



Open Source CI/CD components for GitHub Actions

FossAsia Summit

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2020 03 19

MOOVEL BECOMES

REACHNOW 

pic: © moovel



MOOVEL BECOMES

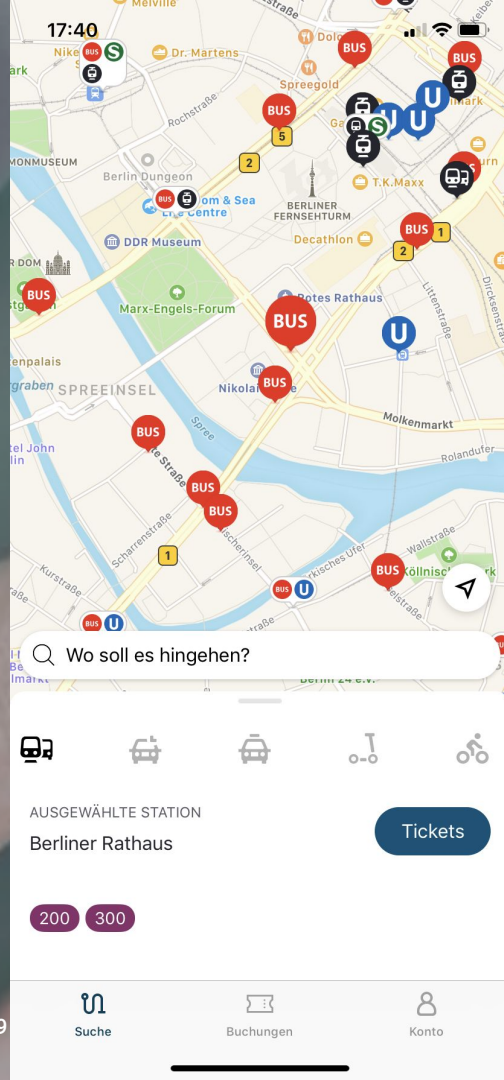
REACHNOW ✓

pic: © moovel



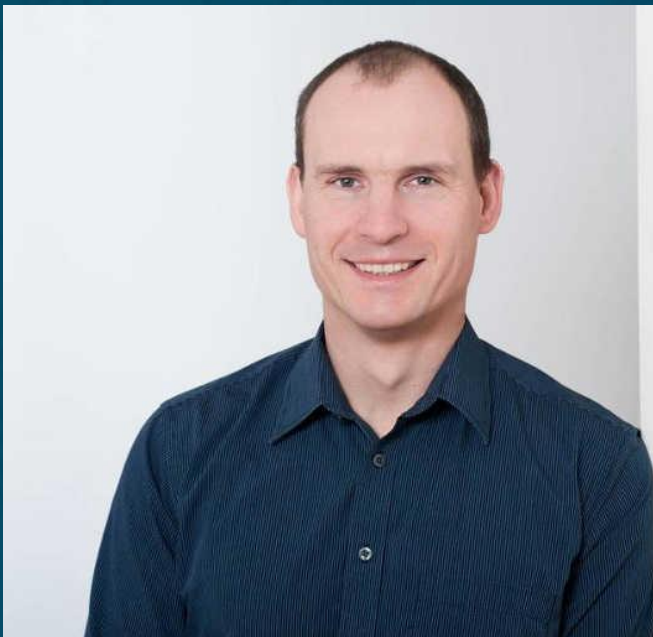
MOOVEL BECOMES

REACHNOW ✓



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Me



Engineering Manager

lotharschulz.info

CI/CD Meetup Berlin

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GitHub Actions

Workflow Automation



GitHub Actions

Built-in CI/CD

What are GitHub Actions?

With GitHub Actions, workflows and steps are just code in a repository, so you can create, share, reuse, and fork your software development practices.

Deploy to Amazon ECS
Deploy a container to an Amazon ECS service powered by AWS Fargate or Amazon EC2.

Set up this workflow

```
# Build a docker container and
# push it to ECR so that it can
# be deployed to ECS.
```

 actions/starter-workflows

Build and Deploy to GKE
Build a docker container, publish it to Google Container Registry, and deploy to GKE.

Set up this workflow

```
# Set up docker to authenticate
# via gcloud command-line tool.
gcloud auth configure-docker
```

 actions/starter-workflows

Deploy Node.js to Azure Web App
Build a Node.js project and deploy it to an Azure Web App.

Set up this workflow

```
# Build and test the project, then
# deploy to Azure Web App.
npm install
```

 actions/starter-workflows

<https://github.blog/2019-08-08-github-actions-now-supports-ci-cd/>

Dart

Build and test a Dart project with Pub.



Set up this workflow

```
pub get
pub run test
```

actions/starter-workflows Dart

Android CI

Build an Android project with Gradle.



Set up this workflow

```
./gradlew build
```

actions/starter-workflows Java

Haskell

Build and test a Haskell project with Cabal.



Set up this workflow

```
cabal update
cabal install --only-dependencies --enable-tests
cabal configure --enable-tests
```

actions/starter-workflows Haskell

Go

Build a Go project.



Set up this workflow

```
go get -v -t -d ./...
if [ -f Gopkg.toml ]; then
  curl
  https://raw.githubusercontent.com/golang/dep/master/install.sh | sh
fi
```

actions/starter-workflows Go

Clojure

Build and test a Clojure project with Leiningen.



Set up this workflow

```
lein deps
lein test
```

actions/starter-workflows Clojure

Python application

Create and test a Python application.



Set up this workflow

```
python -m pip install --upgrade pip
pip install -r requirements.txt
pip install flake8
```

actions/starter-workflows Python

Open Source



pic: © moovel



GitHub Actions

Automate your GitHub workflows

<https://github.com/features/actions> Verified

Repositories 36 Packages 21 People 14 Projects

Pinned repositories

starter-workflows

Accelerating new GitHub Actions workflows

★ 2.2k 🍴 1.4k

toolkit

The GitHub ToolKit for developing GitHub Actions.

● TypeScript ★ 1.4k 🍴 537

setup-node

Set up your GitHub Actions workflow with a specific version of node.js

● TypeScript ★ 375 🍴 170

javascript-action

Template

Create a JavaScript Action with tests, linting, workflow, publishing, and versioning

● JavaScript ★ 239 🍴 70

typescript-action

Template

Create a TypeScript Action with tests, linting, workflow, publishing, and versioning

● TypeScript ★ 280 🍴 74

labeler

An action for automatically labelling pull requests

● TypeScript ★ 228 🍴 83

Find a repository...

Type: All ▾

Language: All ▾

virtual-environments

GitHub Actions virtual environments

● PowerShell 🍴 MIT 🍴 179 ★ 324 ⓘ 117 🍴 14 Updated 36 minutes ago



runner

The Runner for GitHub Actions 🚀

● C# 🍴 MIT 🍴 61 ★ 611 ⓘ 40 🍴 4 Updated 4 hours ago



Top languages

● TypeScript ● JavaScript
● Dockerfile ● C# ● HCL

Most used topics

Loading...

github.com/actions

Community Resources

GitHub Tools and Management

- Declaratively setup GitHub Labels
- Action to sync GitHub labels in the declarative way
- Add releases to GitHub
- Publish a docker image to Dockerhub
- Create an issue using content from a file
- Publish GitHub Releases with Assets
- GitHub Project Automation+ - Automate GitHub Project cards with any webhook event.
- Run GitHub Actions Locally with a web interface
- Run GitHub Actions Locally in Terminal
- Build and Publish Android debug APK
- Generate sequential build numbers for GitHub Actions
- Push Git changes to GitHub repository without authentication difficulties
- Generate release notes based on your events
- Create a GitHub wiki page based on the provided markdown file
- Label your Pull Requests auto-magically (using committed files)
- Add Label to your Pull Requests based on the author team name
- Manually trigger your GitHub Actions from a UI
- Get a list of file changes with PR/Push
- Use private actions in any workflow
- Label Your Issues Using the Issue's Contents
- Rollback a GitHub Release
- Lock Closed Issues and Pull Requests after a Period of Inactivity
- Get Commit Difference Count Between Two Branches

Collection of Actions

- Use HashiCorp's Terraform
- GitHub Actions for Yarn 1
- GitHub Actions for Yarn 2
- GitHub Actions for Golang
- GitHub Actions for R and accompanying #rstats package
- GitHub Actions for WordPress
- GitHub Actions for Composer
- GitHub Actions for Flutter
- GitHub Actions for PHP

[github.com/sdras/
awesome-actions
#community-resources](https://github.com/sdras/awesome-actions#community-resources)



jessfraz / shaking-finger-action

Watch 4 Star 92 Fork 15

Code Issues 0 Pull requests 0 Actions Security Insights

A GitHub action that displays a gif of Conan O'Brien shaking his finger to a pull request on fail.

20 commits 1 branch 0 packages 0 releases 4 contributors

Branch: master New pull request Create new file Upload files Find file Clone or download

File	Commit Message	Time
toc-me	Update ToC for README.md	Latest commit 907e137 on 29 Dec 2018
.travis.yml	update scripts	16 months ago
Dockerfile	Dockerfile: Fixing another mention of Colbert :) (#3)	16 months ago
Makefile	add makefile and tests	16 months ago
README.md	Update ToC for README.md	15 months ago
add-comment.sh	Update add-comment.sh	16 months ago
demo.png	Add files via upload	16 months ago
finger.gif	first commit	16 months ago
test.sh	add makefile and tests	16 months ago

README.md

Shaking Finger Action

BUILD PASSING

A GitHub action that displays a gif of Conan O'Brien shaking his finger to a pull request on fail.

[github.com/
jessfraz/
shaking-finger-action](https://github.com/jessfraz/shaking-finger-action)

Open Source Projects using GitHub actions (list not complete)

- <https://github.com/gatsbyjs/gatsby/tree/master/.github/workflows>
- <https://github.com/hakimel/reveal.js/blob/master/.github/workflows/js.yml>
- <https://github.com/twbs/bootstrap/blob/master/.github/workflows/test.yml>
- <https://github.com/microsoft/vscode/tree/master/.github/workflows>
- <https://github.com/facebook/create-react-app/tree/master/.github/workflows>
- <https://github.com/hakimel/reveal.js/blob/master/.github/workflows/js.yml>
- <https://github.com/babel/babel/tree/master/.github/workflows>
- <https://github.com/nodejs/node/tree/master/.github/workflows>
- <https://github.com/microsoft/TypeScript/tree/master/.github/workflows>

How To's



pic: © moovel

Matrix - Builds on Linux, macOS, Windows

```
strategy:
  fail-fast: false
  matrix:
    os: [macOS-10.14,
ubuntu-18.04]
    goos: [linux, darwin]
    exclude:
      - os: macOS-10.14
        goos: linux
      - os: ubuntu-18.04
        goos: darwin
  runs-on: ${ matrix.os }
```

Matrix - Excludes

```
strategy:
  fail-fast: false
  matrix:
    os: [macOS-10.14,
ubuntu-18.04]
    goos: [linux, darwin]
    exclude:
      - os: macOS-10.14
        goos: linux
      - os: ubuntu-18.04
        goos: darwin
  runs-on: ${ matrix.os }
```

```
exclude:
  - os: macOS-10.14
    goos: linux
  - os: ubuntu-18.04
    goos: darwin
```

Matrix - Includes & Excludes

```
strategy:
  fail-fast: false
  matrix:
    os: [macOS-10.14,
ubuntu-18.04]
    goos: [linux, darwin]
    exclude:
      - os: macOS-10.14
        goos: linux
      - os: ubuntu-18.04
        goos: darwin
  runs-on: ${ matrix.os }
```

```
exclude:
  - os: macOS-10.14
    goos: linux
  - os: ubuntu-18.04
    goos: darwin
```

```
include:
  - os: macOS-10.14
    goos: darwin
  - os: ubuntu-18.04
    goos: linux
```

Matrix - Includes & Excludes

```
strategy:
  fail-fast: false
  matrix:
    os: [macOS-10.14,
ubuntu-18.04]
    goos: [linux, darwin]
    exclude:
      - os: macOS-10.14
        goos: linux
      - os: ubuntu-18.04
        goos: darwin
  runs-on: ${ matrix.os }
```

```
exclude:
  - os: macOS-10.14
    goos: linux
  - os: ubuntu-18.04
    goos: darwin
```

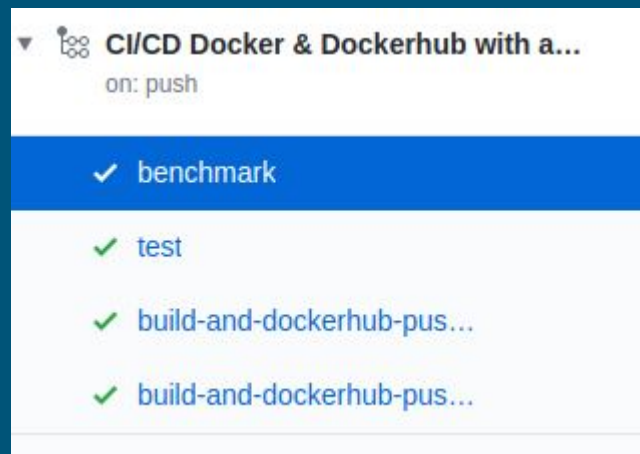
```
include:
  - os: macOS-10.14
    goos: darwin
  - os: ubuntu-18.04
    goos: linux
```



Jobs

Jobs can run at the same time in parallel or be dependent on the status of a previous job and run sequentially.

```
build-and-dockerhub-push-if-linux:  
  needs: [benchmark, test]
```



Conditionals

```
if: matrix.os == 'ubuntu-18.04'
```

```
env:
```

```
  DOCKER_USERNAME: ${ secrets.DOCKER_USERNAME }
```

```
  DOCKER_PASSWORD: ${ secrets.DOCKER_PASSWORD }
```

```
run: |
```

```
  d=$(date +%Y-%m-%d)
```

```
  tag=$d-${ matrix.os }-${ github.sha }
```

```
  docker build -t lotharschulz/hello-github-actions:$tag .
```

```
  docker login -u ${DOCKER_USERNAME} -p ${DOCKER_PASSWORD}
```

```
  docker push lotharschulz/hello-github-actions:$tag
```

Matrix

▼  CI/CD Docker & Dockerhub with a...
on: push

✓ benchmark

✓ test

✓ build-and-dockerhub-pus...

✓ build-and-dockerhub-pus...

CI/CD Docker & Dockerhub with actions v2 / build-and-dockerhub-push-if-linux (macOS-10.14, darwin)
succeeded 3 days ago in 6s

Search logs

< > ...

▶ ✓ Set up job1s

▶ ✓ Dump GitHub context0s

▶ ✓ Dump strategy context0s

▶ ✓ Dump matrix context0s

▶ ✓ Dump job context0s

▶ ✓ Dump runner context0s

▶ ✓ Dump steps context0s

▶ ✓ Run actions/checkout@v11s

▶ ✓ builds the binary3s

▶ ✓ Run actions/checkout@master1s

▶ ■ if linux -> docker build image and docker hub login & push0s

▶ ✓ Post actions/checkout@master0s

▶ ✓ Complete job0s

Matrix

The screenshot displays a GitHub Actions workflow run for a repository named 'CI/CD Docker & Dockerhub with a...'. The workflow is triggered on 'push' and has succeeded 3 days ago in 6s. The workflow consists of several steps, with the following steps listed in the table:

Step	Duration
benchmark	1s
test	0s
build-and-dockerhub-pus...	0s
build-and-dockerhub-pus...	0s
Set up job	1s
Dump GitHub context	0s
Dump strategy context	0s
Dump matrix context	0s
Dump job context	0s
Dump runner context	0s
Dump steps context	0s
Run actions/checkout@v1	1s
builds the binary	3s
Run actions/checkout@master	1s
if linux -> docker build image and docker hub login & push	0s
Complete job	0s

The step 'if linux -> docker build image and docker hub login & push' is highlighted with a red box.

Matrix

CI/CD Docker & Dockerhub with a...
on: push

CI/CD Docker & Dockerhub with actions v2 / **build-and-dockerhub-push-if-linux (ubuntu-18.04, linux)**
succeeded 3 days ago in 1m 16s

Search logs

- ✓ benchmark 3s
- ✓ test 0s
- ✓ build-and-dockerhub-pus... 0s
- ✓ build-and-dockerhub-pus... 0s

- ▶ ✓ Set up job 3s
- ▶ ✓ Dump GitHub context 0s
- ▶ ✓ Dump strategy context 0s
- ▶ ✓ Dump matrix context 0s
- ▶ ✓ Dump job context 0s
- ▶ ✓ Dump runner context 0s
- ▶ ✓ Dump steps context 0s
- ▶ ✓ Run actions/checkout@v1 2s
- ▶ ✓ builds the binary 7s
- ▶ ✓ Run actions/checkout@v1 1s
- ▶ ✓ if linux -> docker build image and docker hub login & push 1m 3s
- ▶ ✓ Post version and build @master 0s
- ▶ ✓ Complete job 0s

Surprises

test:

runs-on: ubuntu-18.04

steps:

- uses: actions/checkout@v1
- uses: actions/setup-java@v1

with:

java-version: 11

- uses: eskatos/gradle-command-action@v1

with:

arguments: test

- name: test the code

GitHub Actions / .github/workflows/main.yml

failed 20 minutes ago in 0s

.github/workflows/main.yml

Invalid Workflow File

DETAILS

every step must define a `uses` or `run` key

Fix

```
test:
  runs-on: ubuntu-18.04
  steps:
    - uses: actions/checkout@v1
    - uses: actions/setup-java@v1
      with:
        java-version: 11
    - uses: eskatos/gradle-command-action@v1
      with:
        arguments: test
# - name: test the code
```

GitHub Actions / .github/workflows/main.yml
failed 20 minutes ago in 0s

.github/workflows/main.yml

Invalid Workflow File

DETAILS

every step must define a `uses` or `run` key



Demo

Demo Code

The screenshot shows the GitHub repository page for 'lotharschulz / hello-github-actions'. The repository has 207 commits, 7 branches, 0 packages, 0 releases, and 1 contributor. The 'Code' tab is selected, showing a list of files and folders. The files include .github, action, .gitignore, CONTRIBUTING.md, Dockerfile, Makefile, README.md, build_test_benchmark_docker_build_push_and_shaking_finger..., hello_test.go, hello_world.go, and screenshot2019-08-23--12.17.35.png. The README.md file is open, showing the title 'GitHub Actions'.

lotharschulz / hello-github-actions

Unwatch 1 Star 0 Fork 4

Code Issues 0 Pull requests 2 Actions Projects 0 Wiki Security Insights Settings

hello github actions Edit

Manage topics

207 commits 7 branches 0 packages 0 releases 1 contributor

Branch: master New pull request Create new file Upload files Find file Clone or download

lotharschulz doc: Latest commit 0ac892f on 30 Dec 2019

.github	go with the exclude block	7 months ago
action	drop own docker cli action	11 months ago
.gitignore	make targets	11 months ago
CONTRIBUTING.md	doc:	3 months ago
Dockerfile	make targets	11 months ago
Makefile	linux and darwin target os	7 months ago
README.md	docs:	4 months ago
build_test_benchmark_docker_build_push_and_shaking_finger...	actions screenshot	11 months ago
hello_test.go	unfail tests	11 months ago
hello_world.go	main comment	11 months ago
screenshot2019-08-23--12.17.35.png	v2 screenshot	7 months ago

README.md

GitHub Actions

There is even more

- Core concepts
- Encrypted secrets
- Self hosted runners

There is more

- Contexts available on run time
- Triggered by own events
- Package manager and gh docker registry integrated



THANK YOU

pic: © moovel

SLIDE DECK

