

An introduction to GitHub Actions

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GAP Days Spring 2021

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

github.com

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master gap / .github / workflows / Go to file Add file

ChrisJefferson and fingolfin Switch to ubuntu 18.04 as default (testing, do not merge) ✓ 71196d2 17 days ago History

..

Cl.yml Switch to ubuntu 18.04 as default (testing, do not merge) 17 days ago

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The workflows directory...

<https://github.com/gap-system/gap/tree/master/.github/workflows>

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master gap / .github / workflows / CI.yml Go to file

ChrisJefferson Switch to ubuntu 18.04 as default (testing, do not merge) ✓ Latest commit 71196d2 17 days ago History

2 contributors

213 lines (190 sloc) 7.81 KB Raw Blame

```
1 name: CI
2
3 # Trigger the workflow on push or pull request
4 on:
5   - push
6   - pull_request
7
8 jobs:
9   test:
10    name: ${ matrix.test-suites } - ${ matrix.extra } - ${ matrix.os }
11    runs-on: ${ matrix.os }
12    strategy:
13      fail-fast: false
14      matrix:
15        # base test: fast first test
16        os: [ubuntu-18.04]
17        test-suites: ["testinstall"]
18
```

A workflow file...

<https://github.com/gap-system/gap/blob/master/.github/workflows/CI.yml>

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All workflows New workflow

Filter workflows

The "Actions" tab...

204 workflow runs

| Event | Status | Branch | Actor | Time |
|--|--------|--------|------------------------------|--------------------------|
| changed `ViewObj` and `ViewString` for functions | ✓ | | ThomasBreuer:TB_arg_incon... | 2 hours ago 1h 0m 15s |
| Now, really added file | ✓ | master | | 2 days ago 44m 6s |
| Performance additions to generic 2-cohomology and... | ✓ | master | | 2 days ago 1h 0m 18s |
| Performance additions to generic 2-cohomology and... | ✓ | | | 2 days ago |

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Now, really added file CI #203 Re-run jobs

Summary

Jobs

- testinstall - JULIA=yes CONFIG...
- docomp teststandard - - ubuntu...
- docomp teststandard - ABI=32...
- docomp testinstall - HPCGAP=...
- testpackages testinstall-loadall...
- testpackages testinstall-loadall...
- docomp testinstall - - macos-l...
- makemanuals - - ubuntu-18.04
- testmanuals - - ubuntu-latest
- testbugfix - CONFIGFLAGS="-...
- docomp testbuildsys testinstall...

Triggered via push 2 days ago Status Total duration Artifacts

Success 44m 6s -

CI.yml on: push

Matrix: test

13 jobs completed Show all jobs

Annotations

1 warning

Ubuntu-latest workflows will use Ubuntu-20.04 soon. For more details, see <https://github.com/actions/virtual-environments/issues/1816>

CI: .github#L1

<https://github.com/gap-system/gap/actions/runs/551986043>

Summary

Jobs

- testinstall - JULIA=yes CONFIG...
- docomp teststandard - - ubun...**
- docomp teststandard - ABI=32
- docomp testinstall - HPCGAP=y...
- testpackages testinstall-loadall ...
- testpackages testinstall-loadall ...
- docomp testinstall - - macos-la...
- makemanuals - - ubuntu-18.04
- testmanuals - - ubuntu-latest
- testbugfix - CONFIGFLAGS="--...
- docomp testbuildsys testinstall ...
- docomp testbuildsys testinstall ...
- testspecial test-compile testlibg...

docomp teststandard - - ubuntu-18.04

succeeded 2 days ago in 36m 15s

Search logs

Run tests 33m 7s

```
661 testing: /home/runner/work/gap/gap/tst/testinstall/weakptr-badargs.tst
662     255 ms (253 ms GC) and 99.5KB allocated for weakptr-badargs.tst
663 testing: /home/runner/work/gap/gap/tst/testinstall/weakptr.tst
664     703 ms (647 ms GC) and 16.0MB allocated for weakptr.tst
665 testing: /home/runner/work/gap/gap/tst/testinstall/wordrep.tst
666     713 ms (210 ms GC) and 56.3MB allocated for wordrep.tst
667 testing: /home/runner/work/gap/gap/tst/testinstall/xfuncs.tst
668     251 ms (244 ms GC) and 636KB allocated for xfuncs.tst
669 testing: /home/runner/work/gap/gap/tst/testinstall/xgap.tst
670    1254 ms (214 ms GC) and 55.2MB allocated for xgap.tst
671 testing: /home/runner/work/gap/gap/tst/testinstall/zlattice.tst
672     263 ms (261 ms GC) and 74.6KB allocated for zlattice.tst
673 testing: /home/runner/work/gap/gap/tst/testinstall/zmodnz.tst
674     260 ms (219 ms GC) and 2.30MB allocated for zmodnz.tst
675 testing: /home/runner/work/gap/gap/tst/testinstall/zmodnze.tst
676     259 ms (240 ms GC) and 1.28MB allocated for zmodnze.tst
677 -----
678 total 1962391 ms (124122 ms GC) and 99.8GB allocated
679           0 failures in 297 files
680
681 #I No errors detected while testing
682
683 /bin/cat: + exit 0
```

Gather coverage 36s

Upload coverage data to codecov 17s

Post Run actions/checkout@v2 0s

Complete job 0s

One particular job...

Open

changed `ViewObj` and `ViewString` for functions #4248

ThomasBreuer wants to merge 1 commit into gap-system:master from ThomasBreuer:TB_arg_inconsistency

ThomasBreuer added `topic: library` `release notes: not needed` `kind: quirk` labels 2 hours ago

Add more commits by pushing to the TB_arg_inconsistency branch on ThomasBreuer/gap.

This branch has not been deployed
No deployments

A pull request...

Review required Add your review
At least 1 approving review is required by reviewers with write access. [Learn more.](#)

All checks have passed Hide all checks
14 successful checks

- ✓ CI / testinstall - JULIA=yes CONFIGFLAGS="--enable-debug --disable-Werror" ... [Details](#)
- ✓ CI / docomp teststandard - - ubuntu-18.04 (pull_request) Successful in 41m [Details](#)
- ✓ CI / docomp teststandard - ABI=32 CONFIGFLAGS="" - ubuntu-18.04 (pull_req... [Details](#)
- ✓ CI / docomp testinstall - HPCGAP=yes ABI=64 - ubuntu-18.04 (pull_request) ... [Details](#)
- ✓ CI / testpackages testinstall-loadall - ABI=64 - ubuntu-18.04 (pull_request) S... [Details](#)
- ✓ CI / testpackages testinstall-loadall - ABI=32 NO_COVERAGE=1 - ubuntu-18.04 ... [Details](#)

Merging can be performed automatically with 1 approving review.

Rebase and merge You can also [open this in GitHub Desktop](#) or view [command line instructions](#).

`kind: quirk`
`release notes: not needed`
`topic: library`

Projects None yet

Milestone No milestone

Linked issues Successfully merging this pull request may close these issues. None yet

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1 participant



Lock conversation

github.com

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changed `ViewObj` and `ViewString` for functions #4248

Open ThomasBreuer wants to merge 1 commit from system:master to ThomasBreuer:TB_arg_inconsistency

Conversation 0 Commits Checks 13 Files changed 2 +0 -6

changed `ViewObj` and `ViewString` for functions

CI on: pull_request

- testinstall - JULIA=yes CONFIG...
- docomp teststandard - - ubuntu...
- docomp teststandard - ABI=32 ...
- docomp testinstall - HPCGAP=y...
- testpackages testinstall-loadall ...
- testpackages testinstall-loadall ...
- docomp testinstall - - macos-lat...
- makemanuals - - ubuntu-18.04

testinstall - JULIA=yes CONFIGFLAGS="--enable-debug --disable-Werror" - ubuntu-18.04

succeeded 2 hours ago in 9m 10s

Search logs

- Set up job 3s
- Run actions/checkout@v2 4s
- Set up Python 3.7 1s
- Install dependencies 15s
- Compile GAP and download packages 2m 33s
- Run tests 5m 17s
- Gather coverage 36s
- Upload coverage data to codecov 21s

<https://github.com/gap-system/gap/pull/4248/checks>

The screenshot shows the GitHub Marketplace interface. At the top, the navigation bar includes 'Pull requests', 'Issues', 'Marketplace', and 'Explore', with 'Marketplace' highlighted by an orange circle. Below the navigation bar, the breadcrumb 'Marketplace / Search results' is visible. A search bar contains the text 'Search for apps and actions'. On the left sidebar, the 'Types' section has 'Actions' selected and highlighted with an orange circle. Below 'Types' is the 'Categories' list, which includes 'API management', 'Chat', 'Code quality', 'Code review', 'Continuous integration', 'Dependency management', 'Deployment', 'IDEs', 'Learning', 'Localization', 'Mobile', and 'Monitoring'. The main content area displays '7164 results filtered by Actions' with a filter button. Below this, a grid of action cards is shown, including 'Checkmarx CxFlow Action', 'Amazon Chime "Chime Webhook" Action for GitHub Actions', 'Jira Login', 'EKS on Fargate', 'Alibaba Cloud Container Registry (ACR) Image Scan', 'Git Version', 'Image Actions', and 'ansible-lint'. Each card includes an icon, the action name, the creator, a brief description, and the number of stars.

Questions?