



Continuous Integration (CI)

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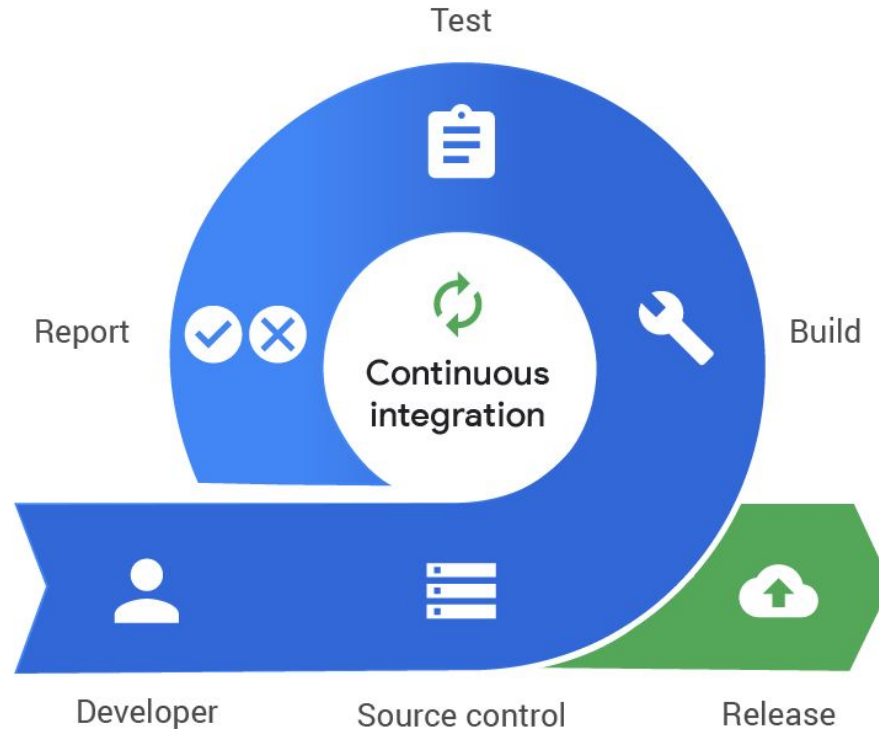
Jorge Cabrera Rodríguez (alu0101351773)



Tips to be covered

1. Introduction
 - a. An example
2. What is CI
3. Advantages and disadvantages
4. CI vs CDep vs CDeI
5. Phases of CI
6. CircleCI
 - a. Creating an account
 - b. Basic concepts
 - c. Workflows
 - d. Jobs
 - e. Step
 - f. Relevant features

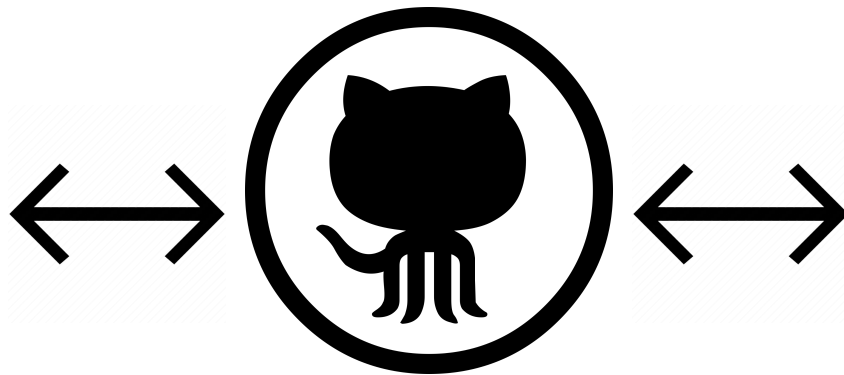
A brief introduction to CI



An introduction example



Alice



Bob




What is CI?

Development practice where developers **integrate code** into a shared repository **frequently**.



Each integration can then be verified by an **automated build** and **automated tests**.





“Continuous Integration doesn’t get rid of bugs, but it does make them dramatically easier to find and remove.”

-Martin Fowler, software developer-

Advantages and Disadvantages




Advantages

- Merging is much easier.
- There is always executable code.
- Bugs are easier to find.
- More communication between team members.

Disadvantages

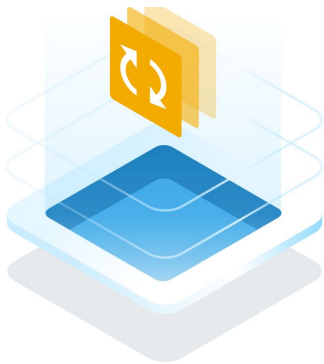
- May be slower.
- Needs a lot of push and pull actions.



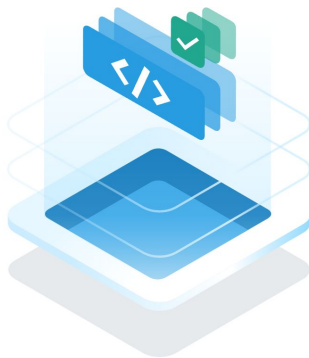
Continuous Integration VS Continuous Deployment VS Continuous Delivery

Differences between each model

Continuous Integration (CI)



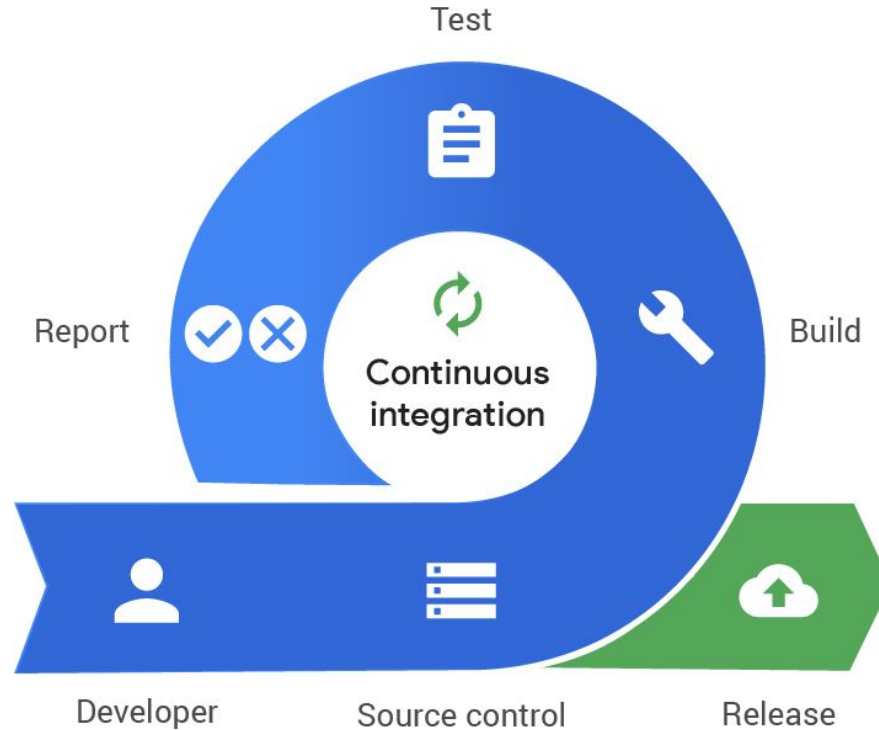
Continuous Deployment (CD)



Continuous Delivery (CD)



Phases of CI





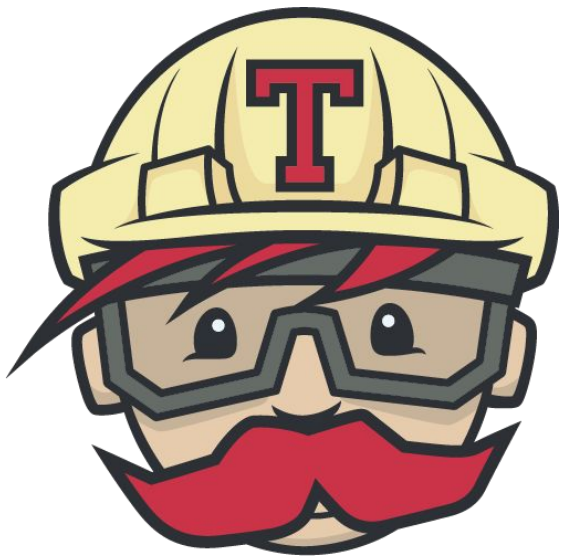
Tools for CI



GitHub Actions



Jenkins

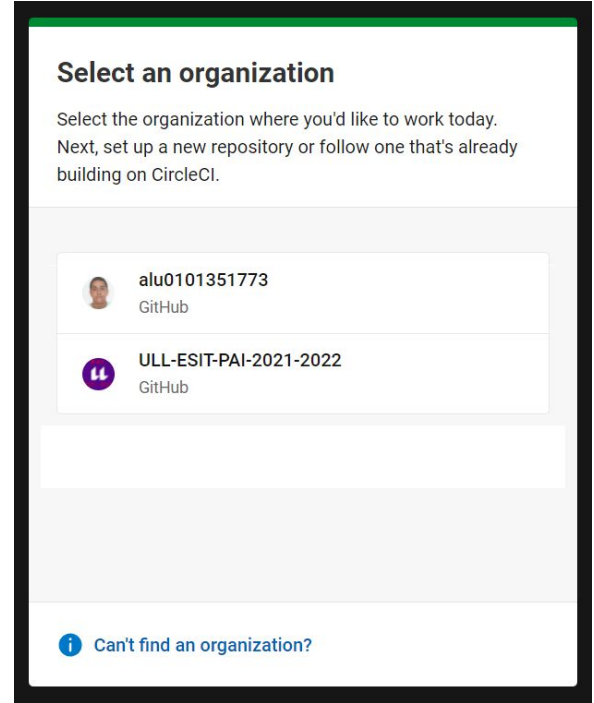
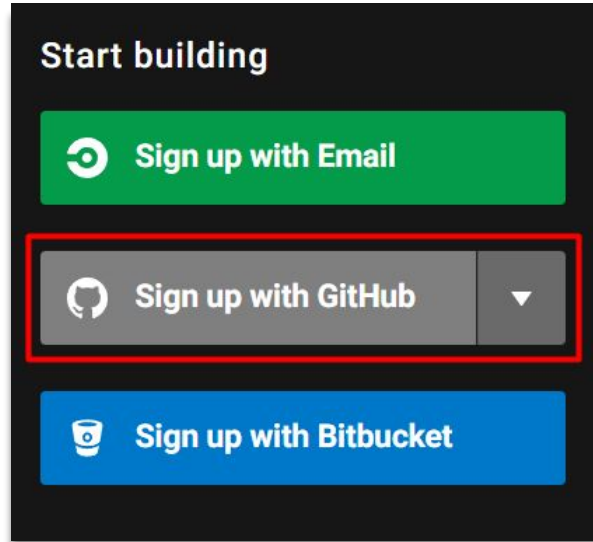
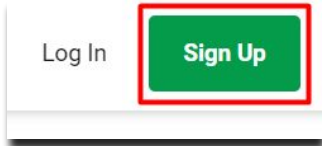


Travis CI



circleci

Creating an account



Setting up a repo

ULL-ESIT-PAI-...
Jorge Cabrera Rodríg...

Dashboard

Projects

Insights

Organization Settings

Plan

Can't find an organization?
[Check permissions](#) and update access to the ones you want.

Notifications **2**

Status **OPERATIONAL**

Set up new projects or follow projects already building on CircleCI.
Following a project adds it to your dashboard.

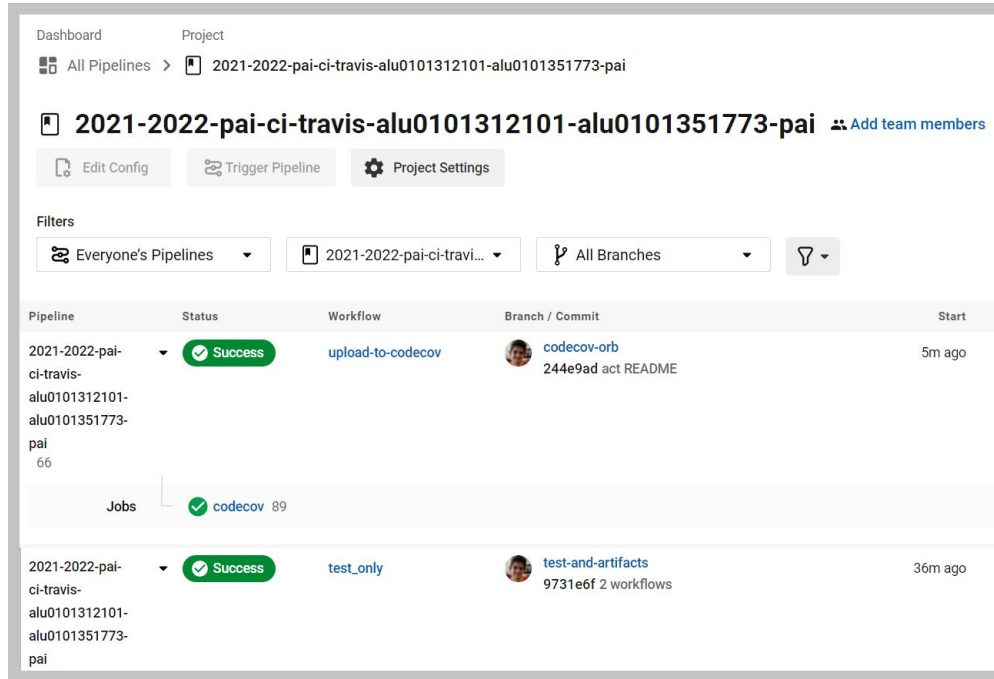
Projects

Repo name

Follow All ...

Repo	
2021-2022-pai-ci-travis-alu0101312101-alu0101351773-pai	Unfollow Project ...
2021-2022-pai-p05-debugging-exercism-alu0101351773 🔗	Set Up Project ...
2021-2022-pai-p06-files-json-alu0101351773 🔗	Set Up Project ...
2021-2022-pai-p04-unit-testing-exercism-alu0101351773 🔗	Set Up Project ...
2021-2022-pai-p02-simpleprograms2-exercism-alu0101351773 🔗	Set Up Project ...

Main page of our CI



The screenshot displays the Jenkins CI dashboard for a project named "2021-2022-pai-ci-travis-alu0101312101-alu0101351773-pai". The interface includes a top navigation bar with "Dashboard" and "Project" tabs. Below the navigation bar, there are buttons for "Edit Config", "Trigger Pipeline", and "Project Settings". A "Filters" section allows users to filter by "Everyone's Pipelines", the specific project, and "All Branches". The main content area shows a table of pipelines with columns for Pipeline, Status, Workflow, Branch / Commit, and Start. The first pipeline, "2021-2022-pai-ci-travis-alu0101312101-alu0101351773-pai", is in a "Success" state with a workflow named "upload-to-codecov". Below the pipeline table, a "Jobs" section shows a job named "codecov" with a status of "89". The second pipeline, "2021-2022-pai-ci-travis-alu0101312101-alu0101351773-pai", is also in a "Success" state with a workflow named "test_only".

Dashboard Project

All Pipelines > 2021-2022-pai-ci-travis-alu0101312101-alu0101351773-pai

2021-2022-pai-ci-travis-alu0101312101-alu0101351773-pai [Add team members](#)

Edit Config Trigger Pipeline Project Settings

Filters

Everyone's Pipelines 2021-2022-pai-ci-travi... All Branches

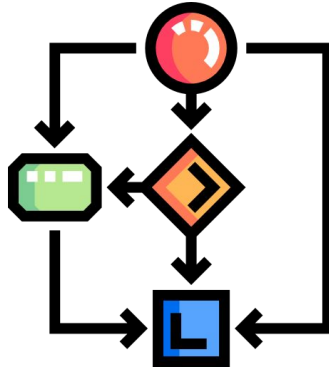
Pipeline	Status	Workflow	Branch / Commit	Start
2021-2022-pai-ci-travis-alu0101312101-alu0101351773-pai 66	Success	upload-to-codecov	codecov-orb 244e9ad act README	5m ago
Jobs ✓ codecov 89				
2021-2022-pai-ci-travis-alu0101312101-alu0101351773-pai	Success	test_only	test-and-artifacts 9731e6f 2 workflows	36m ago

CI basic concepts

Pipelines



Workflows




Jobs




Steps







Workflows

Pipeline	Status	Workflow
2021-2022-pai- ci-travis- alu0101312101- alu0101351773- pai 64	▼  Success	build_and_artifacts

Jobs

 **test_only** ✓ Success

Duration / Finished	Branch	Commit	Author & Message
 21s / 8m ago	 test-and-artifacts	 9731e6f	 2 workflows

✓ tests 18s

Steps

STEPS

TESTS 16

TIMING BETA

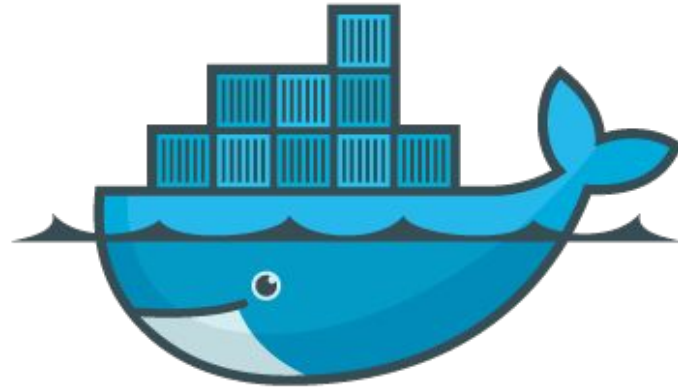
ARTIFACTS

RESOURCES NEW

1 / 16 parallel runs ⓘ

▶ ✓ Spin up environment	3s	↗	↓
▶ ✓ Preparing environment variables	0s	↗	↓
▶ ✓ Checkout code	0s	↗	↓
▶ ✓ npm i	11s	↗	↓
▶ ✓ npm run test	1s	↗	↓
▶ ✓ Uploading test results	0s	↗	↓

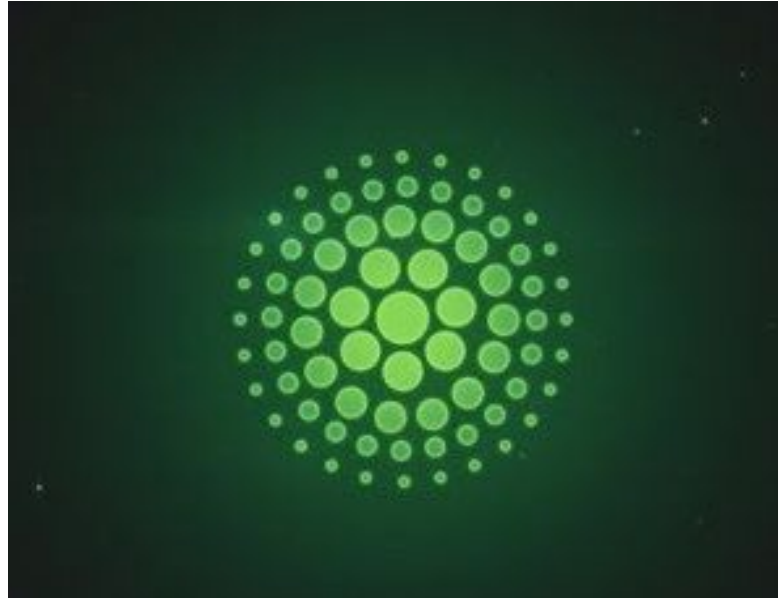
Workflows and jobs



docker

Workflows and jobs

Orbs



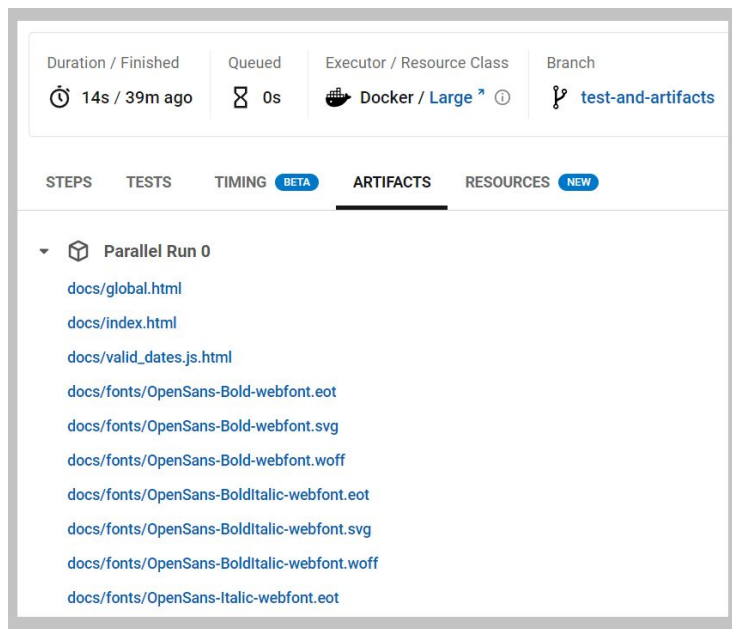
Relevant features

Test and Documentation



Relevant features

Artifacts

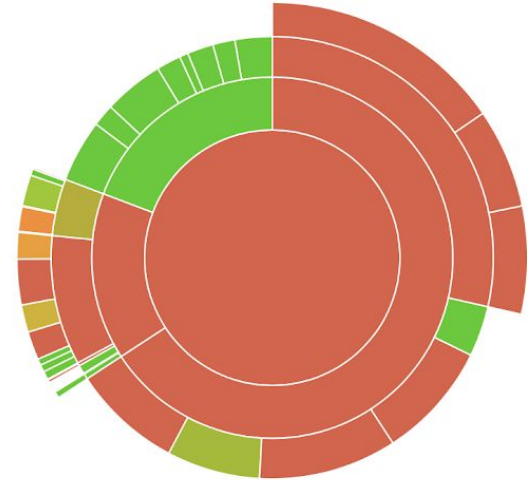


The screenshot displays a CI/CD interface with a top status bar and a main content area. The status bar includes four sections: 'Duration / Finished' showing '14s / 39m ago' with a clock icon; 'Queued' showing '0s' with a queue icon; 'Executor / Resource Class' showing 'Docker / Large' with a Docker icon and a link icon; and 'Branch' showing 'test-and-artifacts' with a branch icon. Below the status bar is a navigation bar with tabs: 'STEPS', 'TESTS', 'TIMING' (with a 'BETA' badge), 'ARTIFACTS' (which is underlined), and 'RESOURCES' (with a 'NEW' badge). The main content area shows a dropdown menu for 'Parallel Run 0' with a cube icon. Below the dropdown is a list of artifact paths:

- [docs/global.html](#)
- [docs/index.html](#)
- [docs/valid_dates.js.html](#)
- [docs/fonts/OpenSans-Bold-webfont.eot](#)
- [docs/fonts/OpenSans-Bold-webfont.svg](#)
- [docs/fonts/OpenSans-Bold-webfont.woff](#)
- [docs/fonts/OpenSans-BoldItalic-webfont.eot](#)
- [docs/fonts/OpenSans-BoldItalic-webfont.svg](#)
- [docs/fonts/OpenSans-BoldItalic-webfont.woff](#)
- [docs/fonts/OpenSans-Italic-webfont.eot](#)

Relevant features

Code coverage



Other interesting features

Environment Variables

... declared with the **environment** key for a job

```
jobs:
  build-job:
    docker:
      - image: cimg/base:2020.01
    environment:
      LITTLE_CORVETTE: red
```

Context

Context: **my-context**

```
$MY_ENV_VAR = myvalue
```

```
jobs:
  build:
    docker:
      - image: <image-name>:<version TAG>
    steps: # use env var from Context
      - run: echo $MY_ENV_VAR
```

Other interesting features

Multiple Branches Execution

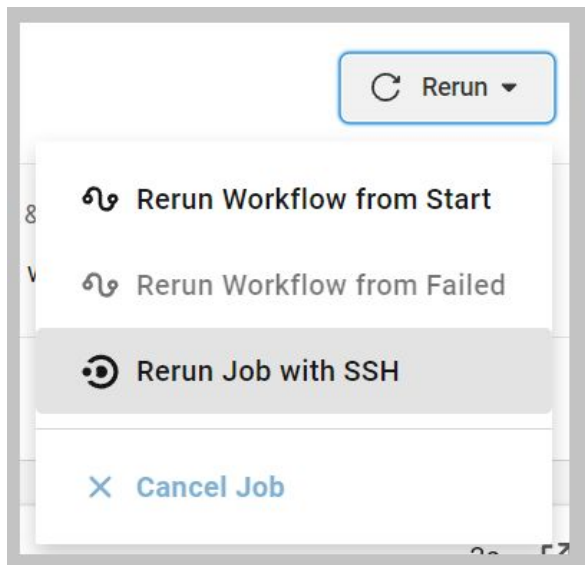
```
filters:  
  branches:  
    only:  
      - dev  
      - /user-.*/
```

Job approval

```
- hold:  
  type: approval  
  requires:  
    - build  
    - test  
- deploy:  
  requires:  
    - hold
```

Other interesting features

SHH



Schedules

```
nightly:
  triggers:
    - schedule:
        cron: "0 0 * * *"
        filters:
```

Bibliografía



- YT Video - [What is Continuous Integration?](#)
- Wikipedia - [Continuous Integration definition](#)
- [Another definition of CI and its uses](#)
- [CircleCI](#)
- [CircleCI getting started](#)
- [14 Examples of CI tools](#)

Bibliografía (CircleCI)



- Workflows
- Orbs
- Docker
- Store test results
- Artifacts
- Code Coverage



Questions ?

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