Automating Open Source with Probot

Bex Warner
DevOps

'We think autonomous coding is a very real thing' – GitHub CEO imagines a future without programmers
How long can you work on making a routine task more efficient before you’re spending more time than you save? (Across five years)

<table>
<thead>
<tr>
<th>How often you do the task</th>
<th>50/day</th>
<th>5/day</th>
<th>Daily</th>
<th>Weekly</th>
<th>Monthly</th>
<th>Yearly</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 second</td>
<td>1 day</td>
<td>2 hours</td>
<td>30 minutes</td>
<td>4 minutes</td>
<td>1 minute</td>
<td>5 seconds</td>
</tr>
<tr>
<td>5 seconds</td>
<td>5 days</td>
<td>12 hours</td>
<td>2 hours</td>
<td>21 minutes</td>
<td>5 minutes</td>
<td>25 seconds</td>
</tr>
<tr>
<td>30 seconds</td>
<td>3 days</td>
<td>12 hours</td>
<td>2 hours</td>
<td>30 minutes</td>
<td>2 minutes</td>
<td>2 minutes</td>
</tr>
<tr>
<td>1 minute</td>
<td>6 days</td>
<td>1 day</td>
<td>4 hours</td>
<td>1 hour</td>
<td>5 minutes</td>
<td>25 minutes</td>
</tr>
<tr>
<td>5 minutes</td>
<td>4 weeks</td>
<td>6 days</td>
<td>21 hours</td>
<td>5 hours</td>
<td>25 minutes</td>
<td>25 minutes</td>
</tr>
<tr>
<td>30 minutes</td>
<td>6 months</td>
<td>5 weeks</td>
<td>5 days</td>
<td>1 day</td>
<td>2 hours</td>
<td>2 hours</td>
</tr>
<tr>
<td>1 hour</td>
<td>10 months</td>
<td>2 months</td>
<td>10 days</td>
<td>2 days</td>
<td>5 hours</td>
<td>5 hours</td>
</tr>
<tr>
<td>6 hours</td>
<td>2 months</td>
<td>2 weeks</td>
<td>1 day</td>
<td>8 weeks</td>
<td>5 days</td>
<td>5 days</td>
</tr>
<tr>
<td>1 day</td>
<td>8 weeks</td>
<td>5 days</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
Jidoka

automation with a human touch.
Automating Process

Improves consistency, reduces overhead, increases your confidence
Identify repeated tasks

“We {action} every {period of time}.”
Identify repeated tasks

“We release a changelog every two weeks.”
What does automation look like on GitHub?
OAuth Apps
Authorize GitHub Classroom

GitHub Classroom by github

- Personal user data
  Email addresses (read-only)
- Repositories
  Public and private
- Delete repositories
  Ability to delete any admissible repository

Organization access
- campus-experts
- github
- octokit

Authorize github

Authorizing will redirect to https://classroom.github.com
ACCESS TO

ALL THE THINGS
GitHub's Permission System is Flawed #113

zenorocha opened this issue on Feb 10, 2016 · 65 comments

zenorocha commented on Feb 10, 2016

This is an open letter to @github on behalf of third-party app developers.

For a very long time, permission scopes has been a common issue for both users and app developers. These scopes are extremely permissive and far too broad, preventing users from using third-party applications.

We need a more granular permission system and we hope you listen to this.

Below you can find some examples that describes exactly what we mean by how flawed the system is and some suggestions to improve it.

| gist scope |
| Grants write access to gists. |
Granular permissions
Permissions

Changes to permissions will be applied to all future installations. Current users will be prompted to accept any changes and enable the new permissions on their installation.

Repository administration
Repository creation, deletion, settings, teams, and collaborators.

Access: Read & write

Select an access level
No access
Read-only
Read & write

Checks
Checks on code.

Access: No access

Repository contents
Repository contents, commits, branches, downloads, releases, and merged.

Access: No access

Deployments
Deployments and deployment statuses.

Access: No access

Issues
Issues and related comments, assignees, labels, and milestones.

Access: No access
Install WIP

Install on your organization GitHub

- **All repositories**
  This applies to all current and future repositories.

- **Only select repositories**
  Select repositories

...with these permissions:

- **No access to code**
- **Read access to pull requests**
- **Read and write access to commit statuses**

[Install]  [Cancel]
You’ve probably seen it in action
You’ve probably seen it in action

All checks have passed
4 successful checks

- ci/circleci — Your tests passed on CircleCI!
- ci/circleci: build-python27 — Your tests passed on CircleCI!
- ci/circleci: build-python36 — Your tests passed on CircleCI!
- ci/circleci: build-python36 — Your tests passed on CircleCI!

This branch has no conflicts with the base branch
Merging can be performed automatically.

Merge pull request

You can also open this in GitHub Desktop or view command line instructions.
You’ve probably seen it in action

github2 APP 9:50 AM
Pull request merged by hiimbex

#621 Clarifies the Probot requires a webhook secret
- probot/probot | Jul 12th

hiimbex

1 new commit pushed to master
952f88b5 - Clarifies the Probot requires a webhook secret (#621)

hiimbex

1 new commit pushed to master
8f8fe479 - Update docs for v7.0.1

hiimbex

Successfully deployed 8f8fe47 to github-pages

probot/probot.github.io
PROBOT
GitHub Apps to automate and improve your workflow
Use pre-built apps to extend GitHub, and easily build and share your own.

probot.github.io
Listen on Webhooks

Take action via the GitHub API
Authentication

JWT + installation access token
Authenticating with GitHub Apps

You can authenticate as a GitHub App or as an installation.

i. Generating a private key
ii. Verifying private keys
iii. Deleting private keys
iv. Authenticating as a GitHub App
v. Accessing API endpoints as a GitHub App
vi. Authenticating as an installation
vii. Accessing API endpoints as an installation
viii. HTTP-based Git access by an installation

Note: To access the API with your integration, you must provide a custom media type in the Accept Header for your requests.

```
application/vnd.github.machine-man-preview+json
```

Generating a private key

After you create a GitHub App, you’ll need to generate one or more private keys. You’ll use the private key to sign access token requests.

You can create multiple private keys and rotate them to prevent downtime if a key is compromised or lost. To verify that a private key matches a public key, see Verifying private keys.

To generate a private key:

1. In the upper-right corner of any page, click your profile photo, then click Settings.
Abstracted away
GitHub APIs

REST, GraphQL, Octokits
Authenticated Octokit client
Octokit comes in many flavors

Use the official Octokit library, or choose between any of the available third party libraries.

Ruby  octokit.rb
.NET  octokit.net
Node.js  octokit/rest.js

Let’s build an app!
$ npx create-probot-app my-first-app

github.com/probot/create-probot-app
Let’s write some code
/**
 * This is the entry point for your Probot App.
 * @param {import('probot').Application} app - Probot's Application class.
 */
module.exports = app => {
    // Your code here
    app.log('Yay, the app was loaded!')

    // For more information on building apps:
    // https://probot.github.io/docs/

    // To get your app running against GitHub, see:
    // https://probot.github.io/docs/development/
}
Identify repeated tasks

“We {action} every {period of time}.”
Identify repeated tasks

“We add a label for every new issue.”
// ...
module.exports = app => {
  // Your code here
  app.on('*', async context => {
    app.log(context)
  })
}`

`app.on`
listening for webhooks
Webhooks

https://developer.github.com/webhooks/
Issues Event

#issuesevent
module.exports = app => {
    app.on('issues.opened', async context => {
        app.log(context)
    })
}
Issues - addLabels

REST API doc

POST

/repos/:owner/:repo/issues/:number/labels

async/await | Promise | Callback

const result = await octokit.issues.addLabels({labels, owner, repo, number})
Probot’s Internal APIs

https://probot.github.io/api/latest/classes/context.html#issue
issue

```typescript
issue<T>({object?: T}): object & object & T
```

Defined in `context.ts:73`

Return the `owner`, `repo`, and `number` params for making API requests against an issue or pull request. The object passed in will be merged with the repo params.

```typescript
const params = context.issue({body: 'Hello World!'});
```

```
`context.issue()`
```
module.exports = app => {
  app.on('issues.opened', async context => {
    const params = context.issue({labels: ['needs-response']})
    // {owner: 'username', repo: 'reponame', number: 123, labels: ['needs-response']}
  })
}
module.exports = app => {
  app.on('issues.opened', async context => {
    const params = context.issue({labels: ['needs-response']})
    await context.github.issues.addLabels(params)
  })
}

Make the API call
Watch it work!
Existing Apps
Featured Apps

- **Stale**: Close stale Issues and Pull Requests (845 stars, 431 forks)
- **Work In Progress**: Prevent merging of Pull Requests with "WIP" in the title (572 stars, 239 forks)
- **First Timers**: Create starter issues to help onboard new open source contributors (238 stars, 136 forks)
- **Developer Certificate of Origin**: Enforce the DCO on Pull Requests (224 stars, 66 forks)
- **todo**: Creates new issues from actionable comments in your code (221 stars, 140 forks)
- **Reminders**: Set reminders on issues and Pull Requests (213 stars, 31 forks)
- **Welcome**: Welcomes new users (181 stars, 32 forks)
- **Settings**: Pull Requests for repository settings (180 stars, 218 forks)
- **Request Info**: Requests more info on issues and pull requests with the default title or an empty body (142 stars, 25 forks)

probot.github.io/apps
Welcome
Welcomes new users

Update README.md #5

Open Bookmark Pre-release hiimbex-testing wants to merge 1 commit into hiimbex:master from hiimbex-test

Conversation 7 Commits 1 Files changed 1

hiimbex-testing commented 14 days ago

This is my first pull request!

Update README.md

new-pr-welcome bot commented 14 days ago

Thanks for making your first PR here!

Repository
behaviorbot/welcome

Authors
hiimbex

Updated
October 17, 2018

Used By

Used By

Used By

Used By
This issue has been automatically marked as stale because it has not had recent activity. It will be closed if no further activity occurs. Thank you for your contributions.
Semantic Pull Requests

Status check that ensures your pull requests follow the Conventional Commits spec

Some checks haven't completed yet
1 pending and 3 successful checks

- Semantic Pull Request — Pending — add semantic commit or PR title
- WIP — ready for review
- continuous-integration/travis-ci/pr — The Travis CI build passed
- continuous-integration/travis-ci/push — The Travis CI build passed
Developer Certificate of Origin
Enforce the DCO on Pull Requests

Update README.md #62

Nilnix wants to merge 1 commit into text from Nilnix patch-2k

Signed-off-by: Dex Warner daxw@nixin.com

Add more commits by pushing to the Nilnix-patch-2k branch on Nilnix/toolbox-things.

All checks have passed
1 successful check

- DCO  Successful n-1m — DCO

This branch has no conflicts with the base branch
Merger can be performed automatically.

Merge pull request
You can also open this in GitHub or view command line instructions.

Repository
probot/dco
Authors
bkeepers
nilnix
Updated
October 21, 2018
Used By

Used By

Used By

Used By
Stay up to date

Use `/github subscribe [repository name]` in Slack to start receiving updates about activities like:

- New commits
- New pull requests
- New issues
- Code reviews
- Deployment statuses

`#521 Add additional fallbacks`

This extends the solution in #253 for React Native compatibility.

- [check passed] codecov/project: 97.94% (+0.1) compared to b8a2627
- [check passed] codecov/patch: 0% of diff hit (target 97.14%)
- 3 other checks have passed
  3/5 successful checks
Learn from GitHub

The Learning Lab bot will guide you through projects and provide feedback right from your GitHub repository, helping you build every step of the way.

GitHub Learning Lab bot commented just now

This issue is unassigned 😥

Unassigned issues don't have someone to look after them. Assigned issues and pull requests tell visitors to your repository that you'll be facilitating this particular conversation 😃.

oueur

Activity

1. On the right side of the screen, under the Assignees section, click assign yourself.
Join the Community
We're thrilled that you'd like to contribute to this project. Your help is essential for keeping it great.

Office Hours
Join us every Thursday at 2:00 PM to give feedback, ask questions, get help, or just chat about ideas.

Listen to the podcast with @bluesprints & @himbox:
- The Changelog #265: Automating GitHub with Probot

Listen to the podcast with @bluesprints & @himbox:
- Frontsize 105: Automating GitHub with Probot

Watch the talk at GitHub Universe from @bjonesjr:
- Extending with GitHub: easy integrations with Probot

Watch the talk at Node Summit from @himbox:
- Automating your Workflow with Probot

probot.github.io/community
We’re hiring!

https://github.com/about/careers