Realistic integration testing with Testcontainers

CHRIS ORTNER

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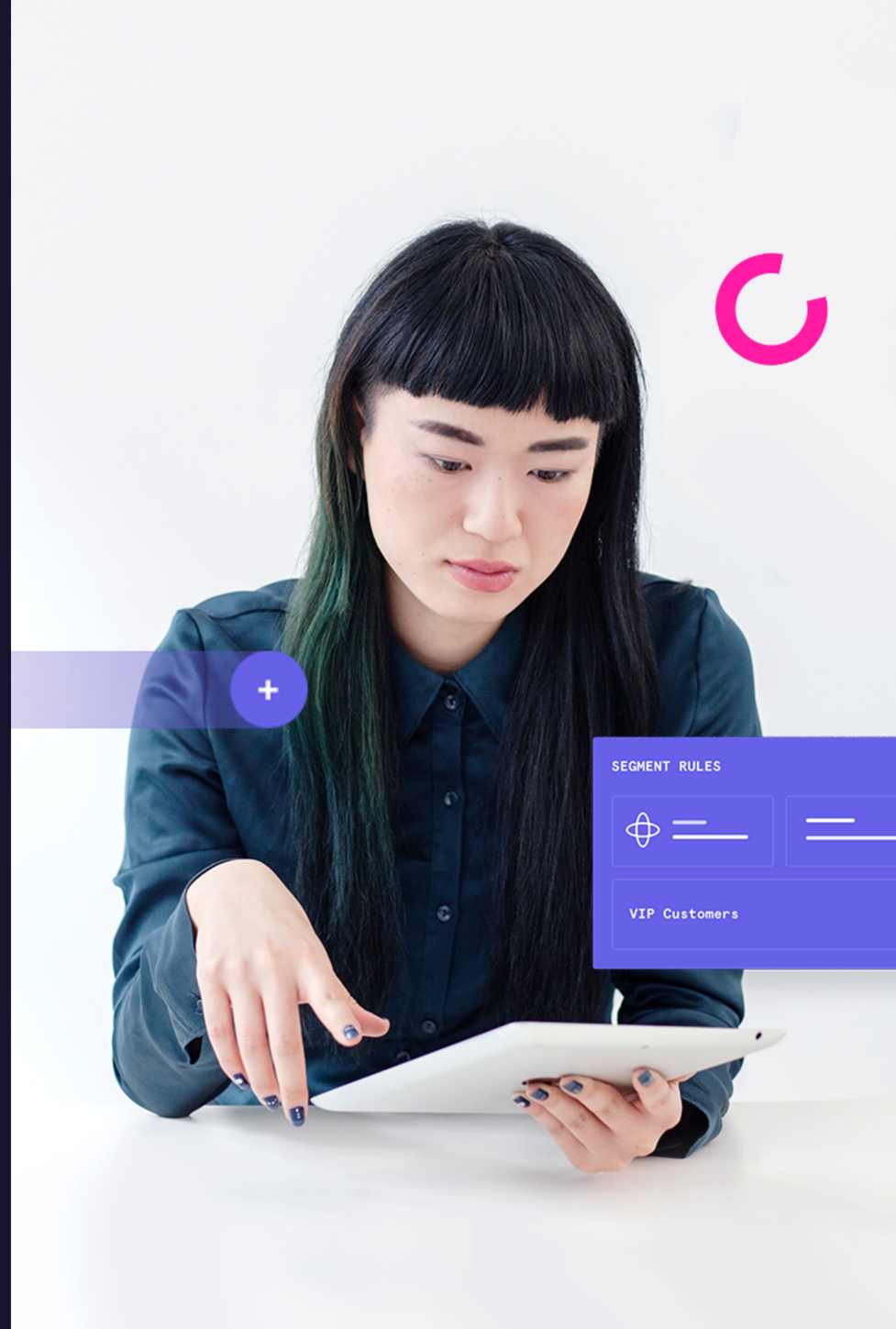

Agenda

1. What is integration testing?
2. How do Testcontainers work?
3. Testcontainers in action
4. Testcontainers in the wild
5. Burgers

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About me

CHRIS ORTNER

SENIOR SOFTWARE ENGINEER

github.com/howard

Scala, Kotlin, TypeScript, PHP...

Cycling, swimming, tinkering, analog/digital gaming

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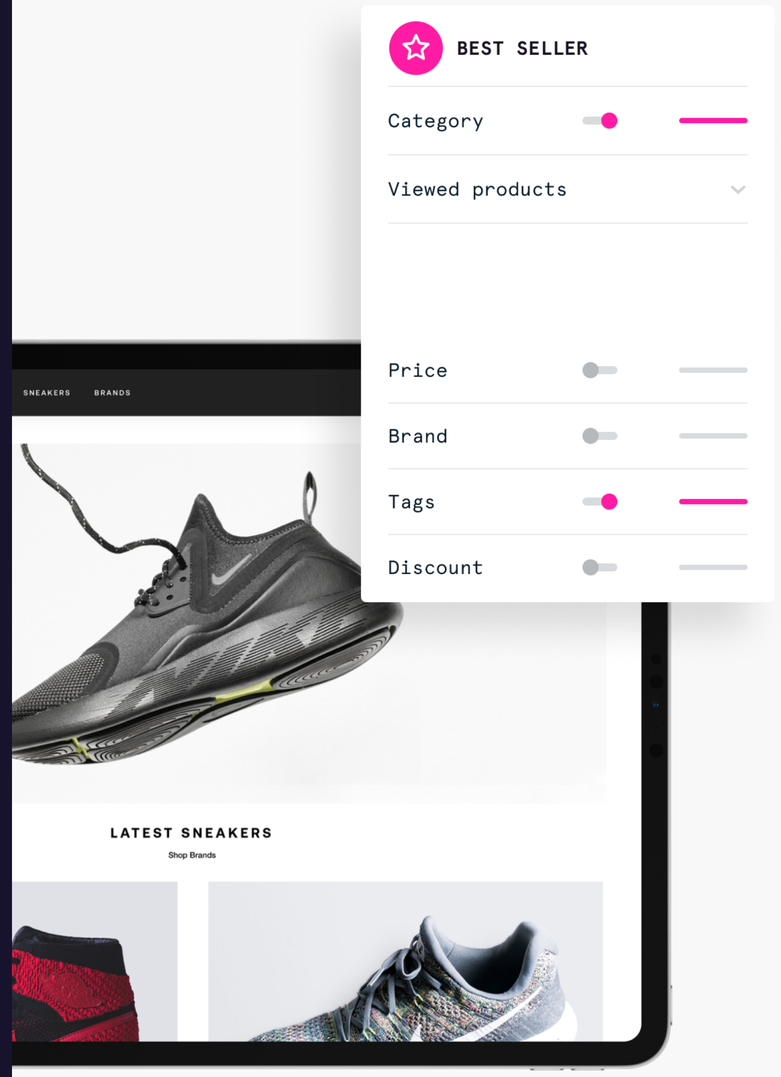
What is integration testing?



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“Testing can only prove the presence of bugs, not their absence.”

– EDSGER W. DIJKSTRA

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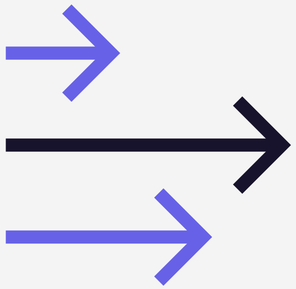
Why test?

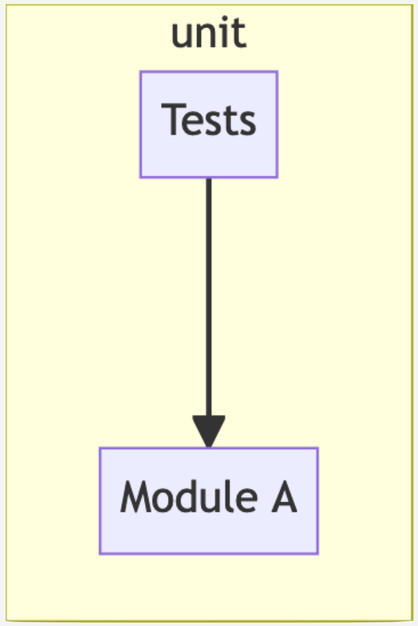
SAFETY

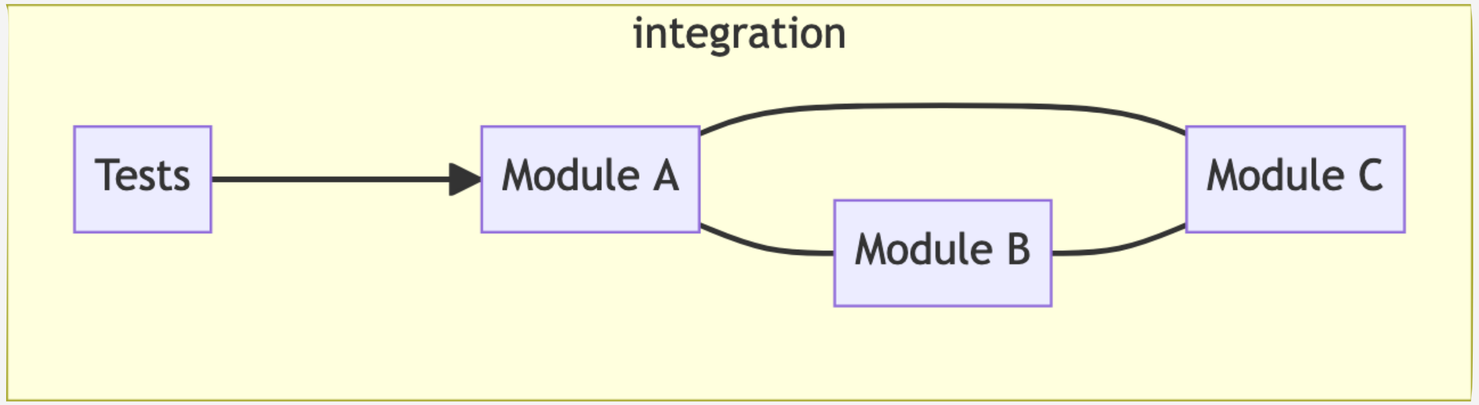


RAPID PROTOTYPING

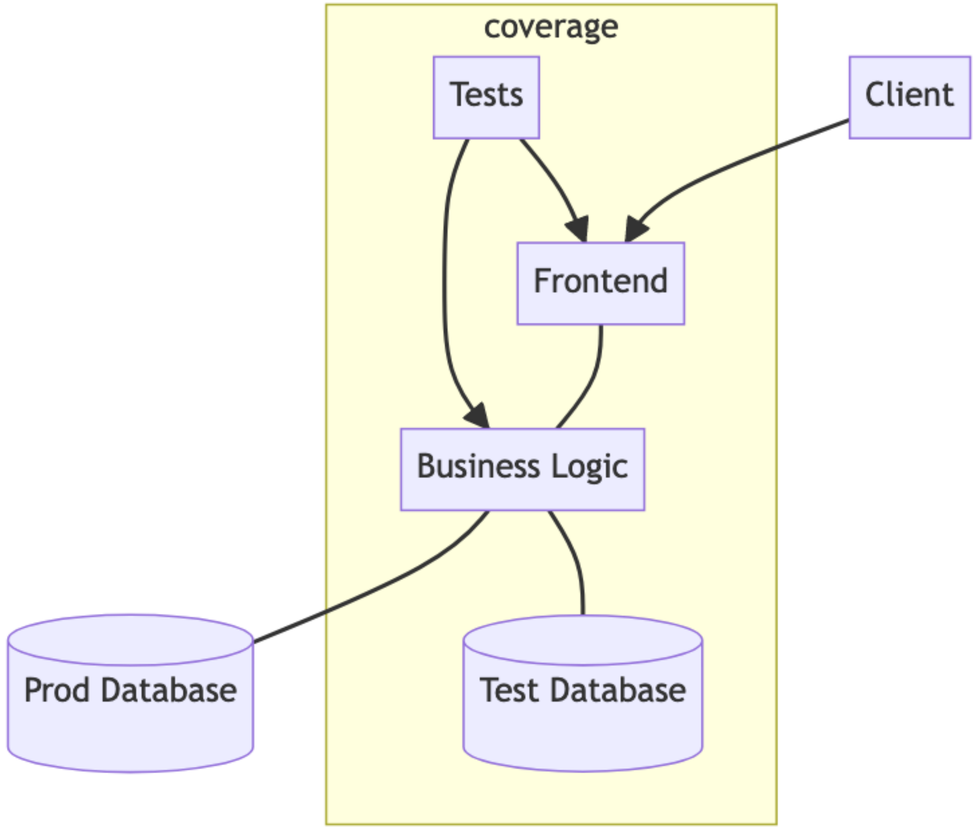
ANSWERING QUESTIONS

Unit test vs. Integration test

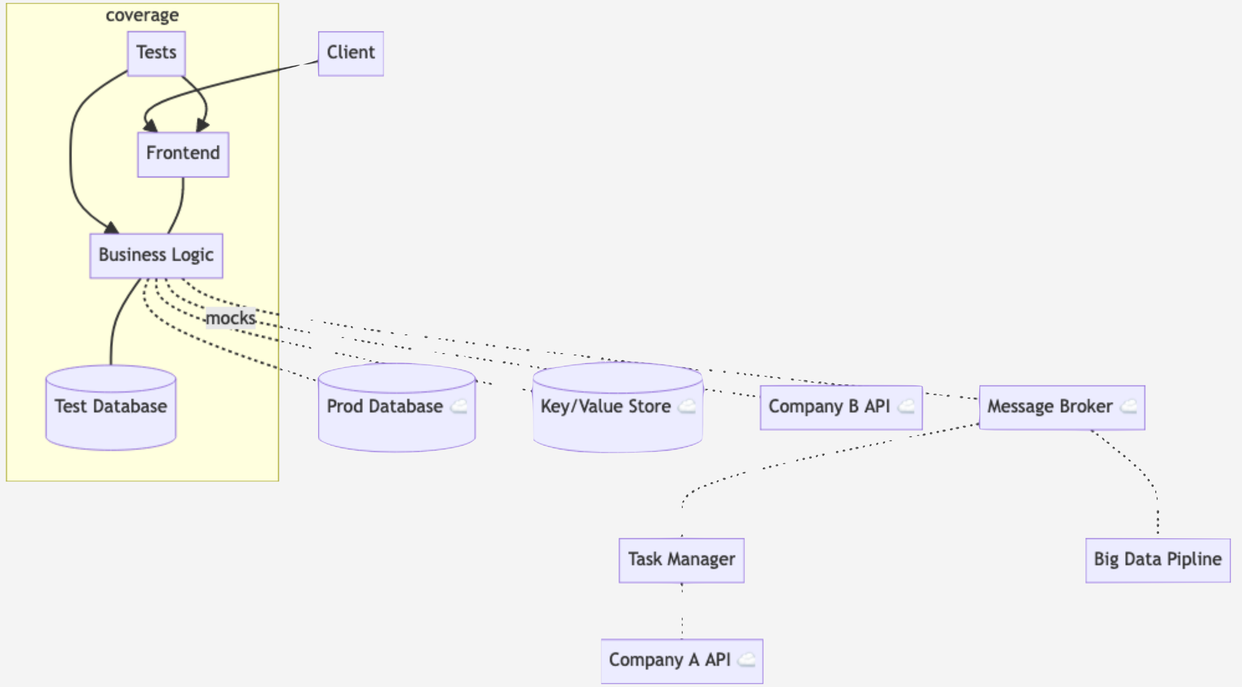




Traditional monolith



2023



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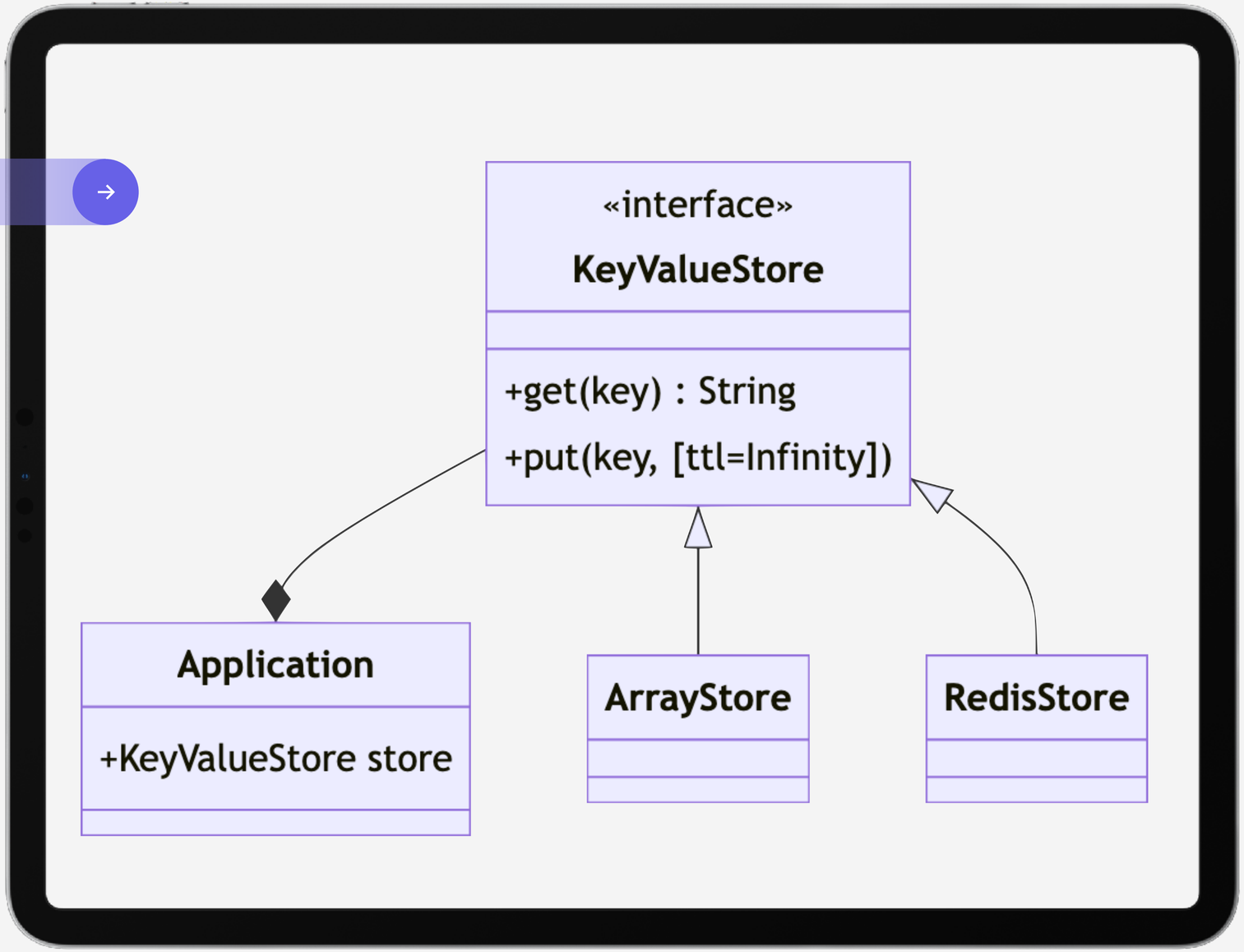
Mocks

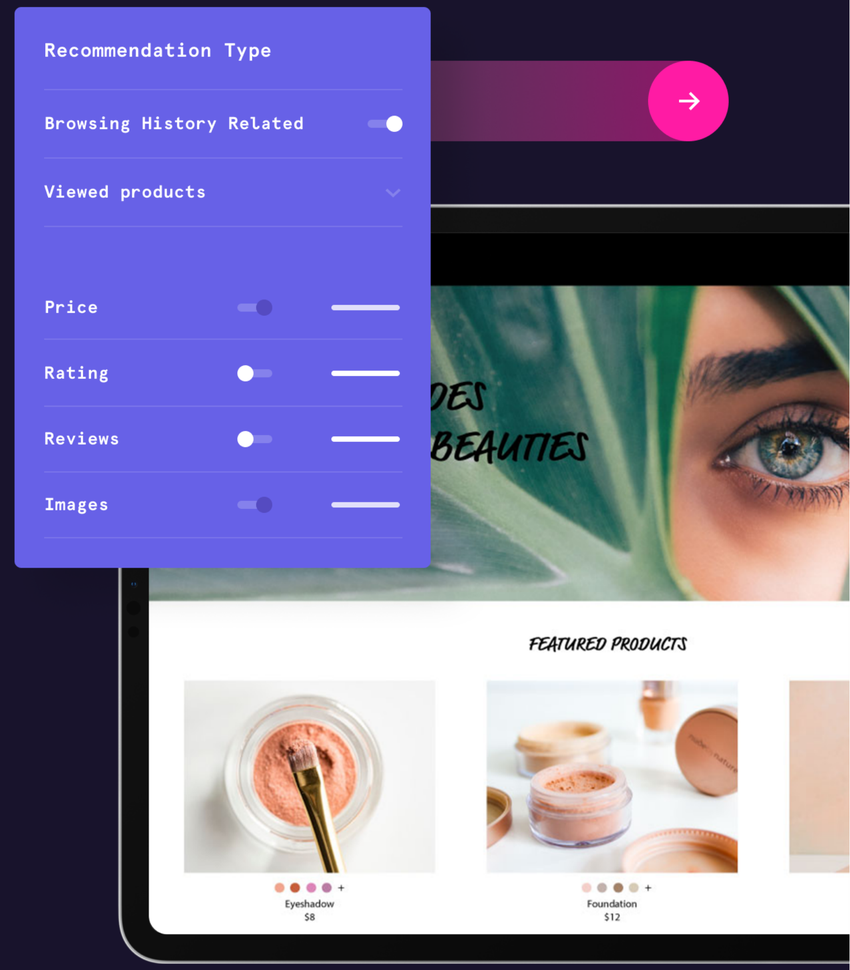
Via Dependency Injection

Other possibilities:

- Module mocks
- Monkey patching
- Code injection
- Spies



How do Testcontainers work?



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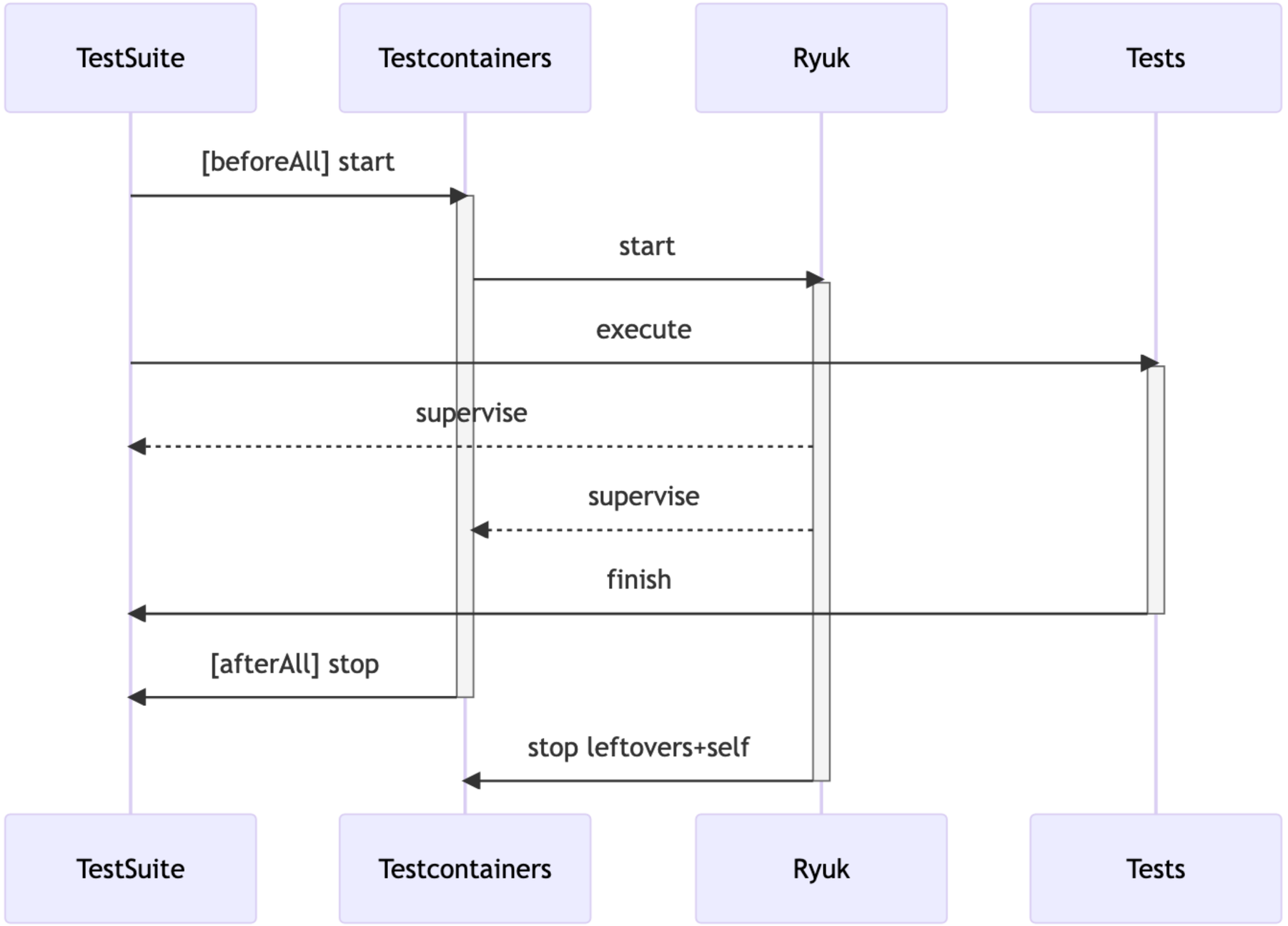
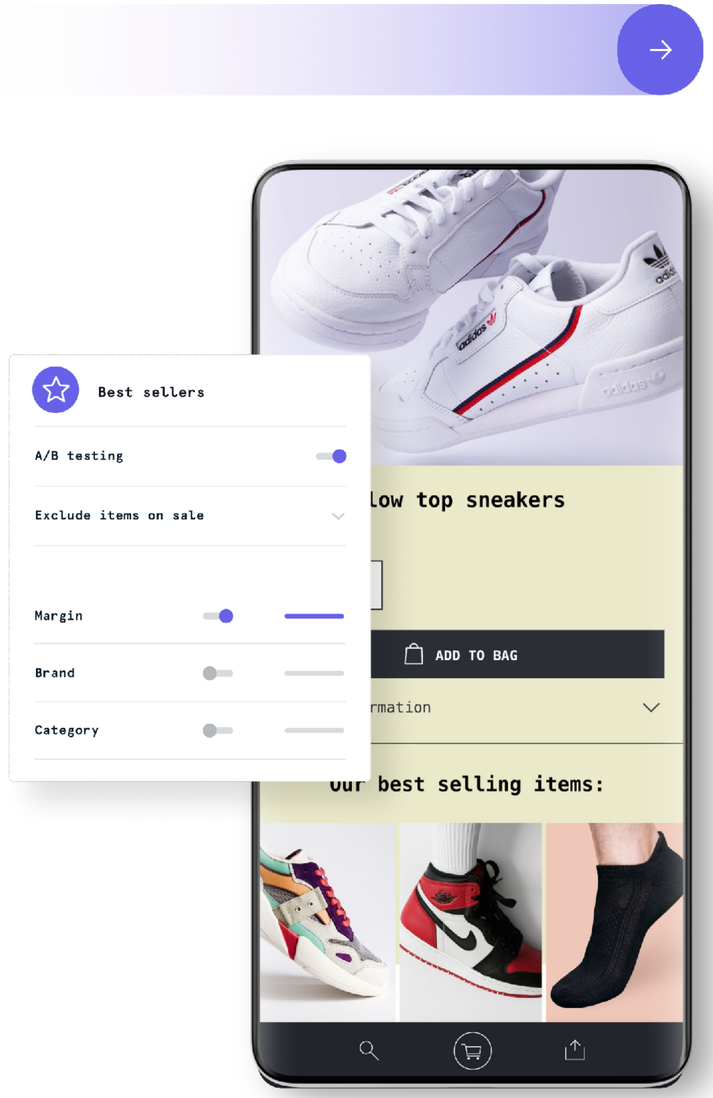

TestSuite
Testcontainers
Ryuk
Tests
[beforeAll] start
start
execute
supervise
supervise
finish
[afterAll] stop
stop leftovers+self
TestSuite
Testcontainers
Ryuk
Tests

Testcontainers in action



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Demo application

Simple Express API for counting terms.

`GET /` (list all terms and counts)

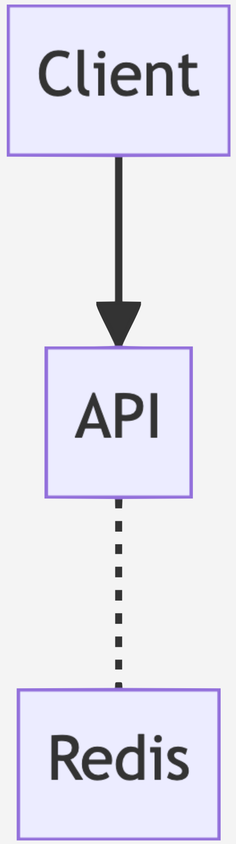
`GET /:term` (list count for this term)

`POST /:term` (increment count for this term)

Example:

```
curl -LX GET mustnot.work/meetup
curl -LX POST mustnot.work/meetup
```

github.com/howard/testcontainers-demo



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Testcontainers in the wild

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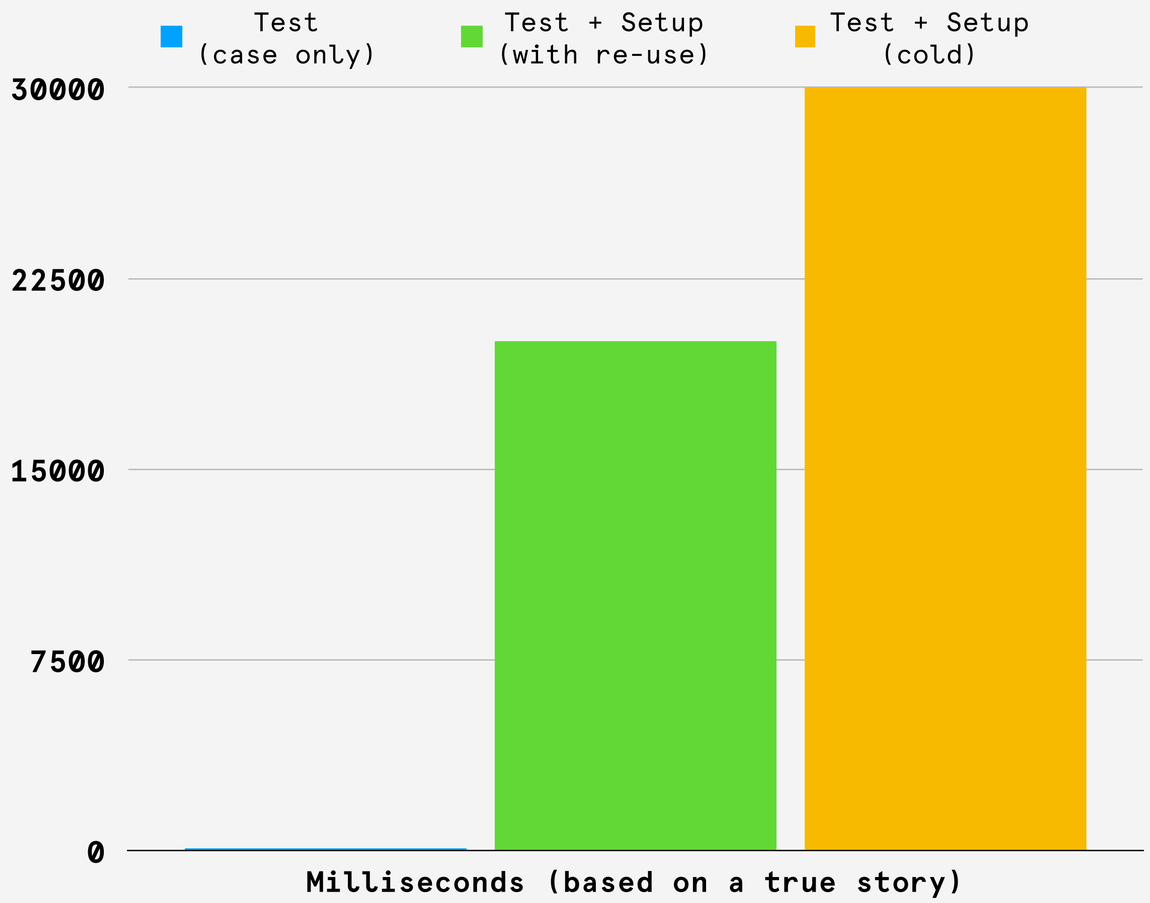
Speed

- Can be really bad, if not careful
- Beware of:
  - Image builds
  - Bad wait strategies
  - Heavy images
- Mitigate with re-use, in `~/.testcontainers.properties`: `testcontainers.reuse.enable=true`



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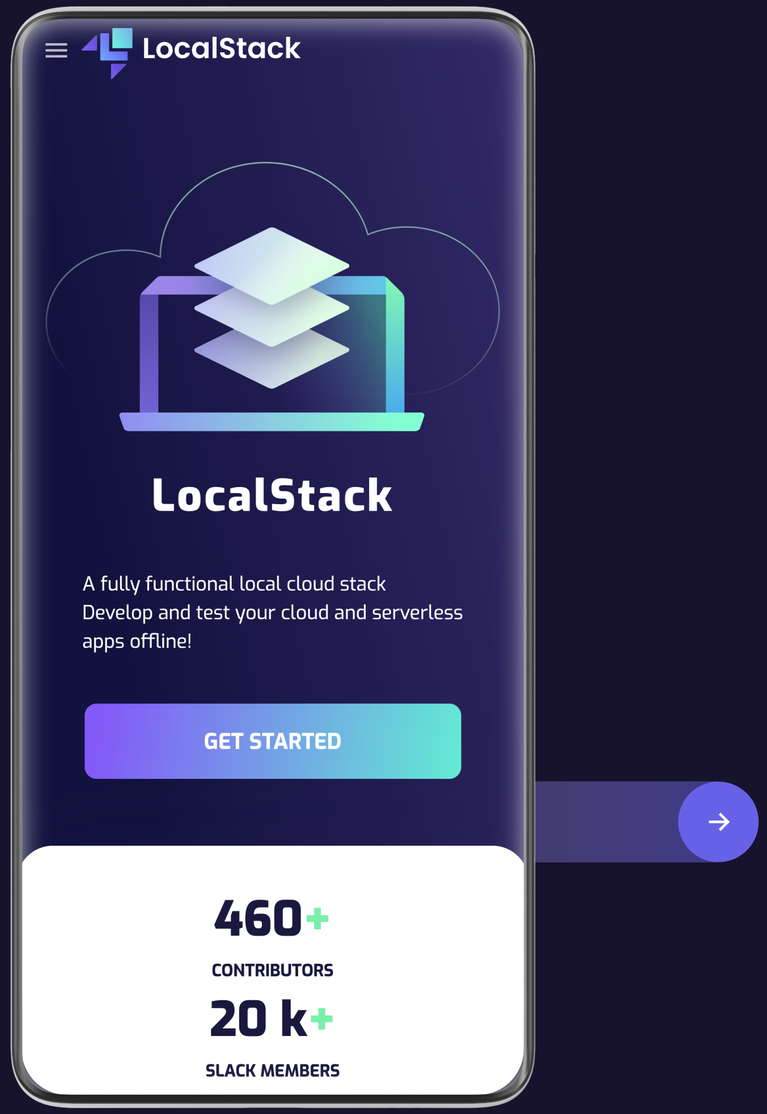
Cloud

LocalStack emulates AWS.

- S3
- EC2
- Kinesis
- ...

Also available:

- Azure
- Google Cloud
- Kafka
- Many more



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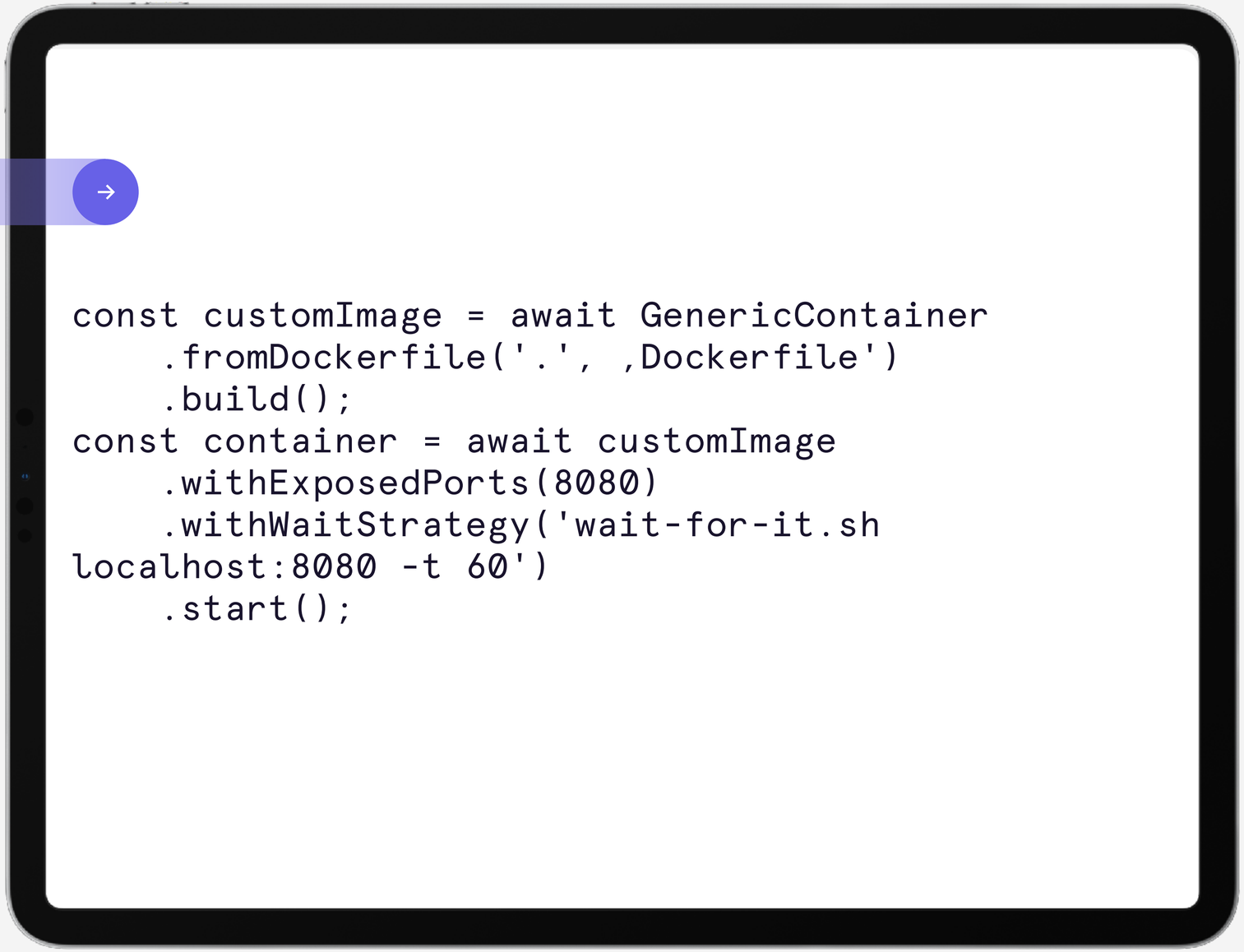
Your own images

Very easy.

Good wait strategy critical for stable tests.



```
const customImage = await GenericContainer
    .fromDockerfile('.', ,Dockerfile')
    .build();
const container = await customImage
    .withExposedPorts(8080)
    .withWaitStrategy('wait-for-it.sh
localhost:8080 -t 60')
    .start();
```

Thank you!

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