An introduction to GitHub Actions

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Outline

- The conceptual purpose of GitHub Actions
- Why we're talking about this now
- A brief look at GitHub Actions in... action
- Then Sergio:
 - Doing GAP package CI with GitHub Actions

GitHub Actions at its most basic

- In a GitHub repository...
- ...when a particular event happens...
- ...run a sequence of tasks.

(Remotely, for free*, in a dual core virtual machine, with 7 GB RAM, 14 GB storage, running Windows, macOS, or Ubuntu.)

Examples of triggers/events

- A new commit is pushed to a branch
- Someone opens/edits a pull request
- Someone closes an issue
- A new release is made
- Another GitHub Action finishes running
- It's 9:20 am
- Manual triggering

Examples of tasks

- Run regression tests
- Calculate code coverage
- Profile performance
- Update a website
- Prepare a new release
- Build the manual
- Check code formatting

Example workflows

A "workflow" is a unit consisting of configurations and tasks. Examples:

- When a pull request is made: run the regression tests, and see if new code has test coverage.
- Every morning at 8am, prepare a release of your software.
- Every time there's a new release, download it, check that it works, and update a website.

Benefits

- Automation can save time
- Automation is consistent
- Automation aids decentralisation and transparency
- It reduces your need for computer resources
- It offers a wide range of easy configurations

Costs & difficulties

- Takes some effort to set up
- The virtual machines are not supercomputers
- Easy configuration options are not endless*
- You don't have full control over the remote machines*
- No guarantee that it will be around forever...

Why now?

GitHub Actions is new, powerful, useful for release process.

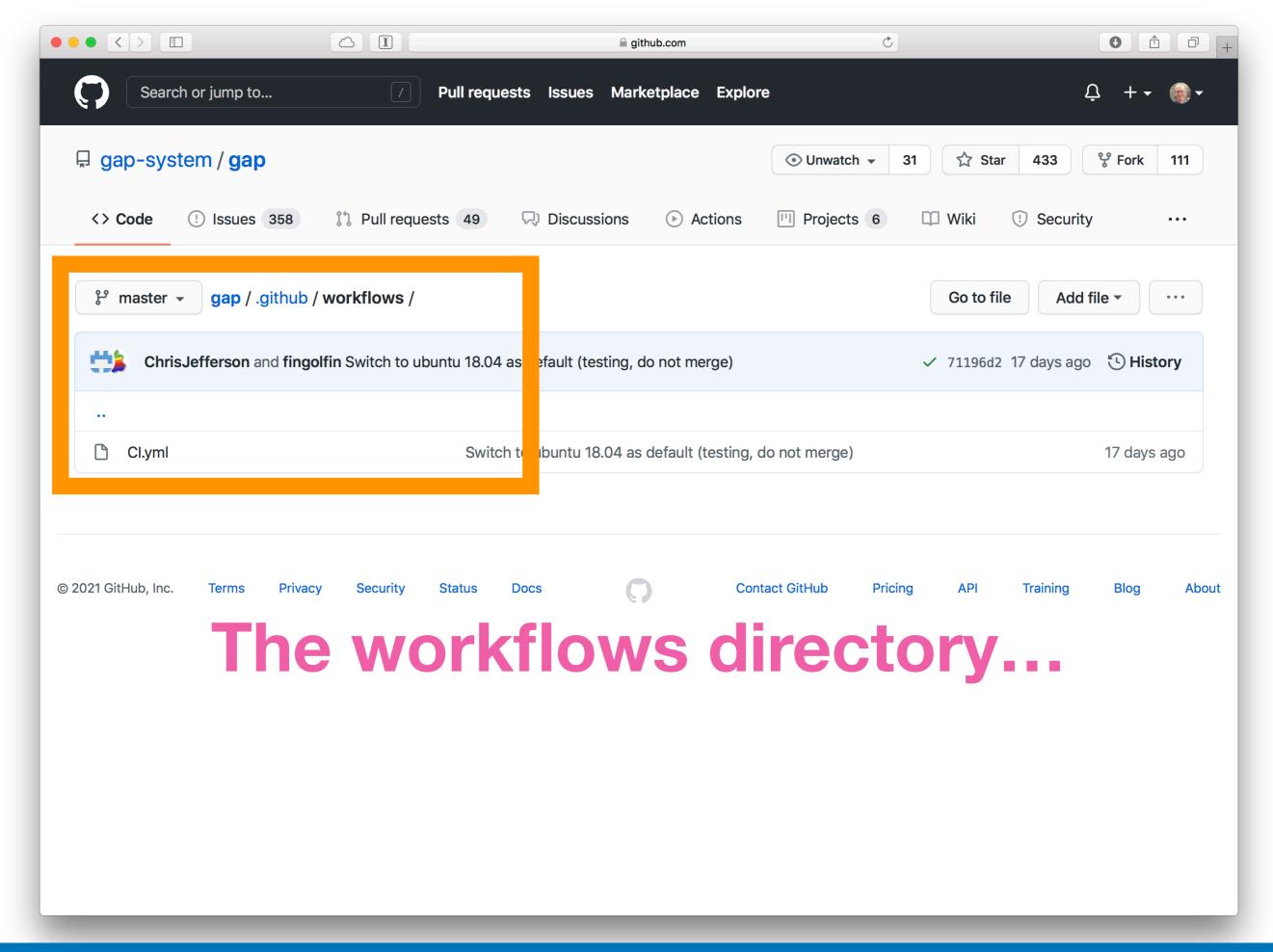
Competing/similar services:

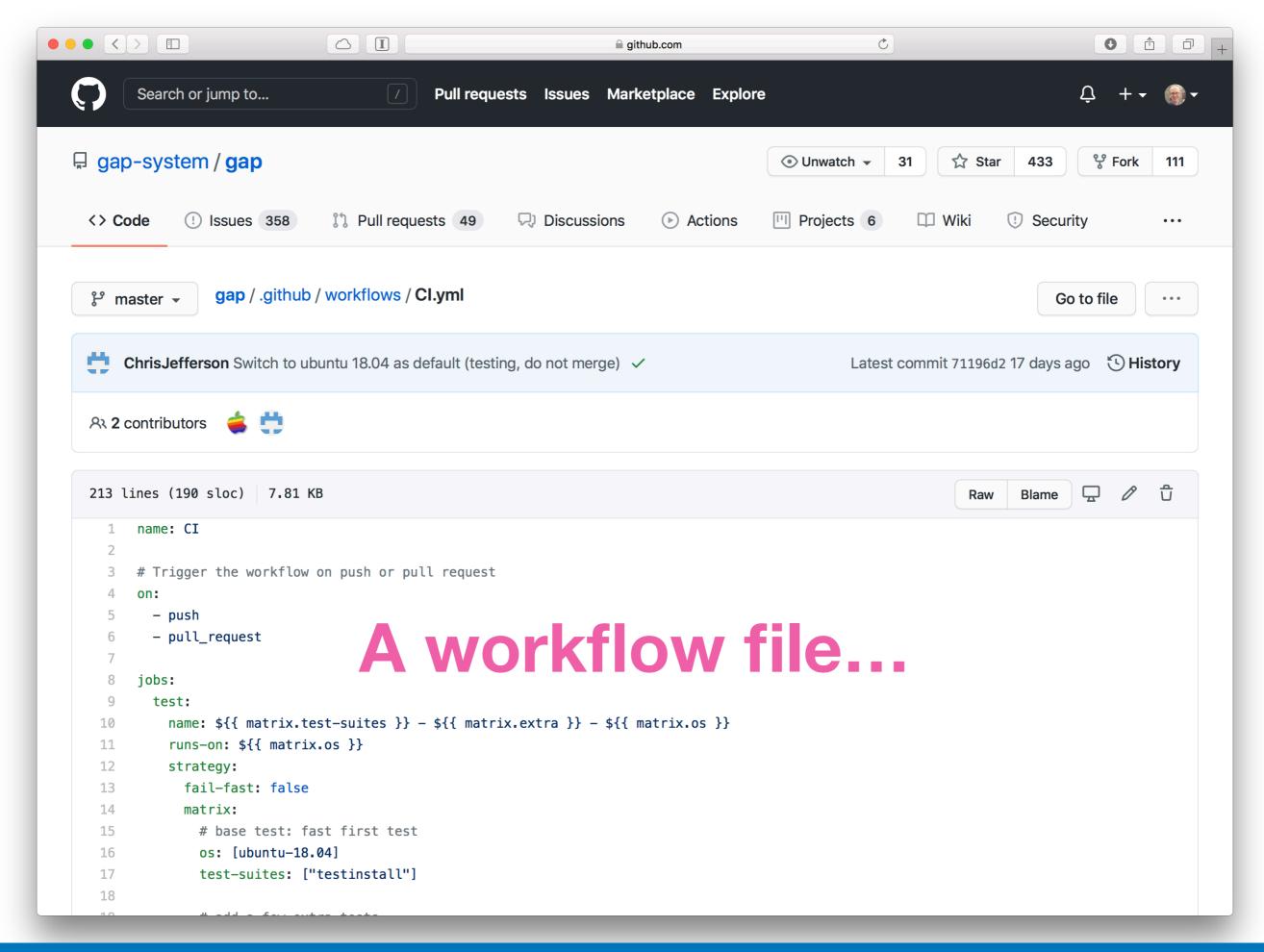
- AppVeyor
- Azure Pipelines
- Jenkins
- Travis: no longer a realistic option; move away from it!

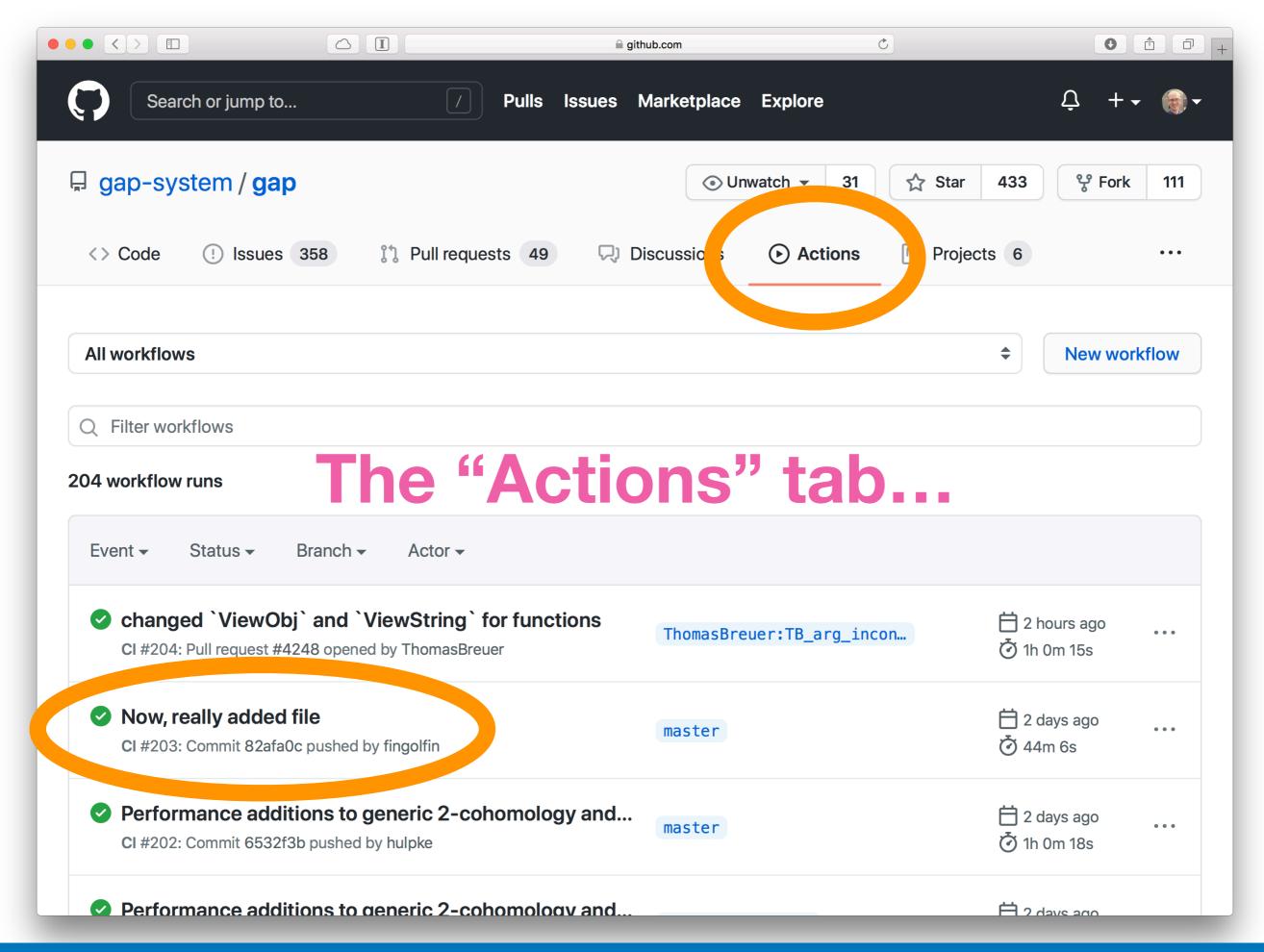
Rough practical aspects of how GitHub Actions works

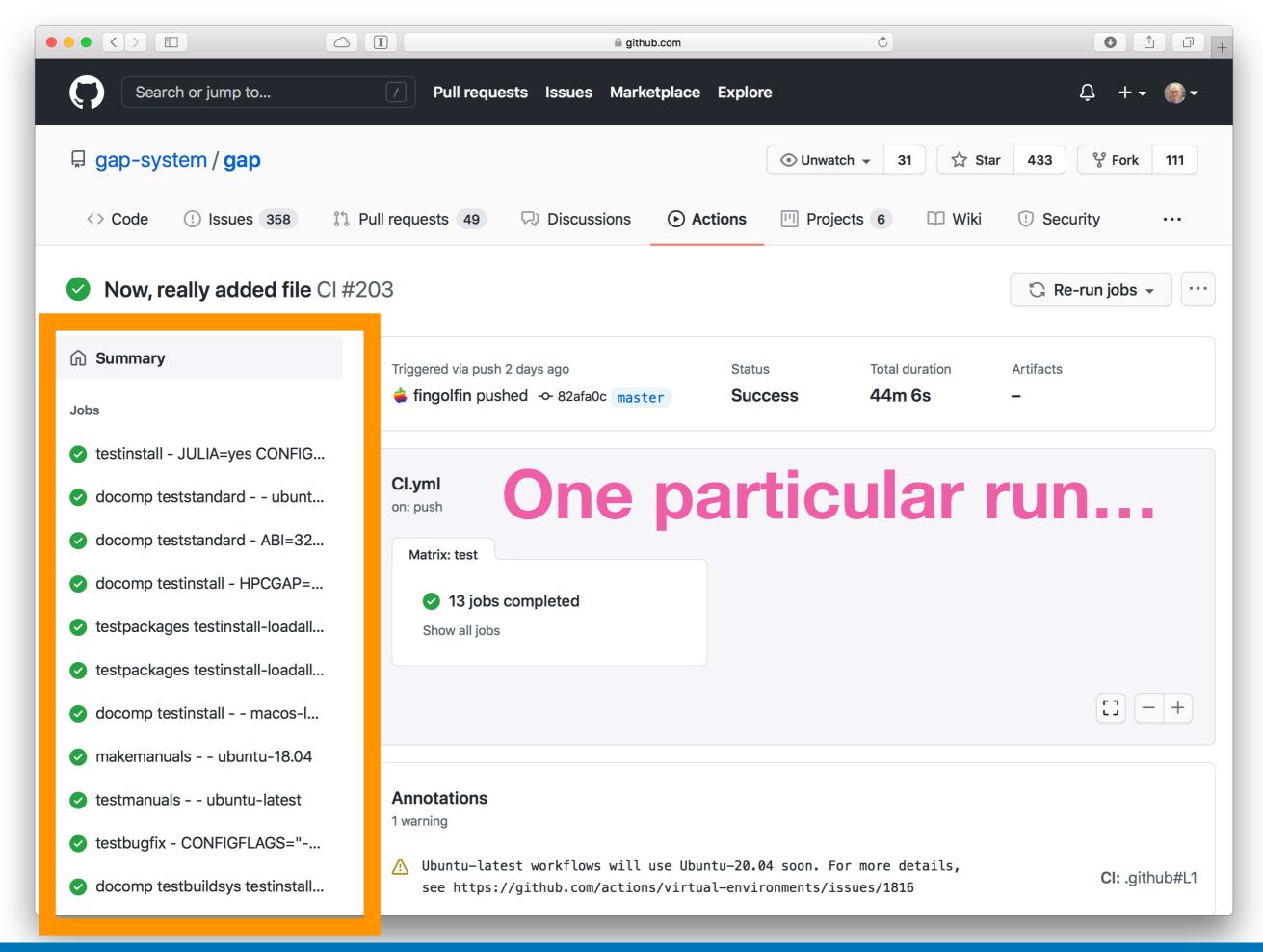
- A workflow exists as a YAML file in _github/workflows/
- Structure: configuration options & a sequence of actions
- GitHub keeps track & runs workflows as appropriate
- The results are shown in the "Actions" tab on GitHub, and on corresponding pull request pages

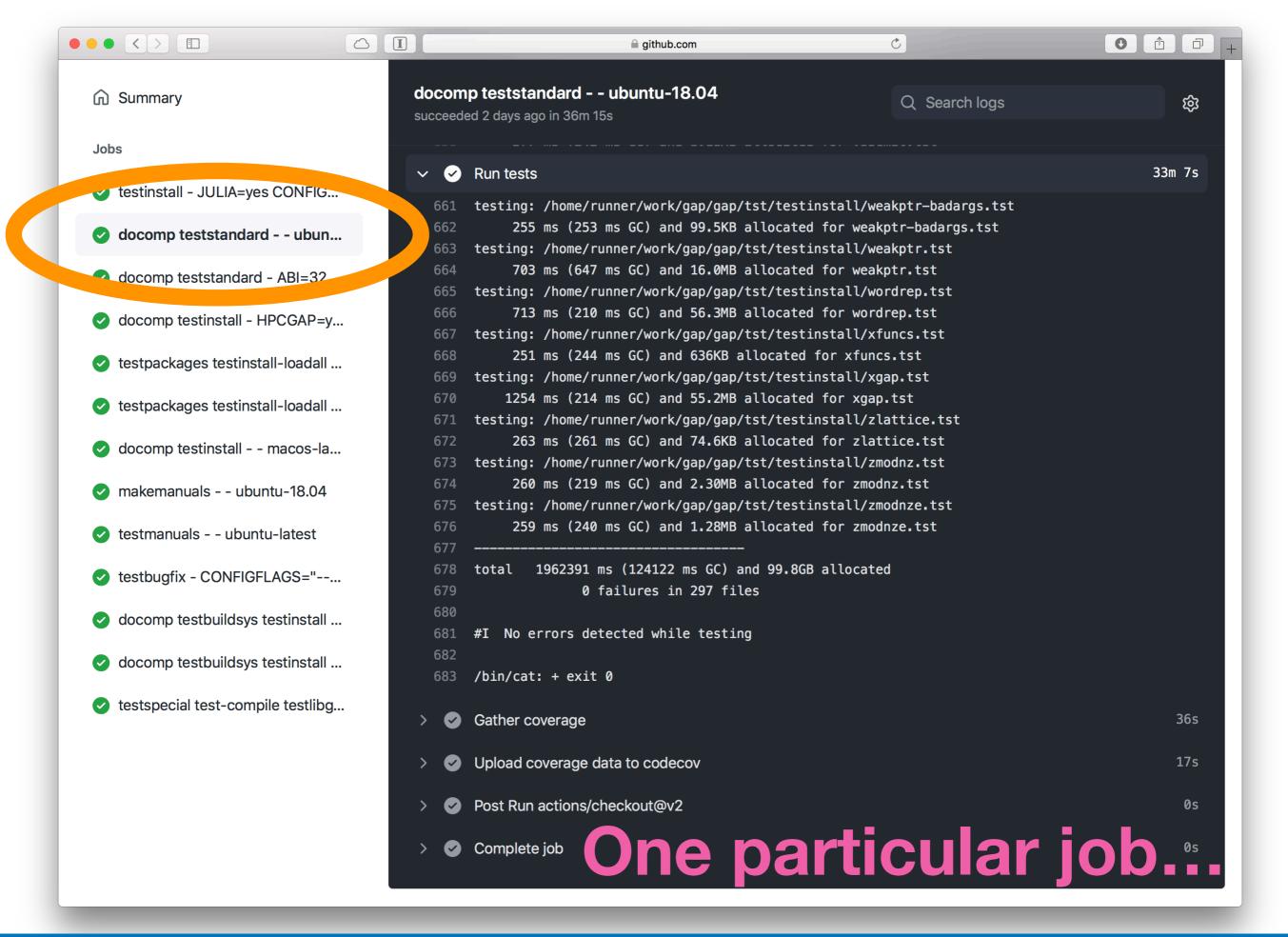
How GitHub Actions look on GitHub

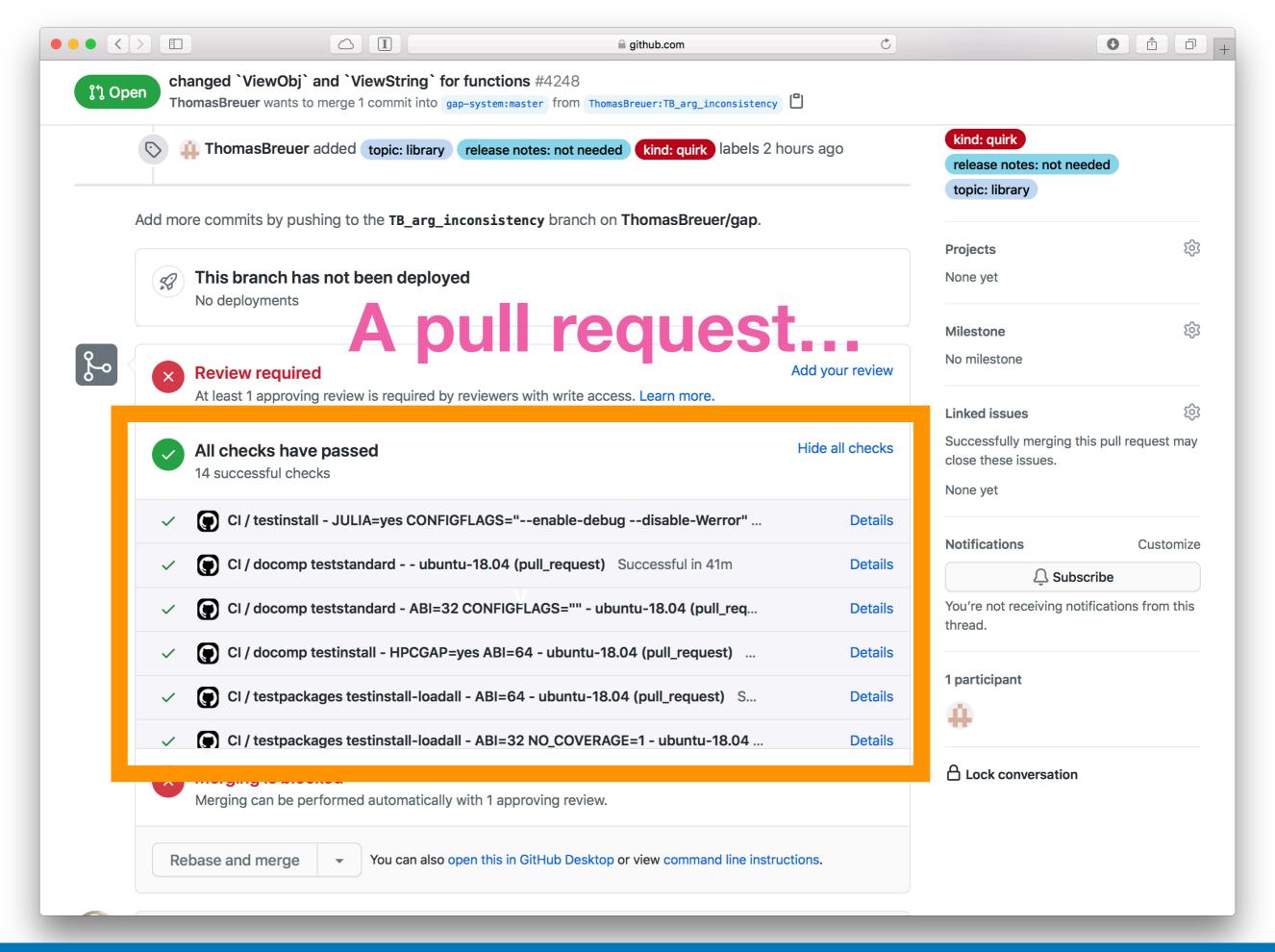


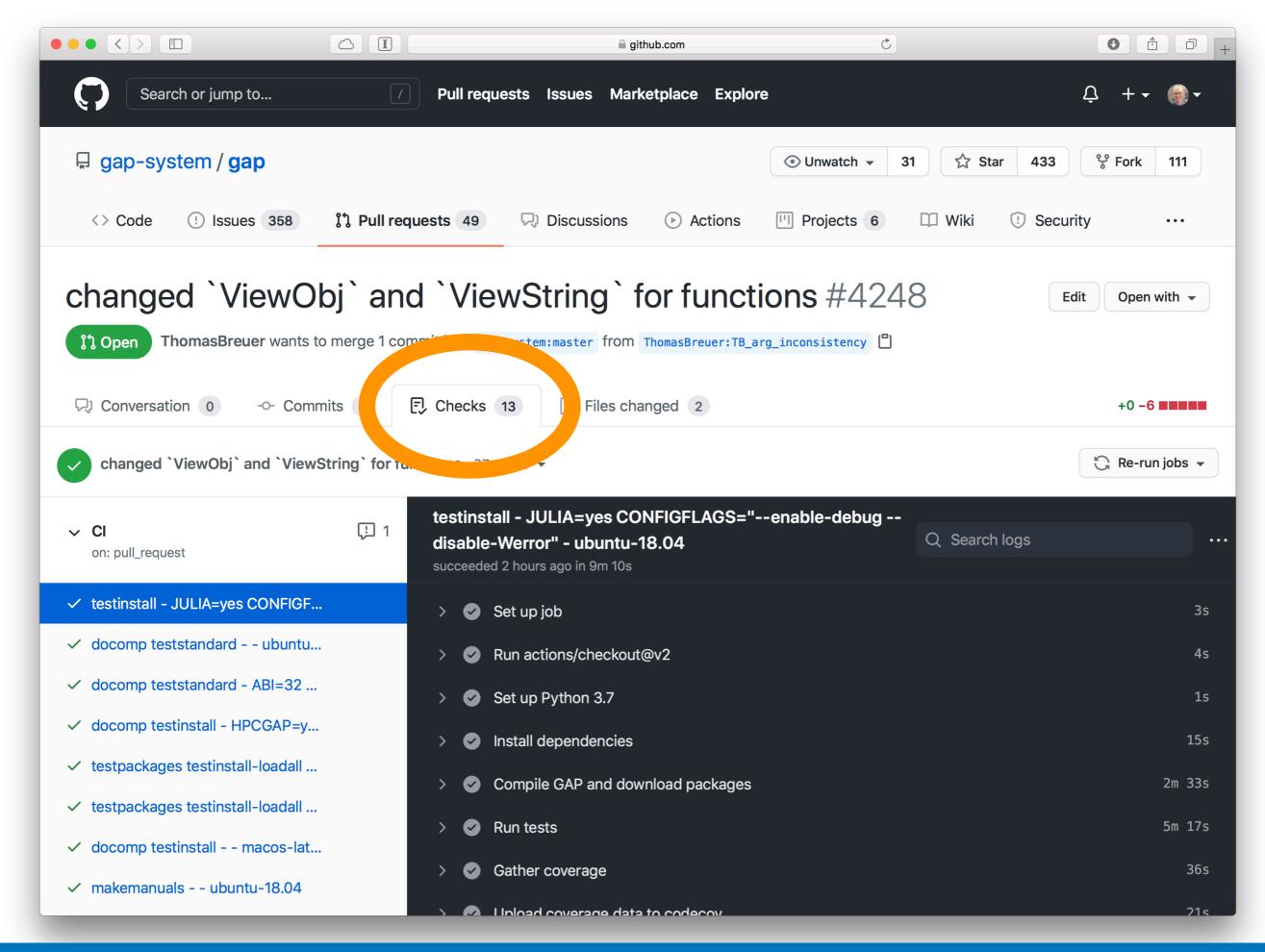


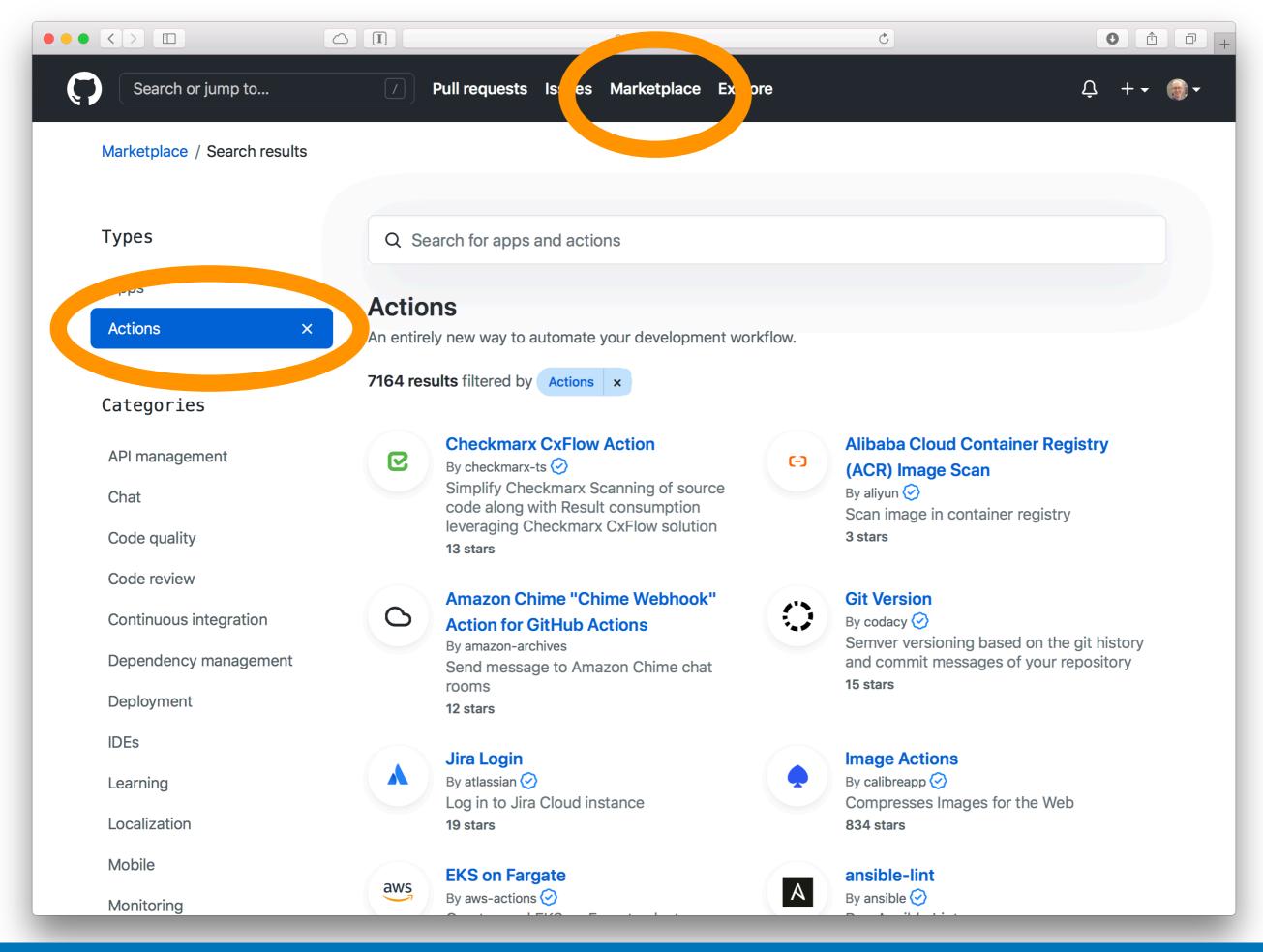












Questions?