Protect your code with GitHub security features





https://myoctocat.com

Protect your code with GitHub security features



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Security features

Commit signing

Dependabot

Security alerts on dependencies

Secret scanning

CodeQL

Why? Attack vectors!

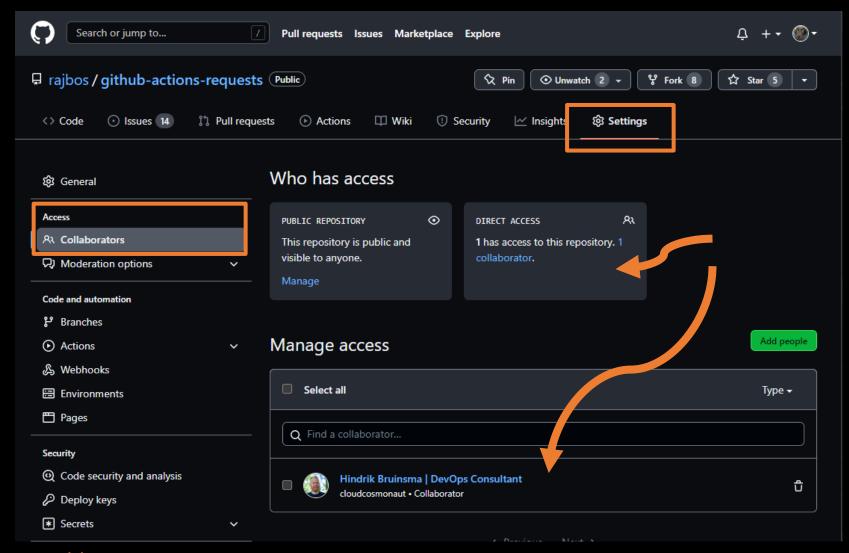
your code

```
// if npm is called as "npmg" or "npm_g", then
// run in global mode.
if (process.argv[1][process.argv[1].length - 1] === 'g') {
  process.argv.splice(1, 1, 'npm', '-g')
const log = require('./utils/log-shim.js')
const replaceInfo = require('./utils/replace-info.js')
log.verbose('cli', replaceInfo(process.argv))
log.info('using', 'npm@%s', npm.version)
log.info('using', 'node@%s', process.version)
const updateNotifier = require('./utils/update-notifier.js')
```

your pipelines



Who can push code?



Who can push code?

Direct: users with write access

- https
- ssh

Deploy keys
Machine users
GitHub Apps
GITHUB_TOKEN

Indirect (public repo):

- anyone can send in a Pull Request

How do you push code?

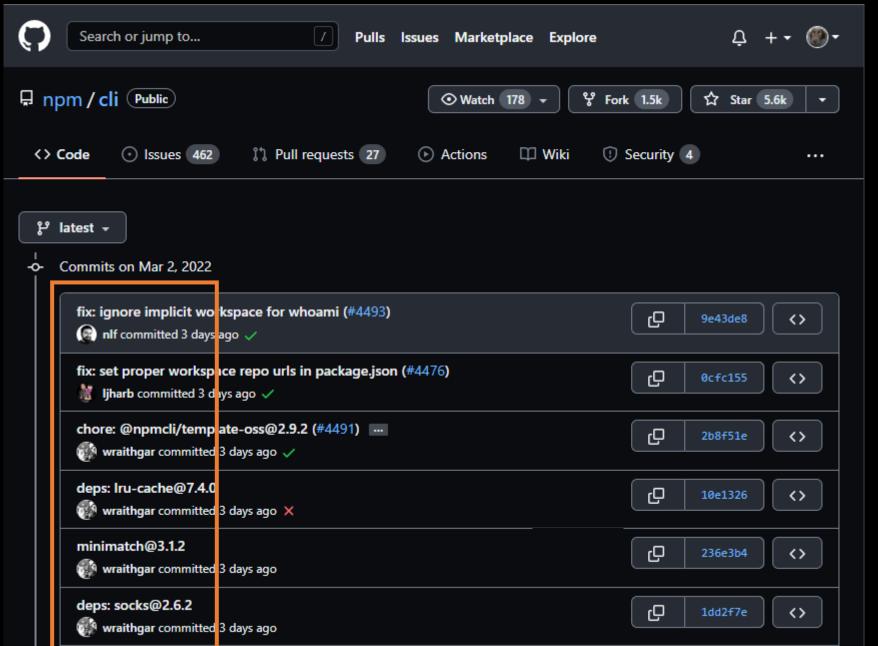
```
$ git config --global user.name "Some name"
```

\$ git config --global user.email some-name@example.com



GitHub uses this info to match the user!

Not the authentication method!



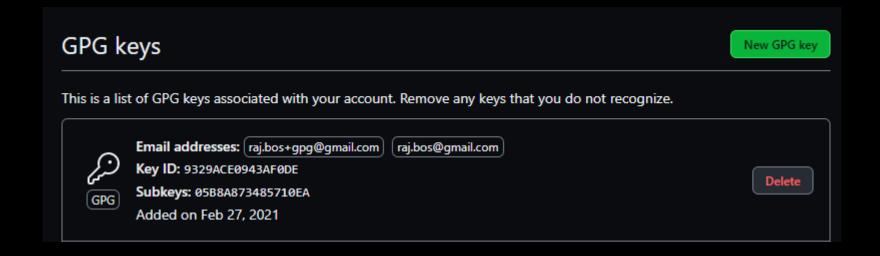
What's so bad?

• I can automate your commits!

• Default setup (Linux/Windows/https/ssh):

```
git add .
git commit -m 'doing the commit for you'
git push
```

Commit signing



Always configure commit signing

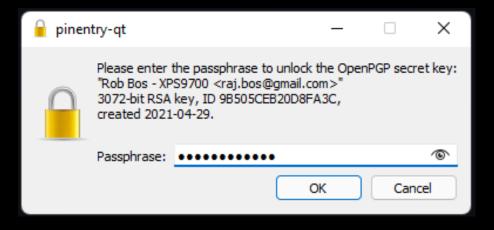
```
git commit -S -m "your commit message"
```

git config commit.gpgsign true

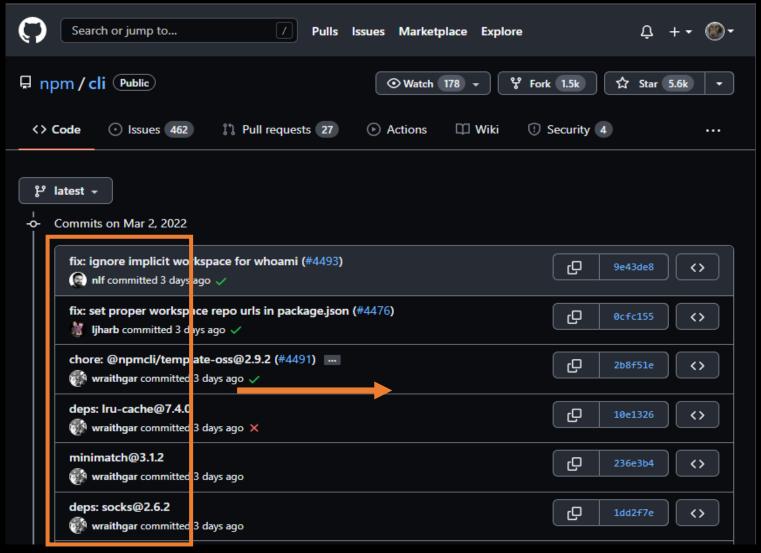
Demo / example

Demo – Commit signing

git commit -m 'my commit'



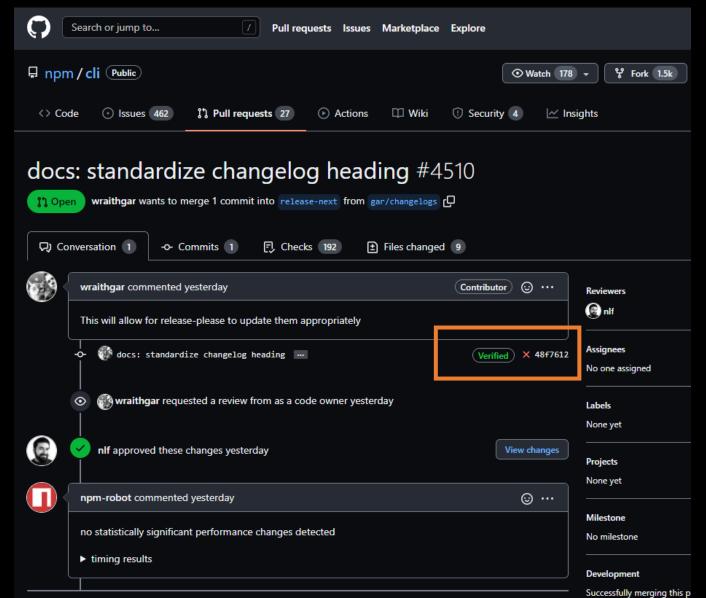
Commit signing

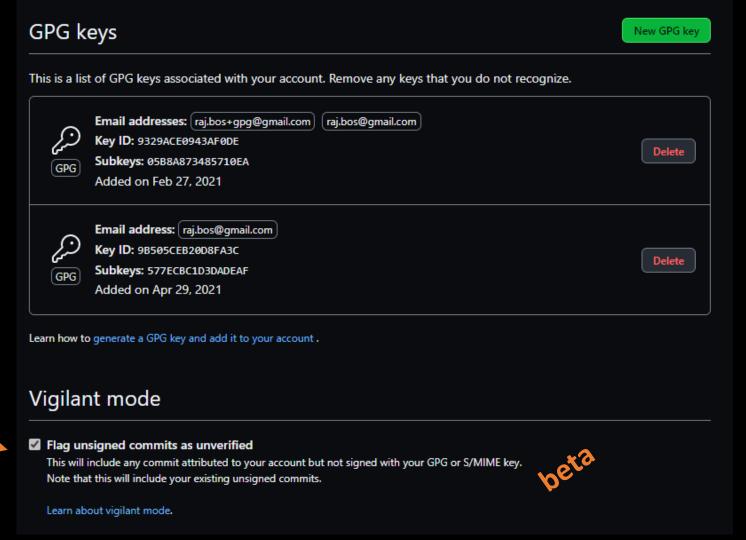


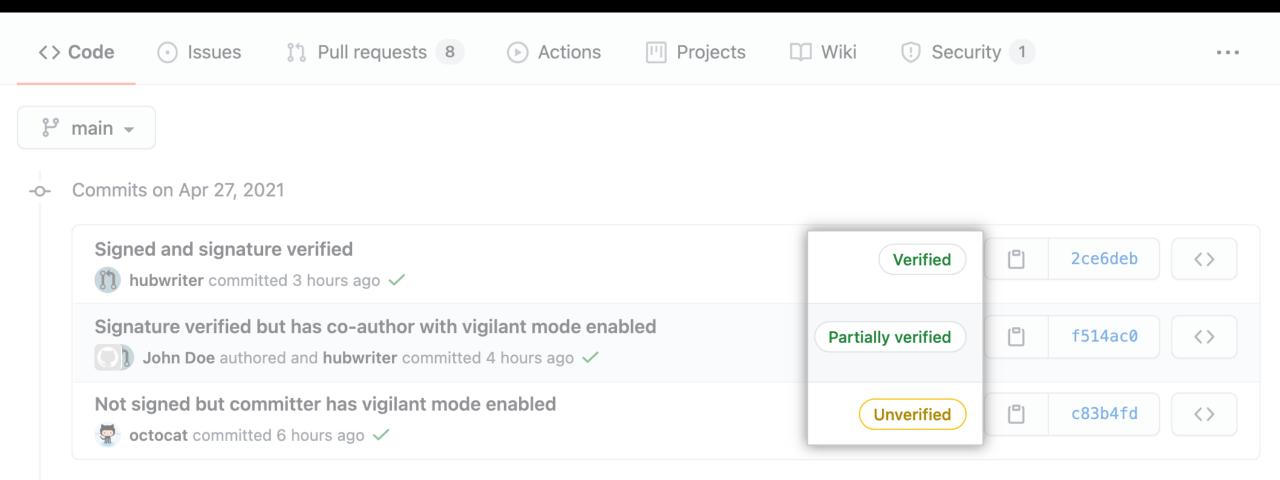
@robbos81

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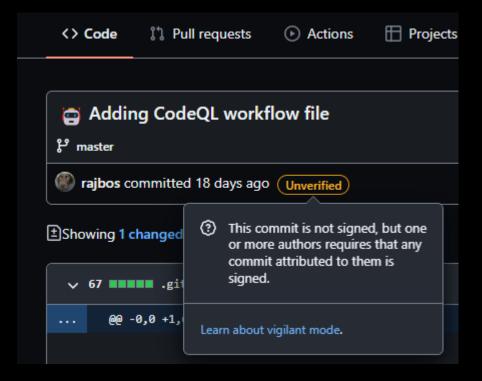
Commit signing



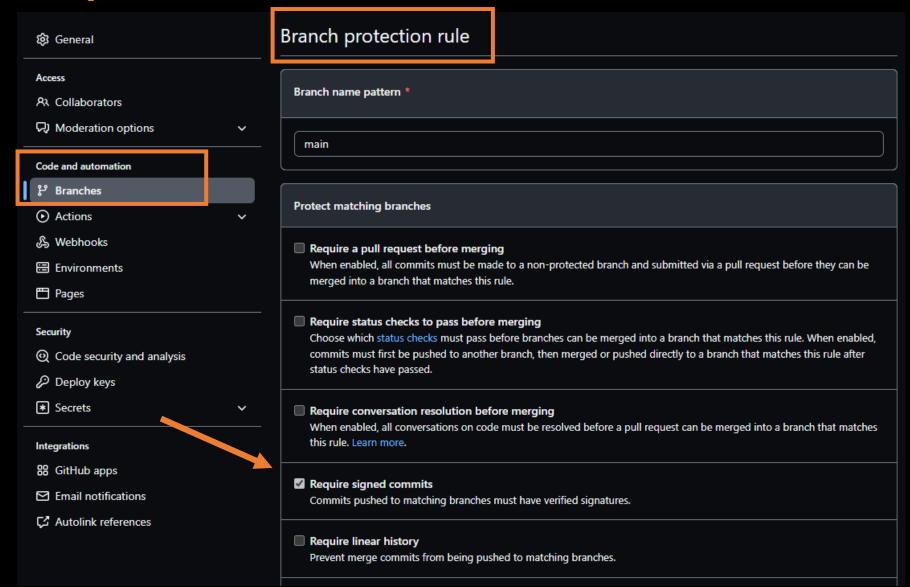




Status	Commit signed?	Signature verified?	Commit matches author?
Verified			
Partially verified	\checkmark		×
Unverified	\checkmark	×	
	×		



Next step:



Require signed commits - impact

Users' setup: needs to install/configure tools

Automation:

- Dependabot will sign automatically
- GitHub Apps
- Personal Access Tokens

Codespaces

GPG verification

Codespaces created from the following repositories can have GPG capabilities and sign commits that they come from a trusted source. Only enable this for repositories that you trust.

- DisabledGPG will not be available in Codespaces
- All repositories
 GPG will be available for Codespaces for all repositories
- Selected repositories
 GPG will be available for Codespaces from the selected repositories

Security features

Commit signing

Dependabot

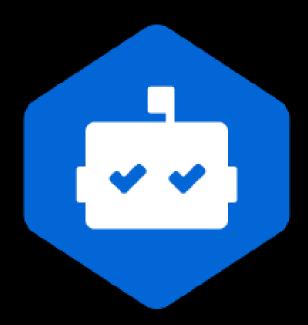
Security alerts on dependencies

Secret scanning

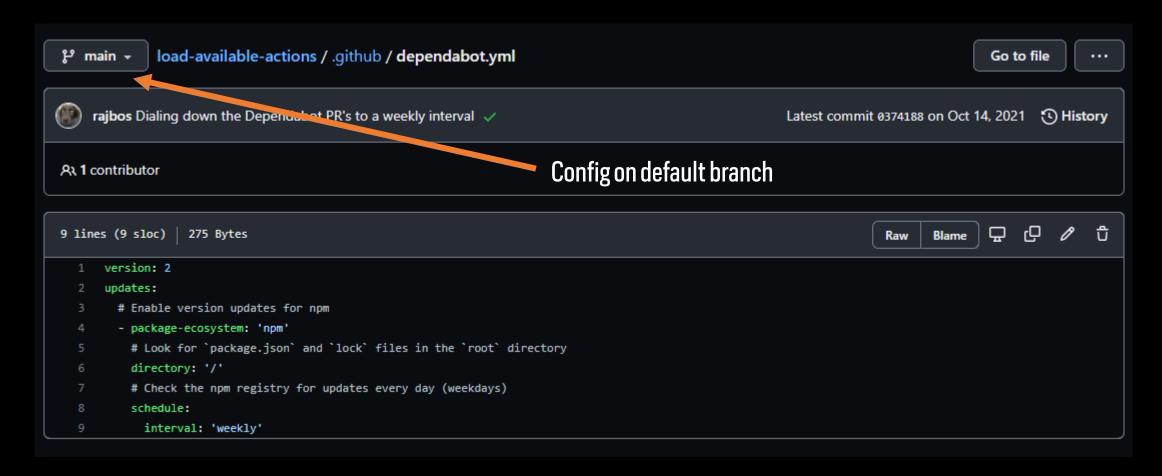
CodeQL

Stay up to date

- Dependabot + updates
 - Why
 - What to do
 - How
- Free for public repos



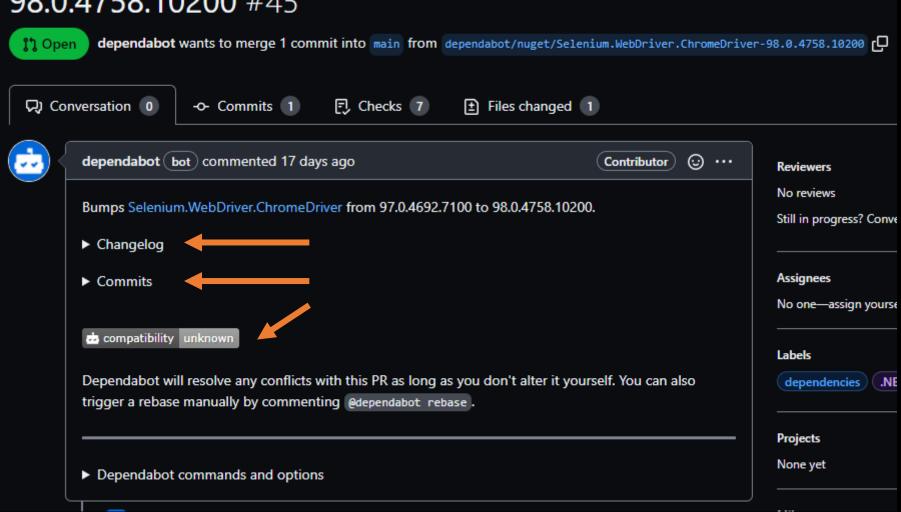
Dependabot config

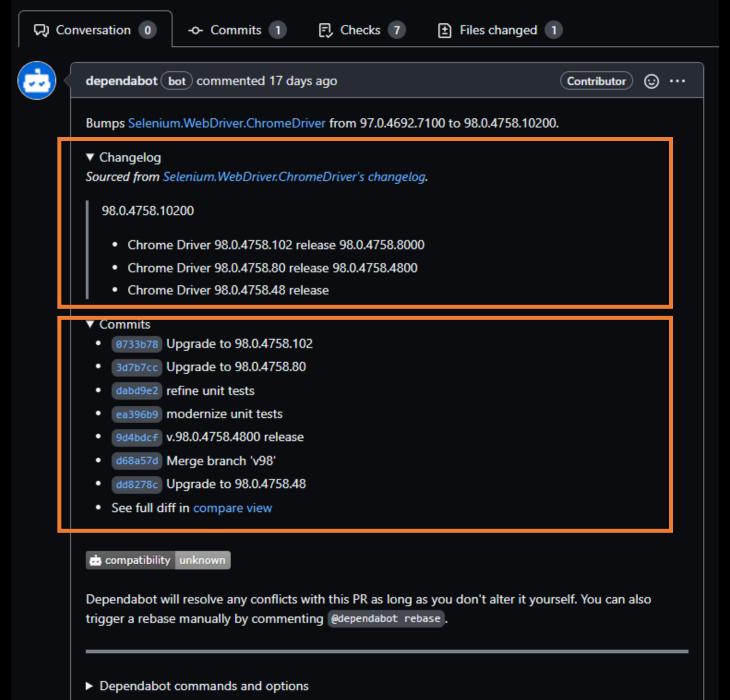


Dependabot demo

https://github.com/devops-actions/load-runner-info/pull/98

Bump Selenium.WebDriver.ChromeDriver from 97.0.4692.7100 98.0.4758.10200 #45





▼ Dependabot commands and options

You can trigger Dependabot actions by commenting on this PR:

- @dependabot rebase will rebase this PR
- @dependabot recreate will recreate this PR, overwriting any edits that have been made to it
- @dependabot merge will merge this PR after your CI passes on it
- @dependabot squash and merge will squash and merge this PR after your CI passes on it
- @dependabot cance1 merge will cancel a previously requested merge and block automerging
- @dependabot reopen will reopen this PR if it is closed
- @dependabot close will close this PR and stop Dependabot recreating it. You can achieve the same result by closing it manually
- @dependabot ignore this major version will close this PR and stop Dependabot creating any more for this major version (unless you reopen the PR or upgrade to it yourself)
- @dependabot ignore this minor version will close this PR and stop Dependabot creating any more for this minor version (unless you reopen the PR or upgrade to it yourself)
- @dependabot ignore this dependency will close this PR and stop Dependabot creating any more for this dependency (unless you reopen the PR or upgrade to it yourself)

```
# Use `ignore` to specify dependencies that should not be updated
version: 2
updates:
  - package-ecosystem: "npm"
    directory: "/"
    schedule:
      interval: "daily"
    ignore:
     - dependency-name: "express"
        # For Express, ignore all updates for version 4 and 5
        versions: ["4.x", "5.x"]
```

```
# Use `ignore` to specify dependencies that should not be updated
version: 2
updates:
  - package-ecosystem: "npm"
    directory: "/"
    schedule:
      interval: "daily"
    ignore:
        # For Lodash, ignore all updates
      - dependency-name: "lodash"
```

```
# Use `ignore` to specify dependencies that should not be updated
version: 2
updates:
  - package-ecosystem: "npm"
    directory: "/"
    schedule:
      interval: "daily"
    ignore:
        # For AWS SDK, ignore all patch updates
      - dependency-name: "aws-sdk"
        update-types: ["version-update:semver-patch"]
```

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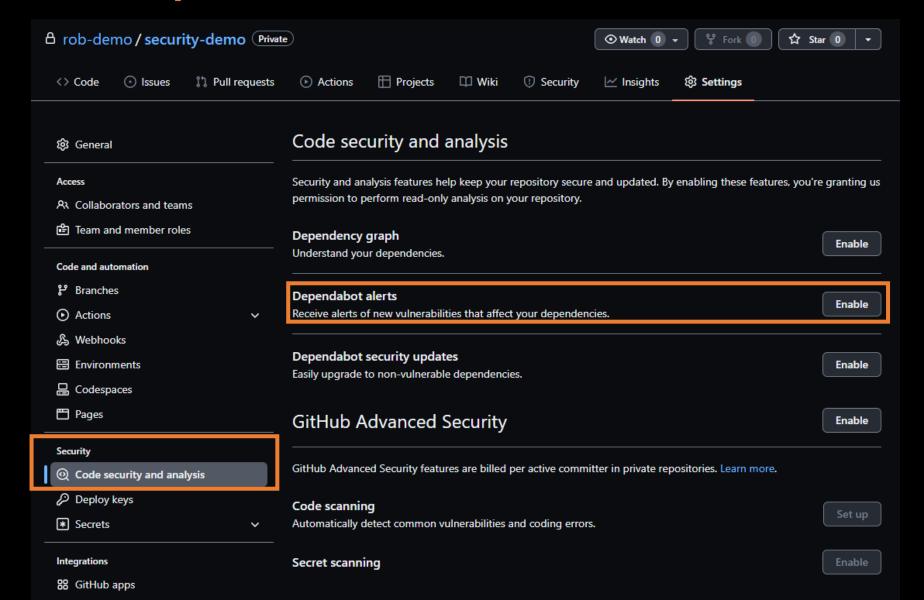
CodeQL

Security alerts on dependencies

Security updates from Dependabot Free for public repos

Dependabot knows your dependency graph Dependency has vulnerability? Alert!

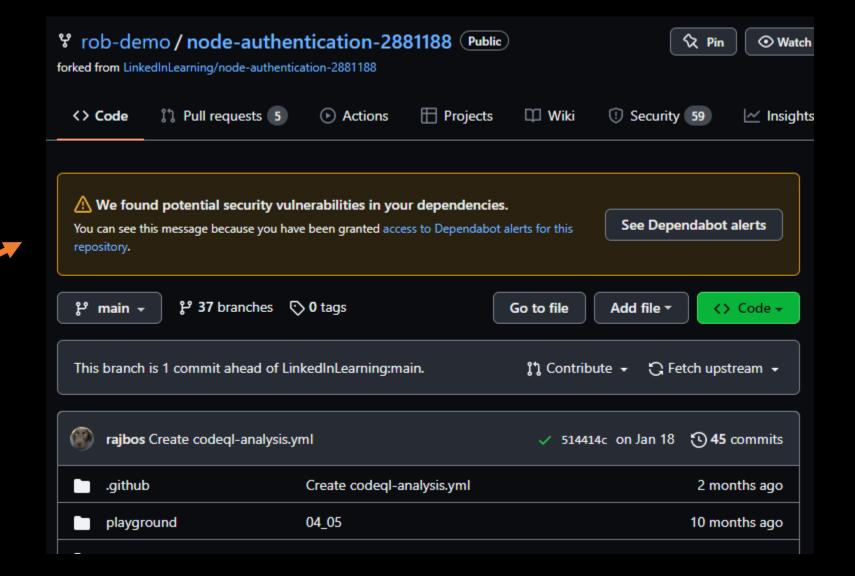
Alerts on dependencies

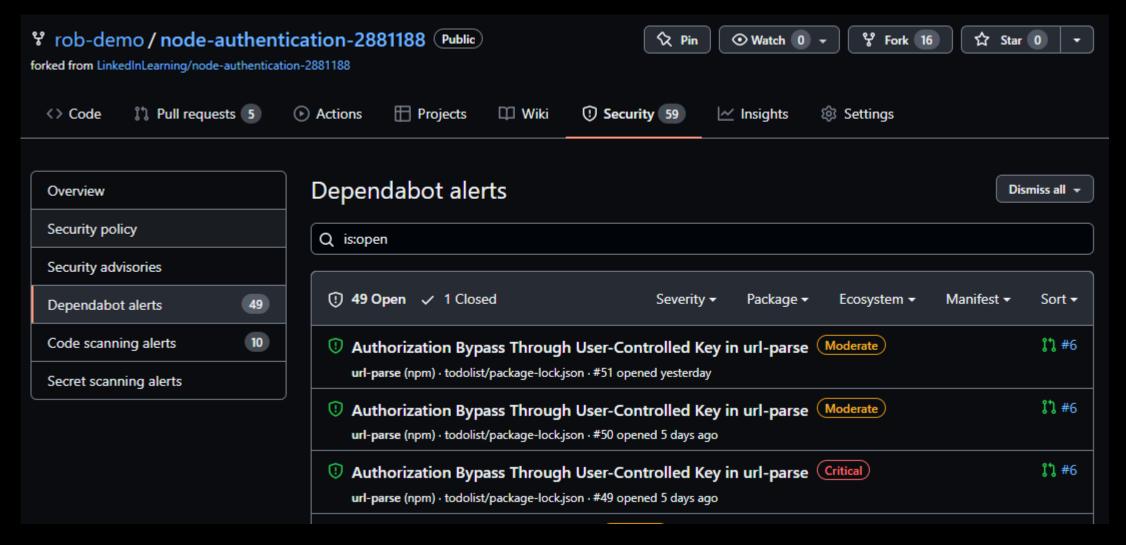


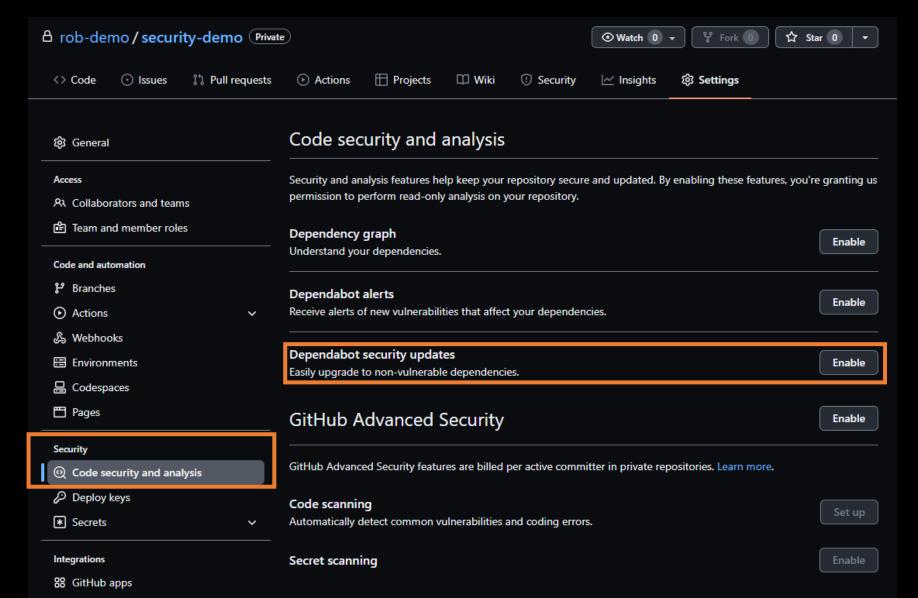
Demo

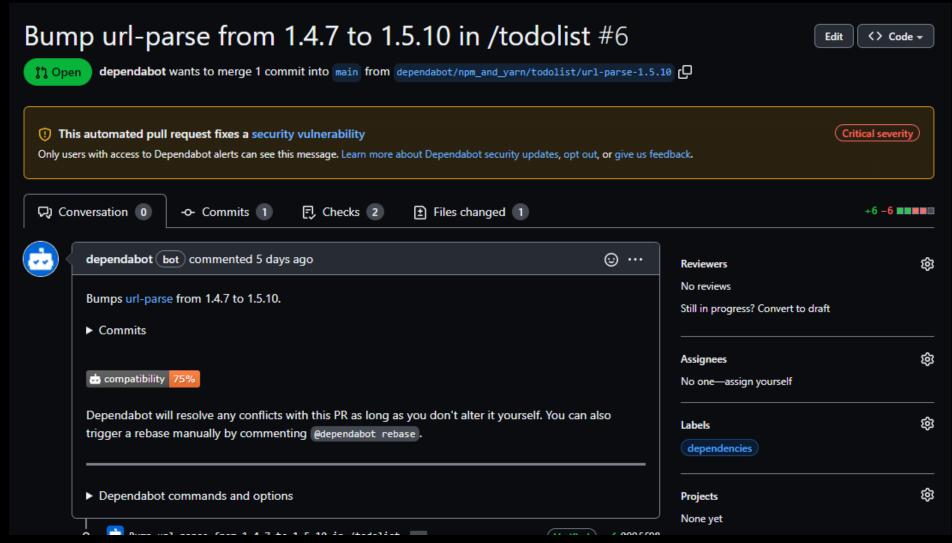
https://github.com/rob-demo/node-authentication-2881188

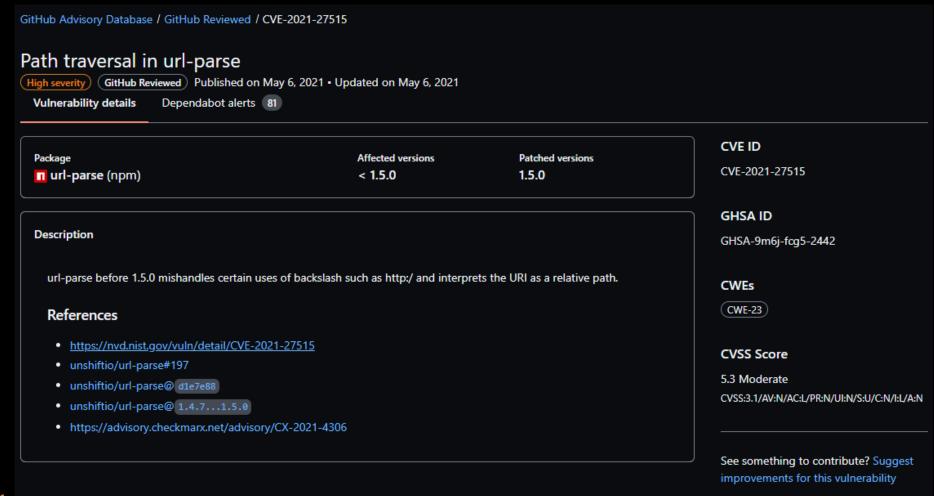
DEMO: Security alerts on dependencies











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Secret scanning

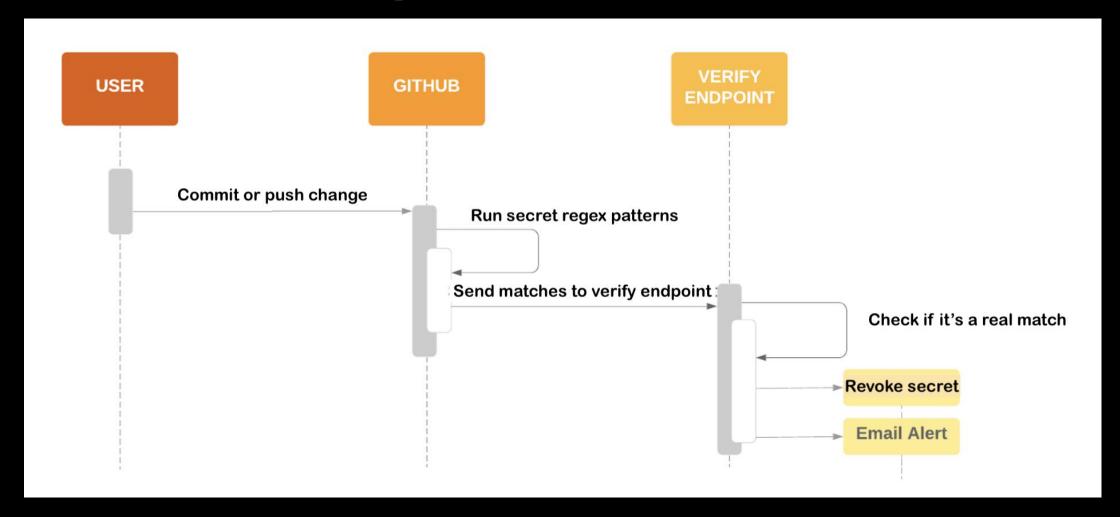
Secrets have a high risk!

Enabled by default on public repos

70+ secret scanning partners

- AWS / GCP/ Azure
- Discord
- npm
- NuGet
- Postman
- Twillio

Secret scanning



Secret scanning

Runs after a push event (scanning issues/PR's is on the roadmap)

Scans the entire history of the repo as well

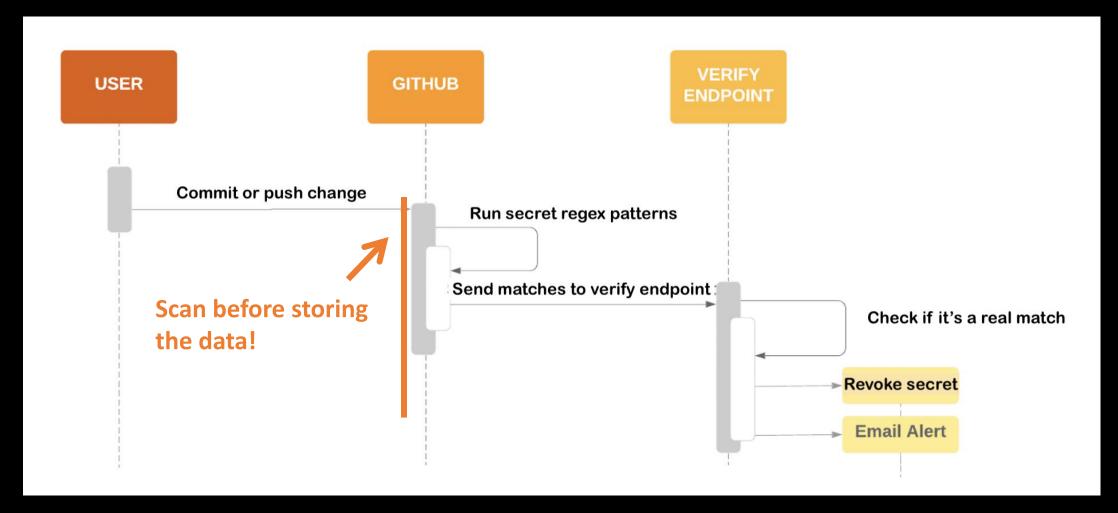
Public repo + actionable secret = high probability of revoking

Demo with an example repository:

- https://github.com/Microsoft-Bootcamp/attendee-rajbos

@robbos81 48

Secret scanning – push protection



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CodeQL

CodeQL - What is it?

```
- name: Initialize CodeQL
  uses: github/codeql-action/init@v1
  with:
    languages: ${{ matrix.language }}
    config-file: ./.github/codeql/codeql-config.yml
Database
```

- name: Perform CodeQL Analysis
 uses: github/codeql-action/analyze@v1



Using CodeQL

Free for public repos, uses your own Action minutes

CLI support

Open-source queries

```
Support for:
```

```
javascriptc#gojavapython
```

CodeQL - demo

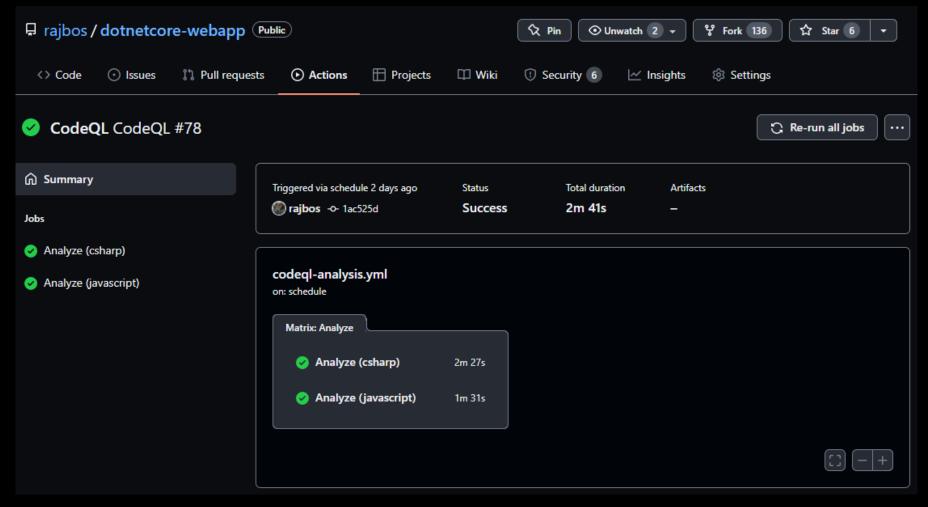
a: https://github.com/rajbos/TailwindTraders-Website

b: https://github.com/github/codeql

c: https://sarifweb.azurewebsites.net/

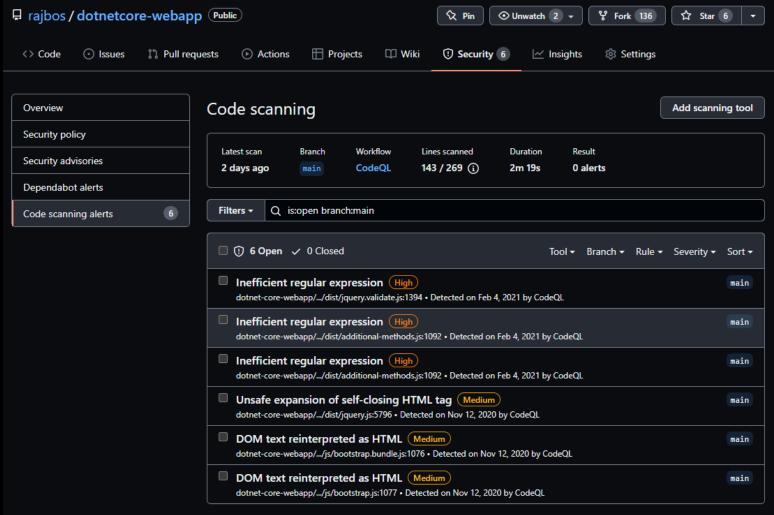
@robbos81 53

CodeQL - demo



@robbos81 54

CodeQL - demo



Security features - overview

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