IDVOC
– gitlab-ci

CRI
CENTRE DES RESSOURCES INFORMATIQUES

-- Cyril zarak Duval, root CRI/ACU 2020

Git workflow and CI/CD

- You need to use a VCS to work efficiently with many people
  - Git is obviously the most popular VCS
- The way you work with git is called a git workflow
- A git workflow is a set of rules and best practices for a project or a team
  - Ex: don't push on master branch directly

Git workflow and CI/CD

- Usual git workflow looks like this:
  - master/main/devel branch represents the project “stable” version
    - It’s the most important branch
    - One cannot push directly to it (protected)
    - The ability to merge is limited to maintainers
  - To add a new feature, one must create a branch

Git workflow and CI/CD

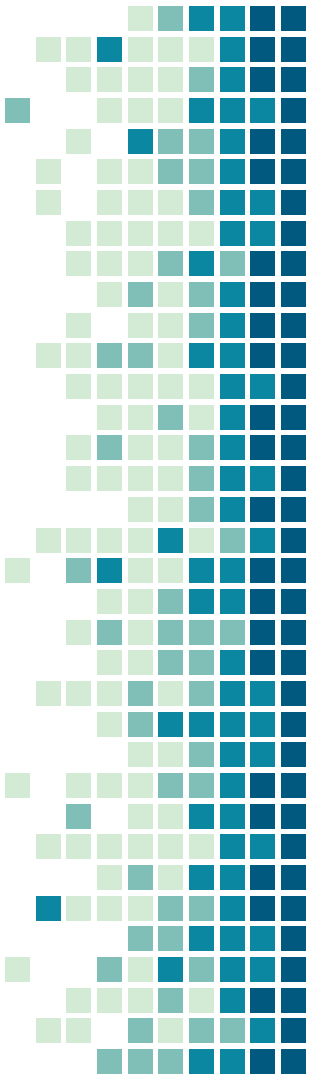
- Git workflow can also:
  - Setup a git message format
  - Allow/force/forbid to squash commits in a branch
  - Choose between merge commits, fast forward or not, or rebases
  - Enforce a branch naming convention
  - Allow or not push force on feature branches
  - …

Git workflow and CI/CD

- Usually you want to assert code quality before merging it
- People review Merge/Pull Requests before merging them
  - Again, it depends on your git workflow
- People often make mistakes
- Continuous integrations (CI) can help but running your
  - e2e tests
  - Unit tests
  - Linter
  - …

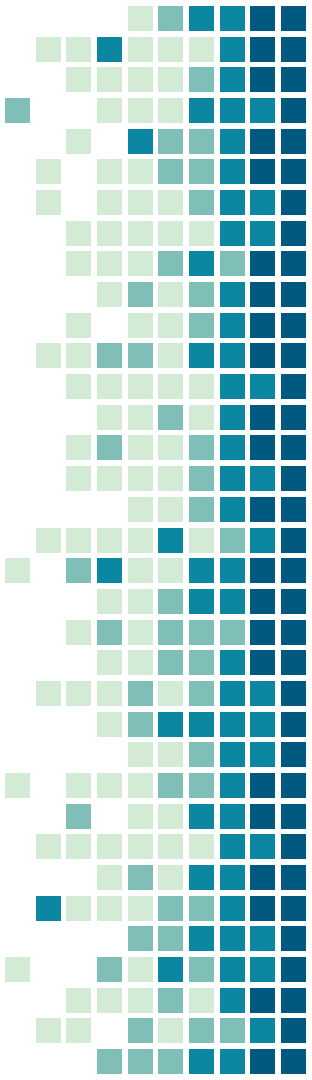
Git workflow and CI/CD

- CI can also try to compile your project to see if there are errors or warnings
- Make available build on release
- Push the new version somewhere
  - In this case it's called a CD: continuous deployment
- CI/CD are more or less the same: code to be executed with a git workflow
  - CI are tests to ensure quality
  - CD deploys automatically



Git workflow and CI/CD

- When to run your CI/CD depends on your git workflow
- Examples include:
  - On each commit
  - Manually
  - On tags
  - On specific branches
  - Based on the commit name
  - On merge requests
  - …



Gitlab-CI

- Gitlab comes with a CI/CD system: Gitlab-CI
- In your project, create a .gitlab-ci.yml
- This file is a config file describing your CI/CD:
  - What to do
  - When to do it
  - How to do it
- In the project options, CI/CD options available to:
  - Provide variables (like keys for deployment)
  - Setup pipeline triggers
  - ....

Gitlab-CI and its integration

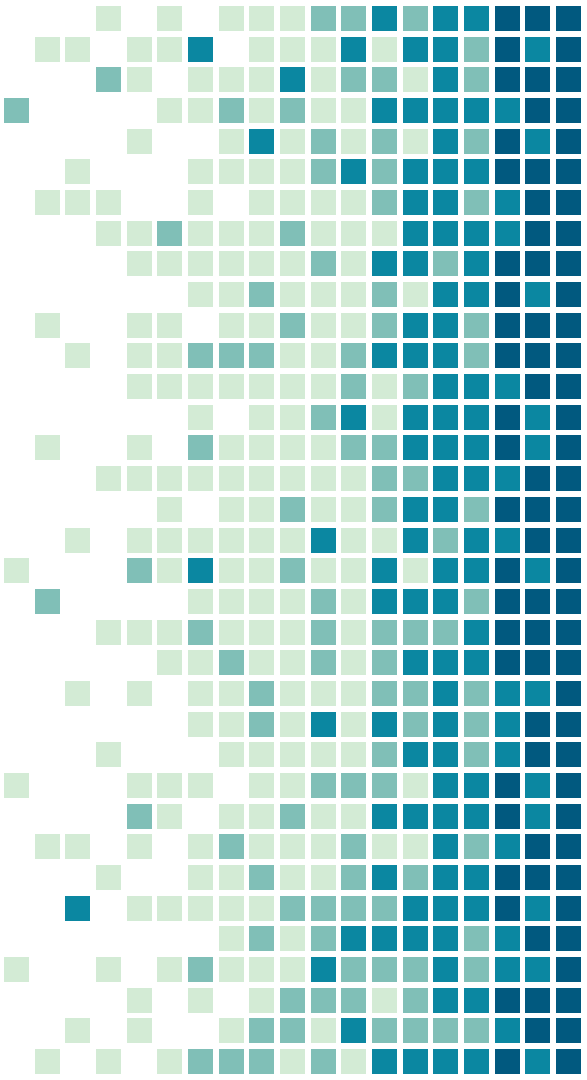
- Gitlab-ci in itself is a very powerful tool
  - Checkout the gitlab-ci.yml reference file to be convinced
- Its strength is also with the integration it comes with:
  - Secrets
  - Built-in container registry
  - Specific/shared runners
  - Badges: pipeline status, coverage, etc
  - Triggers
  - Scheduling
  - Cross-projects

Gitlab as a DevOps tool

- Gitlab provides services for DevOps in general
- On top of the previously mentioned:
  - Deployment
    - Tracking deployments
    - Listing platforms with types
    - Well integrated with CI/CD
    - Integration with Sentry
  - Release
  - Allow advanced Git workflows
  - Permission system

How to write a .gitlab-ci.yml

Don’t get confused with jobs, stages, …



Gitlab-CI

- Gitlab-CI have a concept of pipeline
- A pipeline is a list of stages to execute in a specific order
- A stage is a list of jobs to execute in parallel
- You can put rules for which jobs/stage to run for a specific pipeline
- You can put rules to allow failure in a job to not fail the whole pipeline
- https://docs.gitlab.com/ee/ci/yaml/ is the reference

gitlab-ci.yml

- On the root of the YAML file you can put:
  - A global keyword
  - A job

Keyword	Description
`default`	Custom default values for job keywords.
`include`	Import configuration from other YAML files.
`stages`	The names and order of the pipeline stages.
`variables`	Define CI/CD variables for all job in the pipeline.
`workflow`	Control what types of pipeline run.

gitlab-ci.yml

```yaml
---

stages:
    - build

buildWithMake:
    stage: build
    script:
        - make
```

Gitlab-ci.yml – job

- A job
  - has a name (its key on the root of the doc)
  - is in a stage
  - has a script to run

Gitlab-ci.yml - job

- ➔ Job context is independant
  - ◆ Each job is run in a new environment
    - Except for the artifacts which remain
    - Artifacts are defined explicitly
  - ◆ The script is executed in a directory where the project is
    - It's provided as a git repo, you can do git operations
      - ○ You can even commit from a CI/CD
  - ◆ Environment variables are provided with informations about the job
    - Git commit hash, git branch, repo URL, ...

Gitlab-ci.yml - job

- How can you run a job in a new environment every time ?
  - Without being able to escape this environment
  - While being as deterministic as possible
  - While having a way to choose what will be in the env
    - Like packages, or even the OS
- If you don't have a hint on how to implement that, go back to the first slide
- (sidenote: some people don't use containers as a runner executor. It remains the most popular one though)

Thanks !

Questions ?

Slides available on zarak.fr/

Contact: cyril@cri.epita.fr

zarak production#5492