git & devops2

phil

whoami

phil

okay knowledge of git

a bit of experience in devops

the internet is your best friend when you don’t have an answer

on today’s program

- **git**
- devops

wtf is git?

scm: source control management

- bazaar (ubuntu)
- cvs (netbsd, openbsd)
- git (linux kernel, a billion projects)
- mercurial (mozilla, facebook)
- apache subversion (webkit)

git history

created by Linus Torvalds to maintain the kernel in april 2005 (**15 years ago!**)

- fast
- distributed (not centralized)
- no corruptions

2 weeks to get something working

1 month later: kernel 2.6.12 released with git

https://github.com/git/git/tree/e83c5163316f89bfbde7d9ab23ca2e25604af290

git / git

Stop ignoring 2.2k | Unstar 32.3k | Fork 18.8k

Code | Pull requests 27 | Actions | Security 11 | Insights

Git Source Code Mirror - This is a publish-only repository and all pull requests are ignored. Please follow Documentation/SubmittingPatches procedure for any of your improvements.

c shell

1 commit | 5 branches | 0 packages | 768 releases | 1,356 contributors | View license

Tree: e83c516331 | New pull request | Create new file | Upload files | Find file | Clone or download

Linus Torvalds Initial revision of "git", the information manager from hell — 234 — Latest commit e83c516 on Apr 8, 2005

Makefile	Initial revision of "git", the information manager from hell	15 years ago
README	Initial revision of "git", the information manager from hell	15 years ago
cache.h	Initial revision of "git", the information manager from hell	15 years ago
cat-file.c	Initial revision of "git", the information manager from hell	15 years ago
commit-tree.c	Initial revision of "git", the information manager from hell	15 years ago
init-db.c	Initial revision of "git", the information manager from hell	15 years ago
read-cache.c	Initial revision of "git", the information manager from hell	15 years ago
read-tree.c	Initial revision of "git", the information manager from hell	15 years ago
show-diff.c	Initial revision of "git", the information manager from hell	15 years ago
update-cache.c	Initial revision of "git", the information manager from hell	15 years ago
write-tree.c	Initial revision of "git", the information manager from hell	15 years ago

README

```
        GIT - the stupid content tracker

"git" can mean anything, depending on your mood.

 - random three-letter combination that is pronounceable, and not
   actually used by any common UNIX command.  The fact that it is a
   mispronounciation of "get" may or may not be relevant.
 - stupid. contemptible and despicable. simple. Take your pick from the
   dictionary of slang.
 - "global information tracker": you're in a good mood, and it actually
   works for you. Angels sing, and a light suddenly fills the room.
 - "goddamn idiotic truckload of sh*t": when it breaks
```

git config

```
git config --global user.name “Philippe Loctaux”

git config --global user.email p@philippeloctaux.com

git config --global core.editor emacs

git config --global color.ui auto
```

CLI vs GUI

CLI: Command Line Interface

GUI: Graphical User Interface

Learn with the CLI first, because it forces you to understand what you are doing

Once you are comfortable with the CLI, use a GUI (because it’s faster)

git commit

commits help you **keep track** of your work

regular and **small** commits are important to see what you've done

with a nice message you know what you did

useful if you need to go back in time to fix a nasty bug

https://xkcd.com/1296

git commit message

first line: single short summary of the change

second line: blank

rest: description of the change, explain why you did that

explain what you did

“Like your math professor, show me your work, show the individual steps of what you did”

Your commit message can be used for documentation

Useful when something breaks and you need to get some context

```
Summarize changes in around 50 characters or less

More detailed explanatory text, if necessary. Wrap it to about 72
characters or so. In some contexts, the first line is treated as the
subject of the commit and the rest of the text as the body. The
blank line separating the summary from the body is critical (unless
you omit the body entirely); various tools like `log`, `shortlog`
and `rebase` can get confused if you run the two together.

Explain the problem that this commit is solving. Focus on why you
are making this change as opposed to how (the code explains that).
Are there side effects or other unintuitive consequences of this
change? Here's the place to explain them.

Further paragraphs come after blank lines.

 - Bullet points are okay, too

 - Typically a hyphen or asterisk is used for the bullet, preceded
   by a single space, with blank lines in between, but conventions
   vary here

If you use an issue tracker, put references to them at the bottom,
like this:

Resolves: #123
See also: #456, #789
```

git commit

Don’t use `git commit -m`

Use `git commit` instead

If you forgot something or made a typo in your commit: `git commit --amend`

git log

```
git log
git show sha
git blame path/to/file
```

SHA?

Secure Hash Algorithms

Used to keep data safe (such as passwords)

Can be used for integrity of content (in case of git)

Git has a hash of everything: commits, trees, blobs, etc

In git you will find what you want easily it’s hash

git back in time

```
git checkout <sha>
git reset HEAD~1
git reset --hard HEAD~1
git revert <sha>
```

https://github.blog/2015-06-08-how-to-undo-almost-anything-with-git/

git branch

```
git branch my-feature
git switch my-feature

git merge my-feature

git branch -d my-feature
git push origin --delete my-feature
```

https://learngitbranching.js.org/

git diff

```
git diff
git diff master..my-feature
git diff sha..sha
git diff --staged
```

git stash

```
git stash
git stash pop
git stash list
git stash apply
git stash drop
```

git pretty log

https://raw.githubusercontent.com/x4m3/point/master/git/gitconfig

```
[pretty]
    custom = "%C(magenta)%h %C(red)(%an) %C(yellow)%ar %C(green)%s %Creset%d"
    #                     |          |               |             |          └─ decorations
    #                     |          |               |             └─ message
    #                     |          |               └─ date (relative)
    #                     |          └─ author name
    #                     └─ hash (abbreviated)
[alias]
    l = log --graph --pretty=custom
```

git more

https://ohshitgit.com

https://git-scm.com/book/en/v2

https://education.github.com/git-cheat-sheet-education.pdf

if it breaks `rm -rf` and start again

```
man git
```

on today’s program

- git
- **devops**

wtf is devops?

software development (**dev**) + information technology operations (**ops**)

1. coding
2. building
3. testing
4. packaging
5. releasing
6. configuring
7. monitoring

wtf is ci/cd?

Continuous Integration: get code and build it

Continuous Delivery: publish easily

providers

GitHub

GitHub actions

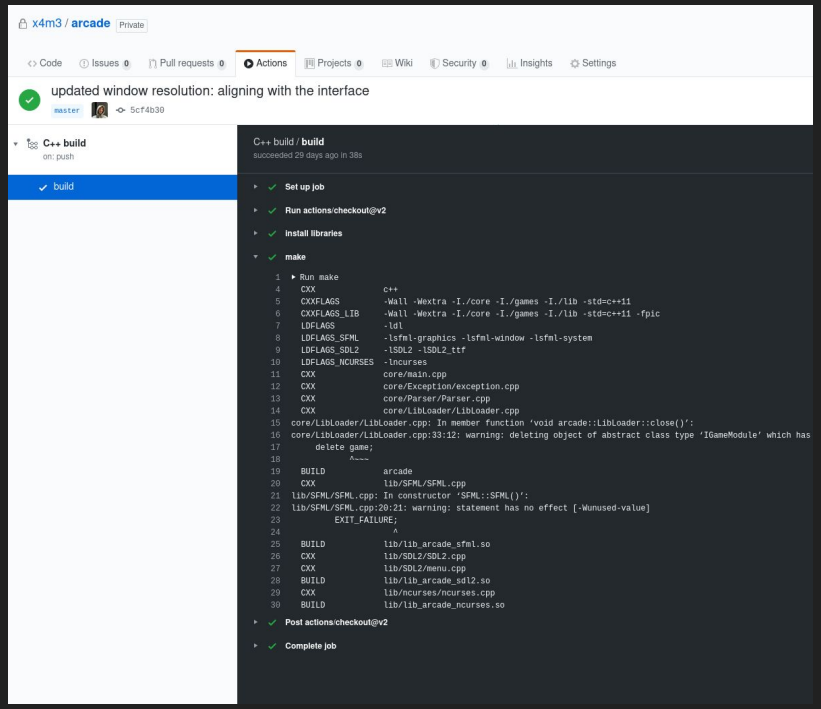
free for public repos, 2000 minutes per month for private repos

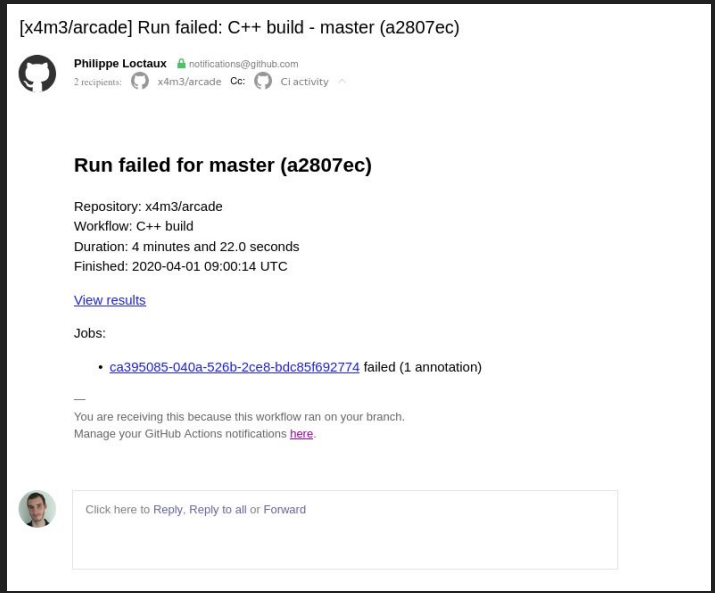
free for epitech projects (epitech pays for us)

actions triggered by events (ex: push on branch)

works with nodejs, python, c, c++, java, php, rust, android, ios, etc

feedback on builds



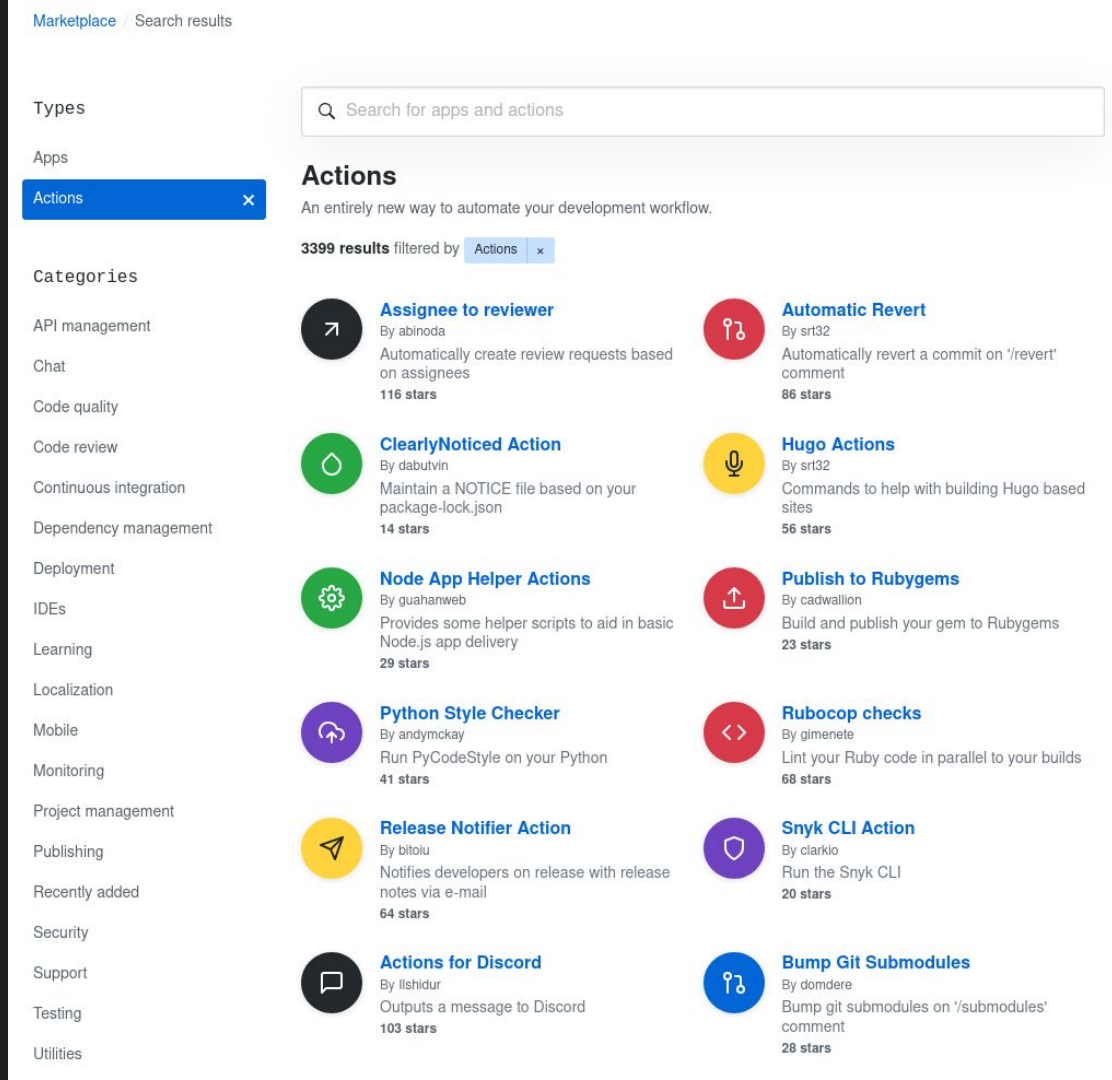


get actions

GitHub Marketplace

https://github.com/marketplace?type=actions

https://github.com/sdras/awesome-actions



what can you do?

- build code
- check coding style
- unit testing
- code statistics
- security tests
- package application
- deploy to production

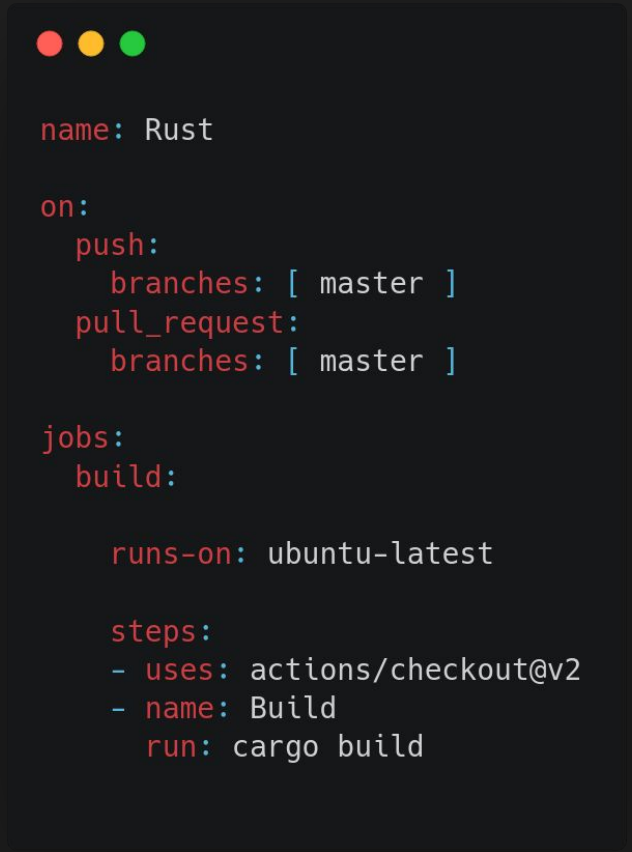
the sky's the limit!

how to write

`.yml` files in `.github/workflows` in your repo

https://help.github.com/en/actions/reference/workflow-syntax-for-github-actions

example of workflow



```yaml
name: Rust

on:
  push:
    branches: [ master ]
  pull_request:
    branches: [ master ]

jobs:
  build:

    runs-on: ubuntu-latest

    steps:
    - uses: actions/checkout@v2
    - name: Build
      run: cargo build
```

let’s go

1. compile code
2. check epitech coding style
3. run unit tests

compile code

use `make re` to build your code like the mouli

code of the workflow job:
https://gist.github.com/x4m3/7f9a1601845024a849fd641e65d383a9

check coding style

WARNING: does not work in a Epitech repository

clang-format: tool to format code

epitech-clang-format: epitech rules

place the `.clang-format` file at the root of your repo

code of the workflow job: https://gist.github.com/x4m3/a582dae33af7da46ee084e7de73e6bb7

run unit tests

Criterion: lib used at tek for unit testing

Learn how to write and run unit tests

Makefile: rule `tests_run` to build and run tests

code of the workflow job:
https://gist.github.com/x4m3/a08900beda2ebe4217ccc4e36c760bc1

thank you

https://x4m3.rocks/talks/git-devops2.pdf