

# Protect your code with GitHub security features

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https://devopsjournal.io

Your Code Powers the World.
Our Training Powers You.

#### **Session Survey**

- Your feedback is very important to us
- Please take a moment to complete the session survey found in the mobile app
- Use the QR code or search for "Converge360 Events" in your app store
- Find this session on the Agenda tab
- Click "Session Evaluation"
- Thank you!





#### Security features

#### **Commit signing**

Dependabot

Security alerts on dependencies

Secret scanning

CodeQL

#### Why? Attack vectors!

#### your code

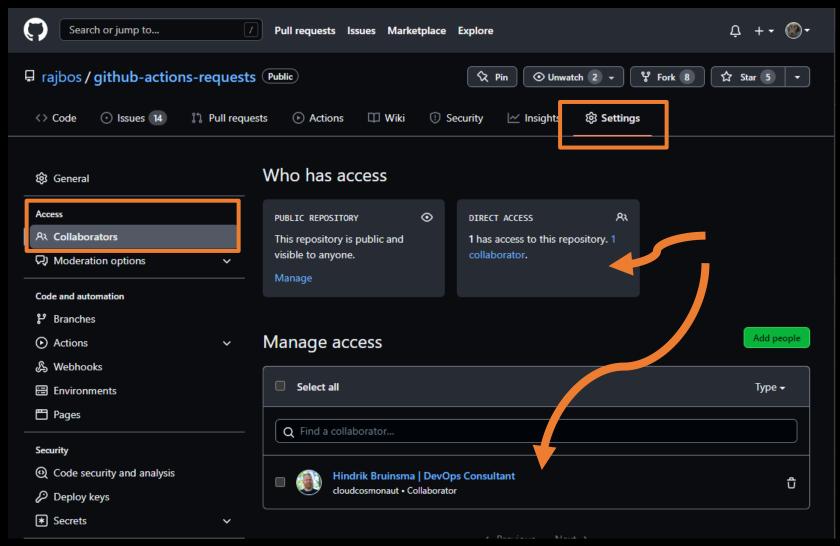
```
// if npm is called as "npmg" or "npm_g", then
// run in global mode.
if (process.argv[1][process.argv[1].length - 1] === 'g') {
  process.argv.splice(1, 1, 'npm', '-g')
const log = require('./utils/log-shim.js')
const replaceInfo = require('./utils/replace-info.js')
log.verbose('cli', replaceInfo(process.argv))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

#### your pipelines



https://owasp.org/Top10

### 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?

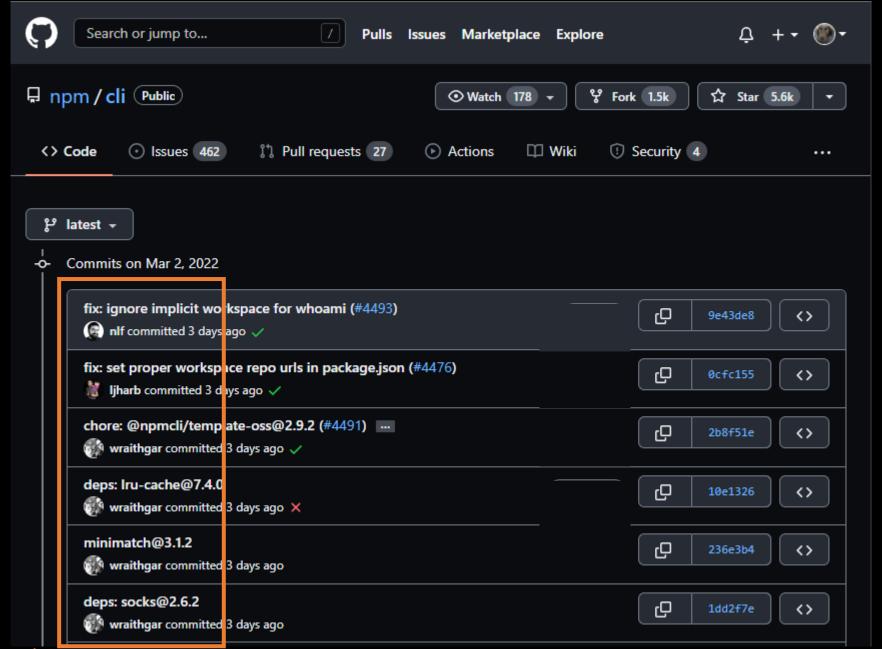
```
$ git config --global user.name "Some name"
```

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



GitHub uses this info to match the user!

Not the authentication method!



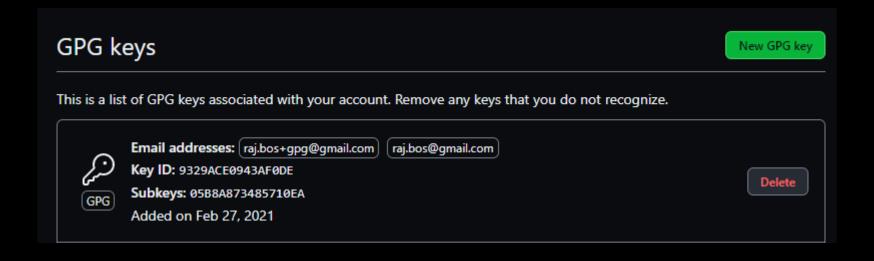
#### What's so bad?

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



You have your private key to sign with

GitHub has public key to verify the commit with

### Commit signing

- GPG keys (most common) Works on Windows with Vs Code
- S/MIME

### Always configure commit signing

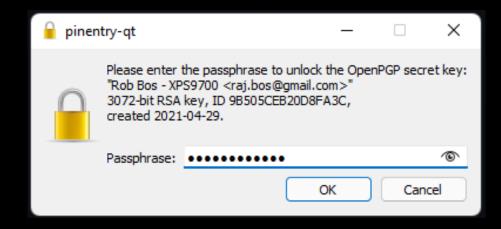
```
git commit -S -m "your commit message"
```

git config commit.gpgsign true

## Demo / example

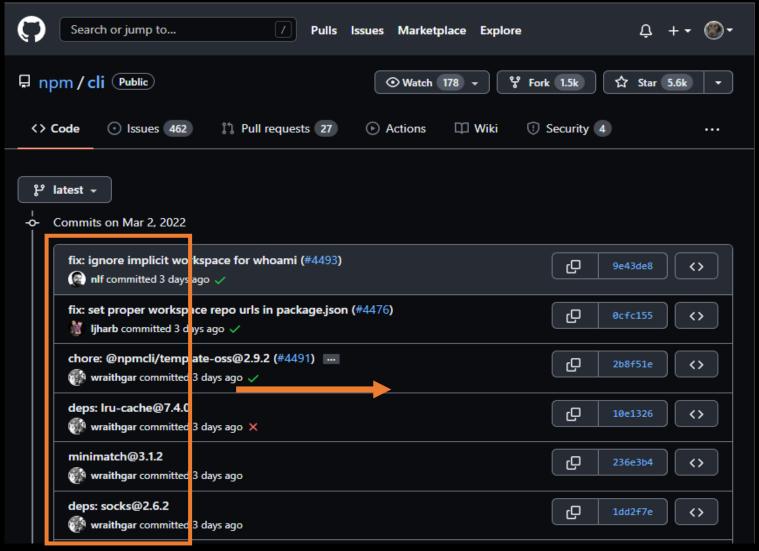
#### Demo – Commit signing

git commit -m 'my commit'

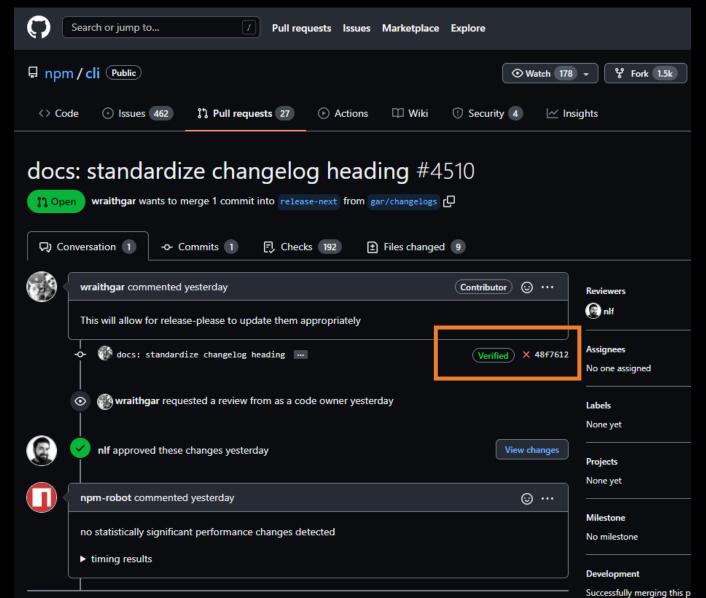


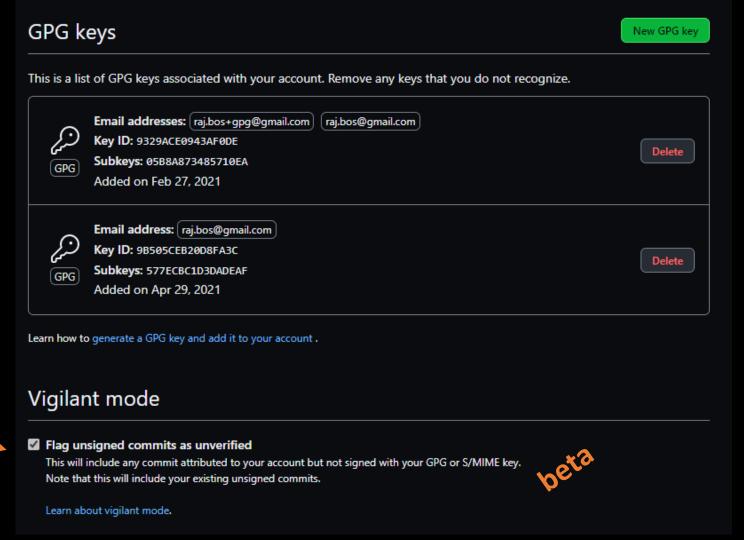


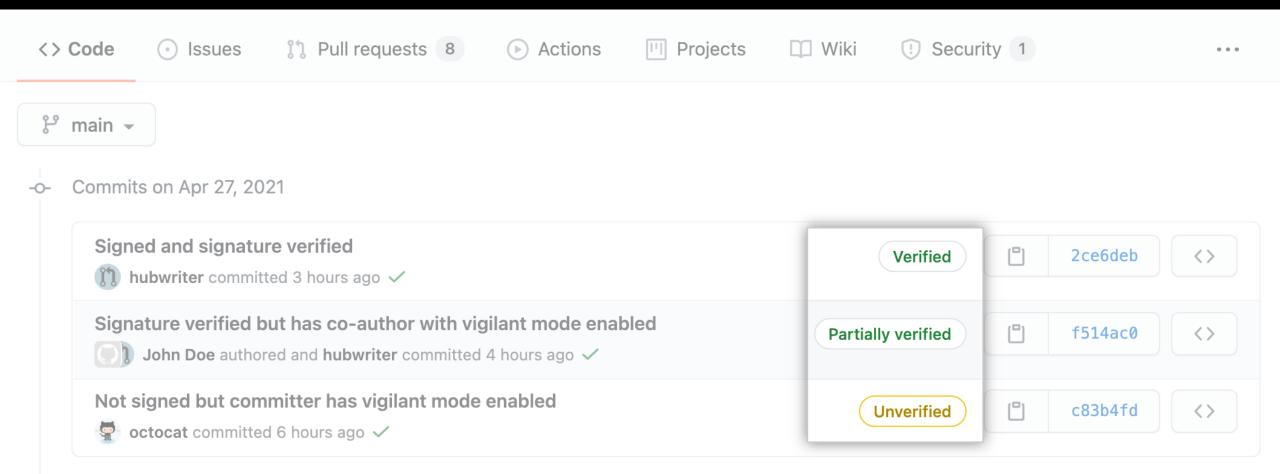
### Commit signing



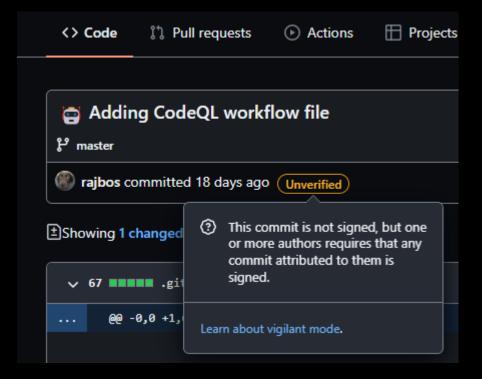
#### Commit signing



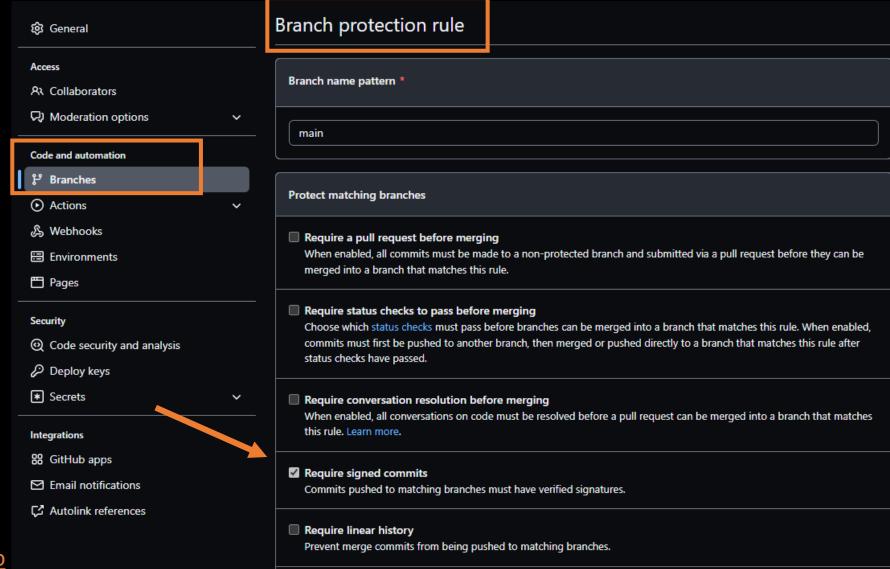




Status	Commit signed?	Signature verified?	Commit matches author?
Verified		$\checkmark$	
Partially verified	$\checkmark$		×
Unverified	$\checkmark$	×	
	×		



#### 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

### Signed commits – recommendation

- Use either a Yubikey or a signing key with a pass phrase!
- No way to enforce / check for this unfortunately

#### Security features

**Commit signing** 

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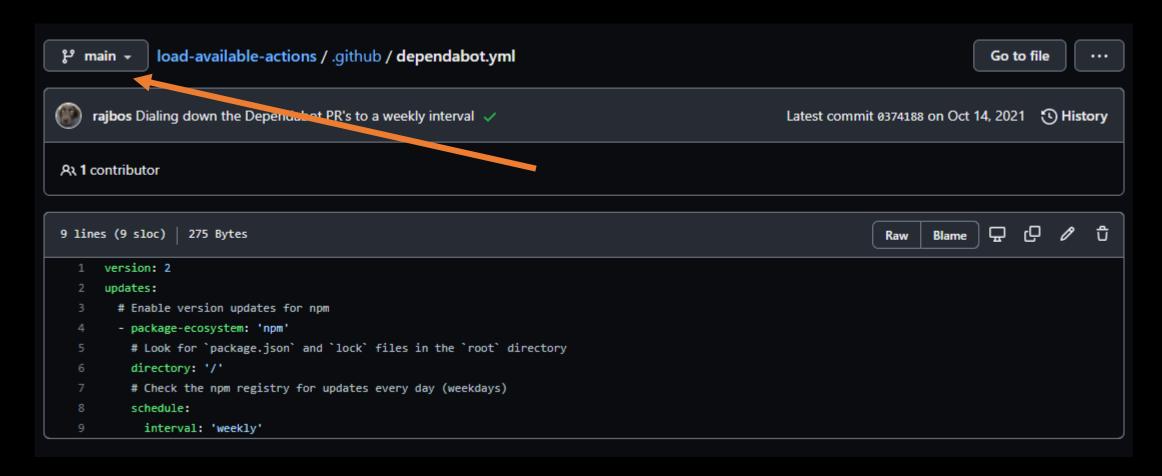
CodeQL

### Stay up to date

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



### Dependabot config



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#### Dependabot demo

https://github.com/devops-actions/load-runner-info/pull/307

#### Bump Selenium.WebDriver.ChromeDriver from 97.0.4692.7100 **98.0.4758.10200** #45 dependabot wants to merge 1 commit into main from dependabot/nuget/Selenium.WebDriver.ChromeDriver-98.0.4758.10200 -o- Commits 1 Checks 7 Files changed 1 Conversation 0 dependabot (bot) commented 17 days ago Contributor Reviewers No reviews Bumps Selenium.WebDriver.ChromeDriver from 97.0.4692.7100 to 98.0.4758.10200. Still in progress? Conve ▶ Changelog Assignees Commits No one—assign yourse compatibility unknown Labels

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dependencies

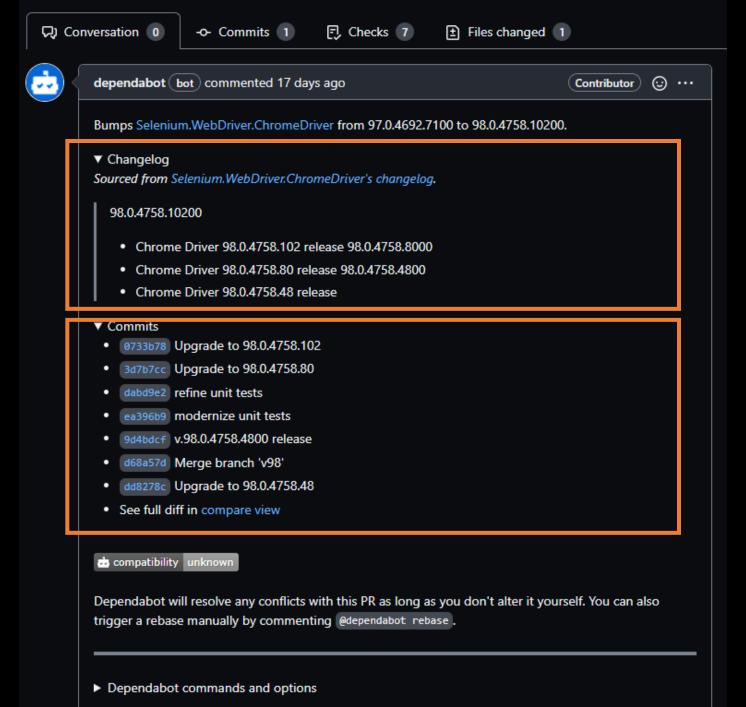
**Projects** 

None yet

Dependabot will resolve any conflicts with this PR as long as you don't alter it yourself. You can also

trigger a rebase manually by commenting @dependabot rebase.

Dependabot commands and options



▼ 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 Cl 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
- edependabot 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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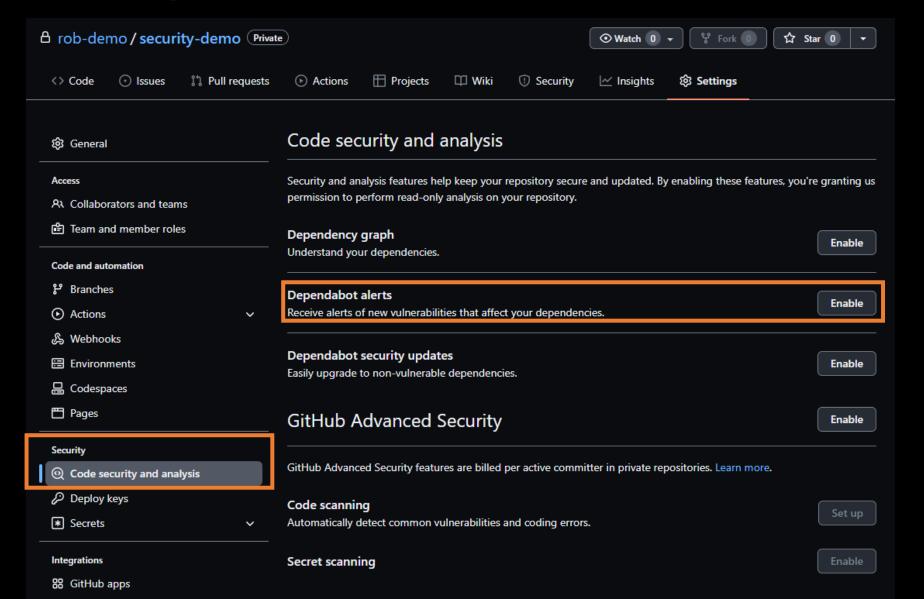
@robbos81

#### Security alerts on dependencies

Security updates from Dependabot Free for public repos

Dependabot knows your dependency graph Dependency has vulnerability? Alert!

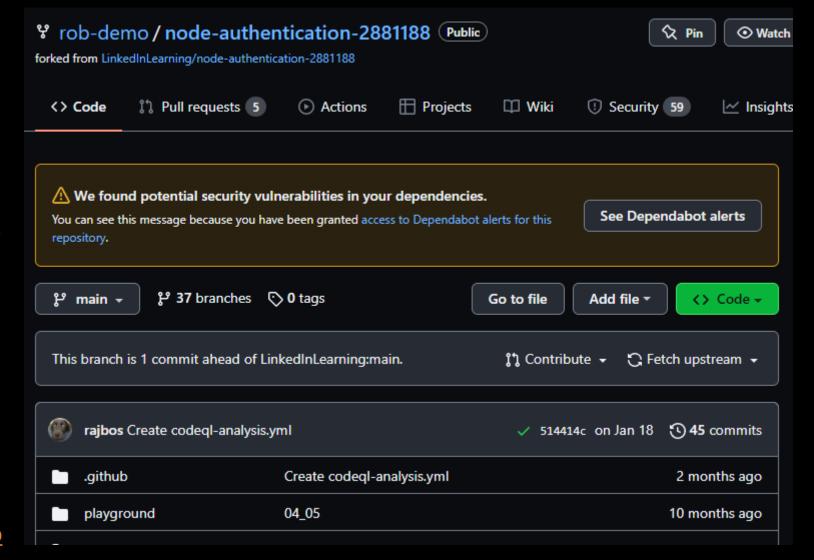
#### Alerts on dependencies

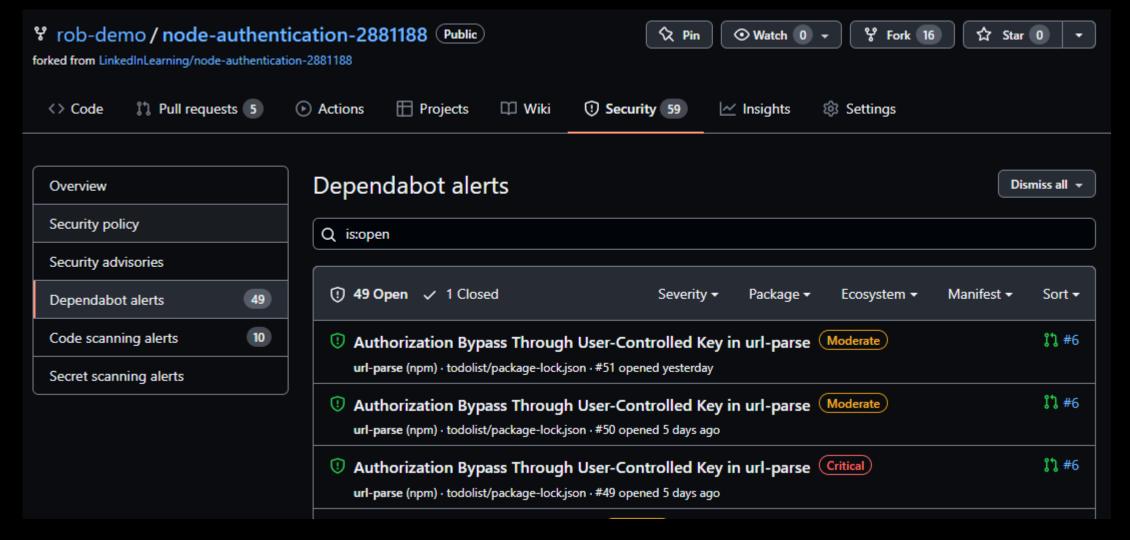


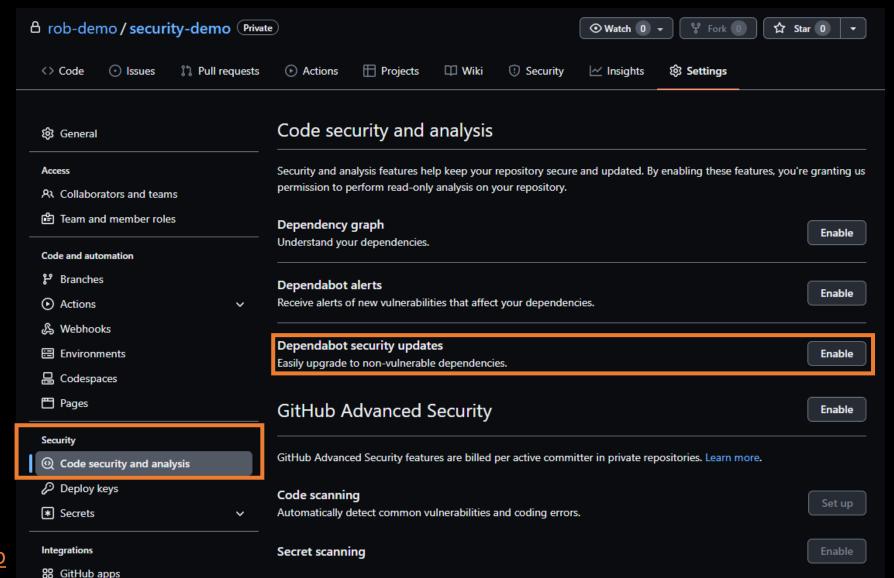
#### Demo

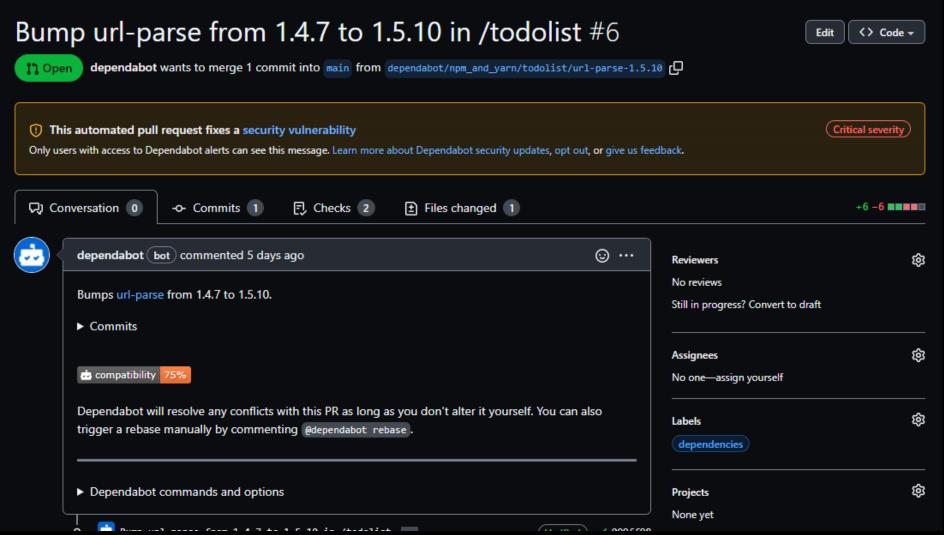
https://github.com/rob-demo/node-authentication-2881188

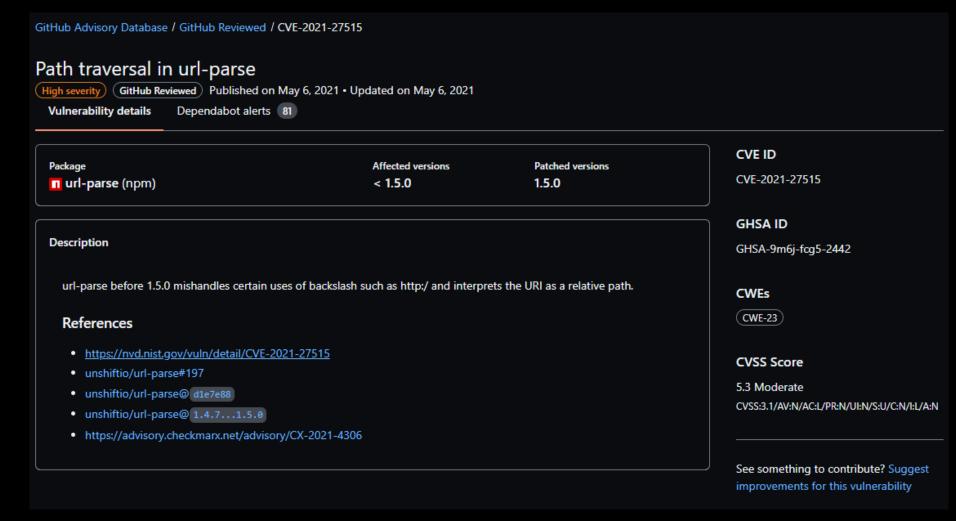
<u>devopsjournal.io</u> 44











# Security features

**Commit signing** 

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### Secret scanning

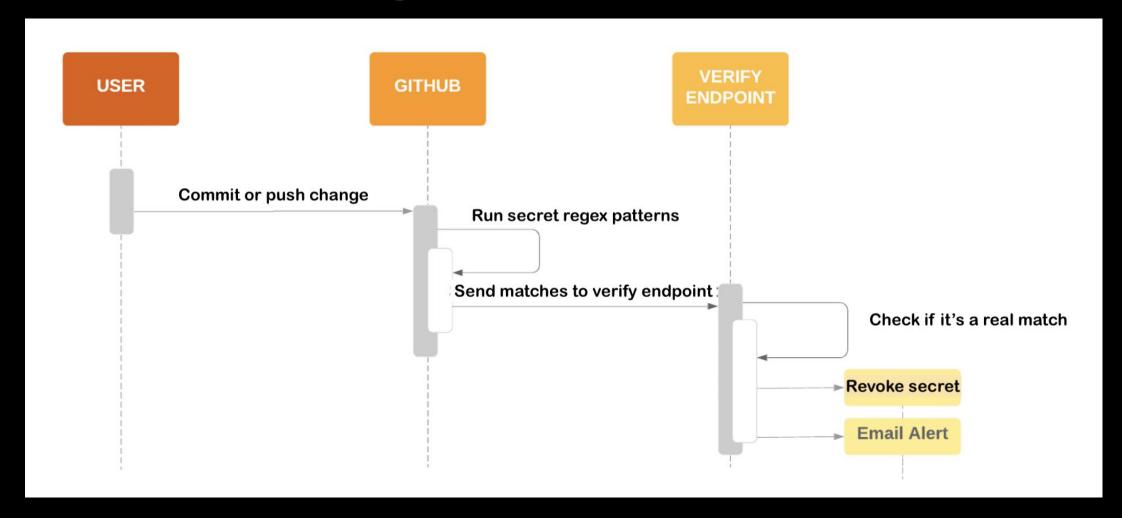
Secrets have a high risk!

Enabled by default on public repos

80+ secret scanning partners

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

### Secret scanning



<u>devopsjournal.io</u> 52

### Secret scanning

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

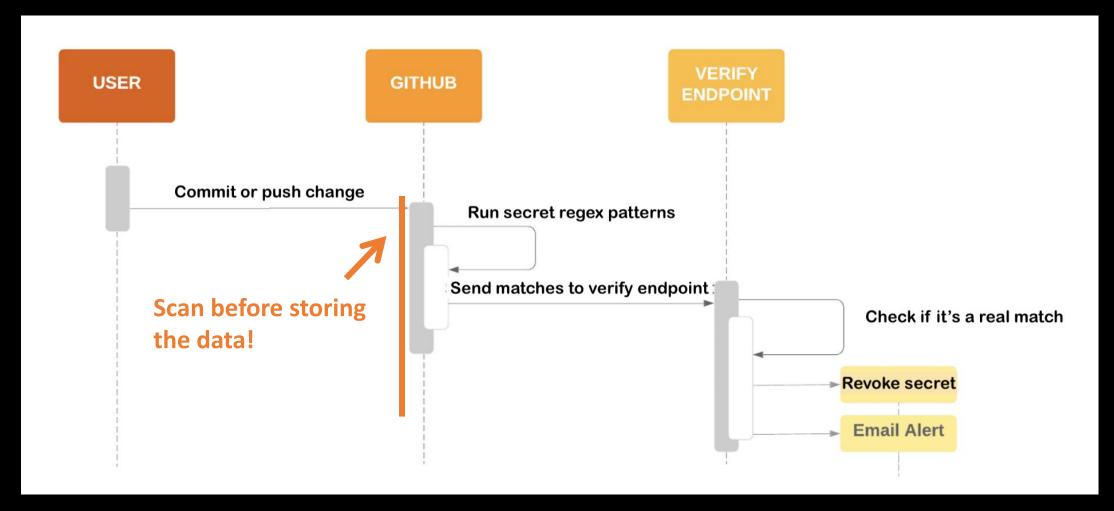
Scans the entire history of the repo as well

Public repo + actionable secret = high probability of revoking

Demo with an example repository:

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

# Secret scanning – push protection [PAID]



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### 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



<u>devopsjournal.io</u> 56

# Using CodeQL

Free for public repos, uses your own Action minutes

**CLI** support

Open-source queries

```
Support for:
```

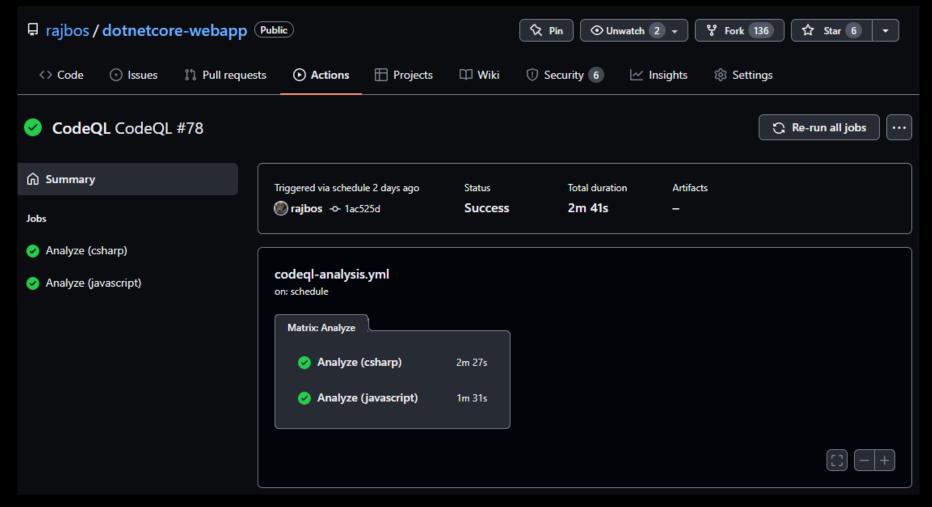
# CodeQL - demo

a: <a href="https://github.com/rajbos/TailwindTraders-Website">https://github.com/rajbos/TailwindTraders-Website</a>

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

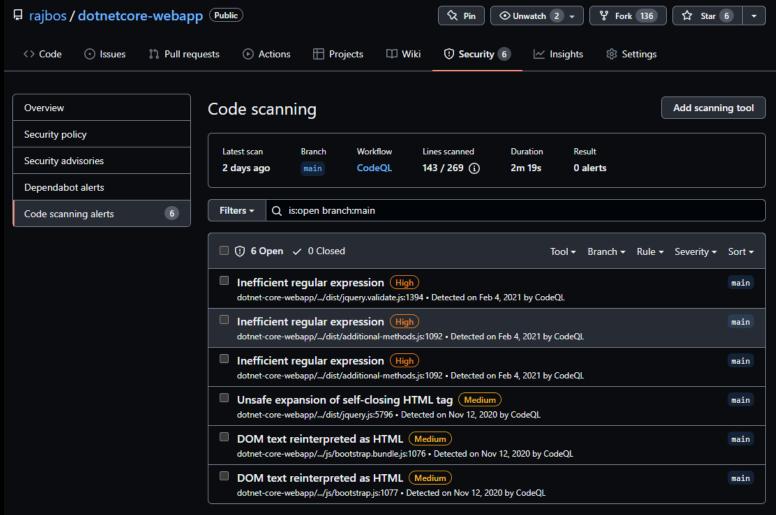
c: <a href="https://sarifweb.azurewebsites.net/">https://sarifweb.azurewebsites.net/</a>

### CodeQL - demo



<u>devopsjournal.io</u> 59

#### CodeQL - demo



### Security features - overview

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