



CI: BUILD PROCESS & AUTOMATED TESTING OF UI5 APPS

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Why Continuous Integration?

The Application

Highly complex

Many developers working simultaneously

openui5-sample-app

github.com/SAP/openui5-sample-app

The screenshot displays the 'todos' application interface. At the top, there is a light blue header bar with the title 'todos'. Below the header, there is a search bar with the placeholder text 'Search' and a magnifying glass icon. Underneath the search bar is a text input field with the placeholder text 'What needs to be done?'. Below the text input field, there is a teal-colored bar indicating '1 item left'. The main content area shows a list of tasks. The first task is 'Start this app', which is marked as completed with a checked checkbox. The second task is 'Learn OpenUI5', which is marked as incomplete with an unchecked checkbox.

| todos | |
|---|----------------|
| <input type="text" value="Search"/> | |
| <input type="text" value="What needs to be done?"/> | |
| 1 item left | |
| <input checked="" type="checkbox"/> | Start this app |
| <input type="checkbox"/> | Learn OpenUI5 |

Workflows

New change:



Problem:

Any code can be submitted to master

New release:



Problem:

Manual build and deployment process

Problem I: Any code can be submitted to master

What needs to be done?

4 items left

☐

Code that breaks the application and/or tests

☐

Code violating style conventions

☐

Untested code

☐

Code that is not reviewed by another developer

Problem I: Any code can be submitted to master

What needs to be done?

3 items left

- ☒ ~~Code that breaks the application and/or tests~~
- ☐ Code violating style conventions
- ☐ Untested code
- ☐ Code that is not reviewed by another developer



Execute unit- and integration tests



If anything fails: Block merge into master

Problem I: Any code can be submitted to master

What needs to be done?

2 items left

☒ ~~Code that breaks the application and/or tests~~

☒ ~~Code violating style conventions~~

☐ Untested code

☐ Code that is not reviewed by another developer



Execute unit- and integration tests



Run a linter



If anything fails: Block merge into master

Problem I: Any code can be submitted to master

What needs to be done?

1 item left

☒ ~~Code that breaks the application and/or tests~~

☒ ~~Code violating style conventions~~

☒ ~~Untested code~~

☐ Code that is not reviewed by another developer

➔ Execute unit- and integration tests

➔ Run a linter

➔ Check code coverage

 **If anything fails: Block merge into master**

Problem I: Any code can be submitted to master

What needs to be done?

0 items left

- ☒ ~~Code that breaks the application and/or tests~~
- ☒ ~~Code violating style conventions~~
- ☒ ~~Untested code~~
- ☒ ~~Code that is not reviewed by another developer~~

➔ Execute unit- and integration tests

➔ Run a linter

➔ Check code coverage

➔ Enforce code reviews



If anything fails: Block merge into master

Problem II: Manual build and deployment process

Whenever the master is stable:
Build and deploy the application

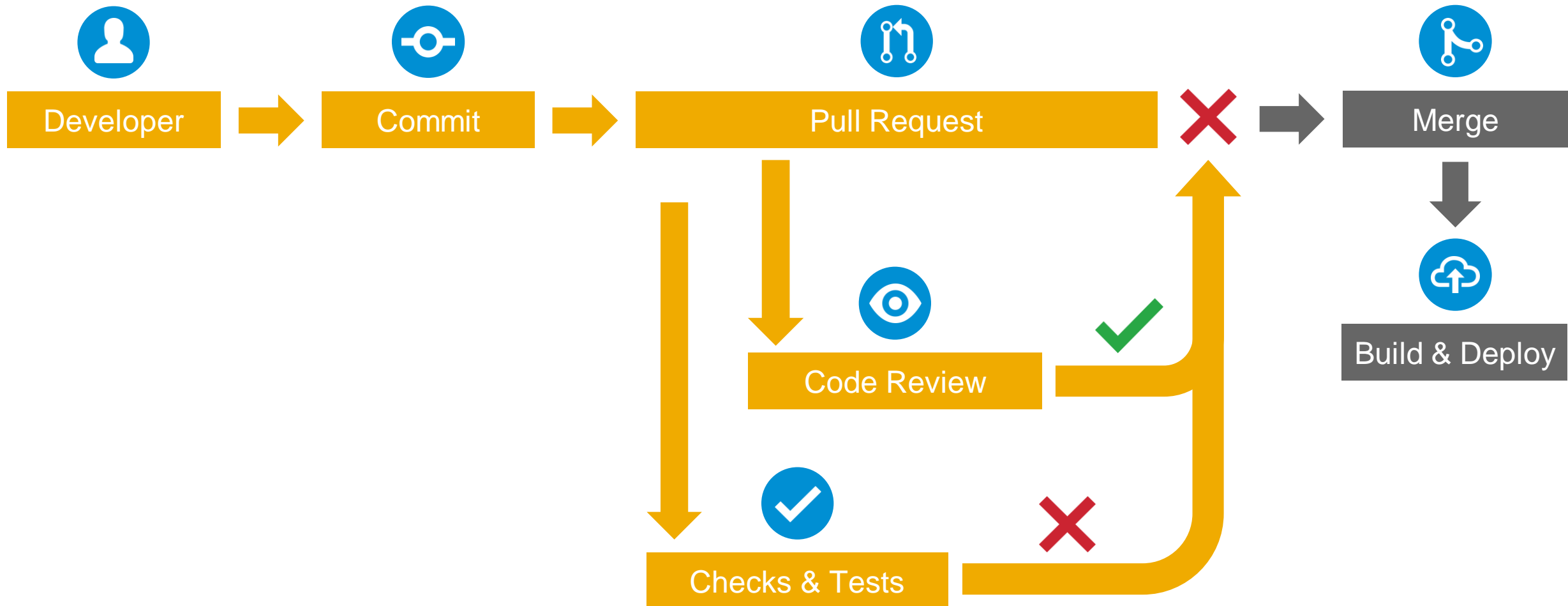
What needs to be done?

1 item left

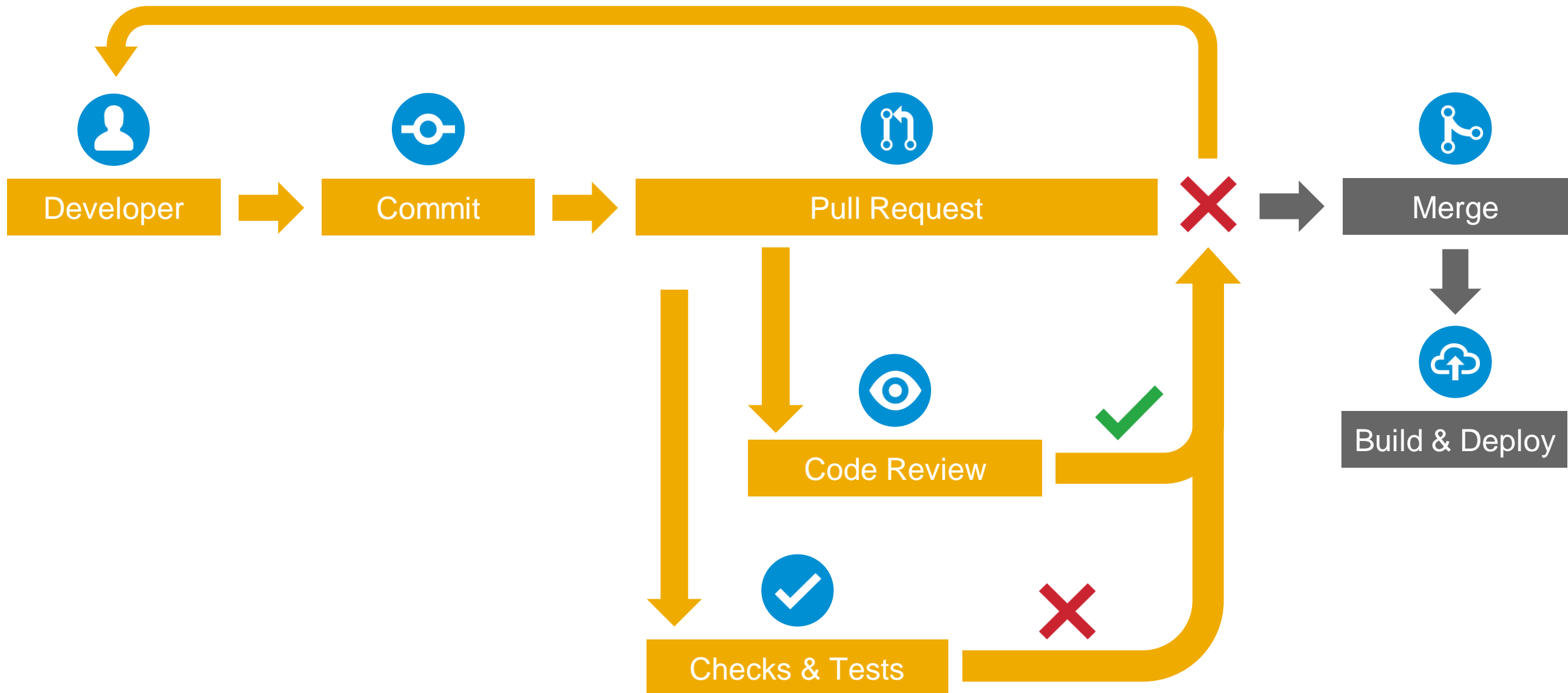
☒ ~~Build the app~~

☐ Deploy the app

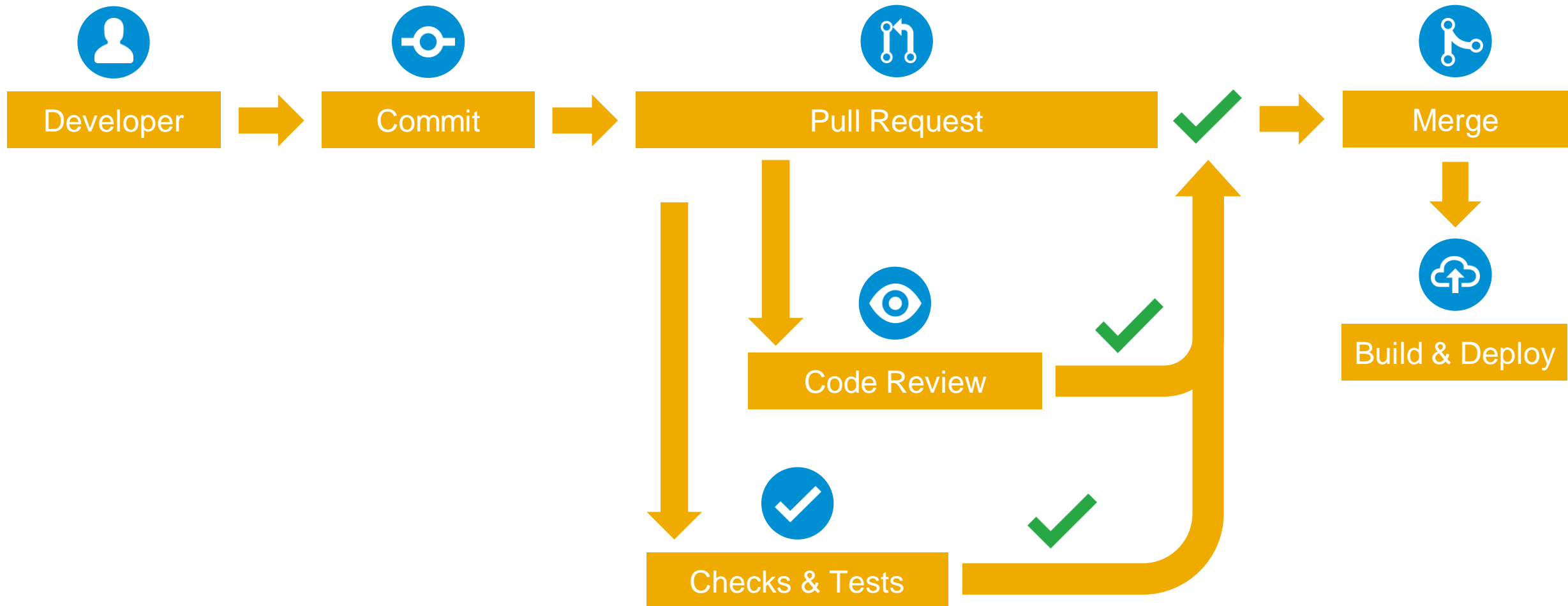
CI Workflow



CI Workflow



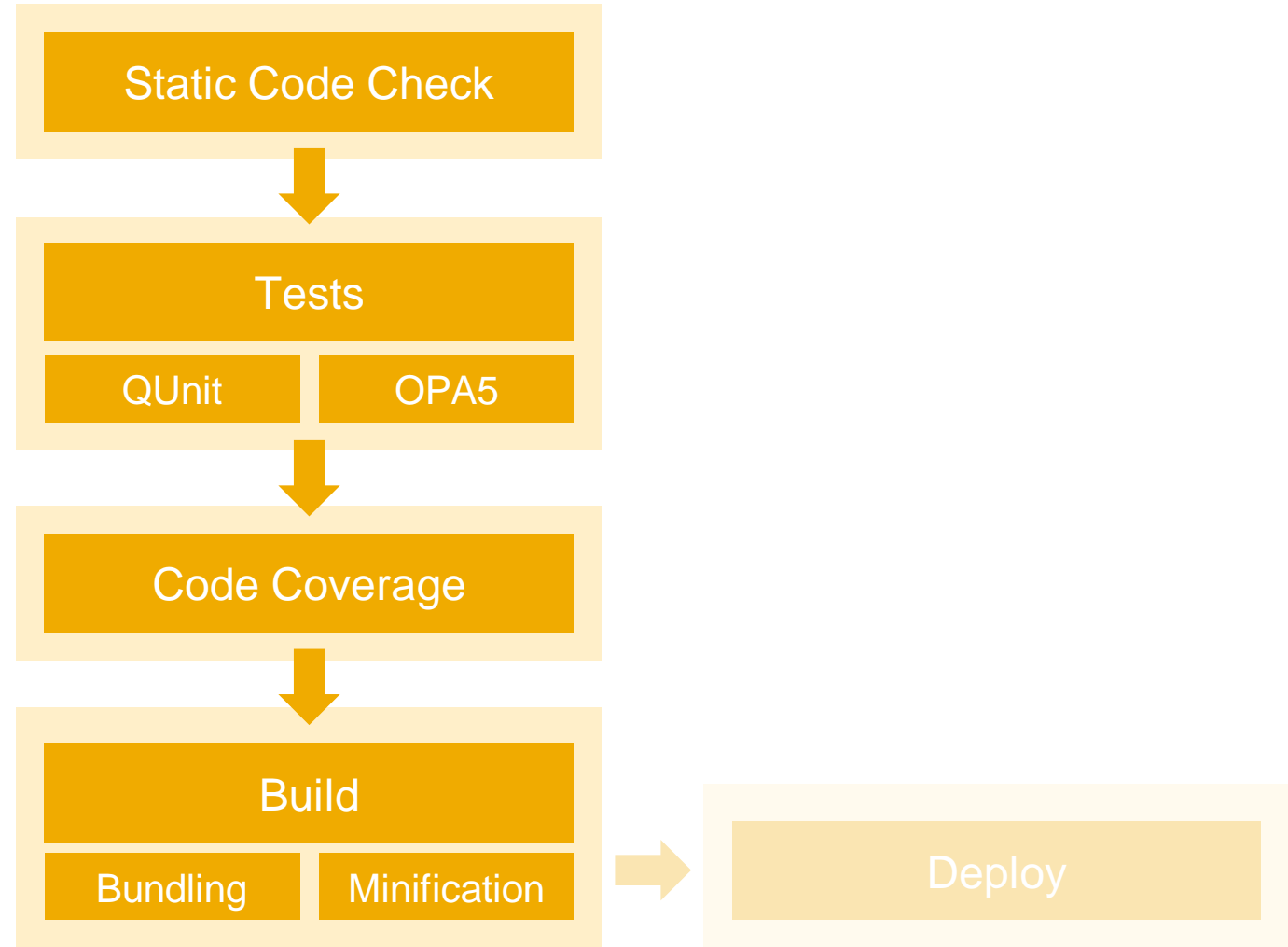
CI Workflow



The Pipeline

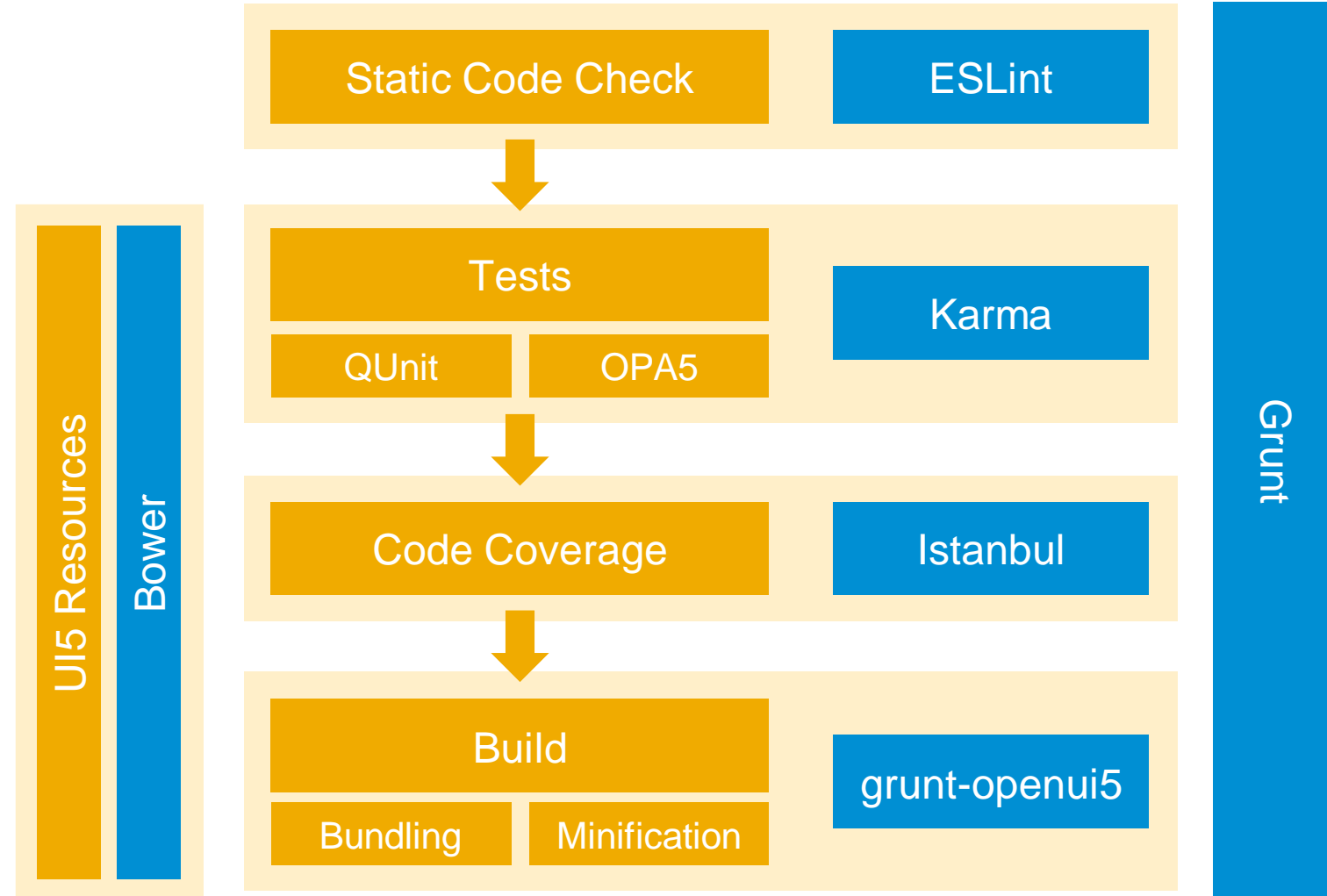
Pipeline

Abstract



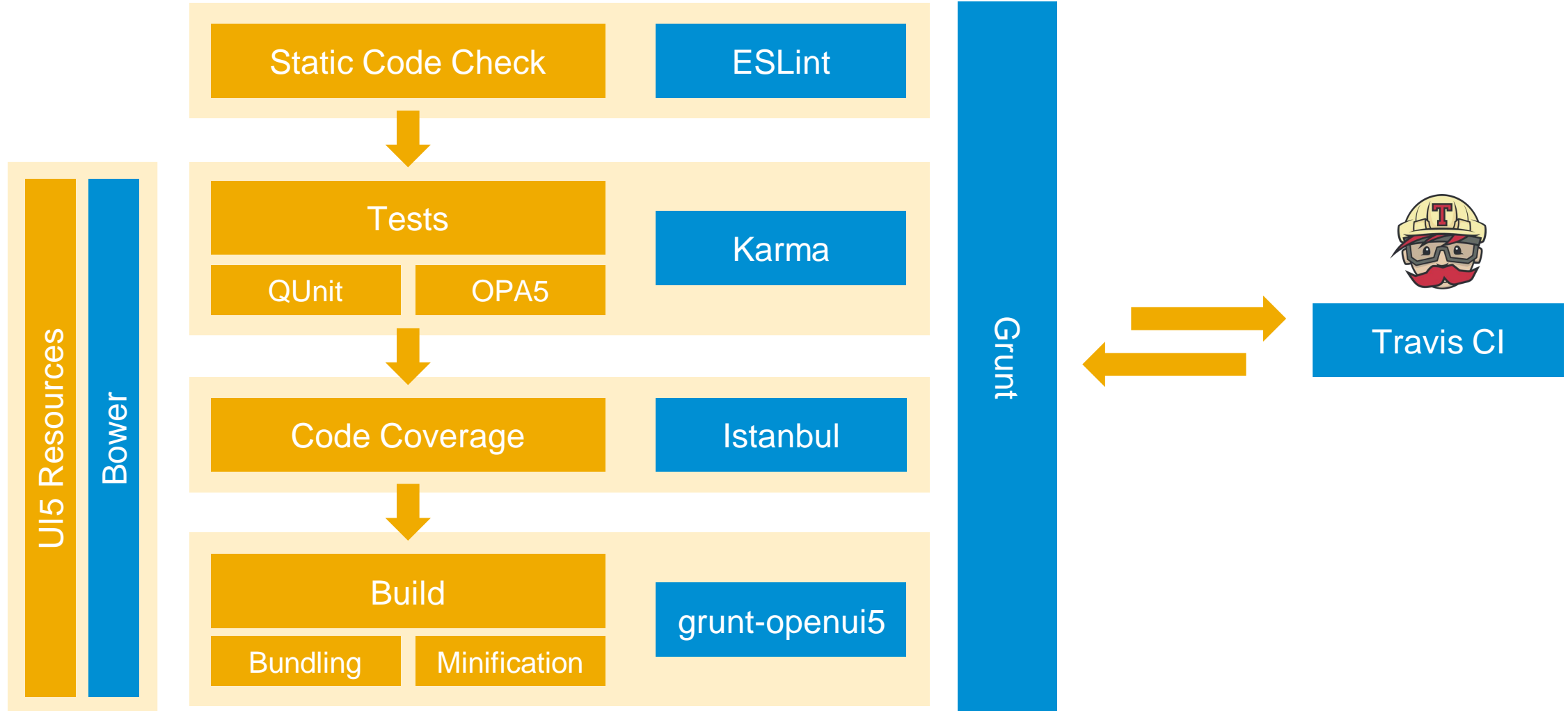
Pipeline

Tools

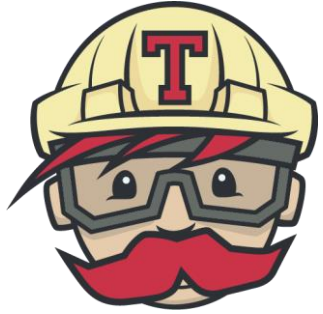


Pipeline

Tools



Travis CI



Continuous Integration Service for GitHub projects

Free for Open Source projects

Easy to configure with `.travis.yml` in your project

SAP / openui5-sample-app  build unknown

[Current](#) [Branches](#) [Build History](#) [Pull Requests](#)

More options 

✓ **master** Continuous Integration enablement

🔄 #3 passed

 Restart build

- Add Karma test runner (including Istanbul code coverage)
- Restructure and adopt tests according to UI5 best practices
- Add additional tests

🕒 Ran for 1 min 6 sec


📅 42 minutes ago

- 📁 Commit b2298ee
- 📁 Compare 15db9d9..b2298ee
- 📁 Branch master

👤 Merlin Beutlberger authored 👤 Merlin Beutlberger committed

[Job log](#)

[View config](#)

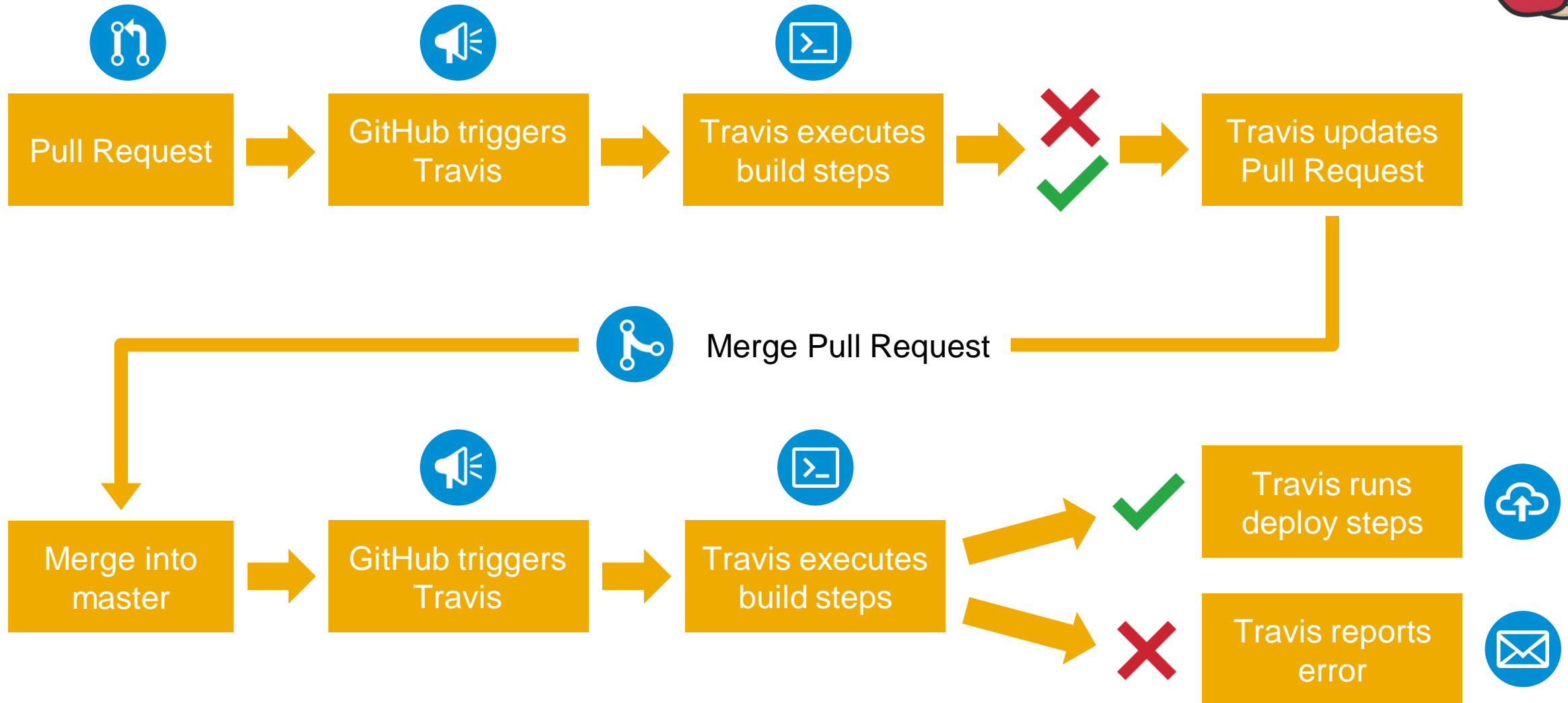
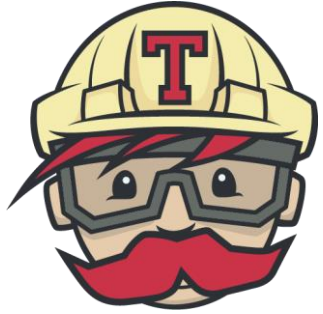
 Remove log

 Raw log

1 W: <http://us-central1.gce.archive.ubuntu.com/ubuntu/dists/precise-updates/InRelease>: Signature by key 630239CC130E1A7FD81A27B140976EAF437D0585 uses weak digest algorithm (SHA1)

Travis CI Workflow

GitHub +



Travis CI

.travis.yml

```
language: node_js
```

```
node_js:  
  - 'stable'
```

```
install:  
  - <custom install commands>  
script:  
  - <custom build commands>
```

Any command that can be executed locally, Travis can execute as well

Travis CI

.travis.yml

```
language: node_js
```


```
node_js:  
  - 'stable'
```

Language defaults



```
install:  
  - <custom install commands>  
script:  
  - <custom build commands>
```

```
install:  
  - npm install  
script:  
  - npm test
```



Any command that can be executed locally, Travis can execute as well

ESLint

Static Code Checks



JavaScript Linter

Widely adopted

Helps you enforce code conventions

```

> eslint webapp

/SAPDevelop/SAP/openui5-sample-app/webapp/controller/App.controller.js
  15:8  error  'oView' is defined but never used  no-unused-vars

✖ 1 problem (1 error, 0 warnings)

```

Grunt

Task Runner



Based on Node.js

Lets you orchestrate and automate various tasks

6.000+ plugins for linting, testing, building and more

```
openui5-sample-app: grunt watch — ⌘2
> grunt watch
Running "openui5_connect:src" (openui5_connect) task

Running "connect:src" (connect) task
Started connect web server on http://localhost:8080

Running "karma:watch" (karma) task
29 06 2017 17:26:22.699:WARN [karma]: No captured browser, open http://localhost:9876/
29 06 2017 17:26:22.704:INFO [karma]: Karma v1.7.0 server started at http://0.0.0.0:9876/
29 06 2017 17:26:22.705:INFO [launcher]: Launching browser Chrome with unlimited concurrency
```

Karma

Test Runner



Browser independent (Chrome, Firefox, Internet Explorer, ...)

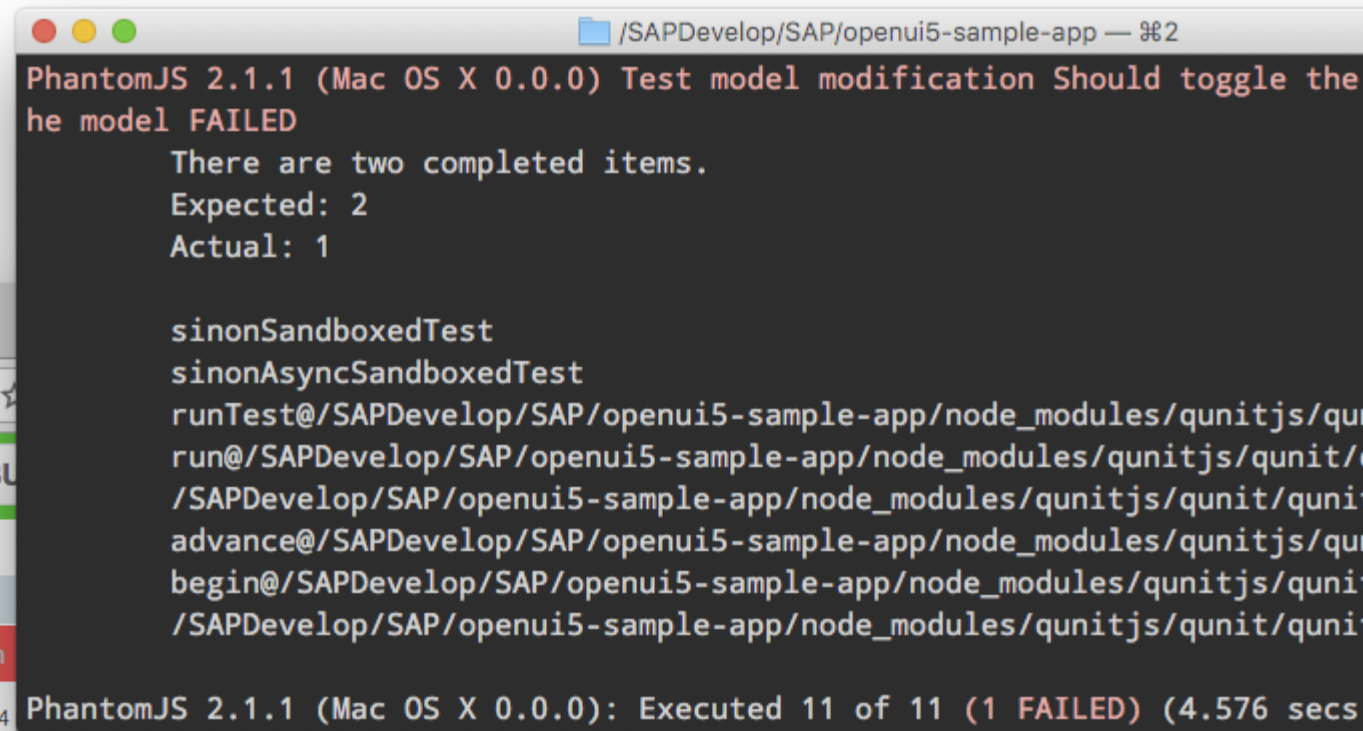
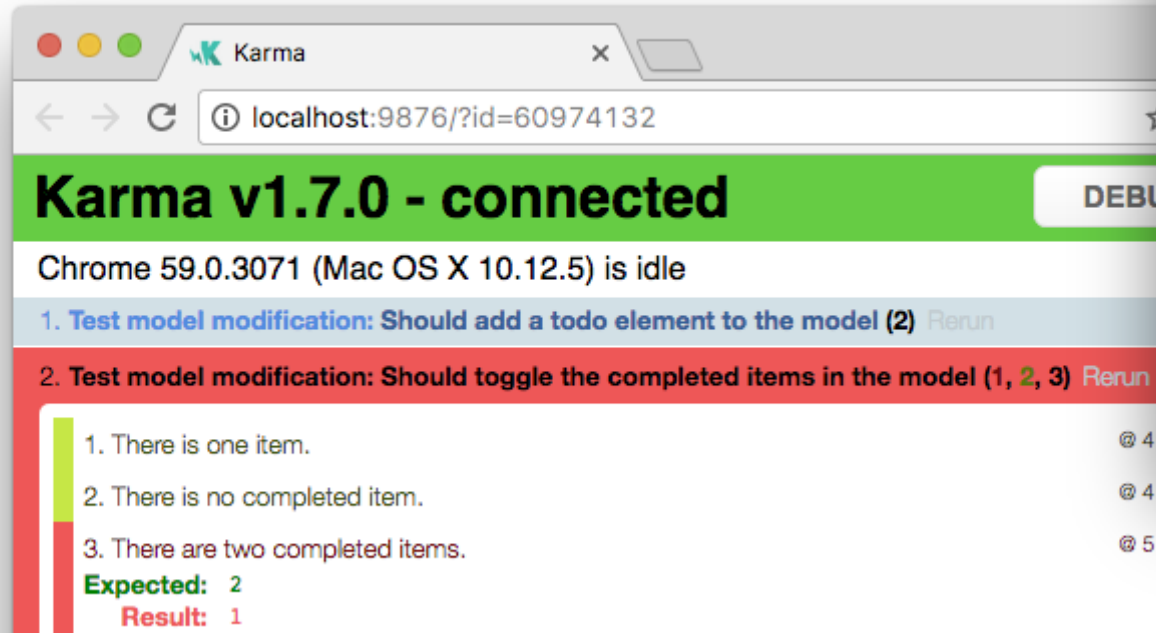
Headless execution (Chrome, PhantomJS 2)

Can run QUnit and OPA5 tests

Watch mode

Returns with error code when tests fail

github.com/SAP/karma-openui5



Istanbul

Code Coverage



Easy to integrate into Karma via **karma-coverage**

Offers terminal, HTML and other outputs

```
14 06 2017 16:18:46.596:ERROR [coverage]: PhantomJS 2.1.1 (Mac OS X 0.0.0): Coverage
for functions (83.33%) does not meet per-file (/SAPDevelop/SAP/openui5-sample-app/w
ebapp/controller/App.controller.js) threshold (100%)
-----|-----|-----|-----|-----|-----|
File      | % Stmts | % Branch | % Funcs | % Lines | Uncovered Lines |
-----|-----|-----|-----|-----|-----|
webapp/   |         |          |         |         |                 |
  Component.js |      100 |       100 |      100 |      100 |                 |
webapp/controller/ |    62.07 |     37.5 |     83.33 |    62.07 |                 |
  App.controller.js |    62.07 |     37.5 |     83.33 |    62.07 | ... 70,74,75,76 |
-----|-----|-----|-----|-----|-----|
All files |    64.52 |     37.5 |     85.71 |    64.52 |                 |
-----|-----|-----|-----|-----|-----|

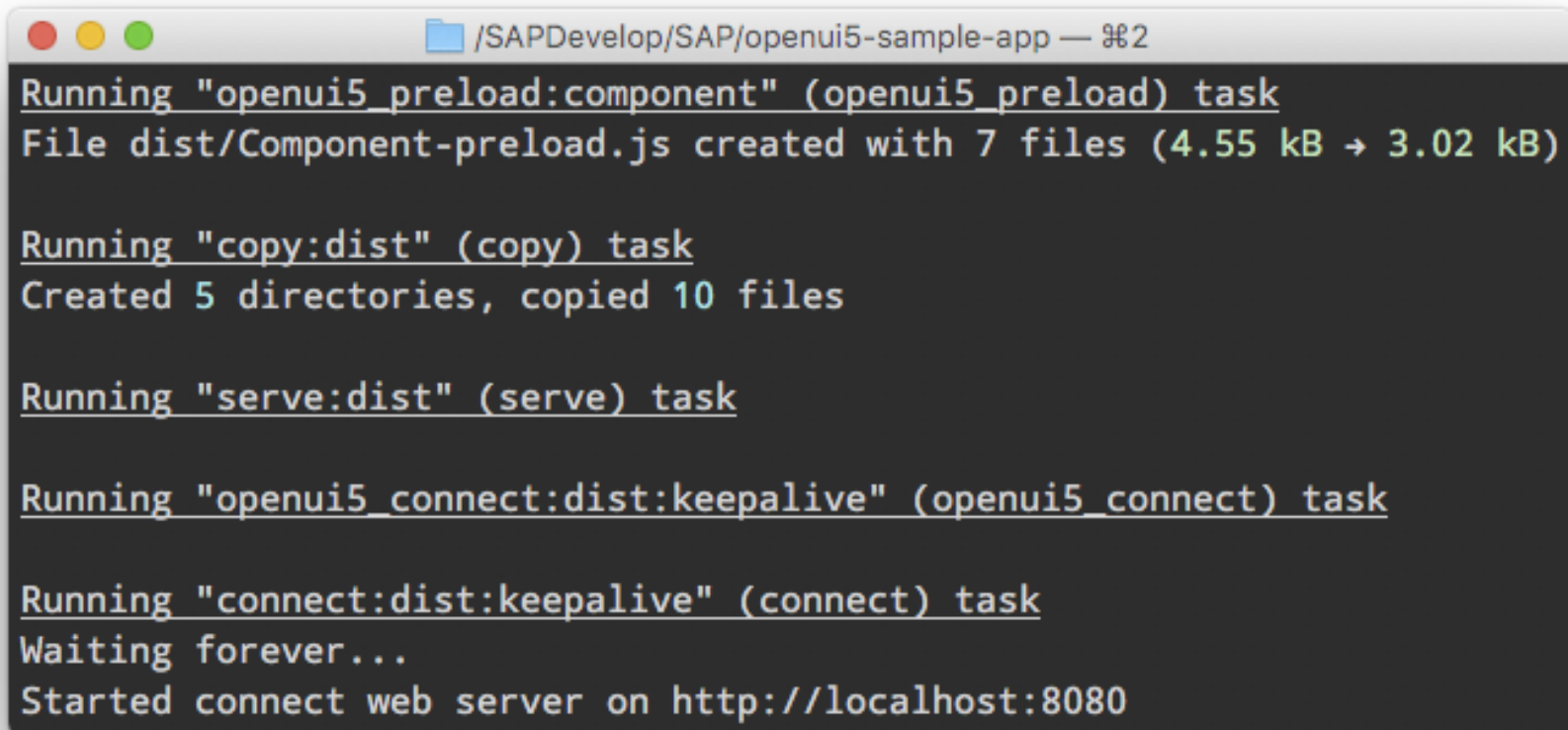
Warning: Task "karma:ci" failed. Use --force to continue.

Aborted due to warnings.
```

Local development server

Preload bundling

Theme build



```
/SAPDevelop/SAP/openui5-sample-app — 2
Running "openui5_preload:component" (openui5_preload) task
File dist/Component-preload.js created with 7 files (4.55 kB → 3.02 kB)

Running "copy:dist" (copy) task
Created 5 directories, copied 10 files

Running "serve:dist" (serve) task

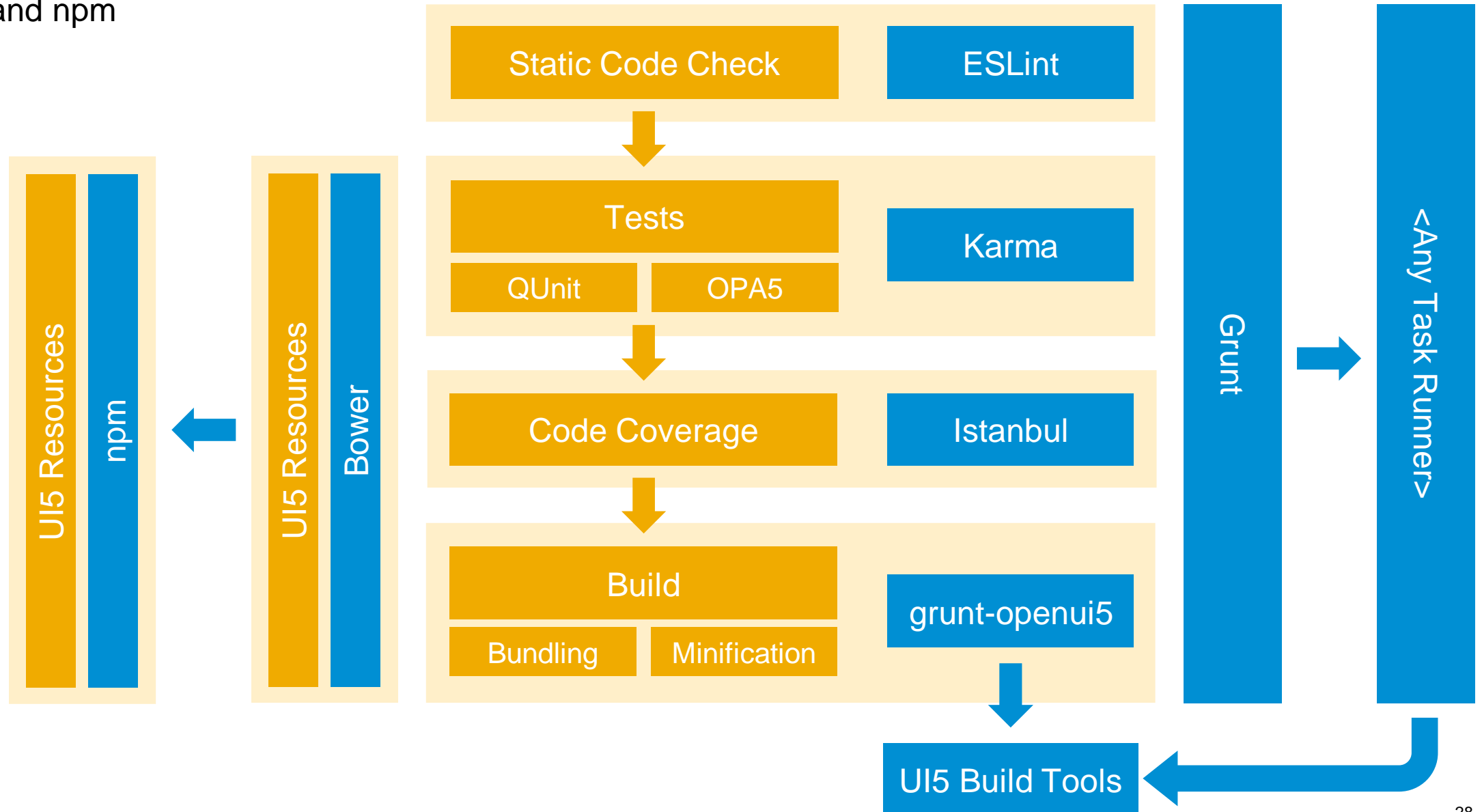
Running "openui5_connect:dist:keepalive" (openui5_connect) task

Running "connect:dist:keepalive" (connect) task
Waiting forever...
Started connect web server on http://localhost:8080
```

Demo: Continuous Integration in Action

Outlook: UI5 evolution build tooling

Node.js and npm



Thank you.

Contact information:

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Find the application at:
<https://github.com/SAP/openui5-sample-app>



You are welcome to give feedback for this session
in the UI5con Event App

