

# DEVELOPER WEEK '23

# Protect your code with GitHub security features

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https://myoctocat.com

# Security features

### **Commit signing**

Dependabot

Security alerts on dependencies

Secret scanning

CodeQL

# Why? Attack vectors!

### your code

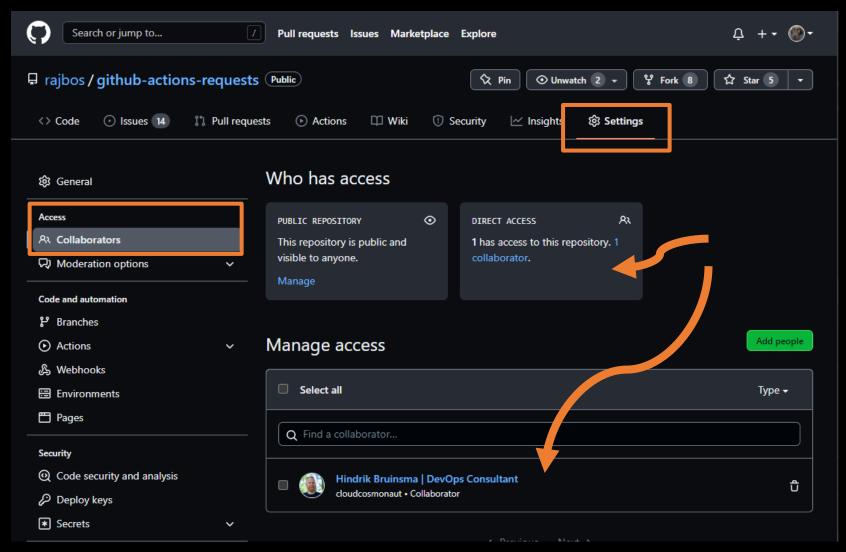
```
// if npm is called as "npmg" or "npm_g", then
// run in global mode.
if (process.argv[1][process.argv[1].length - 1] === 'g') {
  process.argv.splice(1, 1, 'npm', '-g')
const log = require('./utils/log-shim.js')
const replaceInfo = require('./utils/replace-info.js')
log.verbose('cli', replaceInfo(process.argv))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

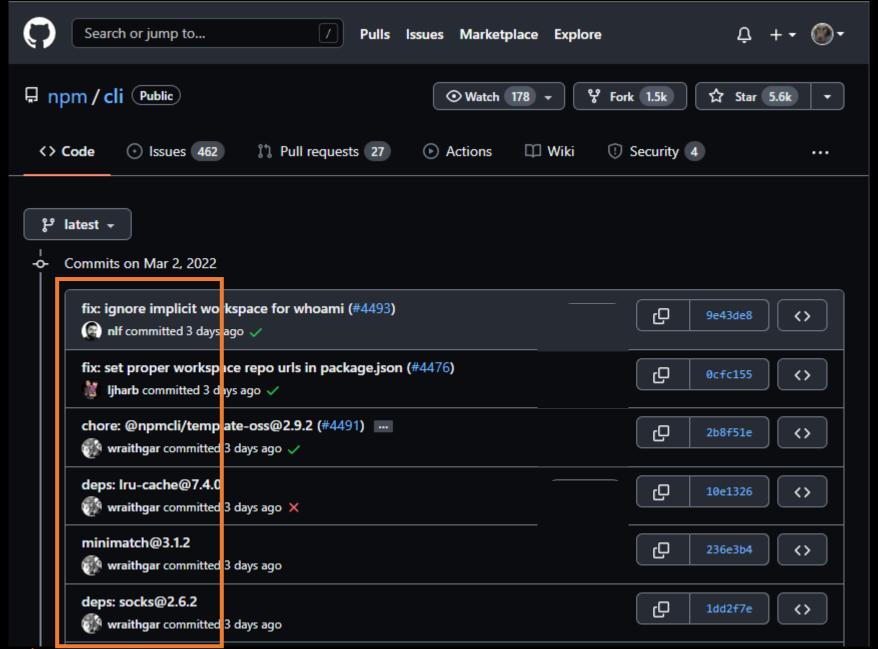
```
$ git config --global user.name "Some name"
```

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



GitHub uses this info to match the user!

Not the authentication method!



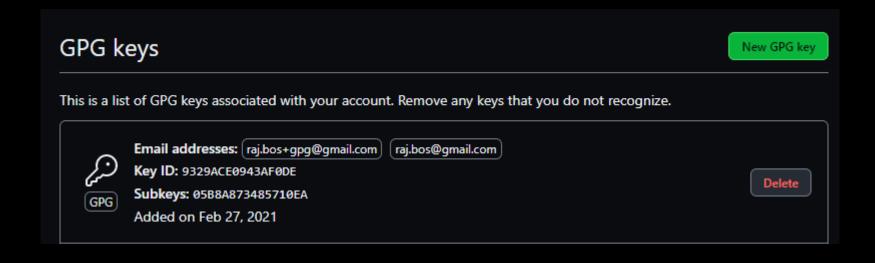
### What's so bad?

• 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

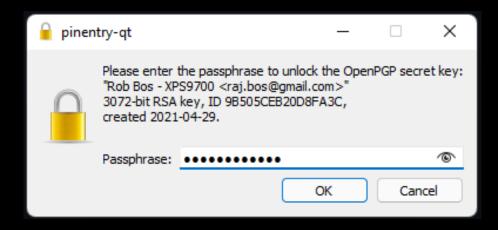
```
git commit -S -m "your commit message"
```

git config commit.gpgsign true

# Demo / example

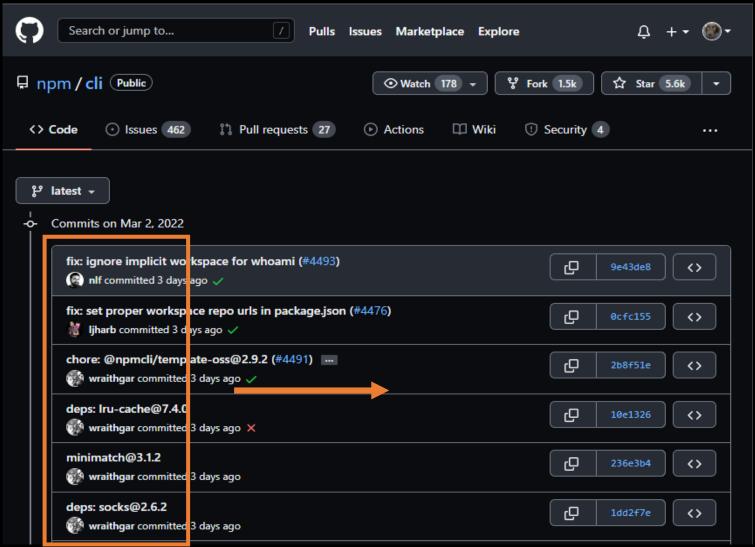
# Demo – Commit signing

git commit -m 'my commit'

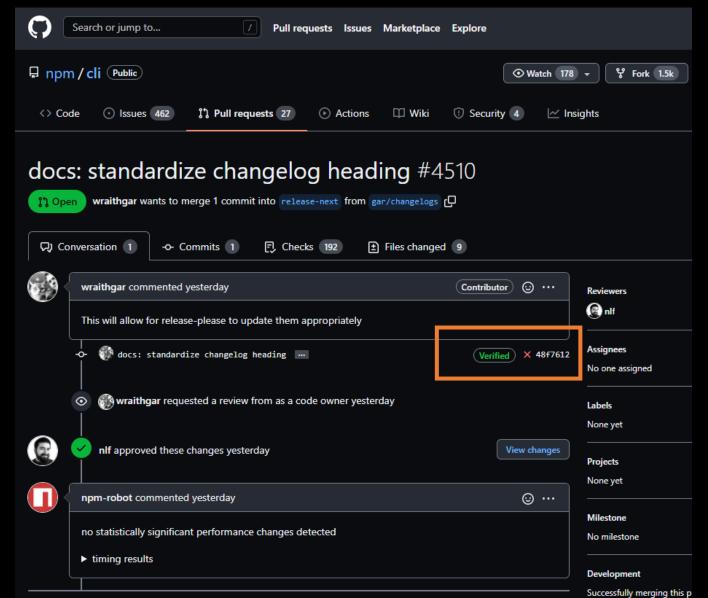


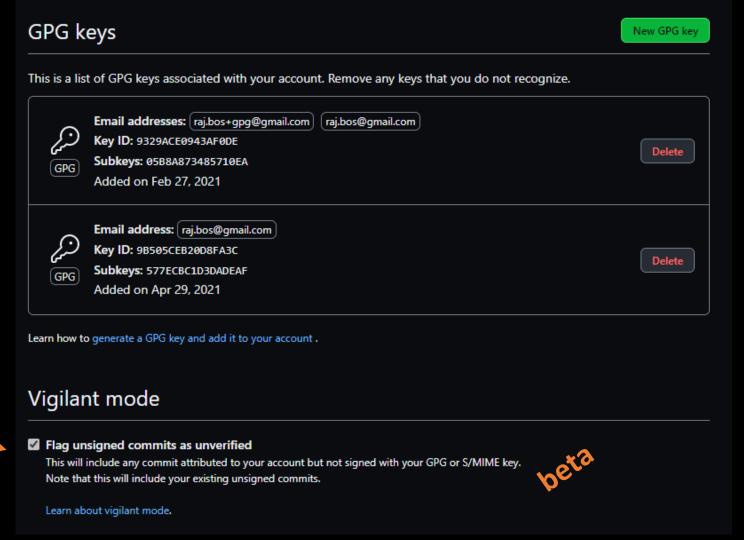


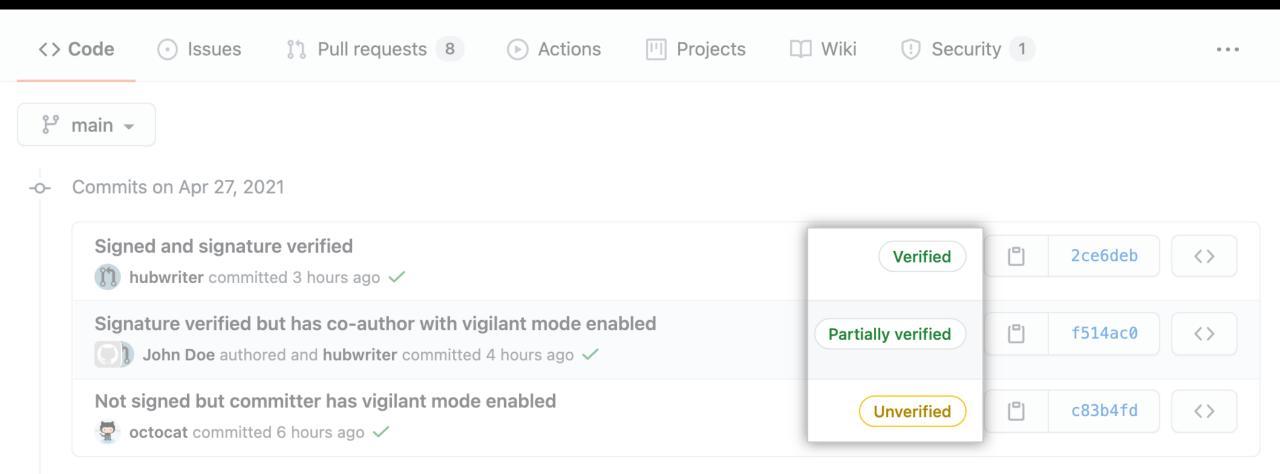
# Commit signing



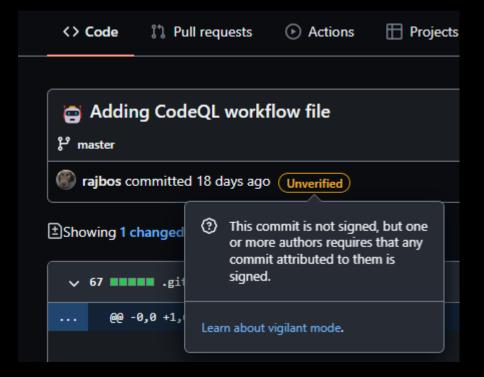
# Commit signing



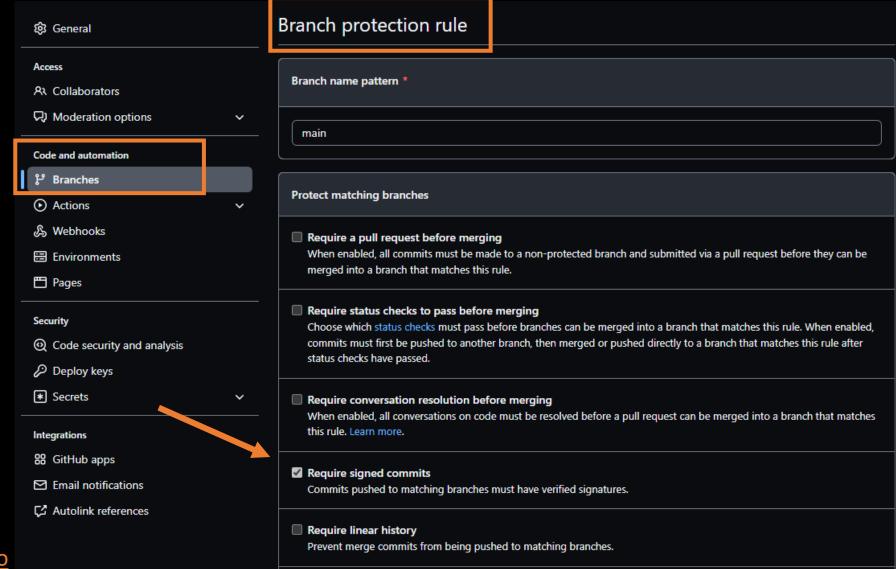




| Status             | Commit signed? | Signature verified? | Commit matches author? |
|--------------------|----------------|---------------------|------------------------|
| Verified           |                |                     |                        |
| Partially verified |                |                     | ×                      |
| 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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Secret scanning

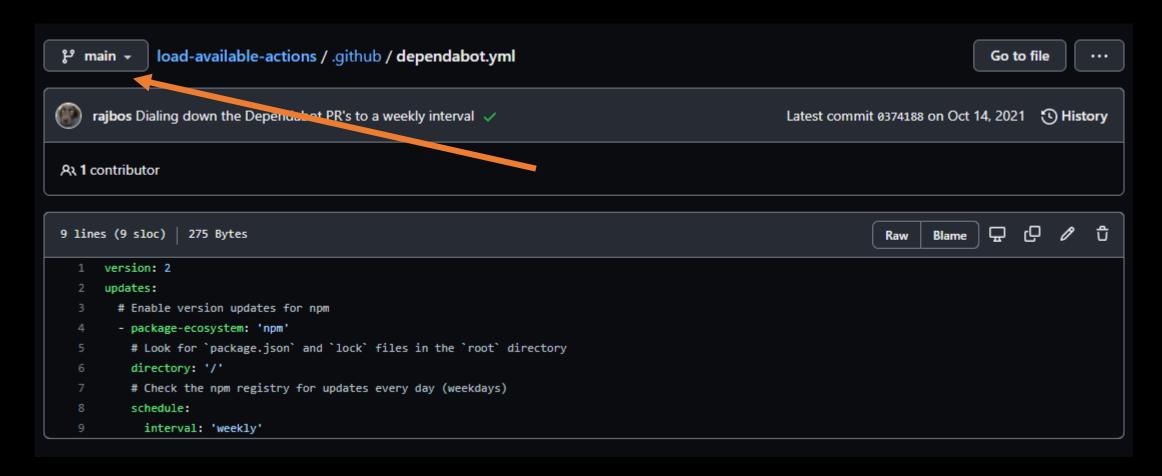
CodeQL

# Stay up to date

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



# Dependabot config



devopsjournal.io <a href="https://xpir.it/magic">https://xpir.it/magic</a> 30

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

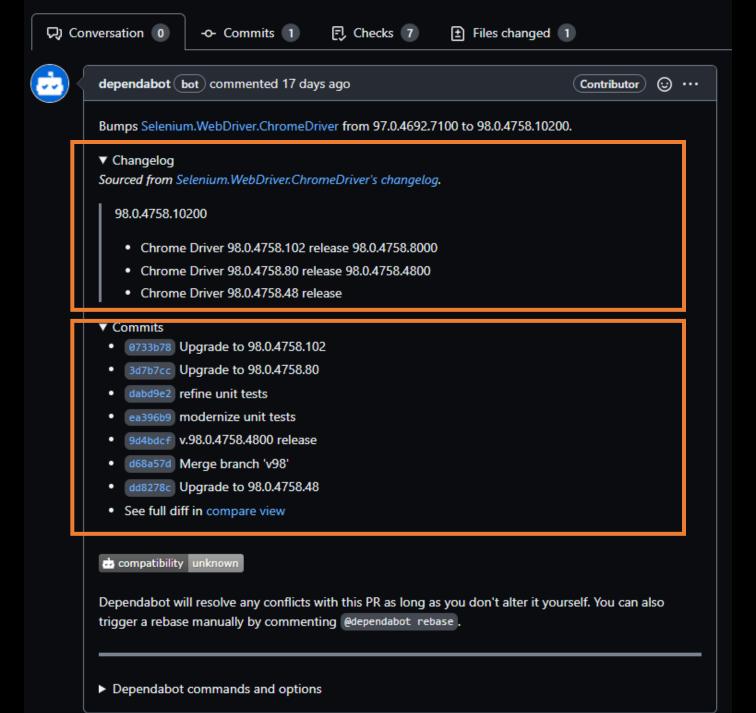
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**Projects** 

None yet

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
- @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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@robbos81

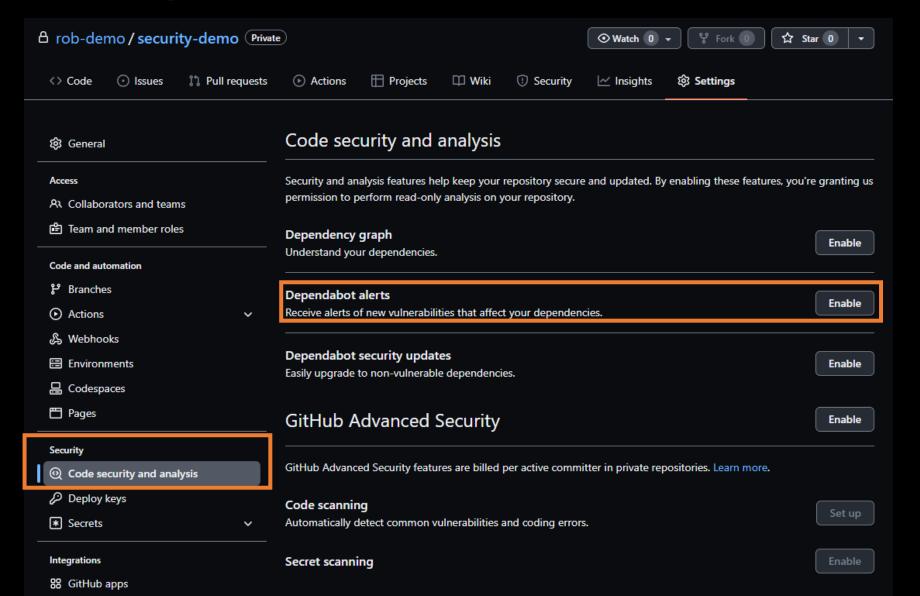
# Security alerts on dependencies

Security updates from Dependabot Free for public repos

Dependabot knows your dependency graph Dependency has vulnerability? Alert!

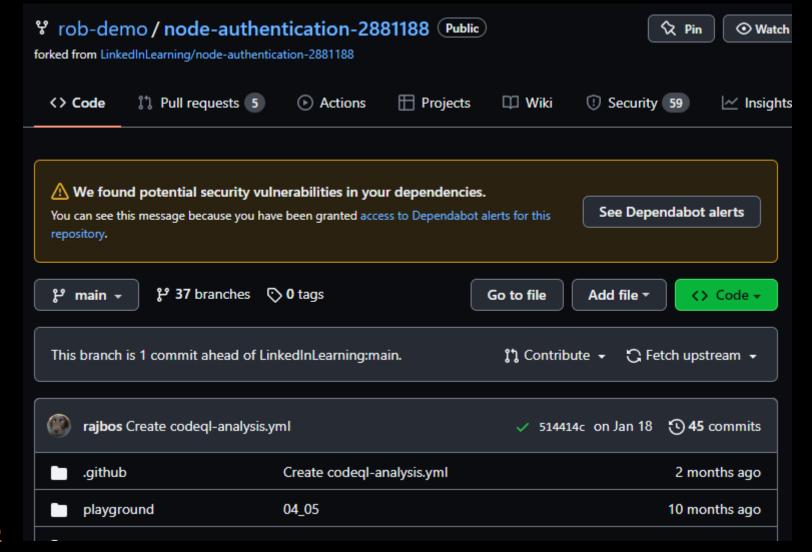
@robbos81

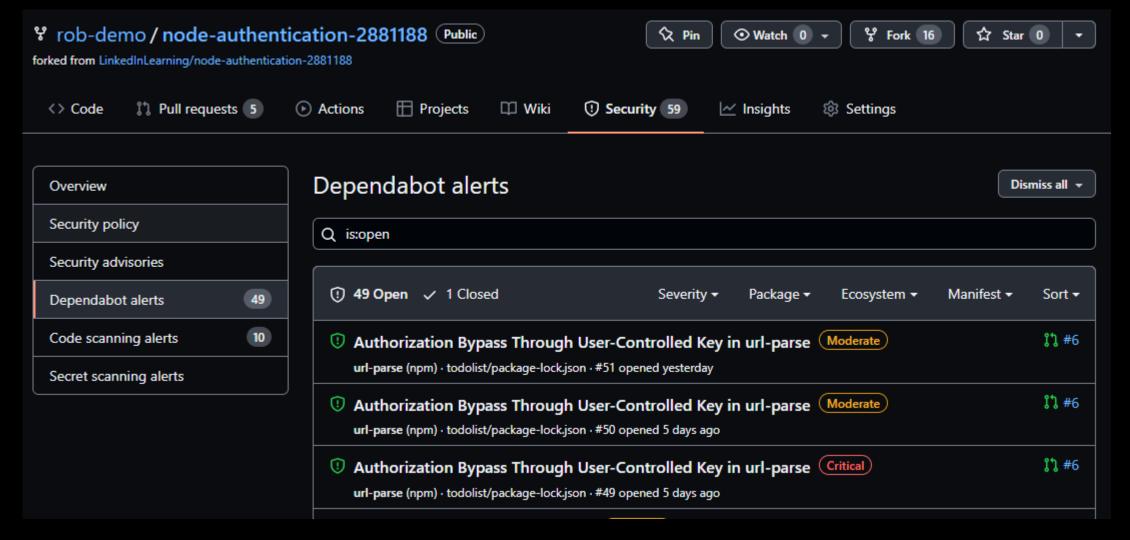
# Alerts on dependencies

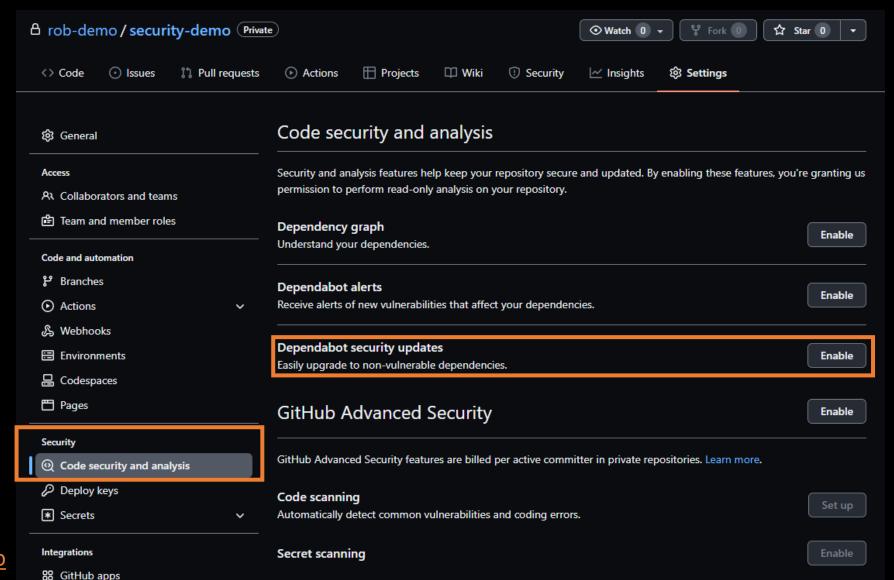


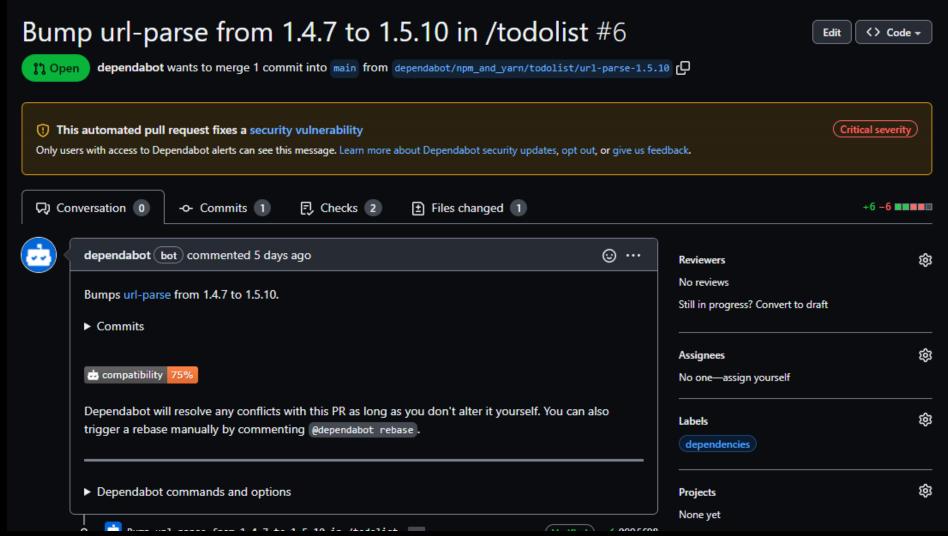
### Demo

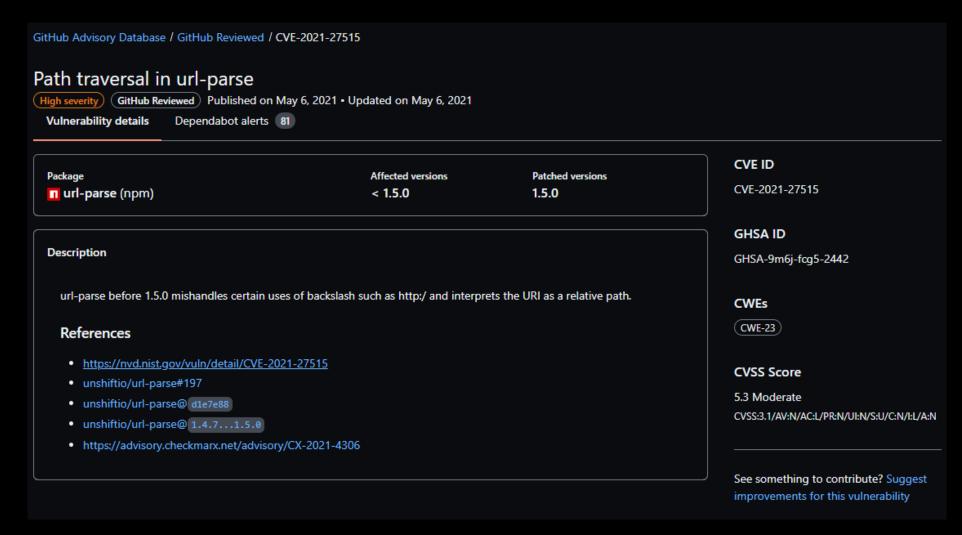
https://github.com/rob-demo/node-authentication-2881188











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#### Security features

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#### Secret scanning

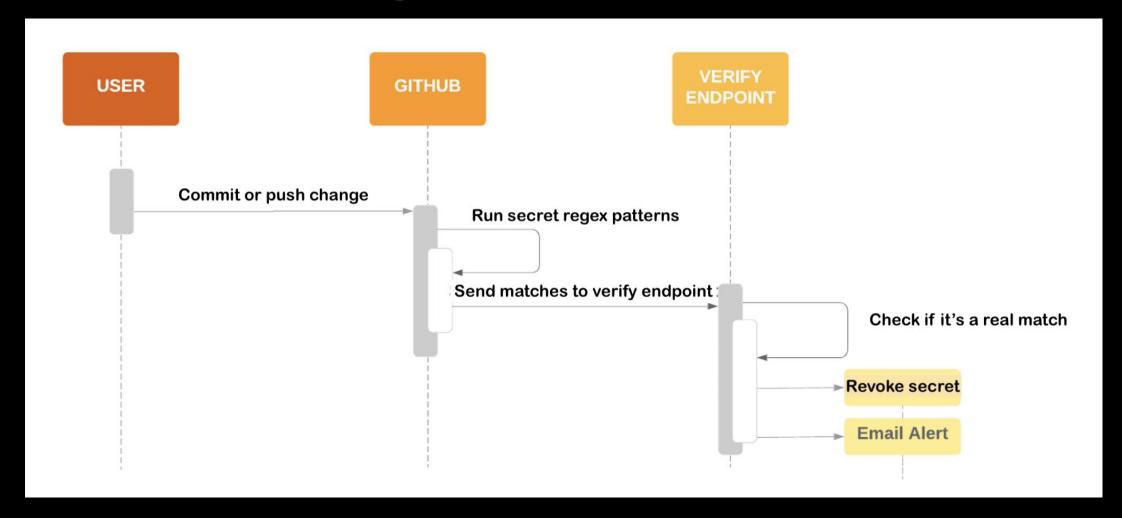
Secrets have a high risk!

Enabled by default on public repos

80+ secret scanning partners

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

#### Secret scanning



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#### Secret scanning

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

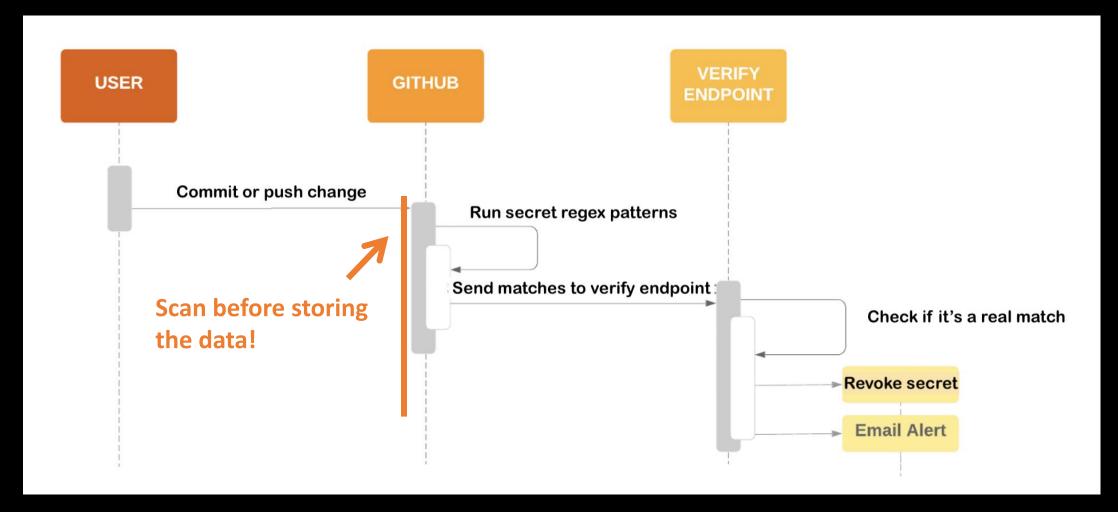
Scans the entire history of the repo as well

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]



#### Security features

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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



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### Using CodeQL

Free for public repos, uses your own Action minutes

**CLI** support

Open-source queries

```
Support for:
```

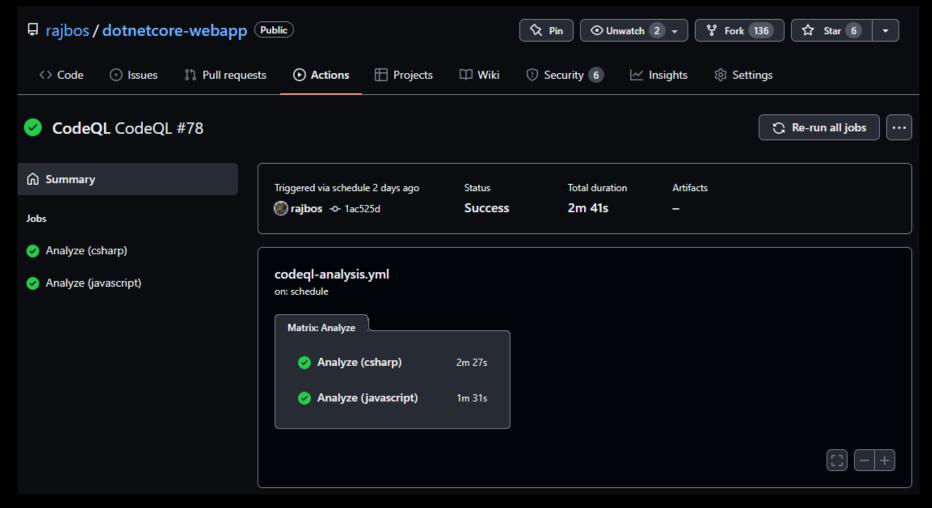
#### CodeQL - demo

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

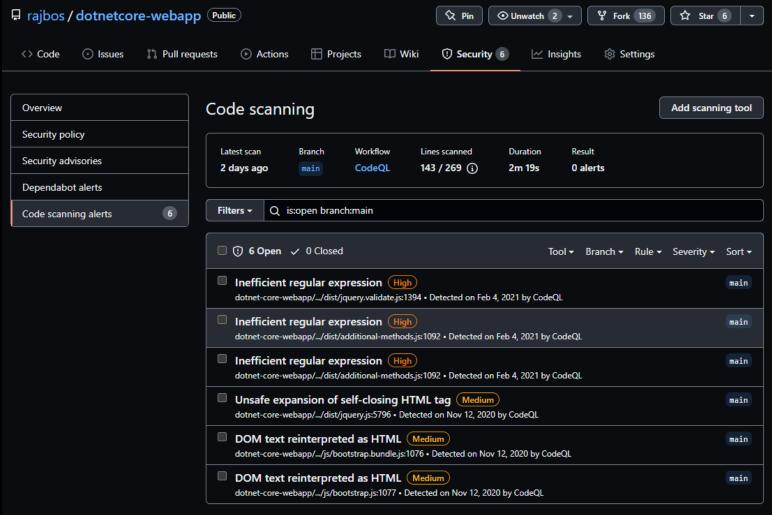
b: https://github.com/github/codeql

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

#### CodeQL - demo



#### CodeQL - demo



#### Security features - overview

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## DEVELOPER WEEK '23

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