Github Actions

吴温炎

GO →

技术大讲堂
给成长开一扇窗

精彩继续！

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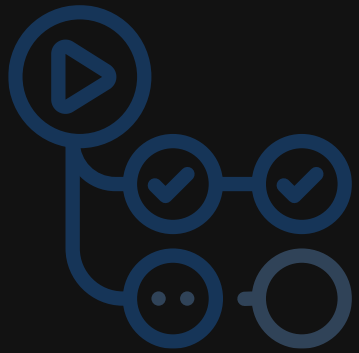
说 明

本内容适合新手或初入开源领域的人

TOC

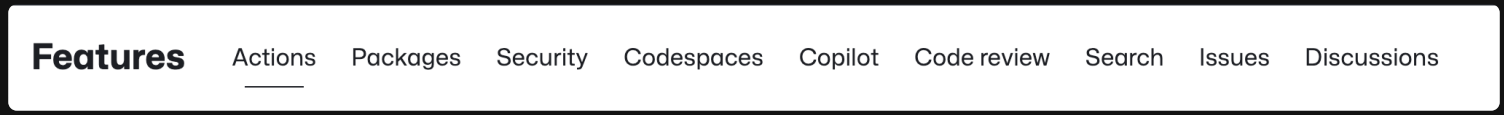


基本介绍

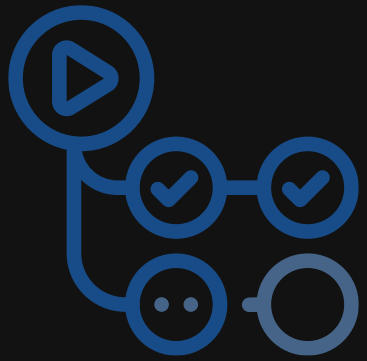
- Github Actions 是什么?
- Features
- Pricing
- 简单演示

基本介绍 Github Actions 是什么?

先看个东西:



> 来源: https://github.com/features/actions



Automate your workflow from idea to production

从想法到生产，自动化您的工作流程

GitHub Actions makes it easy to automate all your software workflows, now with world-class CI/CD. Build, test, and deploy your code right from GitHub. Make code reviews, branch management, and issue triaging work the way you want.

GitHub Actions 现在可以使用世界一流的 CI/CD 轻松实现所有软件工作流程的自动化。直接从 GitHub 构建、测试和部署您的代码。按照您想要的方式进行代码审查、分支管理和问题分类。

- 首个公测版，发布于 2018 年 10 月
- 在此之前 Github 的 CI/CD 以第三方服务 Travis CI 居多。

基本介绍 Features

- 🖥️ **操作系统** - 适用于 Linux、macOS、Windows、ARM 和容器；直接在虚拟机或容器内运行。
- 📎 **矩阵构建** - 通过矩阵工作流程可以同时跨多个操作系统和运行时版本进行测试，从而节省时间。
- 👷 **任何语言** - 支持 Node.js、Python、Java、Ruby、PHP、Go、Rust、.NET 等。
- 📝 **实时日志** - 查看您的工作流程实时运行的颜色和表情符号。
- 🔑 **秘钥存储** - 通过将包含 Git 流程的工作流程文件编码到您的存储库中，自动执行您的软件开发实践。
- 🐳 **多容器测试** - compose 只需将一些内容添加到工作流程文件中即可在工作流程中测试您的 Web 服务及其数据库。
- 🎀 **社区支持的工作流程** - GitHub Actions 连接您的所有工具，以自动化开发工作流程的每一步。

详情：更多介绍

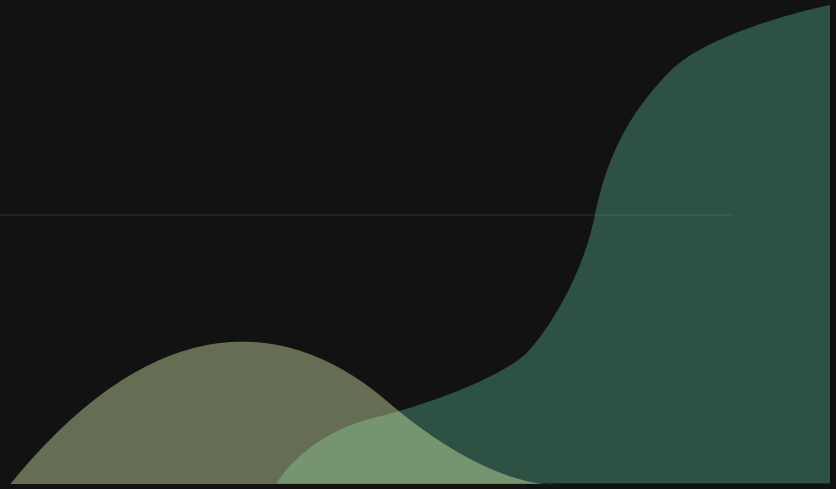
基本介绍 Pricing

- **免费版** - 2000 分钟/月
- **Pro** - 3000 分钟/月（其中 Pro 为 4 美元/月）
- **Team** - 3000 分钟/月（其中 Team 为 4 美元/用户/月）
- **Enterprise** - 50000 分钟/月（其中 Enterprise 为 21 美元/用户/月）

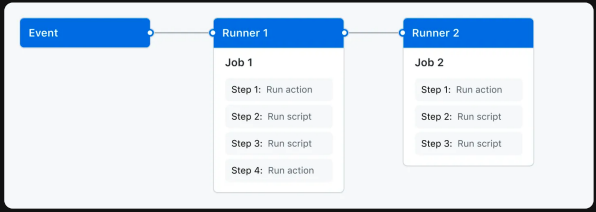
对于 开源 项目，无限制。

开源就可以薅羊毛.....

详见：个人计划 | 组织计划



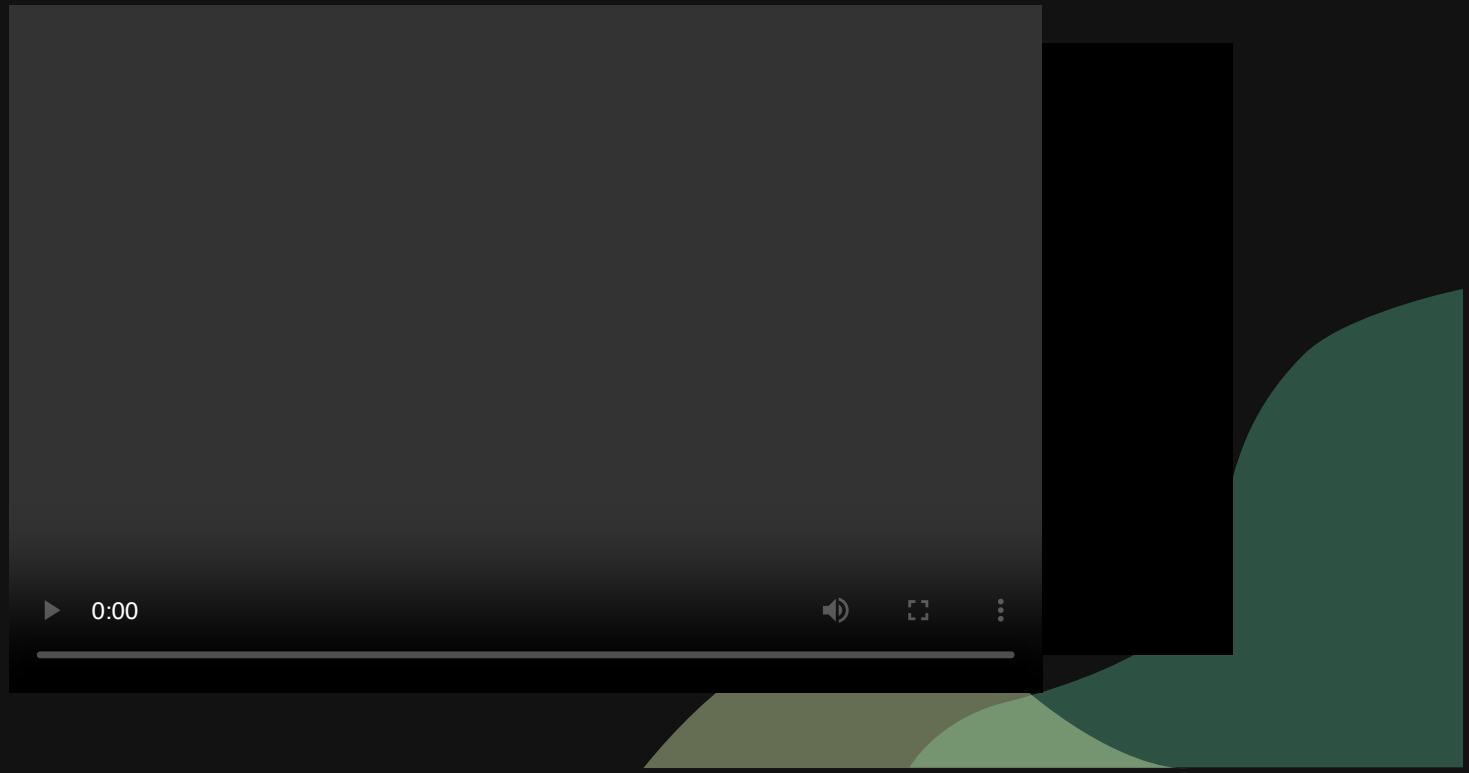
基本介绍 基础概念




```yaml
on: push
jobs:
  test:
    strategy:
      matrix:
        platform: [ubuntu-latest, macos-latest, windows-latest
    runs-on: ${{ matrix.platform }}
    steps:
    - uses: actions/checkout@v3
    - uses: actions/setup-node@v3
      with:
        node-version: 16
    - run: npm run test
```

工作流 `workflows`	自动化流程，可以有多个，存放在 `.github/workflows` 目录中。
事件 `event`	比如推送代码，创建 PR 等；支持的事件
作业 `jobs`	在同一运行器上执行的一组步骤。顺序执行，相互依赖。
操作 `actions`	作业中的一组任务，可以是自定义的，也可以是开源市场提供的。
运行程序 `runners`	运行工作流的服务器；支持 Ubuntu Linux、Microsoft Windows 和 macOS。

基本介绍 简单演示

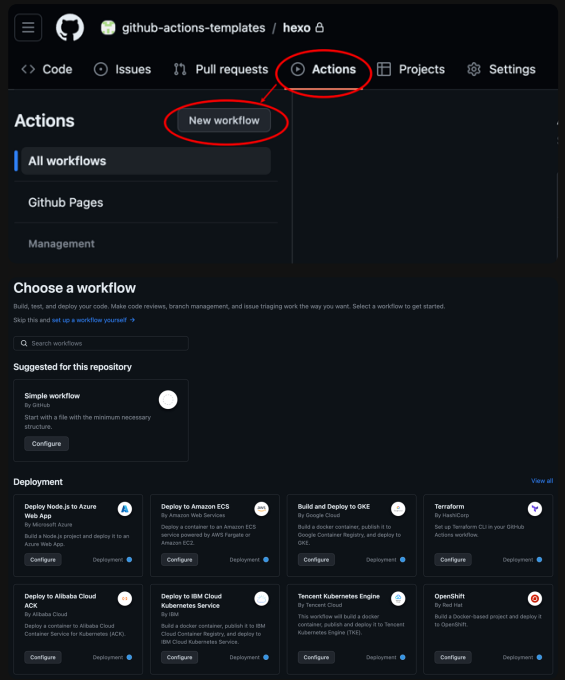


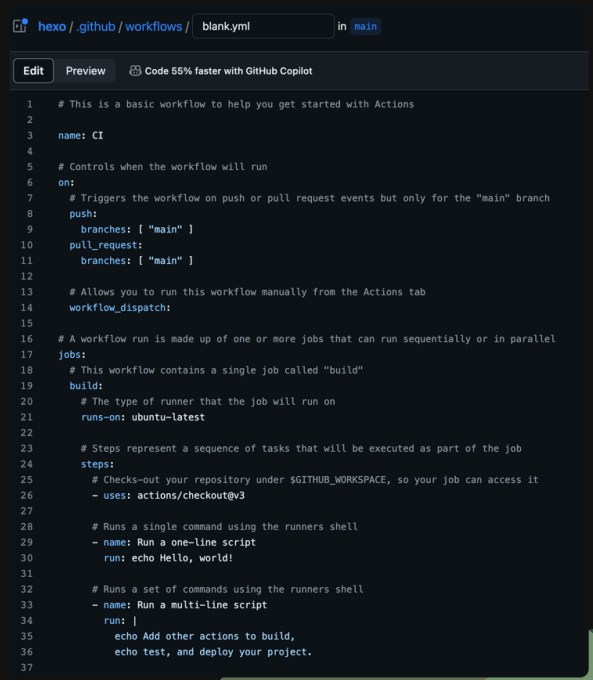
上手指南

- 创建工作流(`workflows`)
- `workflows` 文件的结构和语法
- 触发器和事件
- 任务和步骤
- 使用环境变量和密钥

上手指南 创建 workflows

- 方式一：使用官方模板（适合新手）





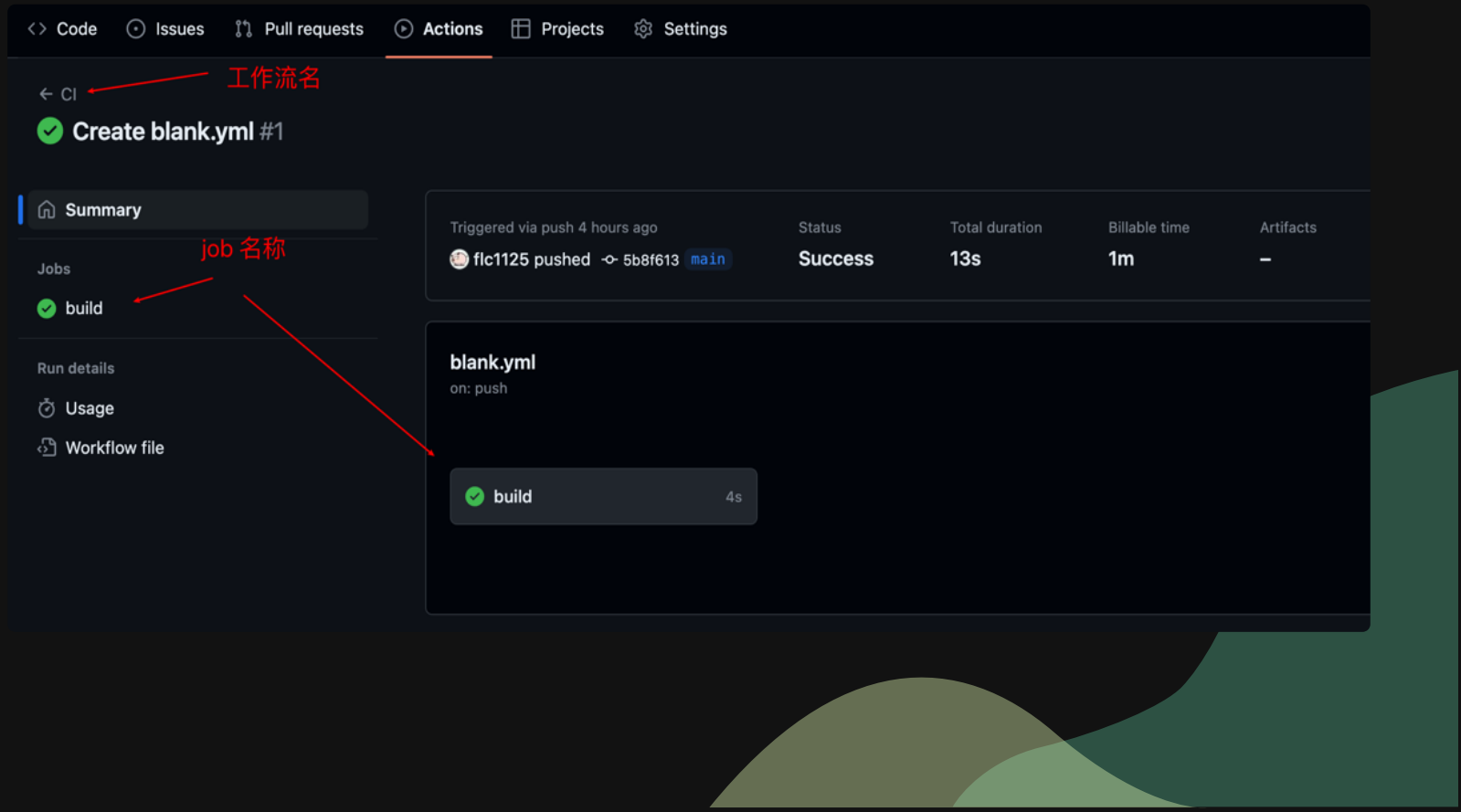
- 方式二：手动创建（适合有经验的用户）

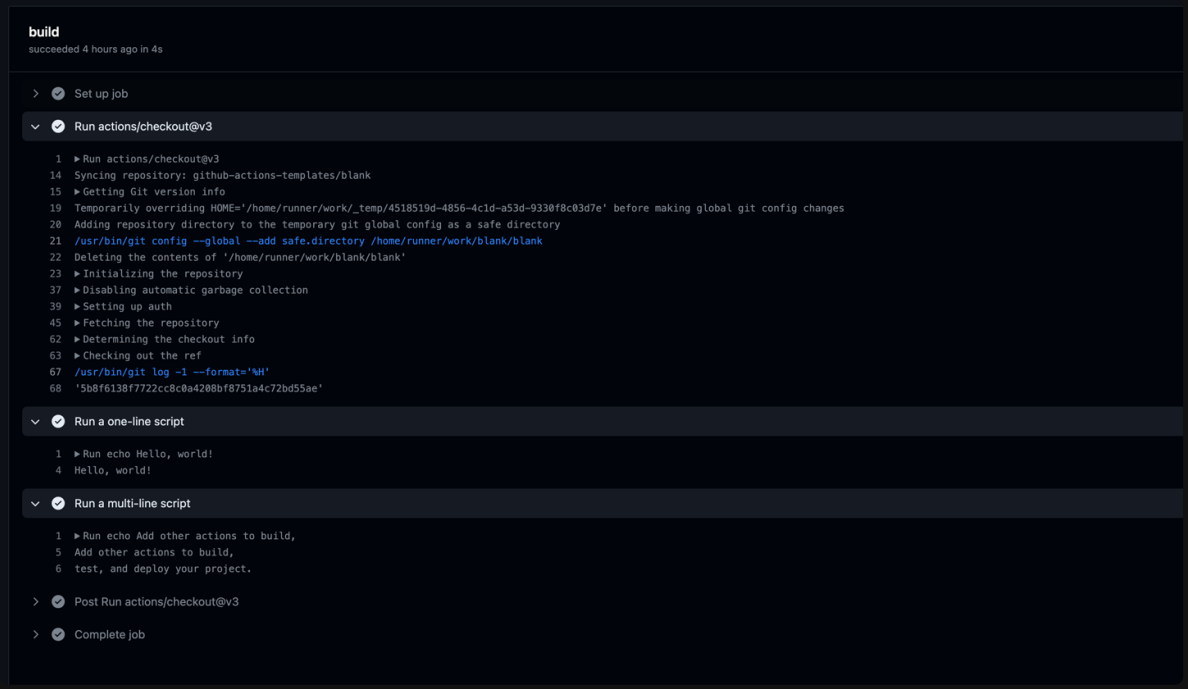
> 文件路径：`.github/workflows/[xxx].yml`，支持配置多个 `workflows` 文件。

```yaml
name: CI

on:
  push:
    branches: [ "main" ]
  pull_request:
    branches: [ "main" ]

jobs:
  build:
    runs-on: ubuntu-latest
    steps:
      - uses: actions/checkout@v3

      - name: Run a one-line script
        run: echo Hello, world!

      - name: Run a multi-line script
        run: |
          echo Add other actions to build,
          echo test, and deploy your project.
```

上手指南 workflows 文件的结构和语法

```yaml
# 工作流的名称
name: CI

# 触发器
on:
  # 当往 main 分支推送代码，或发起合并请求时触发
  push:
    branches: [ "main" ]
  pull_request:
    branches: [ "main" ]

# 任务列表（此处只列了一个）
jobs:
  # 任务名称，比如此处为 build 任务；多个任务默认是并行，可通过配置建立依赖关系
  build:
    # 任务运行的服务器环境
    runs-on: ubuntu-latest

    # 任务运行的步骤，此处是串行
    steps:
      # 拉取代码，此处使用的时第三方（虽然是官方组织）的 actions 组件
      - uses: actions/checkout@v3

      # 执行一个单行命令（其中 name 为该命令的名称）
```


Code
Issues
Pull requests
Actions
Projects
Settings
← CI
工作流名
Create blank.yml #1
Summary
job 名称
Jobs
build
Run details
Usage
Workflow file
Triggered via push 4 hours ago
flc1125 pushed 5b8f613 main
Status
Success
Total duration
13s
Billable time
1m
Artifacts
–
blank.yml
on: push
build
4s


build
succeeded 4 hours ago in 4s
Set up job
Run actions/checkout@v3
1 ▶ Run actions/checkout@v3
14 Syncing repository: github-actions-templates/blank
15 ▶ Getting Git version info
19 Temporarily overriding HOME='/home/runner/work/_temp/4518519d-4856-4c1d-a53d-9330f8c03d7e' before making global git config changes
20 Adding repository directory to the temporary git global config as a safe directory
21 /usr/bin/git config --global --add safe.directory /home/runner/work/blank/blank
22 Deleting the contents of '/home/runner/work/blank/blank'
23 ▶ Initializing the repository
37 ▶ Disabling automatic garbage collection
39 ▶ Setting up auth
45 ▶ Fetching the repository
62 ▶ Determining the checkout info
63 ▶ Checking out the ref
67 /usr/bin/git log -1 --format='%H'
68 '5b8f6138f7722cc8c0a4208bf8751a4c72bd55ae'
Run a one-line script
1 ▶ Run echo Hello, world!
4 Hello, world!
Run a multi-line script
1 ▶ Run echo Add other actions to build,
5 Add other actions to build,
6 test, and deploy your project.
Post Run actions/checkout@v3
Complete job

示例地址：查看 ↗

上手指南 触发器和事件

工作流程触发器是导致工作流程运行的事件。 这些事件可以是：

- 工作流存储库中发生的事件，如：推送代码、创建 ISSUE、发起 PR
- 在 GitHub 之外发生并在 GitHub 上触发 `repository_dispatch` 事件的事件，如：通过 Webhook 发送自定义时间
- 预定时间，如：每天 4 点全量单测
- 手动，如：点击按钮

> 例如：当你推送代码到某个分支时，可以触发事件，以运行相关任务。

```yaml
on:
  issues:
    types:
      - opened

jobs:
  label_issue:
    runs-on: ubuntu-latest
    steps:
      - env:
          GITHUB_TOKEN: ${{ secrets.MY_TOKEN }}
          ISSUE_URL: ${{ github.event.issue.html_url }}
        run: |
          gh issue edit $ISSUE_URL --add-label "triage"
```

> 配合官方的 `gh` 命令工具效果更佳。

常用工作流事件

- 推送代码，创建合并等

```yaml
on:
  push:
    branches:
      - 'main'
      - 'releases/**' # 指定分支
    tags:
      - 'v1.*' # 指定 Tag
    paths:
      - '**.js' # 指定文件
      - '!**-aplha.js' # 排除文件
  pull_request:
    branches:
      - 'main'
      - '!releases/**-alpha' # 忽略分支
```

常用工作流事件

- 定时事件

```yaml
on:
  schedule:
    - cron: '30 5 * * 1,3'
    - cron: '30 5 * * 2,4'
```

Cron 语法：

```
┌──────────── minute (0 - 59)
│ ┌──────────── hour (0 - 23)
│ │ ┌──────────── day of the month (1 - 31)
│ │ │ ┌──────────── month (1 - 12 or JAN-DEC)
│ │ │ │ ┌──────────── day of the week (0 - 6 or SUN-SAT)
│ │ │ │ │
│ │ │ │ │
│ │ │ │ │
* * * * *
```

工作流事件

- 更多事件：https://docs.github.com/zh/actions/using-workflows/events-that-trigger-workflows
- 基础概念：https://docs.github.com/zh/actions/using-workflows/triggering-a-workflow
- 手动运行工作流程：https://docs.github.com/zh/actions/using-workflows/manually-running-a-workflow
- 工作流语法：https://docs.github.com/zh/actions/using-workflows/workflow-syntax-for-github-actions

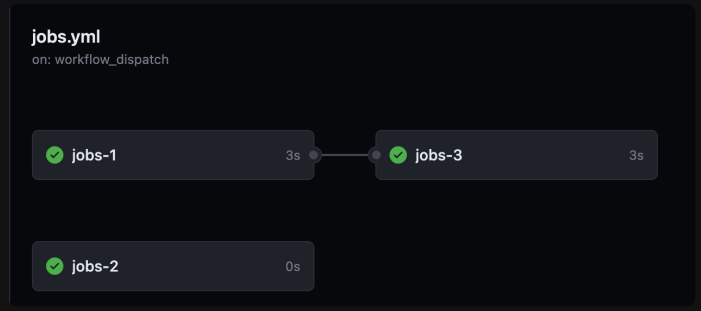
上手指南 任务和步骤

- 工作流运行由一个或多个 `jobs` 组成，默认情况下 **并行** 运行。
- 可使用 `jobs.<job_id>.needs` 关键字定义对其他作业的依赖关系，来实现顺序运行。
- 每个作业在 `runs-on` 指定的运行器环境中运行。

一个 

案例地址

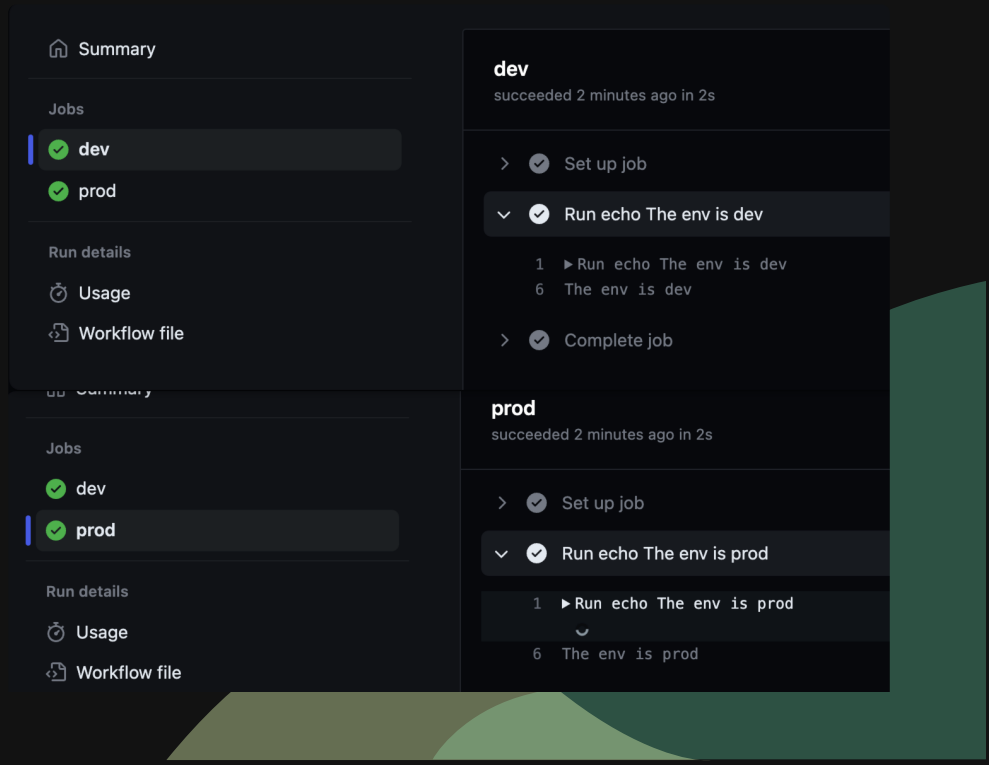
```yaml
name: Test Jobs

on:
  workflow_dispatch:
    inputs:
      test-jobs:
        description: '测试 Jobs'


jobs:
  jobs-1:
    runs-on: ubuntu-latest
    steps:
      - name: Run a one-line script
        run: echo Hello, world! This is jobs-1

  jobs-2:
    runs-on: ubuntu-latest
    steps:
      - name: Run a one-line script
        run: echo Hello, world! This is jobs-2

  jobs-3:
    runs-on: ubuntu-latest
```



上手指南 使用环境变量和密钥

案例地址

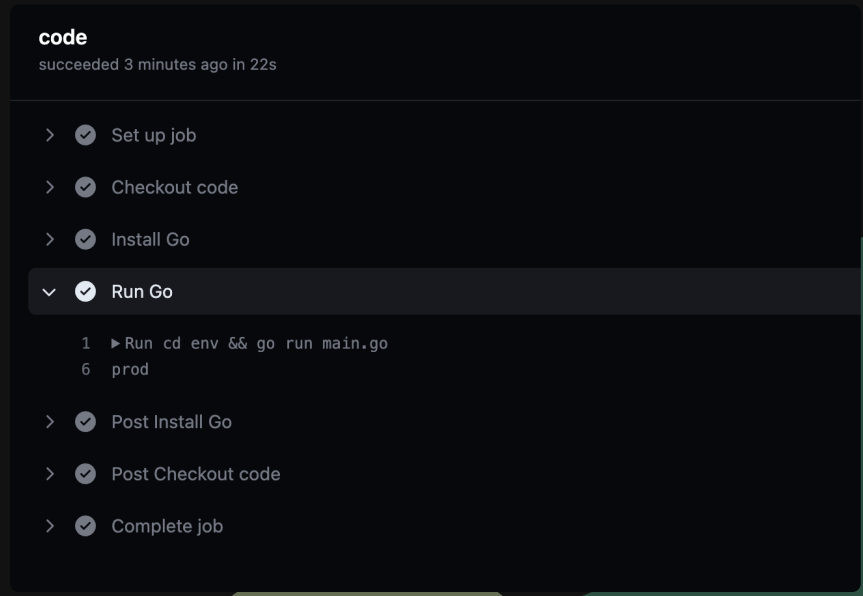
```yaml
name: Test Env

on:
  workflow_dispatch:
    inputs:
      test-jobs:
        description: '测试 Env'

env:
  ENVIRONMENT: prod

jobs:
  dev:
    runs-on: ubuntu-latest
    env:
      ENVIRONMENT: dev
    steps:
      - run: echo The env is ${{ env.ENVIRONMENT }}

  prod:
    runs-on: ubuntu-latest
    steps:
      - run: echo The env is ${{ env.ENVIRONMENT }}
```



补充

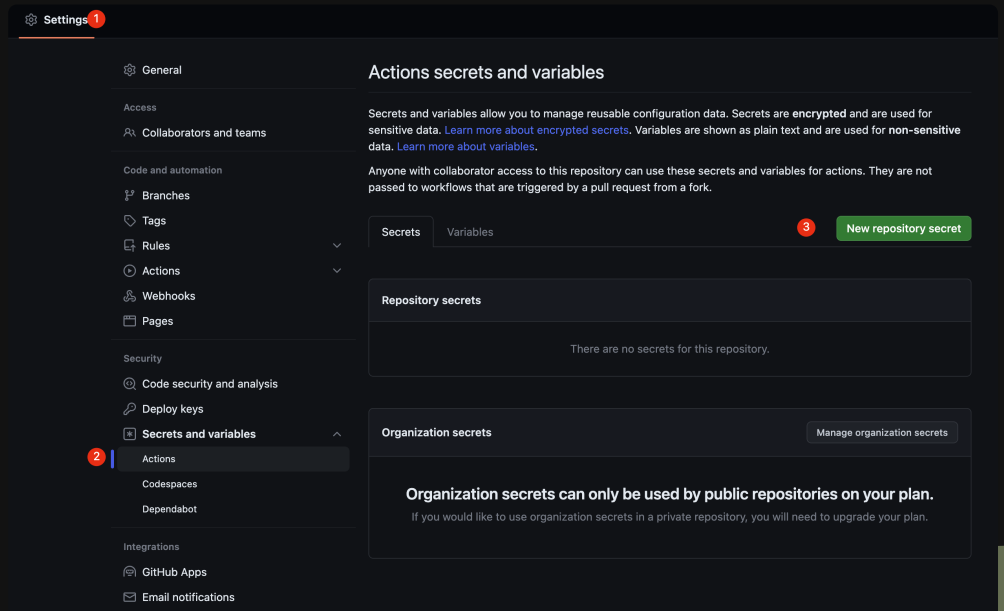
- 环境变量你可以理解为执行了： `export ENVIRONMENT=prod`
- 支持编程语言中的获取，如：Go 语言的 `os.LookupEnv`

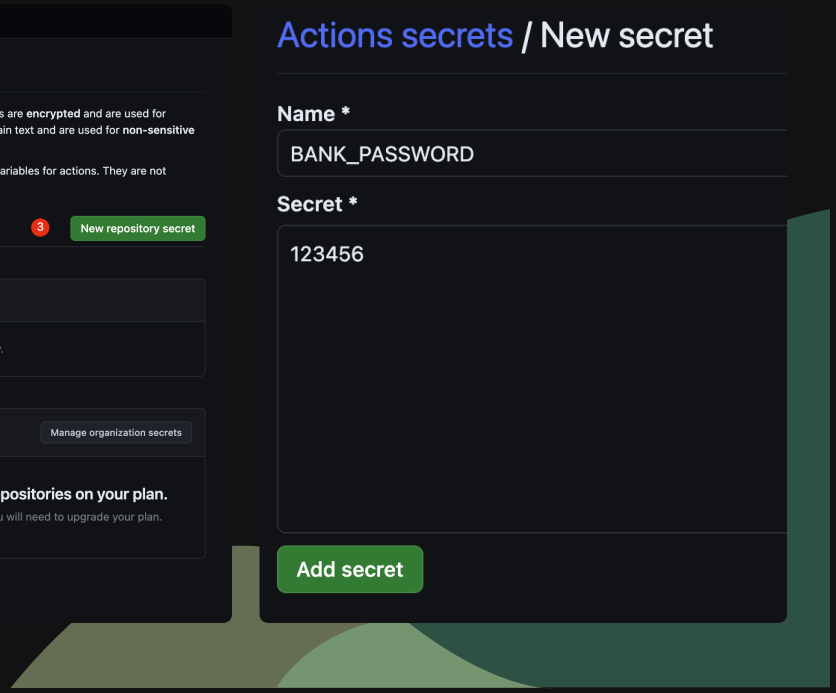
```go
package main

import "os"

func main() {
    if env, ok := os.LookupEnv("ENVIRONMENT"); !ok {
        panic("ENVIRONMENT is not set")
    } else {
        println(env)
    }
}
```



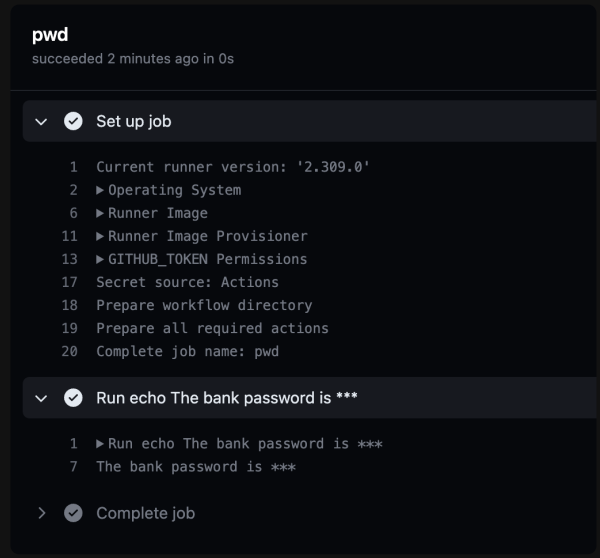
如果我要输入我的银行卡密码怎么办?

- 路径: `Settings → Security → Actions secrets and variables → Actions → New repository secret`





```yaml
name: Test Env

on:
  workflow_dispatch:
    inputs:
      test-jobs:
        description: '测试 Env'

env:
  PWD: ${{ secrets.BANK_PASSWORD }}

jobs:
  pwd:
    runs-on: ubuntu-latest
    steps:
      - run: echo The bank password is ${{ env.PWD }}
```



适用场景：

- 单元测试：API 秘钥、地址等
- 第三方服务：单测覆盖率（如： `codecov` ）
- 敏感信息：密码等
- ……

应用场景

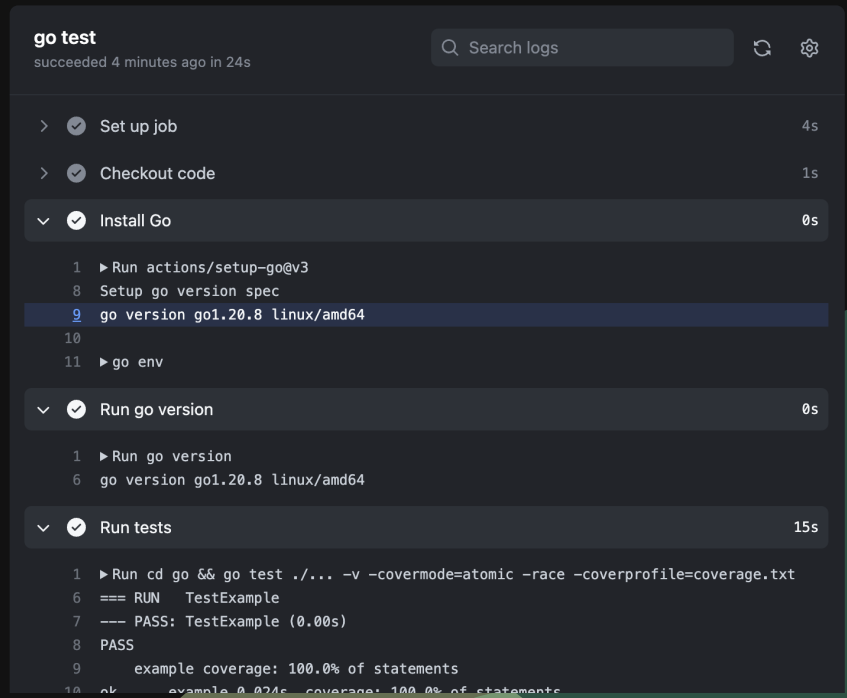
- 自动化构建和测试
- 自动化部署
- 定时任务和计划作业
- 集成第三方服务

应用场景 自动化构建和测试

案例地址

```go
// package
package example

func Example() string {
    return "Hello, world!"
}

// package test
package example

import "testing"
```

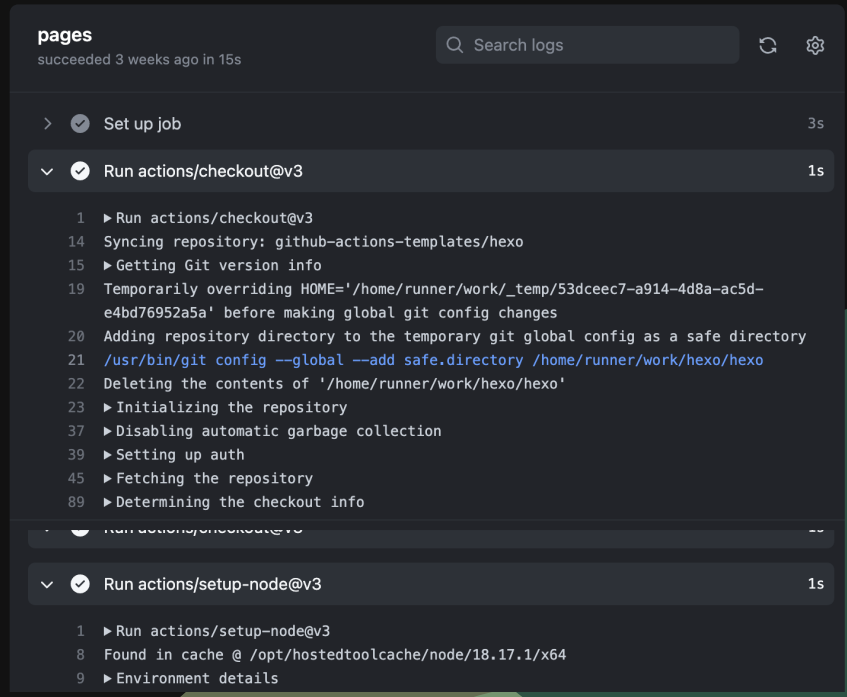
```yaml
name: Go Test
on:
  push:
    branches: [ main ]
    paths:
      - "go/**"
env:
  GOPROXY: "https://proxy.golang.org"

jobs:
  test:
```



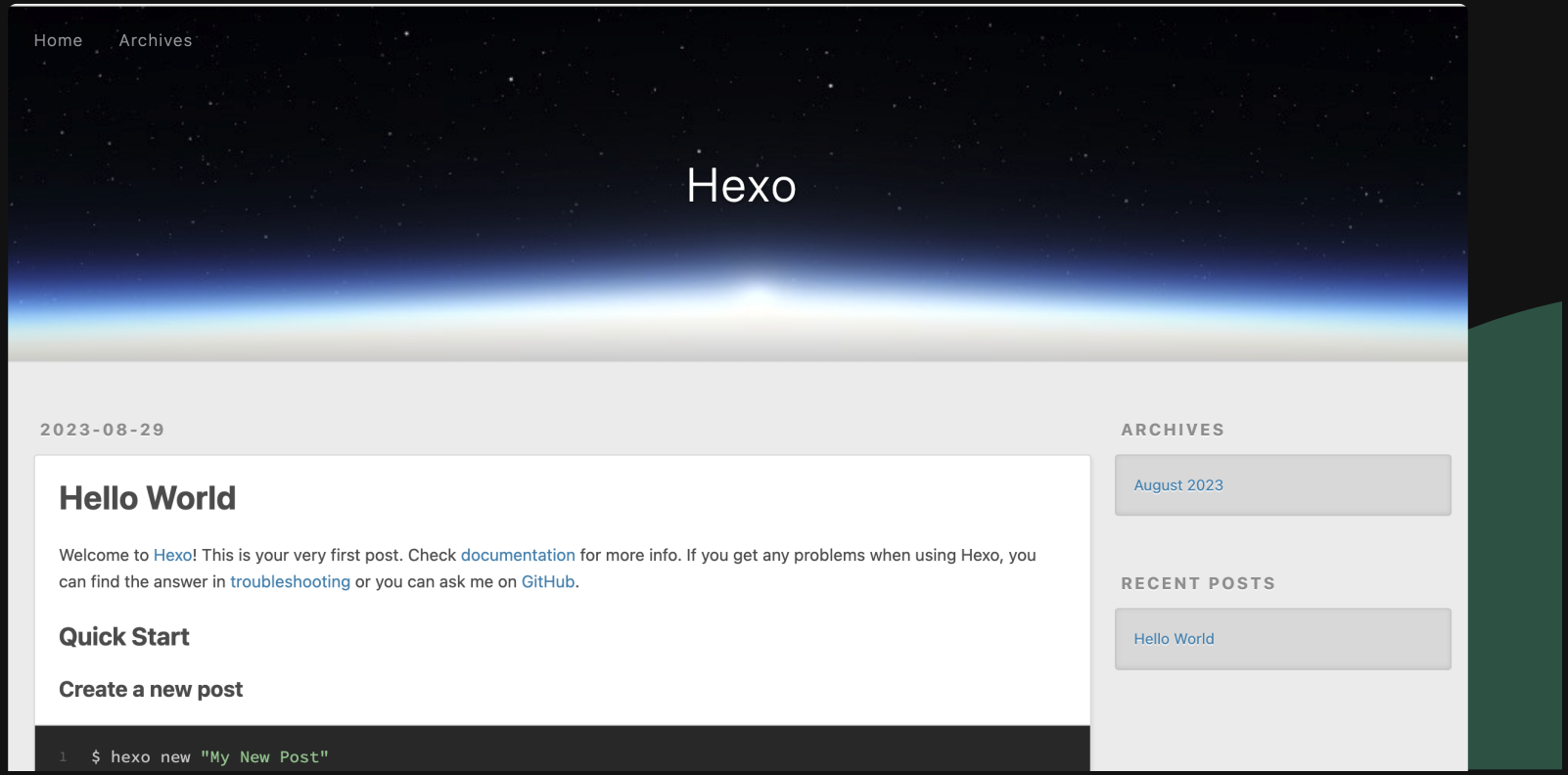
应用场景 自动化部署

案例地址

```yaml
name: Github Pages

on:
  push:
    branches:
      - main

jobs:
  pages:
    runs-on: ubuntu-latest
    permissions:
      contents: write
    steps:
      - uses: actions/checkout@v3

      - uses: actions/setup-node@v3
        with:
          node-version: 18
          cache: 'npm'

      - uses: actions/cache@v3
        with:
          path: node_modules
          key: ${{ runner.OS }}-npm-cache-${{ hashFiles(
```



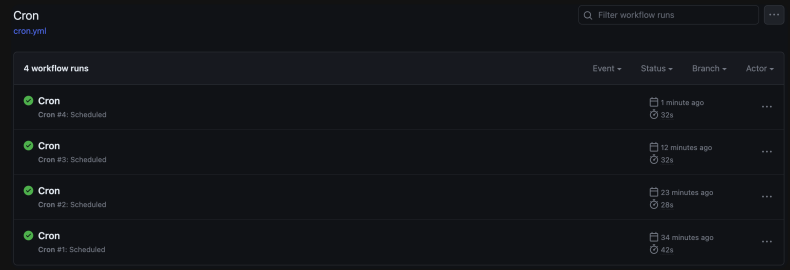
效果地址


Home
Archives
Hexo
2023-08-29
Hello World
Welcome to Hexo! This is your very first post. Check documentation for more info. If you get any problems when using Hexo, you can find the answer in troubleshooting or you can ask me on GitHub.
Quick Start
Create a new post
1 $ hexo new "My New Post"
ARCHIVES
August 2023
RECENT POSTS
Hello World

应用场景 定时任务和计划作业

案例地址

```yaml
name: Cron
on:
  schedule:
    - cron: "0 0 * * *"
    - cron: "0 12 * * *"
    - cron: "*/5 * * * *"

env:
  GOPROXY: "https://proxy.golang.org"

jobs:
  test:
    name: "go test"
    runs-on: ubuntu-latest

    steps:
      - name: Checkout code
        uses: actions/checkout@v3
```



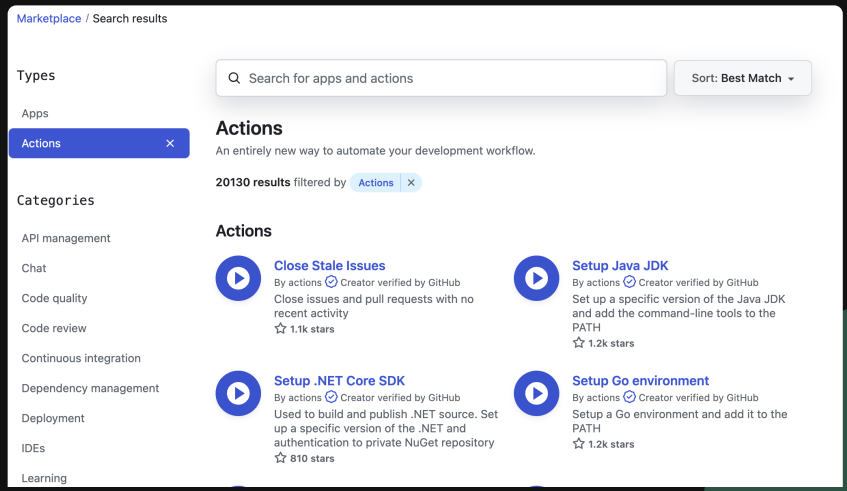
> 实际操作下来，并不一定非常准时。（可能是 Queue 机制）

说明：

- 时区相关：基于 UTC 时区
- 最短支持：每 5 分钟一次

应用场景 集成第三方服务

```yaml
name: Go Test
on:
  push:
    branches: [ main ]
    paths:
      - "go/**"
env:
  GOPROXY: "https://proxy.golang.org"

jobs:
  test:
    name: "go test"
    runs-on: ubuntu-latest

    steps:
      - name: Checkout code
        uses: actions/checkout@v3

      - name: Install Go
        uses: actions/setup-go@v3
      - run: go version

      - name: Run tests
        run: go test ./... -v -covermode=atomic -race -c
```



Github Actions 第三方服务：

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

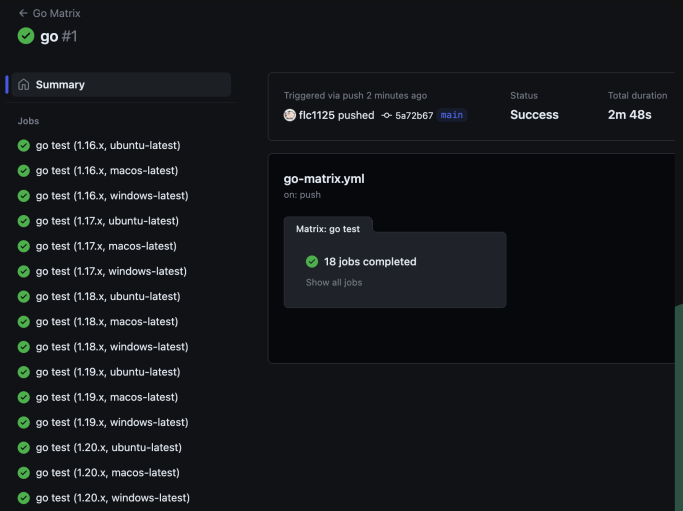
高级特性

- 矩阵任务
- 依赖和条件

高级特性 矩阵任务

Q： 测试用例希望在多个环境，多个不同版本的语言环境下运行?

```yaml
name: Go Test
on:
  push:
    branches: [ main ]
    paths:
      - "go/**"
env:
  GOPROXY: "https://proxy.golang.org"

jobs:
  test:
    name: "go test"
    strategy:
      matrix:
        go-version: [ 1.16.x, 1.17.x, 1.18.x, 1.19.x, 1.20.x,
        platform: [ ubuntu-latest, macos-latest, windows-lates
    runs-on: ${{ matrix.platform }}

    steps:
      - name: Checkout code
        uses: actions/checkout@v3
```



说明：

- 任务运行：并行运行
- 案例地址

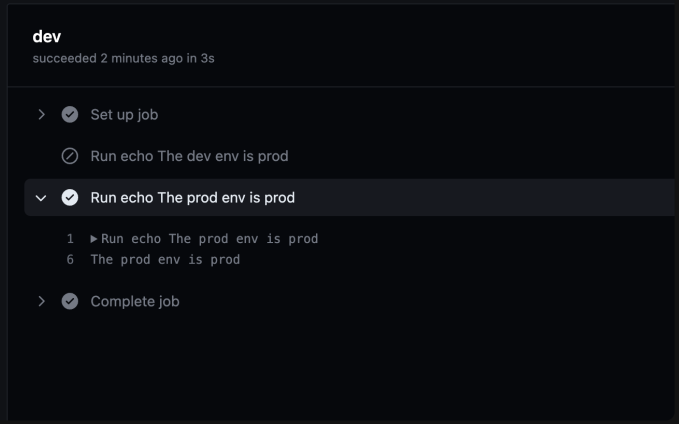
高级特性 依赖和条件

依赖

```yaml
name: Test Jobs

on:
  workflow_dispatch:
    inputs:
      test-jobs:
        description: '测试 Jobs'

jobs:
  jobs-1:
    runs-on: ubuntu-latest
    steps:
      - name: Run a one-line script
        run: echo Hello, world! This is jobs-1

  jobs-2:
    runs-on: ubuntu-latest
    needs: # 依赖设定
      - jobs-1
    steps:
      - name: Run a one-line script
        run: echo Hello, world! This is jobs-3, but after jobs
```

条件

```yaml
name: Test IF

on:
  workflow_dispatch:
    inputs:
      test-jobs:
        description: '测试 IF'

env:
  ENVIRONMENT: prod

jobs:
  dev:
    runs-on: ubuntu-latest
    steps:
      - run: echo The dev env is ${{ env.ENVIRONMENT }}
        if: env.ENVIRONMENT == 'dev'

      - run: echo The prod env is ${{ env.ENVIRONMENT }}
        if: env.ENVIRONMENT == 'prod'
```



说明：

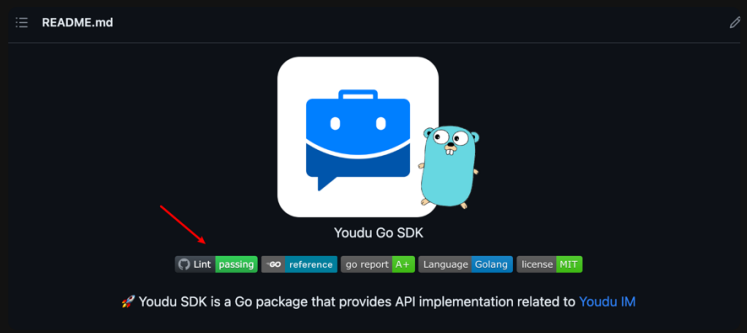
- 表达式：https://docs.github.com/zh/actions/learn-github-actions/expressions
- 您需要使用特定语法指示 GitHub 对表达式求值，而不是将其视为字符串。 `${{ <expression> }}`

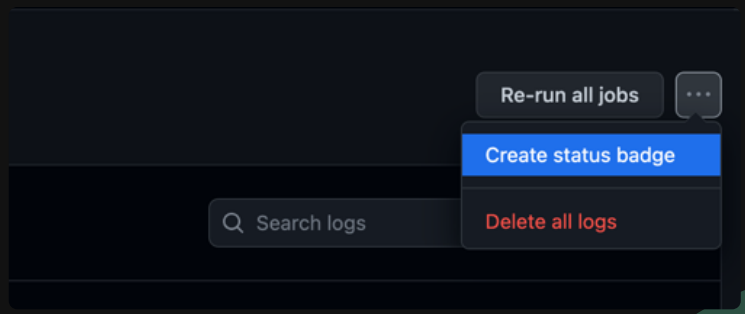
  在 `if` 条件下使用表达式时，可以省略 `${{ }}` 表达式语法，因为 GitHub Actions 会自动将 `if` 条件作为表达式求值。 使用 `${{ }}` 表达式语法将内容转换为字符串，并且字符串是真值。 例如， `if: true && ${{ false }}` **的计算结果为** `true` 。

最佳实践

- 使用徽章来标记 CI 状态
- 使用缓存提高性能
- GITHUB_TOKEN
- 容器化服务
- 版本控制和代码审查
- 效率和资源管理

最佳实践 使用徽章来标记 CI 状态






```
[![Lint](https://github.com/addcnos/youdu/actions/workflows/lint.yml/badge.svg)](https://github.com/addcnos/youdu/actions/workflows/lint.
```

Lint

最佳实践 使用缓存提高性能

基础版本

```yaml
name: Cache
on:
  push:
    branches: [ main ]

jobs:
  test:
    runs-on: ubuntu-latest

    steps:
      - name: Mkdir
        run: mkdir -p ~/test

      - uses: actions/cache@v3 # 缓存服务
        id: cache-test # 缓存 ID
        with:
          path: ~/test/ # 需要缓存的路径
          key: ${{ runner.os }}-cache-test # 缓存唯一标识
          restore-keys: |
            ${{ runner.os }}-cache- # 备选标识（多个换行）

      - run: sleep 10 && echo "Hello world" > ~/test/1.log
```

案例地址

首次（未命中缓存）

test
succeeded 7 minutes ago in 12s

- Set up job
- Run mkdir -p ~/test
- Run actions/cache@v3

```
1  ▶ Run actions/cache@v3
10 Cache not found for input keys: Linux-cache-test, Linux-cache-
```

- Run sleep 5 && echo "Hello world" > ~/test/1.log
- Run sleep 5 && echo "Hello world" > ~/test/2.log
- Run cat ~/test/*.log

```
1  ▶ Run cat ~/test/*.log
4  Hello world
5  Hello world
```

- Post Run actions/cache@v3
- Complete job

第二次（命中缓存）

test
succeeded 12 minutes ago in 6s

- Set up job
- Mkdir
- Run actions/cache@v3

```
1  ▶ Run actions/cache@v3
10 Cache Size: ~0 MB (289 B)
11 /usr/bin/tar -xf /home/runner/work/_temp/ec1ea60c-fa4f-4b3b-8431-cc07e4f041ba/cache.tzst
12 Cache restored successfully
13 Cache restored from key: Linux-cache-test
```

- Run sleep 5 && echo "Hello world" > ~/test/1.log
- Run sleep 5 && echo "Hello world" > ~/test/2.log
- Run cat ~/test/*.log

```
1  ▶ Run cat ~/test/*.log
4  Hello world
5  Hello world
```

- Post Run actions/cache@v3
- Complete job

9 workflow runs Event ▾ Status ▾ Branch ▾ Actor ▾

命中

init main
Cache #9: Commit b6cd664 pushed by flc1125
15 minutes ago
15s

未命中

init main
Cache #8: Commit 4af790d pushed by flc1125
16 minutes ago
20s

一些第三方服务直接支持的缓存参考

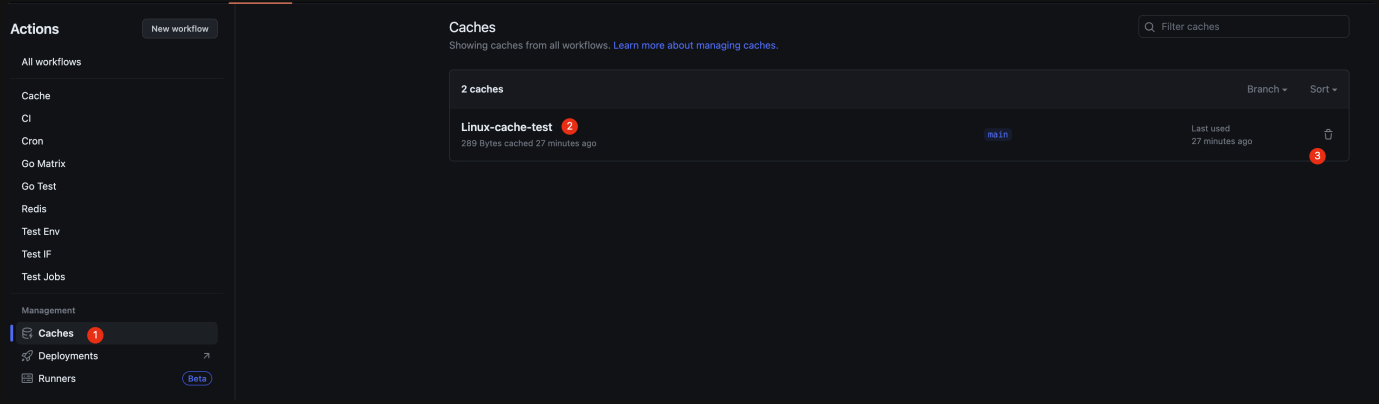
包管理器	用于缓存的 setup-* 操作
npm、Yarn、pnpm	setup-node
pip、pipenv、Poetry	setup-python
Go `go.sum`	setup-go
PHP `composer.lock`	setup-php
.....	

> 一般情况下，我们会结合上下文等实现缓存 key 的命名。如：
> `${{ runner.os }}-build-${{ env.cache-name }}-${{ hashFiles('**/package-lock.json') }}`

一个简单的🌰

```yaml
steps:
  - uses: actions/checkout@v4
  - uses: actions/setup-go@v4
    with:
      go-version: '1.21'
      check-latest: true
      cache-dependency-path: |
             subdir/go.sum
             tools/go.sum
    # cache-dependency-path: "**/*.sum"

  - run: go run hello.go
```

如果你想手动清理缓存：



其他小知识：

- 存储库中的多个工作流运行可以**共享缓存**。 可以从**同一存储库和分支**的另一个工作流运行访问和还原为工作流运行中的分支创建的缓存。

最佳实践 `GITHUB_TOKEN`

💡 自动令牌身份验证

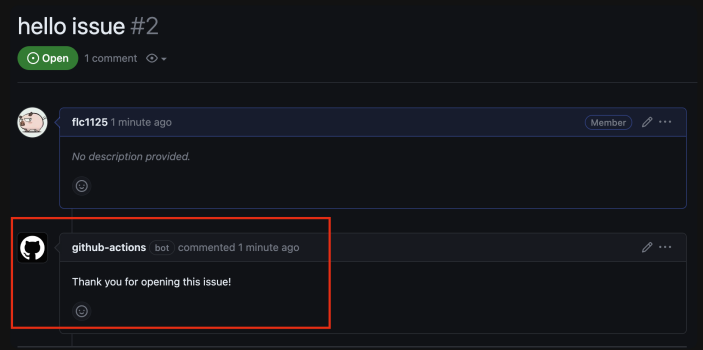
在每个工作流作业开始时，GitHub 会自动创建唯一的 `GITHUB_TOKEN` 机密以在工作流中使用。 可以使用 `GITHUB_TOKEN` 在工作流作业中进行身份验证。

那可以做什么?

- Github Cli 命令
- 调用 Github REST API
- 仓库写入，生成 `gh-page`
- ……
- 代码自动审查（发起 PR）
- 接入 AI 呢?
- ……

一个🌰

```yaml
name: issue welcome
on:
  issues:
    types:
      - opened

jobs:
  comment:
    runs-on: ubuntu-latest
    permissions: # 设置权限
      issues: write # 写入权限
    steps:
      - run: gh issue comment $ISSUE --body "Thank you for ope
        env:
          GITHUB_TOKEN: ${{ secrets.GITHUB_TOKEN }}
          ISSUE: ${{ github.event.issue.html_url }}
```

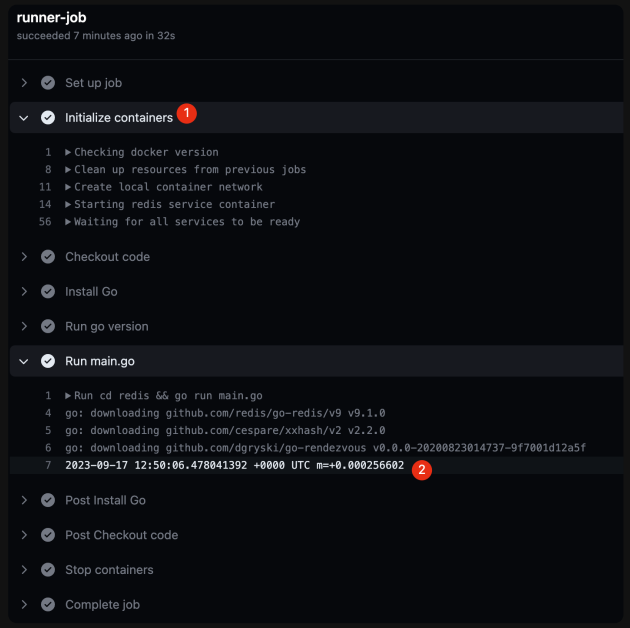


案例地址

最佳实践 容器化服务

```yaml
name: Redis
on: push

jobs:
  runner-job:
    runs-on: ubuntu-latest

    services:
      redis:
        image: redis # Docker Hub 镜像名称
        ports:
          - 6379:6379

    steps:
      - name: Checkout code
        uses: actions/checkout@v3

      - name: Install Go
        uses: actions/setup-go@v3
      - run: go version

      - name: Run main.go
        run: cd redis && go run main.go
```

```go
package main

import (
    "context"
    "time"

    redis "github.com/redis/go-redis/v9"
)

var ctx = context.Background()

func main() {
    rdb := redis.NewClient(&redis.Options{
        Addr: "localhost:6379",
    })

    if err := rdb.Set(ctx, "test", time.Now().String(), time.S
        panic(err)
    }

    if result := rdb.Get(ctx, "test"); result.Err() != nil {
        panic(result.Err())
    } else {
        println(result.Val())
```



说明：

- 容器化服务仅限于在 `ubuntu` 系统下运行
- 案例地址

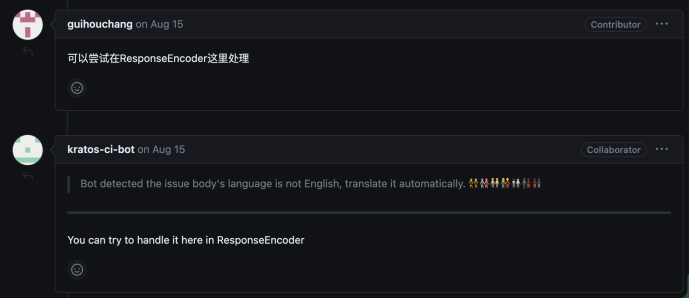
案例分享

- 翻译助手
- 节假日
- 五子棋
- 跨仓库使用
- uptime
- 丰富个人主页
- 单测覆盖率

案例分享 翻译助手

基于 issue 的内容，识别中文，自动翻译成英文。

```yaml
name: 'issue-translator'
on:
  issue_comment:
    types: [created]
  issues:
    types: [opened]

jobs:
  build:
    runs-on: ubuntu-latest
    steps:
      - uses: usthe/issues-translate-action@v2.7
        with:
          IS_MODIFY_TITLE: true
          CUSTOM_BOT_NOTE: Bot detected the issue body's langu
          BOT_GITHUB_TOKEN: ${{ secrets.BOT_GITHUB_TOKEN }}
```



案例分享 节假日

基于计划任务生成中国节假日信息。

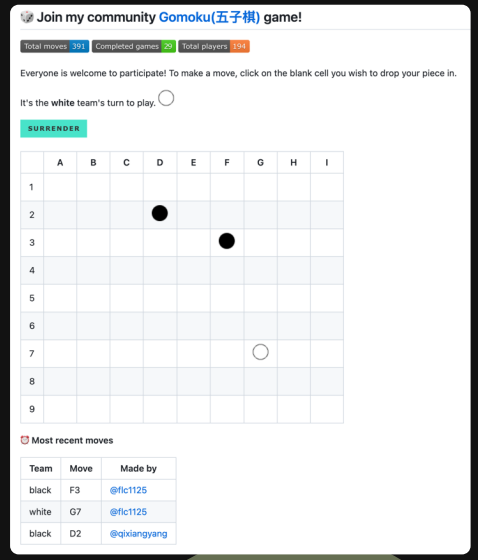
```yaml
name: CI

on:
  push:
    branches: [ master ]
  pull_request:
  workflow_dispatch:
  schedule:
    - cron: "0 12 * * *"
jobs:
  build:
    runs-on: ubuntu-latest
    steps:
      - uses: actions/checkout@v3
      - uses: actions/setup-python@v4
        with:
          python-version: '3.8'
      - name: Install dependencies
        run: pip install -r dev-requirements.txt
      - name: Setup git user
        run: |
          git config user.name "GitHub Actions"
```

```json
{
    "$schema": "https://raw.githubusercontent.com/NateScarlet/
    "$id": "https://raw.githubusercontent.com/NateScarlet/holi
    "year": 2023,
    "papers": [
        "http://www.gov.cn/zhengce/zhengceku/2022-12/08/conter
    ],
    "days": [
        {
            "name": "元旦",
            "date": "2022-12-31",
            "isOffDay": true
        },
        {
            "name": "元旦",
            "date": "2023-01-01",
            "isOffDay": true
        },
        {
            "name": "元旦",
            "date": "2023-01-02",
            "isOffDay": true
```

案例分享 五子棋

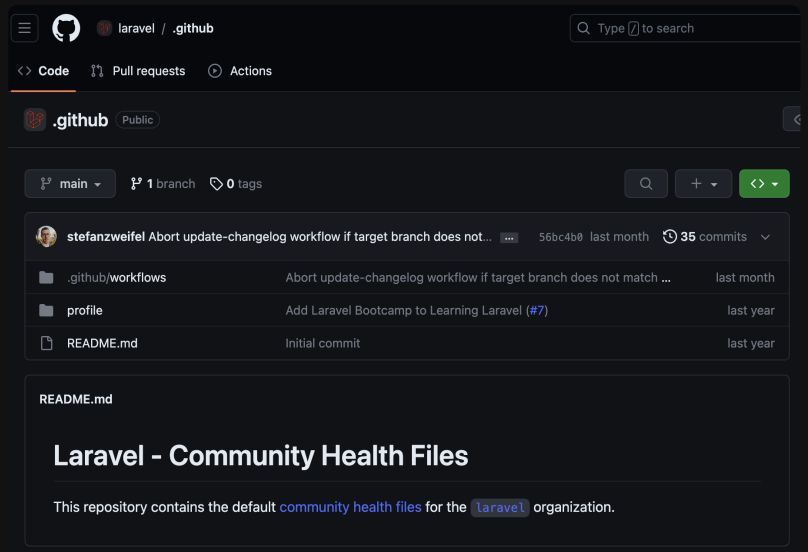
基于创建 `issue` 触发 Github Actions 更新 `README.md`

```yaml
name: "Gomoku"

on:
  issues:
    types: [opened]

jobs:
  move:
    runs-on: ubuntu-latest
    if: startsWith(github.event.issue.title, 'gomoku|')
    steps:
      - name: Checkout
        uses: actions/checkout@v2

      - name: Setup Python
        uses: actions/setup-python@v2
        with:
          python-version: 3.8
      - name: Cache PIP
        uses: actions/cache@v2
        with:
          path: ~/.cache/pip
```



案例分享 跨仓库使用

Laravel 的 workflows，统一托管到 .github 下维护。

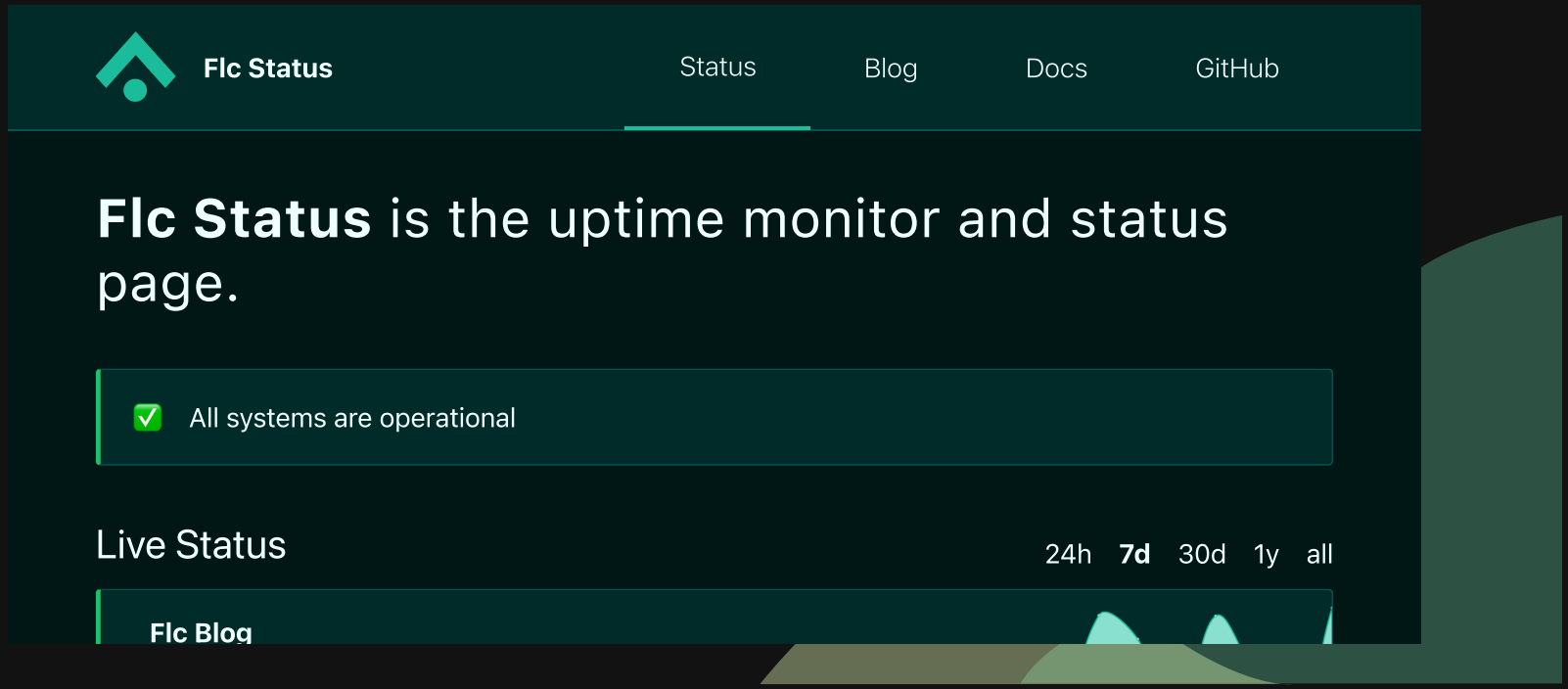


laravel/framework

```yaml
name: pull requests

on:
  pull_request_target:
    types: [opened]

permissions:
  pull-requests: write

jobs:
  uneditable:
    uses: laravel/.github/.github/workflows/pull-requests.ym
```

案例分享 uptime

定时请求网站状态，并可视化相关数据。案例地址、案例仓库地址



案例分享 单测覆盖率

推送代码后，触发单测执行，并上报至第三方平台，便于分析查看。案例地址

release v1.0.5 | reference | codecov 68% | go report A+ | tests | license MIT

```yaml
name: Go Test
on:
  push:
    branches: [ master, feature/* ]
  pull_request:
    branches: [ master ]
env:
  GOPROXY: "https://proxy.golang.org"

jobs:
  test:
    name: "go test"
    strategy:
      matrix:
        go-version: [ 1.18.x, 1.19.x, 1.20.x, 1.21.x ]
        platform: [ ubuntu-latest ]
    runs-on: ${{ matrix.platform }}

    services:
```