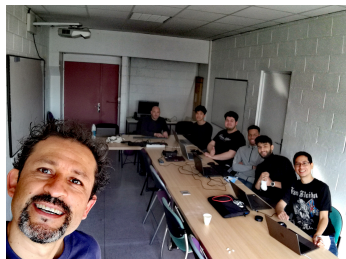- Ambassador @ Software Heritage

You can find me at:

✉ arias@lipn.univ-paris13.fr

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La dev-team

- Development team @ LIPN
- Currently, 4 permanent members:
  - 1 apprentice, 1 IE, 2 IR
- We host interns, engineers, and apprentices throughout the year
  - 2nd year BUT (6 students)
  - 3rd year BUT (1 student)
  - 3rd year bachelor (1 student)
- Hackaton one day per week

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- Hackaton one day per week
- We code and learn a lot of things!
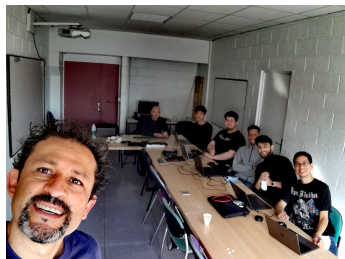
Agile Methodology

- Early and continuous delivery of valuable software.
- Give to the team the environment and support needed.
- Working software is the primary measure of progress.
- …
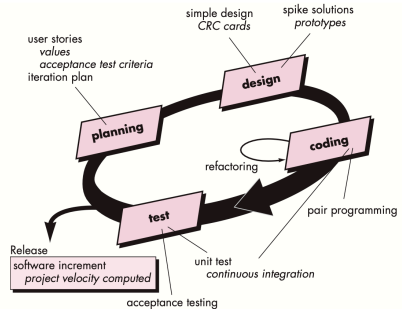
Source: Roger S. Pressman, Bruce Maxim. Software Engineering: A Practitioner's Approach. McGraw Hill

Table of contents

1. Fundamentals of CI/CD

Continuous Integration

- It's a software development practice
- Each member of a team merges its changes into a codebase (*e.g.* SCM) regularly
- Each of these integrations is verified by an automated build to detect integration errors (*e.g.* tests) as quickly as possible

Source: *Atlassian. Gitflow workflow*
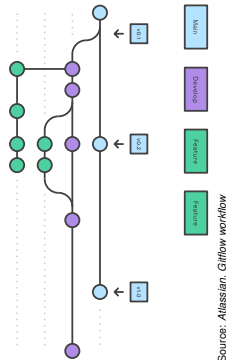
Continuous Integration

Benefits

- Less time wasted in integration
- Less bugs (they are also cumulative)
- Enables refactoring for sustained productivity
- Allows to maintain a *release-ready* mainline

Continuous Delivery/Deployment

- It's a software development strategy where code changes are released (automatically) into the production environment.
- Eliminates the gap between coding and customer value.

Local Development Environment   Staging Environment   Production Environment
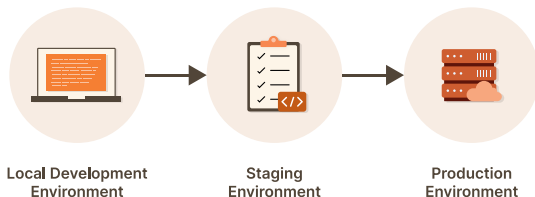
Continuous Delivery/Deployment

- Improved quality
- Accelerated feedback loop
- Better team collaboration
- Faster time to market
- Enhanced customer experience
- Reduced costs

2. GitLab

GitLab

GitLab

- Open Source code repository and collaborative software development platform.
- It's available as a community edition and a commercial edition.
- It supports CI/CD pipelines (`.gitlab-ci.yml`).
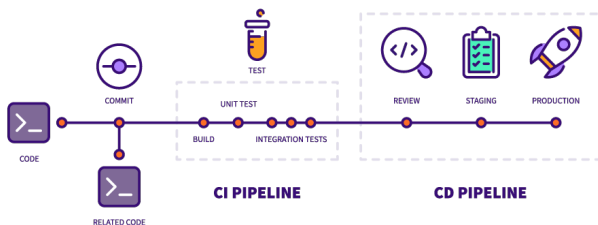
GitLab CI/CD
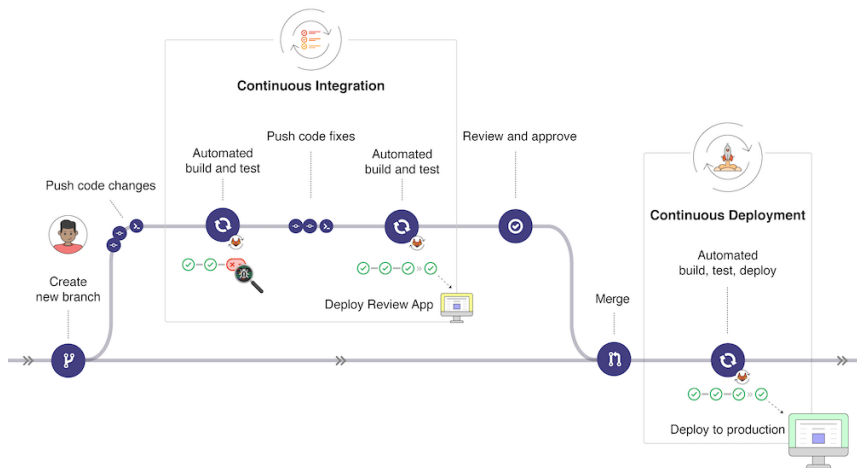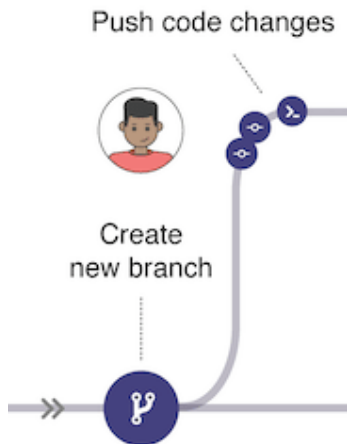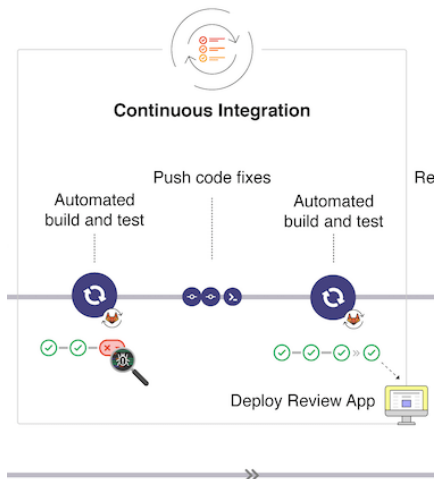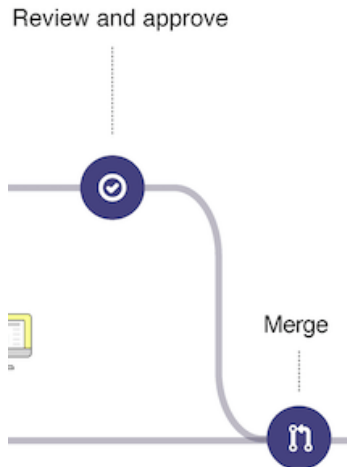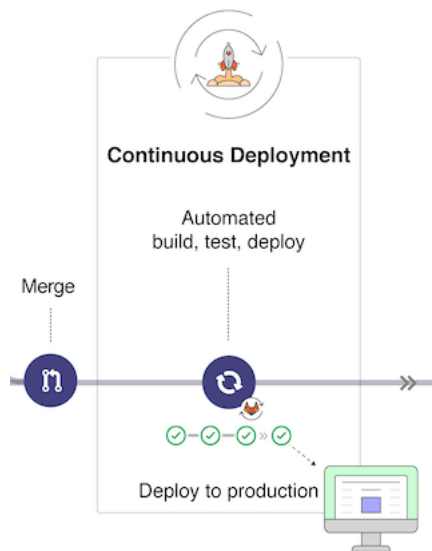
GitLab CI/CD

GitLab CI/CD

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GitLab CI/CD

GitLab CI/CD

`gitlab-ci.yml`

- To use GitLab CI/CD, the file `.gitlab-ci.yml` is placed at the root of your project.
- It specifies the stages, jobs, and scripts to be executed during the CI/CD pipeline.

GitLab CI/CD

`gitlab-ci.yml`

- To use GitLab CI/CD, the file `.gitlab-ci.yml` is placed at the root of your project.
- It specifies the stages, jobs, and scripts to be executed during the CI/CD pipeline.
- The runners are agents that run the jobs. They can run on physical machines or virtual instances.

Instance runners

These runners are available to all groups and projects.

Enable instance runners for this project

Available instance runners: 10

🟢 #22 (8Pz969XF)
runner-04
`docker` `linux`

🟢 #23 (Zh-k7BcW)
runner-05
`docker` `linux`

GitLab CI/CD

gitlab-ci.yml

- Pipelines are made up of stages and jobs:
  - Stages define the order of execution: build, test, deploy, release, etc.
  - Jobs specify the tasks to be performed in each stage, *e.g.* compile or test the code.

GitLab CI/CD

`gitlab-ci.yml`

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  - Stages define the order of execution: `build`, `test`, `deploy`, `release`, etc.
  - Jobs specify the tasks to be performed in each stage, *e.g.* compile or test the code.
- Pipelines can be triggered by various events, like commits or merges, or can be on schedule.

GitLab CI/CD

`gitlab-ci.yml`

- Use CI/CD variables to customize jobs by making values defined elsewhere accessible to jobs.
- Use CI/CD component templates for common tasks and integrations.

Visibility ⓘ

○ Visible
  Can be seen in job logs.

○ Masked
  Masked in job logs but value can be revealed in CI/CD settings. Requires values to meet regular expressions requirements.

○ Masked and hidden
  Masked in job logs, and can never be revealed in the CI/CD settings after the variable is saved.

Flags

☐ Protect variable
  Export variable to pipelines running on protected branches and tags only.

☑ Expand variable reference
  `$` will be treated as the start of a reference to another variable.

Description (optional)

The description of the variable's value or usage.

Key

`PRODUCTION_SERVER`

You can use CI/CD variables with the same name in different places, but the variables might overwrite each other. What is the order of precedence for variables?

Value

`127.0.01`

GitLab CI/CD

gitlab-ci.yml

```yaml
 1  image: node:16
 2
 3  stages:
 4    - test
 5    - e2e
 6    - build
 7    - deploy
 8
 9  variables:
10    GIT_SUBMODULE_STRATEGY: recursive
11
12  include:
13    - template: Jobs/SAST.gitlab-ci.yml
```

GitLab CI/CD

gitlab-ci.yml

```
1  .only-tags:
2    variables:
3      NODE_ENV: "production"
4      IMAGE_VERSION: $CI_COMMIT_TAG
5      IMAGE_NAME: $ARTIFACT_NAME:$IMAGE_VERSION
6    rules:
7      - if: $CI_COMMIT_TAG
8        when: manual
```

GitLab CI/CD

gitlab-ci.yml

```
 1  unit_tests:
 2    stage: test
 3    extends: .tests_setup
 4    script:
 5      - yarn tests
 6    cache:
 7      key:
 8        files:
 9          - yarn.lock
10      paths:
11        - .yarn-cache/
```

GitLab CI/CD

gitlab-ci.yml

```
 1  e2e_tests:
 2    stage: e2e
 3    image: cypress/base:16.0.0
 4    services:
 5      - name: mongo:latest
 6    extends: .tests_setup
 7    script:
 8      - yarn build
 9      - yarn start & yarn wait-on http://localhost:3000
10      - yarn tests:e2e
11    artifacts:
12      when: always
13      paths:
14        - tests/e2e/screenshots/
15        - tests/e2e/videos/
16      expire_in: 1 week
```

GitLab CI/CD

gitlab-ci.yml

```
1  build_image:
2    extends: .only-tags
3    stage: build
4    image:
5      name: himito/docker-publisher
6      entrypoint: [""]
7    script:
8      - sh /kaniko/publish_to_dockerhub.sh Dockerfile
           $CI_PROJECT_DIR $ARTIFACT_NAME $IMAGE_VERSION
           $CI_REGISTRY_AUTH
9    retry: 2
```

GitLab CI/CD

gitlab-ci.yml

```yaml
 1 deploy:
 2   image: alpine
 3   stage: deploy
 4   extends: .only-tags
 5   variables:
 6     USERNAME: "deployer"
 7     CONFIG_FILE: "docker-compose.cosyverif.yml"
 8   before_script:
 9     - apk add --no-cache openssh rsync bash
10     - eval $(ssh-agent -s)
11     - ssh-keyscan $PRODUCTION_SERVER >> ~/.ssh/known_hosts
12   script:
13     - scp docker-compose.prod.yml "$USERNAME@$PRODUCTION_SERVER:${
         COSYVERIF_PATH}/${CONFIG_FILE}"
14     - docker-compose -f ${CONFIG_FILE} up --detach --no-deps ${
         SERVICE_NAME}
15   after_script:
16     - ssh-agent -k
```

3. CI/CD Architecture @ LIPN

CI/CD Architecture @ LIPN
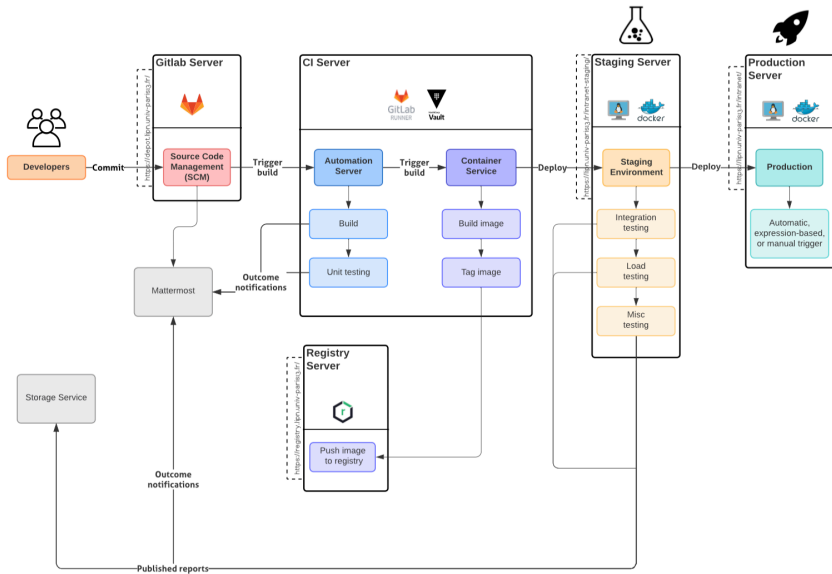
CI/CD Architecture @ LIPN
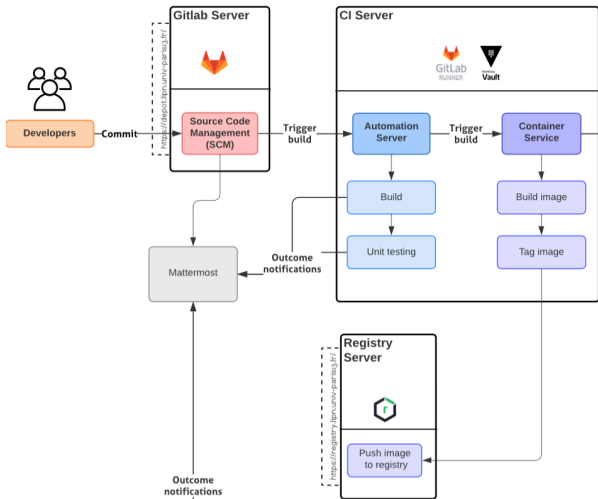
CI/CD Architecture @ LIPN
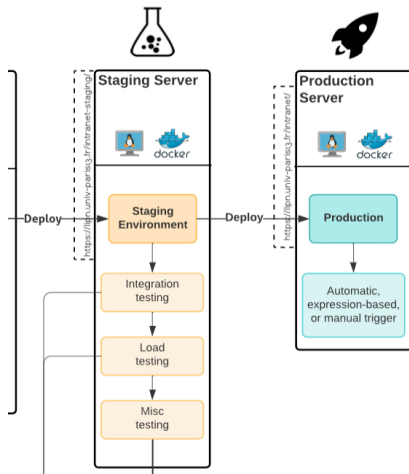
4. Development of the LIPN intranet

Development of the LIPN intranet

Microservice Architecture
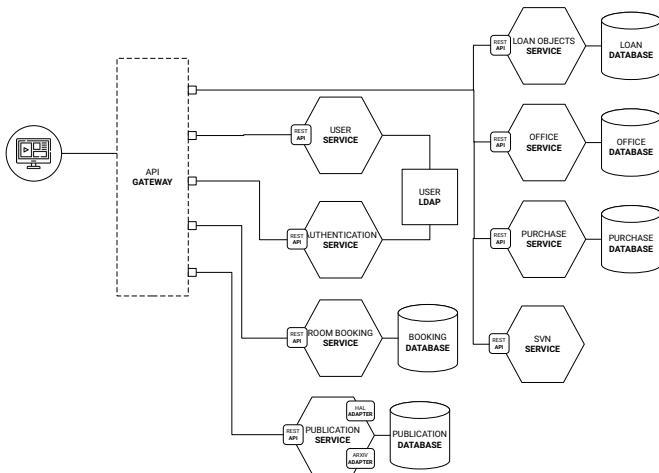
Development of the LIPN intranet
Source Code Management (SCM)

Development of the LIPN intranet
CI/CD Pipeline

Development of the LIPN intranet
CI/CD Pipeline

Development of the LIPN intranet
CI/CD Pipeline

dependencies	linter	test	build	deploy
✔ install	✔ linter	✔ test	✔ package-staging	✔ deploy-staging

Development of the LIPN intranet
CI/CD Pipeline

Development of the LIPN intranet
Code Review

Development of the LIPN intranet

Code Review

Pipeline **#9968** passed
Pipeline passed for `a2ba099c` on `feature/vue3` 1 month ago

8✓ Approval is optional

⋎ Merged by 👤 **Jaime Arias** 1 month ago   Cherry-pick

Merge details
  - Changes merged into `master` with 24df70cb.
  - Deleted the source branch.

Pipeline **#9972** passed
Pipeline passed for `24df70cb` on `master` 1 month ago

Development of the LIPN intranet

Test Automation

Development of the LIPN intranet

Test Automation

Duration: 26 seconds
Finished: 2 years ago
Queued: 39 seconds
Timeout: 1h (from project) ⑦
Runner: #25 (NdyZbFB9) runner-07
Coverage: 66.88%
Test summary: 31

Job artifacts ⑦
The artifacts were removed 2 years ago
⑦

Commit `c1cbb28b` ⑤
fix: clear localstorage when token is ex
pired

Pipeline #5212 ✅ Passed for `develop`
⑤

test ⌄

Development of the LIPN intranet
Build Automation

Development of the LIPN intranet

Dependency Update Automation

chore(deps): update all non-major dependencies

⌥ Merged **Renovate** requested to merge `renovate/all-minor-patch` into `develop` 6 months ago

Overview 0   Commits 1   Pipelines 8   Changes 6

This MR contains the following updates:

Package	Type	Update	Change
@types/node (source)	devDependencies	patch	`22.5.4` -> `22.5.5`
debug	dependencies	patch	`4.3.6` -> `4.3.7`
express (source)	dependencies	minor	`4.19.2` -> `4.21.0`
husky	devDependencies	patch	`9.1.5` -> `9.1.6`
mongoose (source)	dependencies	patch	`8.6.1` -> `8.6.2`
npm-run-all2	devDependencies	patch	`6.2.2` -> `6.2.3`
start-server-and-test	devDependencies	patch	`2.0.5` -> `2.0.7`
typescript (source)	devDependencies	minor	`5.5.4` -> `5.6.2`
vite (source)	devDependencies	patch	`5.4.3` -> `5.4.5`
vue-router	dependencies	patch	`4.4.3` -> `4.4.5`

Development of the LIPN intranet

Build Automation

Development of the LIPN intranet

Notifications

Development of the LIPN intranet

Notifications

Development of the LIPN intranet

Staging Server

Development of the LIPN intranet

Production Server

5. Gitlab Pages

Gitlab Pages

Gitlab Pages

```
1  image: ruby:latest
2
3  variables:
4    JEKYLL_ENV: production
5    LC_ALL: C.UTF-8
6
7  before_script:
8    - gem install jekyll bundler
9    - bundle install
10
11 pages:
12   stage: deploy
13   script:
14     - bundle exec jekyll build -d public
15   artifacts:
16     paths:
17       - public
18     only:
19       - main
```

deploy

✅ pages   ↻

✅ pages:deploy

Gitlab Pages

URL Convention

Group

Project

https://sites.lipn.univ-paris13.fr/cosyverif/documentation

Thank you!

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