

Programmazione Mobile

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Lezione: CI/CD in Flutter

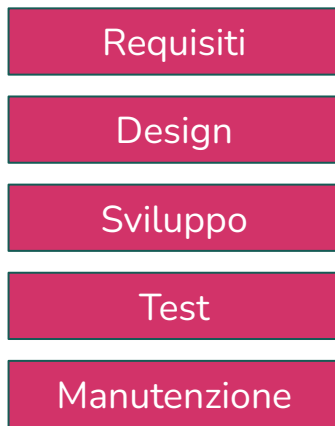
- Approccio DevOps
- GitHub Actions



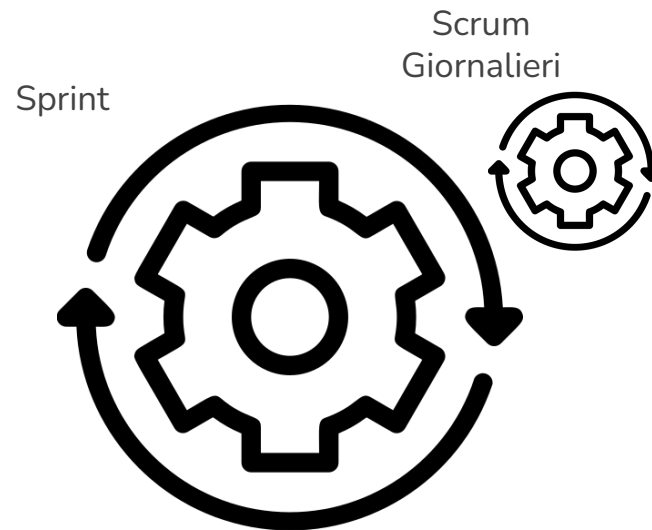


DevOps /
DevSecOps

Evoluzione dello sviluppo software



Waterfall



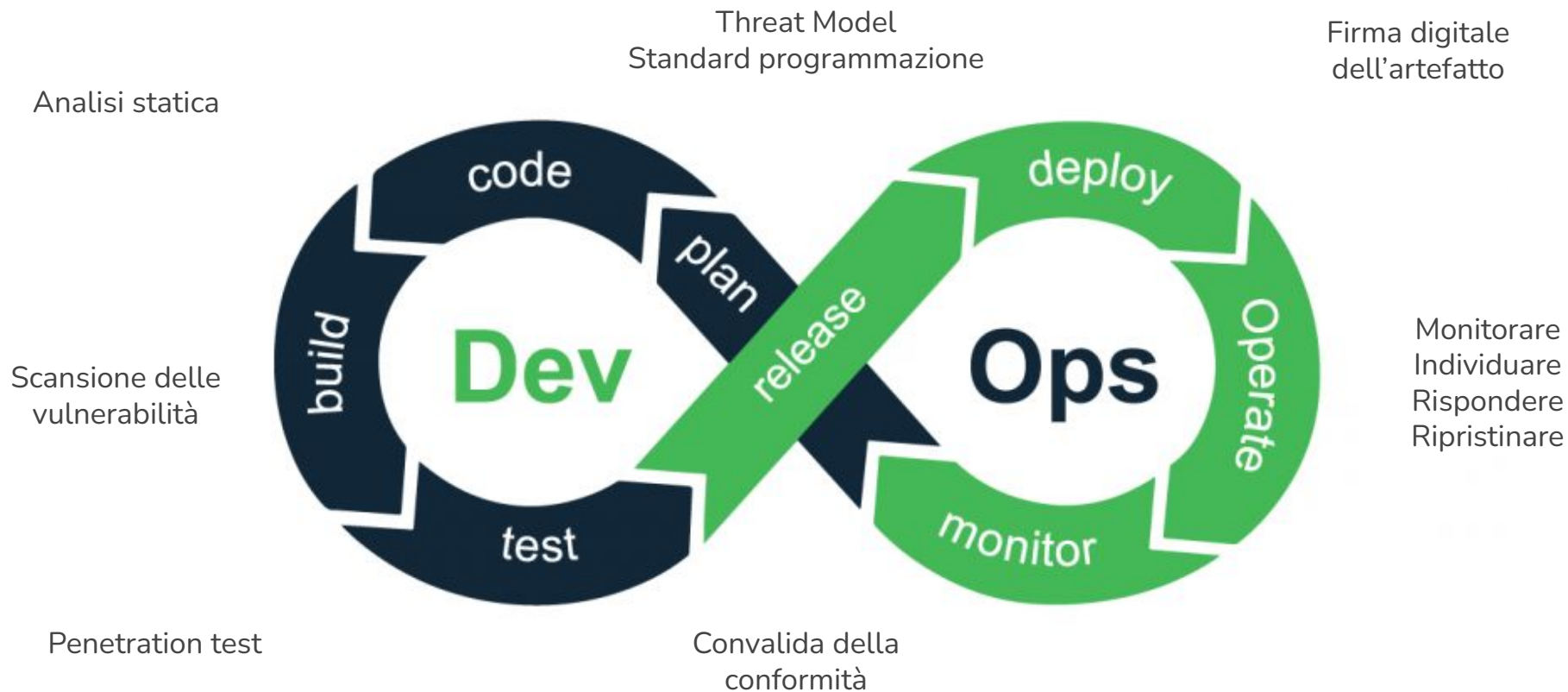
Agile



DevOps



Unire DevOps e Sec per snellire i processi di sicurezza



Esempi pratici - “Security as code”

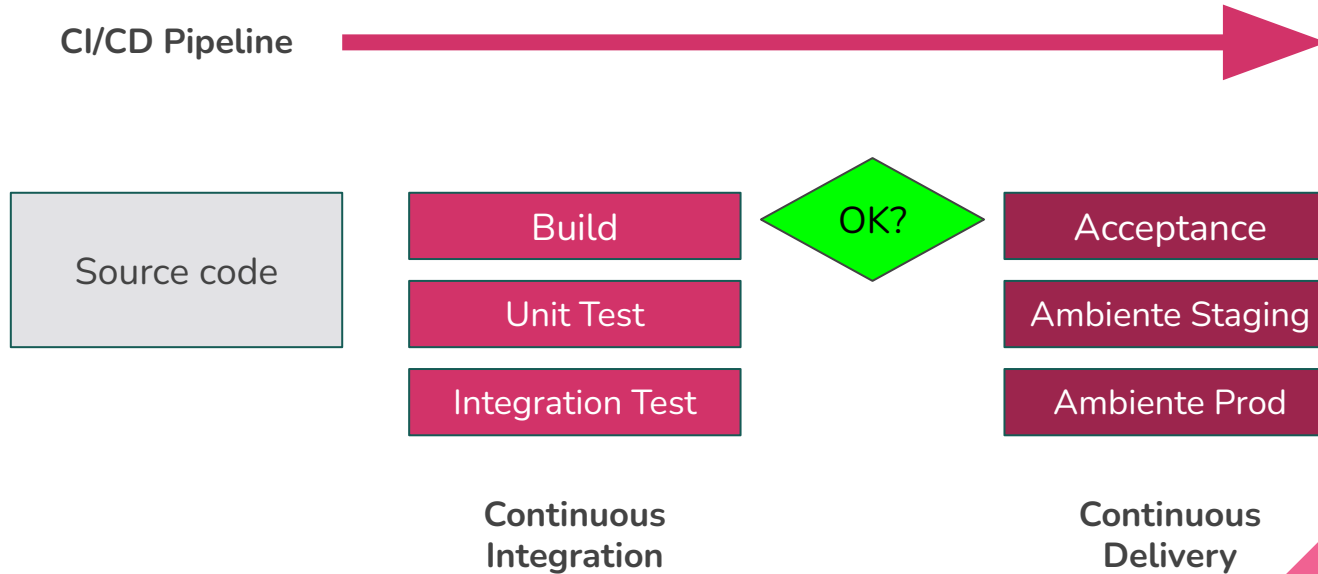
Una **Code review** può diventare una **Code Preview** facendo in modo che il software venga analizzato preventivamente e, in caso di errori, non sia mai rilasciato

Aggiornare un ambiente o mettere **patch di sicurezza** può essere trasformato nella creazione automatica di **nuovi ambienti compatibili con il software e già aggiornati** (in questo i container possono aiutare)

La **risposta agli incidenti** deve essere anticipata con tecniche che ad esempio **evitano l'incidente utilizzando Threat Modeling**



Continuous Integration/Delivery (CI/CD)



Continuous Integration/Delivery (CI/CD)

CI/CD Pipeline



Security Design

Source code

Security Code Review

Build

Unit Test

Integration Test

Security Testing

OK?

Acceptance

Ambiente Staging

Ambiente Prod


Ambiente Security

Ripetibile
Consistente
Integrato
Sostenibile

Continuous
Integration

Continuous
Delivery

DevSecOps - Benefici nell'adozione della pratica

- Ridurre il tempo di rework in caso di problematiche di sicurezza (vengono trovate in anticipo)
 - Ridurre il rischio per l'organizzazione e per i suoi clienti
 - Migliora la collaborazione, la comunicazione e la crescita dei team
 - La sicurezza passa ad un approccio continuo e non istantaneo
 - Effettivamente si risponde al criterio di "security by design" indicato anche dal GDPR
- 

CI/CD GitHub - Flutter

New repository

github.com/new

Search

New repository

Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

Required fields are marked with an asterisk (*).

Owner *

Repository name *

nicolanoviell

/ pipelineflutter

pipelineflutter is available.

Great repository names are short and memorable. Need inspiration? How about [miniature-guide](#) ?

Description (optional)

Pipeline test - Flutter

☒ Public

Anyone on the internet can see this repository. You choose who can commit.

☐ Private

You choose who can see and commit to this repository.

Initialize this repository with:

☐ Add a README file

This is where you can write a long description for your project. [Learn more about READMEs.](#)

Add .gitignore

.gitignore template: None

Choose which files not to track from a list of templates. [Learn more about ignoring files.](#)

Choose a license

License: None

A license tells others what they can and can't do with your code. [Learn more about licenses.](#)

You are creating a public repository in your personal account.

Create repository

```
nico@Mac-mini-di-Nico flutter-proj % flutter create pipelinewidget
Creating project pipelinewidget...
Resolving dependencies in `pipelinewidget`... (1.0s)
Downloading packages...
Got dependencies in `pipelinewidget`.
Wrote 129 files.
```

All done!

You can find general documentation for Flutter at: <https://docs.flutter.dev/>

Detailed API documentation is available at: <https://api.flutter.dev/>

If you prefer video documentation, consider:

<https://www.youtube.com/c/flutterdev>

In order to run your application, type:

```
$ cd pipelinewidget
$ flutter run
```

Your application code is in pipelinewidget/lib/main.dart.

```
nico@Mac-mini-di-Nico flutter-proj % cd pipelinewidget
nico@Mac-mini-di-Nico pipelinewidget % git init
Initialized empty Git repository in /Users/nico/flutter-proj/pipelinewidget/.git/
nico@Mac-mini-di-Nico pipelinewidget % git add .
nico@Mac-mini-di-Nico pipelinewidget % git commit -m "first commit"
[main (root-commit) 48ca55a] first commit
 128 files changed, 4926 insertions(+)
 create mode 100644 .gitignore
...
 create mode 100644 windows/runner/win32_window.cpp
 create mode 100644 windows/runner/win32_window.h
...
```

...

```
nico@Mac-mini-di-Nico pipelinewidget % git branch -M main
nico@Mac-mini-di-Nico pipelinewidget % git remote add origin git@github.com:nicolanoviell/pipelineflutter.git
nico@Mac-mini-di-Nico pipelinewidget % git push -u origin main
Enumerating objects: 177, done.
Counting objects: 100% (177/177), done.
Delta compression using up to 8 threads
Compressing objects: 100% (146/146), done.
Writing objects: 100% (177/177), 266.78 KiB | 2.64 MiB/s, done.
Total 177 (delta 21), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (21/21), done.
To github.com:nicolanoviell/pipelineflutter.git
 * [new branch]      main -> main
branch 'main' set up to track 'origin/main'.
```

...

nicolanoviell / pipelineflutter

github.com/nicolanoviell/pipelineflutter

Type to search

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pipelineflutter

Public

Pin Unwatch 1 Fork 0 Star 0

main 1 Branch 0 Tags

Go to file t Add file <> Code

nicolanoviell first commit 48ca55a · 7 minutes ago 1 Commit

android	first commit	7 minutes ago
ios	first commit	7 minutes ago
lib	first commit	7 minutes ago
linux	first commit	7 minutes ago
macos	first commit	7 minutes ago
test	first commit	7 minutes ago
web	first commit	7 minutes ago
windows	first commit	7 minutes ago
.gitignore	first commit	7 minutes ago
.metadata	first commit	7 minutes ago
README.md	first commit	7 minutes ago
analysis_options.yaml	first commit	7 minutes ago
pubspec.lock	first commit	7 minutes ago
pubspec.yaml	first commit	7 minutes ago

README

pipelineflutter

Pipeline test - Flutter

Readme Activity 0 stars 1 watching 0 forks

No releases published [Create a new release](#)

No packages published [Publish your first package](#)

Languages

C++ 44.3% CMake 36.1% Dart 11.2% Swift 3.2% C 2.6% HTML 2.3% Other 0.3%

Suggested workflows

Based on your tech stack

SLSA Generic generator

Generate SLSA3 provenance for your existing release workflows

Configure

.github/workflows/main.yml

```
name: Flutter CI
```

```
on:
```

```
  push:
```

```
    branches: [main]
```

```
  pull_request:
```

```
    branches: [main]
```

```
jobs:
```

```
  build:
```

```
    runs-on: ubuntu-latest
```

```
  steps:
```

```
    - uses: actions/checkout@v2
```

```
    - name: Set up JDK 11
```

```
      uses: actions/setup-java@v2
```

```
      with:
```

```
        distribution: "adopt"
```

```
        java-version: 11
```

```
    - name: Install Flutter
```

```
      uses: subosito/flutter-action@v1
```

```
    - name: Get Flutter packages
```

```
      run: flutter pub get
```

```
    - name: Run Flutter tests
```

```
      run: flutter test
```

```
    - name: Build Flutter app
```

```
      run: flutter build apk
```

```
    - name: Upload APK
```

```
      uses: actions/upload-artifact@v4
```

```
      with:
```

```
        name: app-${{ github.run_number }}
```

```
        path: build/app/outputs/flutter-apk/app-release.apk
```

name: Flutter CI: Nome della pipeline.

on: push: branches: [main] pull_request: branches: [main]: Specifica che la pipeline dovrebbe essere eseguita ogni volta che viene effettuato un push o una pull request sul branch "main".

jobs: build: runs-on: ubuntu-latest: Il sistema operativo utilizzato come "base" per eseguire la pipeline

- **uses: actions/checkout@v2:** Usa il codice sorgente nel runner

- **name: Set up JDK 11:** Questo step imposta JDK 11 per l'uso nel runner. È necessario per alcune dipendenze di Flutter

- **name: Install Flutter:** Installa Flutter nel runner utilizzando l'azione subosito/flutter-action@v1

- **name: Get Flutter packages:** Esegue *flutter pub get* per installare tutte le dipendenze Flutter definite nel file pubspec.yaml

- **name: Run Flutter tests:** Esegue tutti i test Flutter nel progetto utilizzando flutter test

- **name: Build Flutter app:** Effettua la build dell'app Flutter per Android (APK) utilizzando flutter build apk.

- **name: Upload APK:** Carica l'APK costruito come un artefatto di GitHub Actions, che può essere scaricato dopo che la pipeline è stata eseguita. "APK" è nominato con "app-" seguito dal numero di esecuzione della pipeline.

Push dello script per la pipeline

Effettuando il push dello script per eseguire la pipeline, GitHub la triggera immediatamente e, se tutto va bene, provvede ad effettuare la build.

Ma prima di procedere con la build voglio fare un test...



test/widget_test.dart

Rompo il risultato del test

```
// This is a basic Flutter widget test.
//
// To perform an interaction with a widget in your test, use the WidgetTester
// utility in the flutter_test package. For example, you can send tap and scroll
// gestures. You can also use WidgetTester to find child widgets in the widget
// tree, read text, and verify that the values of widget properties are correct.
```

```
import 'package:flutter/material.dart';
import 'package:flutter_test/flutter_test.dart';
```

```
import 'package:pipelinewidget/main.dart';
```

```
void main() {
  testWidgets('Counter increments smoke test', (WidgetTester tester) async {
    // Build our app and trigger a frame.
    await tester.pumpWidget(const MyApp());

    // Verify that our counter starts at 0.
    expect(find.text('0'), findsOneWidget);
    expect(find.text('1'), findsNothing);

    // Tap the '+' icon and trigger a frame.
    await tester.tap(find.byIcon(Icons.add));
    await tester.pump();

    // Verify that our counter has incremented.
    expect(find.text('0'), findsNothing);
    expect(find.text('2'), findsOneWidget);

  });
}
```

nicolanoviell/pipelineflutter

github.com/nicolanoviell/pipelineflutter/actions

nicolanoviell / pipelineflutter

Type to search

+ ↕ ⌂ 🔍 📧 🛠

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Actions

New workflow

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Flutter CI

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Showing runs from all workflows

Filter workflow runs

Help us improve GitHub Actions

Tell us how to make GitHub Actions work better for you with three quick questions.

Give feedback ×

1 workflow run

Event Status Branch Actor

✖ Pipeline con test rotto

Flutter CI #1: Commit `aca3cc8` pushed by nicolanoviell

main

📅 2 minutes ago ⌚ 1m 15s ...

Pipeline con test rotto - nicola

github.com/nicolanoviell/pipelineflutter/actions/runs/9260859866/job/25475312975

nicolanoviell / pipelineflutter

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Flutter CI

Pipeline con test rotto #1

Re-run jobs

Summary

Jobs

build

Run details

Usage

Workflow file

build

failed 1 minute ago in 1m 5s

Search logs

> Set up job1s

> Run actions/checkout@v21s

> Set up JDK 115s

> Install Flutter42s

> Get Flutter packages6s

> Run Flutter tests8s

> Build Flutter app0s

> Upload APK0s

> Post Set up JDK 110s

> Post Run actions/checkout@v20s

> Complete job0s

1 ▶ Run flutter test

8

9 ▶ Counter increments smoke test (failed)

34

35 Error: 0 tests passed, 1 failed.

36 Error: Process completed with exit code 1.

test/widget_test.dart

Sistemo il test e rieffettuo il push...

```
// This is a basic Flutter widget test.
//
// To perform an interaction with a widget in your test, use the WidgetTester
// utility in the flutter_test package. For example, you can send tap and scroll
// gestures. You can also use WidgetTester to find child widgets in the widget
// tree, read text, and verify that the values of widget properties are correct.
```

```
import 'package:flutter/material.dart';
import 'package:flutter_test/flutter_test.dart';
```

```
import 'package:pipelinewidget/main.dart';
```

```
void main() {
  testWidgets('Counter increments smoke test', (WidgetTester tester) async {
    // Build our app and trigger a frame.
    await tester.pumpWidget(const MyApp());

    // Verify that our counter starts at 0.
    expect(find.text('0'), findsOneWidget);
    expect(find.text('1'), findsNothing);

    // Tap the '+' icon and trigger a frame.
    await tester.tap(find.byIcon(Icons.add));
    await tester.pump();

    // Verify that our counter has incremented.
    expect(find.text('0'), findsNothing);
    expect(find.text('1'), findsOneWidget);

  });
}
```

Flutter CI - Workflow runs - nicolanielli

github.com/nicolanielli/pipelineflutter/actions/workflows/main.yml

Nuovo Chrome disponibile

nicolanielli / pipelineflutter

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2 workflow runs

Event

Status

Branch

Actor

Test fixato

Flutter CI #2: Commit be8af3f pushed by nicolanielli

main

4 minutes ago

3m 33s

Pipeline con test rotto

Flutter CI #1: Commit aca3cc8 pushed by nicolanielli

main

8 minutes ago

1m 15s

Test fixato - nicolanoviell@pipe

github.com/nicolanoviell/pipelineflutter/actions/runs/9260886922/job/25475383378

← → ↺

🔍 ☆ 📄 ⌂ 🌐 📧 📁 📄 📄 📄

Nuovo Chrome disponibile

Summary

Jobs

build

Run details

Usage

Workflow file

build

succeeded 1 minute ago in 3m 24s

Search logs

🔄 ⚙️

> Set up job

2s

> Run actions/checkout@v2

1s

> Set up JDK 11

5s

> Install Flutter

45s

> Get Flutter packages

7s

Run Flutter tests

8s

1 ▶ Run flutter test

8

9 🟢 Counter increments smoke test

10

11 🏁 1 test passed.

Build Flutter app

2m 13s

1 ▶ Run flutter build apk

8

9 Running Gradle task 'assembleRelease'...

10 Checking the license for package Android SDK Platform-Tools in /usr/local/lib/android/sdk/licenses

11 License for package Android SDK Platform-Tools accepted.

12 Preparing "Install Android SDK Platform-Tools (revision: 35.0.1)".

13 "Install Android SDK Platform-Tools (revision: 35.0.1)" ready.

14 Installing Android SDK Platform-Tools in /usr/local/lib/android/sdk/platform-tools

15 "Install Android SDK Platform-Tools (revision: 35.0.1)" complete.

16 "Install Android SDK Platform-Tools (revision: 35.0.1)" finished.

17 Checking the license for package Android Emulator in /usr/local/lib/android/sdk/licenses

18 License for package Android Emulator accepted.

19 Preparing "Install Android Emulator (revision: 34.2.14)".

20 "Install Android Emulator (revision: 34.2.14)" ready.

21 Installing Android Emulator in /usr/local/lib/android/sdk/emulator

22 "Install Android Emulator (revision: 34.2.14)" complete.

23 "Install Android Emulator (revision: 34.2.14)" finished.

24 Checking the license for package Android SDK Tools in /usr/local/lib/android/sdk/licenses

25 License for package Android SDK Tools accepted.

26 Preparing "Install Android SDK Tools (revision: 26.1.1)".

27 "Install Android SDK Tools (revision: 26.1.1)" ready.

28 Installing Android SDK Tools in /usr/local/lib/android/sdk/tools

29 "Install Android SDK Tools (revision: 26.1.1)" complete.

30 "Install Android SDK Tools (revision: 26.1.1)" finished.

31 Checking the license for package Android SDK Build-Tools 30.0.3 in /usr/local/lib/android/sdk/licenses

Test fixato - nicolanoviell/pipe

github.com/nicolanoviell/pipelineflutter/actions/runs/9260886922

Nuovo Chrome disponibile

Flutter CI

Test fixato #2

Re-run all jobs

Summary

Jobs

Run details

Usage

Workflow file

Triggered via push 5 minutes ago

nicolanoviell pushed be8af3f main

Status

Success

Total duration

3m 33s

Artifacts

1

main.yml

on: push

build

3m 24s

Annotations

2 warnings

build

Node.js 16 actions are deprecated. Please update the following actions to use Node.js 20: actions/checkout@v2, actions/setup-java@v2, subosito/flutter-action@v1. For more information see: https://github.com/actions/runner/blob/main/docs/faq.md#nodejs-version. [Show more](#)

build

The following actions uses node12 which is deprecated and will be forced to run on node16: actions/checkout@v2, actions/setup-java@v2, subosito/flutter-action@v1. For more info: https://github.blog/changelog/2022-09-22-github-actions-deprecating-node12/. [Show more](#)

Artifacts

Produced during runtime


Name	Size
app-2	17.5 MB

Dependabot

Cos'è?

- Uno strumento automatizzato integrato in GitHub che analizza i propri progetti alla ricerca di dipendenze obsolete
- Quando Dependabot rileva una nuova versione di una libreria o un pacchetto utilizzato, crea automaticamente una “pull request” con l’aggiornamento necessario

Vantaggi

- **Sicurezza migliorata:** Rileva e corregge automaticamente vulnerabilità note nelle dipendenze
 - **Riduzione del debito tecnico:** Mantiene il codice aggiornato con le ultime versioni, evitando incompatibilità future
 - **Risparmio di tempo:** Automatizza il processo di aggiornamento delle dipendenze, liberando tempo prezioso per gli sviluppatori
 - **Facilità di utilizzo:** Configurazione semplice e immediata direttamente da GitHub
- 

.github/dependabot.yml

```
version: 2
```

```
updates:
```

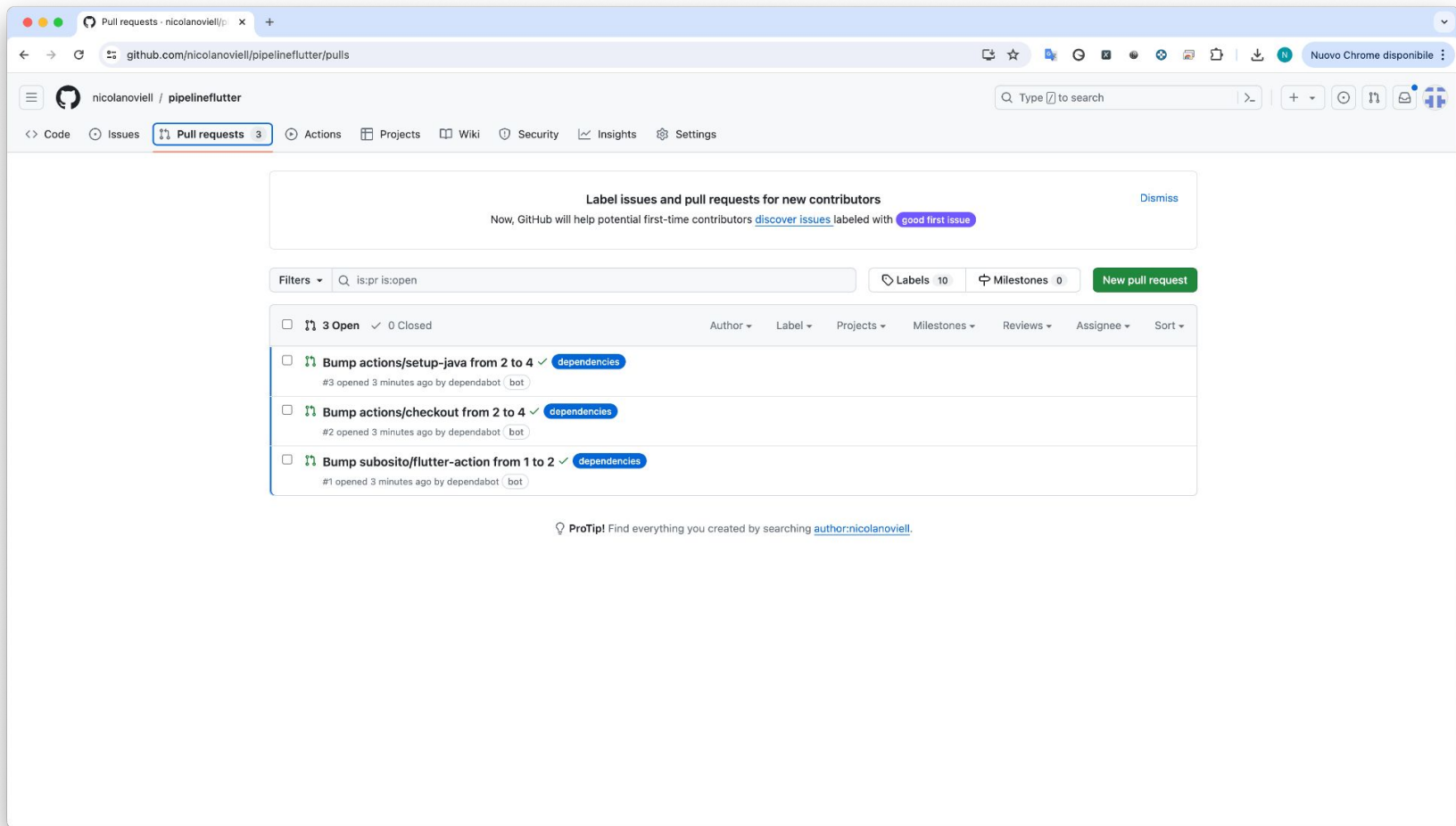
```
- package-ecosystem: "github-actions"
```

```
  directory: "/"
```

```
  schedule:
```

```
    interval: "daily"
```

Pusho dependabot...



Bump actions/setup-java from 2 to 4 #3

github.com/nicolanoviell/pipelineflutter/pull/3

CodeIssuesPull requests3ActionsProjectsWikiSecurityInsightsSettings

Bump actions/setup-java from 2 to 4 #3

EditCode

Opendependabot wants to merge 1 commit into main from dependabot/github_actions/actions/setup-java-4

Conversation0Commits1Checks1Files changed1

+1-1

dependabotbot commented on behalf of github 4 minutes ago

Bumps actions/setup-java from 2 to 4.

Release notes

Commits

compatibilityunknown

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

dependabotbot added the dependencies label 4 minutes ago

Bump actions/setup-java from 2 to 4

Verifiedada99bb

dependabotbot force-pushed the dependabot/github_actions/actions/setup-java-4 branch from 4d41ee8 to ada99bb 4 minutes ago

Compare

Ad more commits by pushing to the dependabot/github_actions/actions/setup-java-4 branch on nicolanoviell/pipelineflutter.

Require approval from specific reviewers before merging

Add rule

Reviewers

Suggestions

nicolanoviell

Request

Still in progress? Convert to draft

Assignees

No one—assign yourself

Labels

dependencies

Projects

None yet

Milestone

No milestone

Development

Successfully merging this pull request may close these issues.

None yet

Notifications

Customize

Unsubscribe

You're receiving notifications because you're watching this repository.

.github/workflows/main.yml - aggiornato

```
name: Flutter CI
```

```
on:
```

```
  push:
```

```
    branches: [main]
```

```
  pull_request:
```

```
    branches: [main]
```

```
jobs:
```

```
  build:
```

```
    runs-on: ubuntu-latest
```

```
  steps:
```

```
    - uses: actions/checkout@v4
```

```
    - name: Set up JDK 11
```

```
      uses: actions/setup-java@v4
```

```
      with:
```

```
        distribution: "adopt"
```

```
        java-version: 11
```

```
    - name: Install Flutter
```

```
      uses: subosito/flutter-action@v2
```

```
    - name: Get Flutter packages
```

```
      run: flutter pub get
```

```
    - name: Run Flutter tests
```

```
      run: flutter test
```

```
    - name: Build Flutter app
```

```
      run: flutter build apk
```

```
    - name: Upload APK
```

```
      uses: actions/upload-artifact@v4
```

```
      with:
```

```
        name: app-${{ github.run_number }}
```

```
        path: build/app/outputs/flutter-apk/app-release.apk
```

Pusho l'aggiornamento...

Pull requests · nicolanoviell

github.com/nicolanoviell/pipelineflutter/pulls?q=is%3Apr+is%3Aclosed

Nuovo Chrome disponibile

nicolanoviell / pipelineflutter

<> Code

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Label issues and pull requests for new contributors

Dismiss

Now, GitHub will help potential first-time contributors [discover issues](#) labeled with [good first issue](#)

Filters

is:pr is:closed

Labels 10

Milestones 0

New pull request

Clear current search query, filters, and sorts

☐

0 Open

☒

3 Closed

Author

Label

Projects

Milestones

Reviews

Assignee

Sort

☐

Bump actions/setup-java from 2 to 4

☒

dependencies

#3 by dependabot[bot] was closed 2 minutes ago

1

☐

Bump actions/checkout from 2 to 4

☒

dependencies

#2 by dependabot[bot] was closed 2 minutes ago

1

☐

Bump subosito/flutter-action from 1 to 2

☒

dependencies

#1 by dependabot[bot] was closed 2 minutes ago

1

ProTip!

Type `g` on any issue or pull request to go back to the issue listing page.

Fine

Ci vediamo all'esame!

Per opportunità lavorative ed endorsment (Ma solo se fate un buon esame 🦴)

<https://www.linkedin.com/in/nicola-noviello/>