

Richtige Integration- Tests mit Testcontainern

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#BaselOne18



Developer 🥑

Tests

UNIT TEST?



IT COMPILED: PASS

A close-up photograph of a baby with light brown hair and blue eyes, wearing a green and white shirt. The baby has a sad, pouting expression and is holding a small clump of sand in their right hand. The background is a blurred outdoor setting, possibly a beach. The text "UNIT TEST" is overlaid in large, white, bold, sans-serif font with a black outline at the top of the image.

UNIT TEST

WORK

Please do not turn off
the light switch.

It also operates the
elevator.

Thank You

**But the unit tests
passed, so...**

**[https://twitter.com/Aaronius/status/
933497253347463168](https://twitter.com/Aaronius/status/933497253347463168)**





via reddit.com/r/programmerhumor







Integration Tests

Mocks

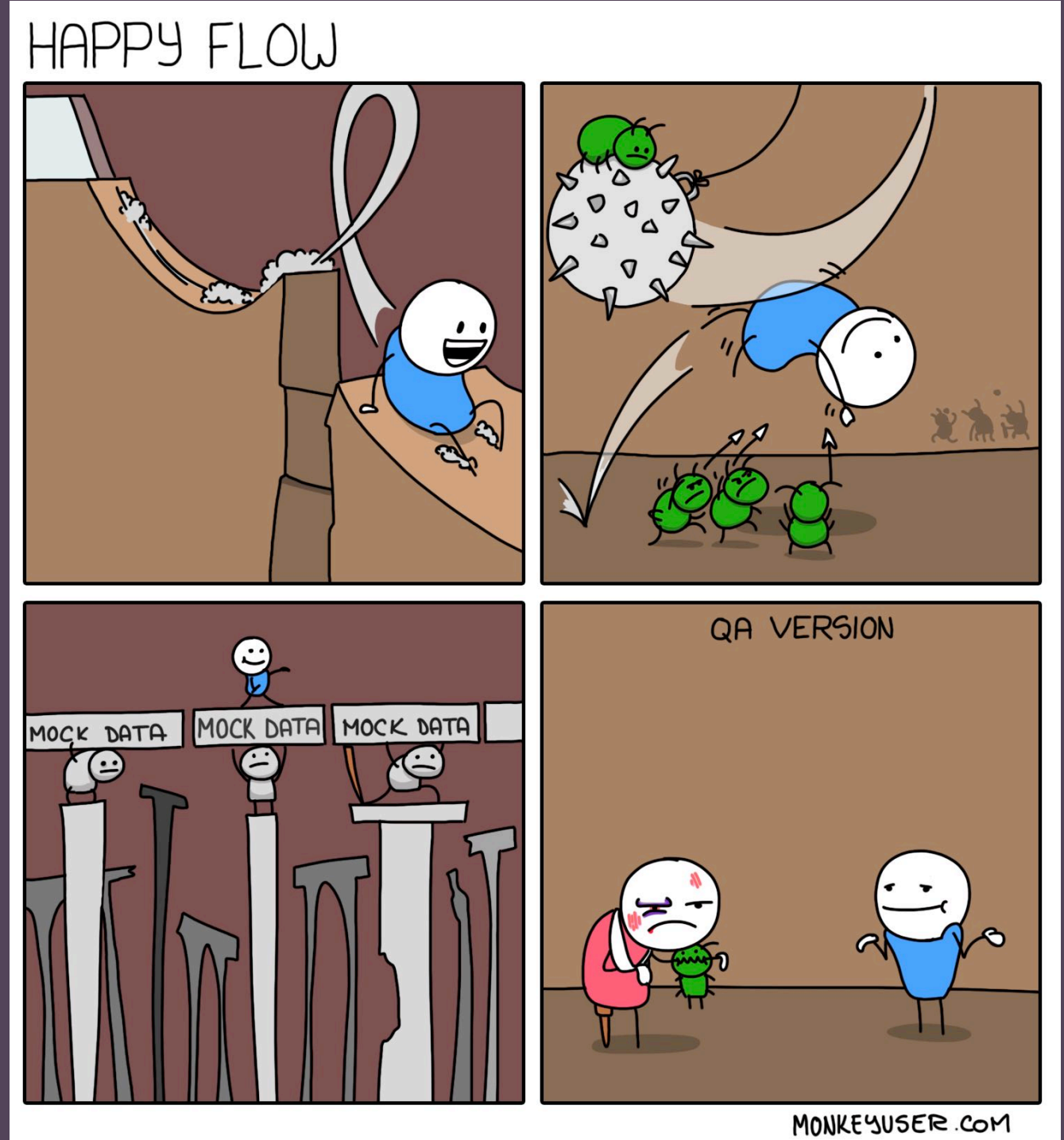
**Mockito, EasyMock,
JMock,...**



A woman with long, wavy red hair styled in two pigtails is shown from the chest up. She is holding a small, fluffy dog with grey and white fur. The background is a soft, out-of-focus grey. The text is overlaid in a bold, white, sans-serif font.

**Ich mock mir die Welt
widdewidde wie sie mir
gefällt**

<https://www.monkeyuser.com/2018/happy-flow/>





**Unit tests, systems not
under your control**



Test real datastore

In-Memory

**H2, HSQLDB, Apache
Derby,...**



same

Embedded Elasticsearch unsupported in 5.0+

<https://www.elastic.co/blog/elasticsearch-the-server>



Often good enough



**Test real datastore,
supported systems**

Actual Datastore

Local installation

Docker container

Cloud

Demo



"Good old approach"



**External dependency,
parallelization**

Embedded

embedded-elasticsearch

<https://github.com/allegro/embedded-elasticsearch>

Demo

Customization & Mappings

```
.withPlugin("analysis-stempel")  
.withIndex("cars", IndexSettings.builder()  
    .withType("car", getSystemResourceAsStream("car-mapping.json"))
```

 **IDE support,
customization, custom
lifecycle**

 **Custom integration**

More embedded datastores

[https://github.com/flapdoodle-oss/
de.flapdoodle.embed.process](https://github.com/flapdoodle-oss/de.flapdoodle.embed.process)

Build Tool

docker-maven-plugin

<http://dmp.fabric8.io>

Dockerfile or Docker assembly

```
<build>  
  <from>java:8</from>  
  <assembly>  
    <descriptor>docker-assembly.xml</descriptor>  
  </assembly>  
  <cmd>  
    <shell>java -jar /maven/service.jar</shell>  
  </cmd>  
</build>
```

Build a custom image:

`docker:build`

Run container:

`docker:start`

`docker:stop`

Demo

maven-failsafe-plugin

<https://maven.apache.org/surefire/maven-failsafe-plugin/>

 **Standard or custom
Docker image**

 **One instance for all
tests, no IDE support**

Testcontainers

Dependency

```
@ClassRule
public static GenericContainer redis =
    new GenericContainer("redis:3.0.2")
        .withExposedPorts(6379);
```

Docker Compose integration

```
@ClassRule
public static DockerComposeContainer environment =
    new DockerComposeContainer(new File("src/test/resources/compose.yml"))
        .withExposedService("elasticsearch_1", ELASTICSEARCH_PORT,
            Wait.forHttp("/").forStatusCode(200));
```

Demo

 **IDE support,
customization, custom
lifecycle**

 **Hacky configuration**

Cleanup: Moby Ryuk

<https://github.com/testcontainers/moby-ryuk>

[Ryuk] drops a Death Note, a notebook that allows the user to kill anyone simply by knowing their name and face

[https://en.wikipedia.org/wiki/Ryuk_\(Death_Note\)](https://en.wikipedia.org/wiki/Ryuk_(Death_Note))



✕ 🔍

Group ID	Artifact ID	Latest Version	Updated	Download
org.testcontainers	vault	1.8.3 (11)	Aug 5, 2018	
org.testcontainers	testcontainers	1.8.3 (39)	Aug 5, 2018	
org.testcontainers	spock	1.8.3 (8)	Aug 5, 2018	
org.testcontainers	selenium	1.8.3 (39)	Aug 5, 2018	
org.testcontainers	postgresql	1.8.3 (39)	Aug 5, 2018	
org.testcontainers	pulsar	1.8.3 (4)	Aug 5, 2018	
org.testcontainers	oracle-xe	1.8.3 (31)	Aug 5, 2018	
org.testcontainers	nginx	1.8.3 (39)	Aug 5, 2018	
org.testcontainers	mysql	1.8.3 (39)	Aug 5, 2018	
org.testcontainers	mockserver	1.8.3 (5)	Aug 5, 2018	
org.testcontainers	...	1.8.3 (11)	Aug 5, 2018	

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testcontainers-java- module-elasticsearch

[https://github.com/dadoonet/testcontainers-java-module-
elasticsearch](https://github.com/dadoonet/testcontainers-java-module-elasticsearch)

Work in progress

<https://github.com/testcontainers/testcontainers-java/pull/826>

Set (randomized) port

Demo

More languages

Scala, Go, .net*, Python*, JavaScript*, Rust*

* Early development



Selenium 2 / Webdriver

VNC screen recording

 **IDE support,
customization, custom
lifecycle**

 **Custom integration**



ALL HOURS 0409 283 454

ALL HOURS 0409 283 454

WISSEKAMP TOWING

Docker in Docker

Or sidecar


```
$ docker run -it
  --rm
  -v $PWD:$PWD
  -w $PWD
  -v /var/run/docker.sock:/var/run/docker.sock
  maven:3 mvn --projects parent,4_testcontainers-custom test
```

```
$ docker ps -a
```

Conclusion

Why Integration Tests

**Why not
Mocking
In-Memory
Actual Datastore**

How
Embedded
Build Tool
Testcontainers

Code

<https://github.com/xeraa/integration-test-demo>

Questions?

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