SPRING FOR ARCHITECTURALLY CURIOUS DEVELOPERS

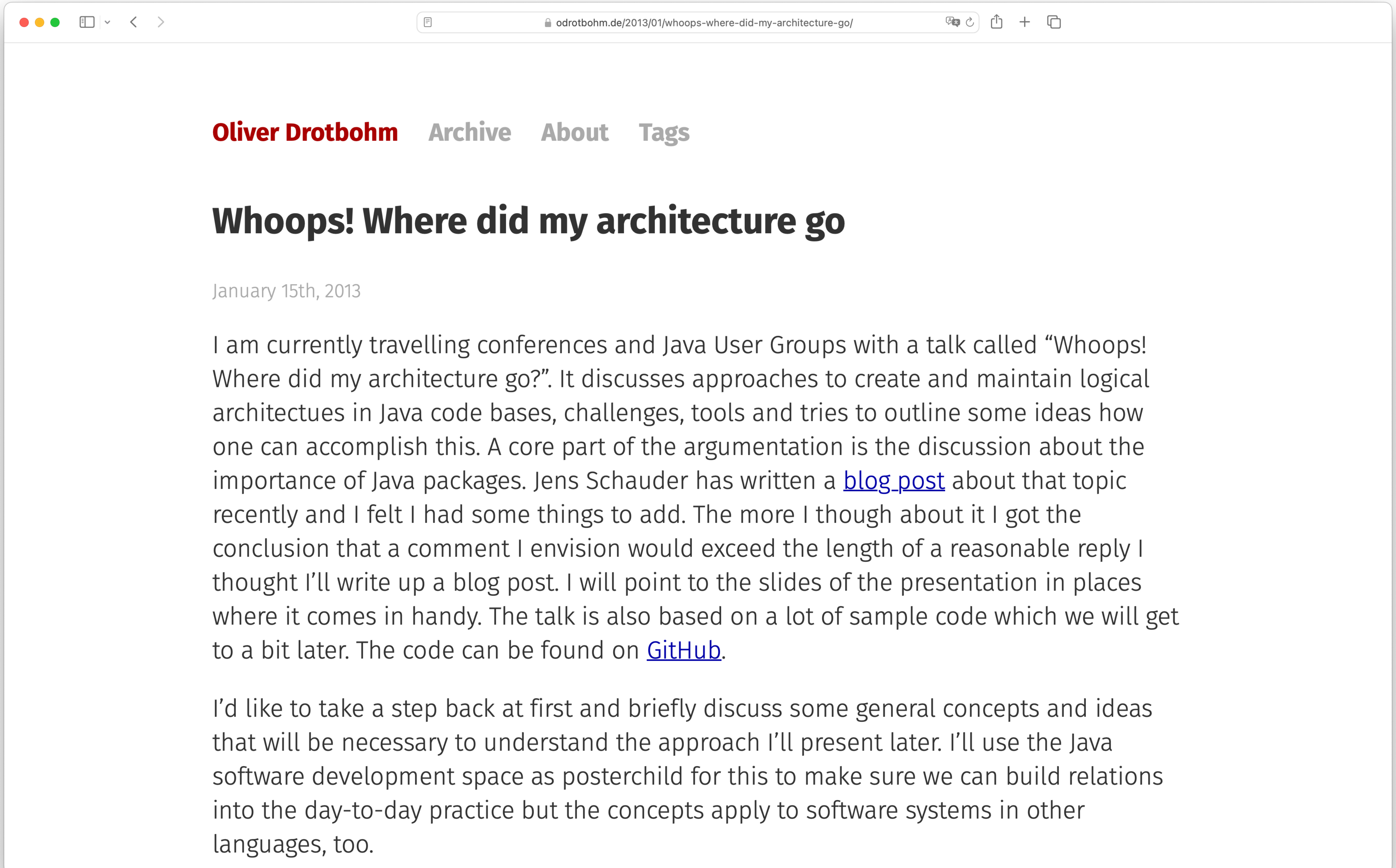
…whirlwind edition.

Oliver Drotbohm / odrotbohm odrotbohm@vmware.com

10 years ago...

10 years ago...

10 years ago...



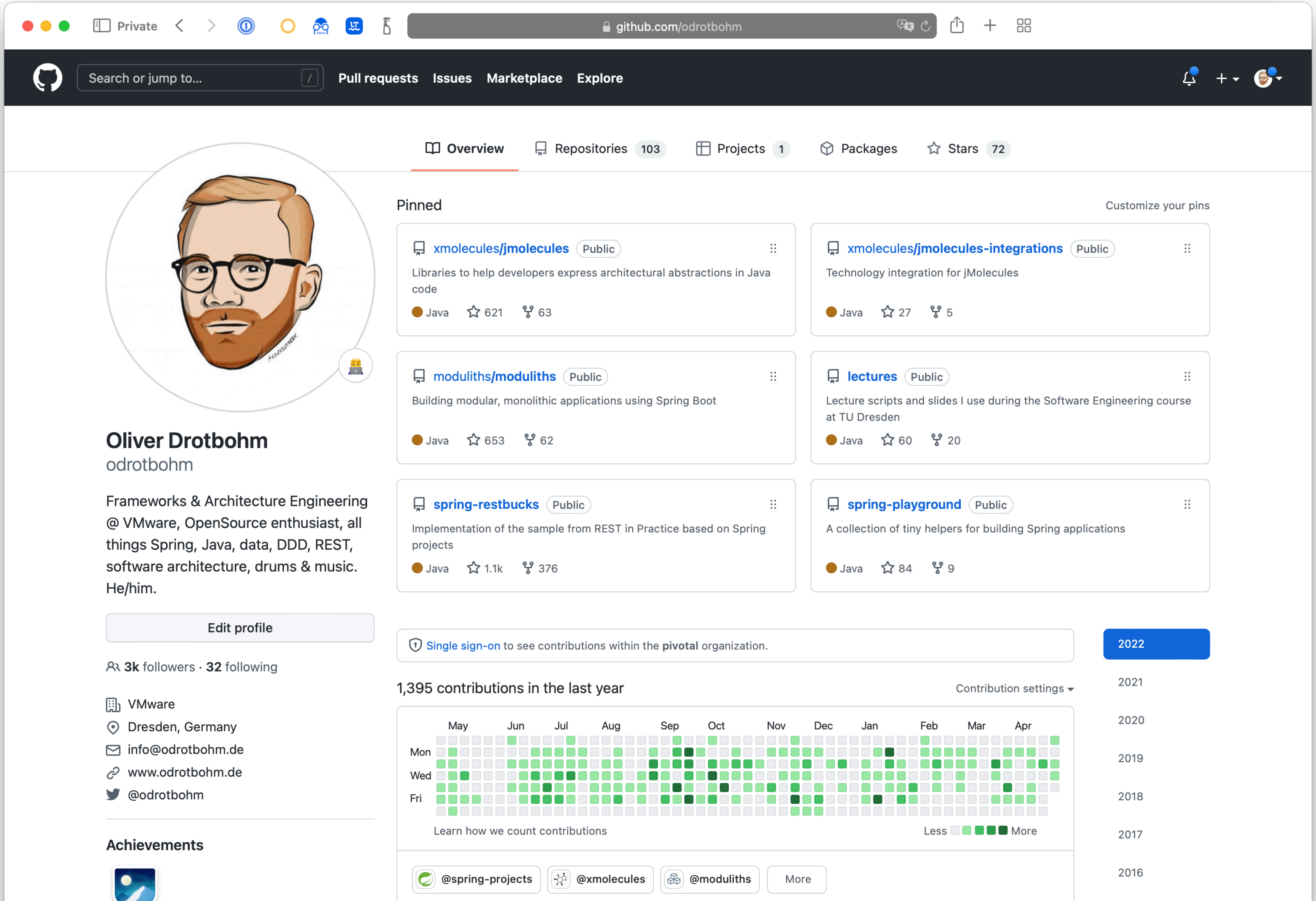
Oliver Drotbohm Archive About Tags

Whoops! Where did my architecture go

January 15th, 2013

I am currently travelling conferences and Java User Groups with a talk called “Whoops! Where did my architecture go?”. It discusses approaches to create and maintain logical architectues in Java code bases, challenges, tools and tries to outline some ideas how one can accomplish this. A core part of the argumentation is the discussion about the importance of Java packages. Jens Schauder has written a blog post about that topic recently and I felt I had some things to add. The more I though about it I got the conclusion that a comment I envision would exceed the length of a reasonable reply I thought I’ll write up a blog post. I will point to the slides of the presentation in places where it comes in handy. The talk is also based on a lot of sample code which we will get to a bit later. The code can be found on GitHub.

I’d like to take a step back at first and briefly discuss some general concepts and ideas that will be necessary to understand the approach I’ll present later. I’ll use the Java software development space as posterchild for this to make sure we can build relations into the day-to-day practice but the concepts apply to software systems in other languages, too.



Oliver Drotbohm
odrotbohm

Frameworks & Architecture Engineering @ VMware, OpenSource enthusiast, all things Spring, Java, data, DDD, REST, software architecture, drums & music. He/him.

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1,395 contributions in the last year

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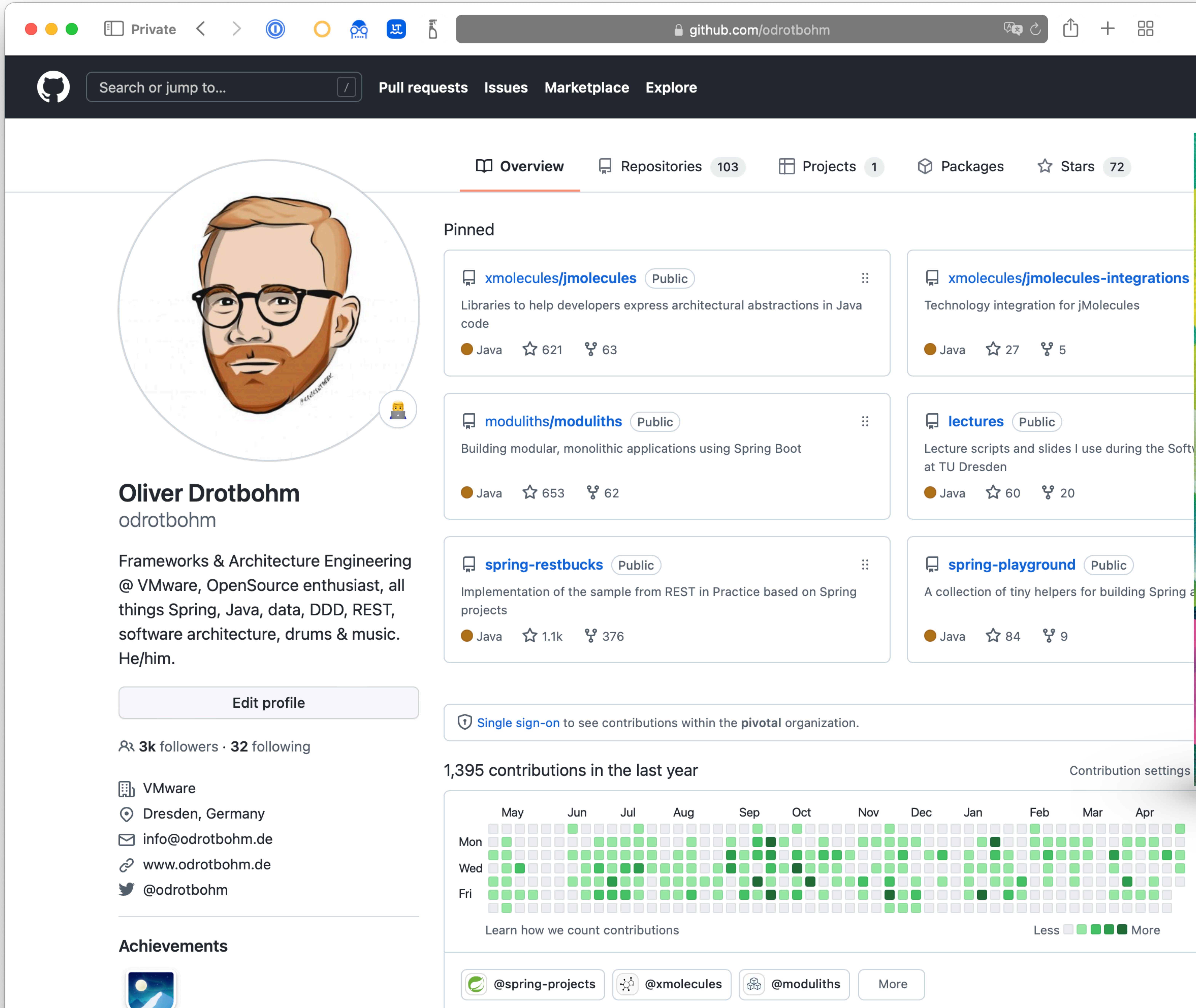

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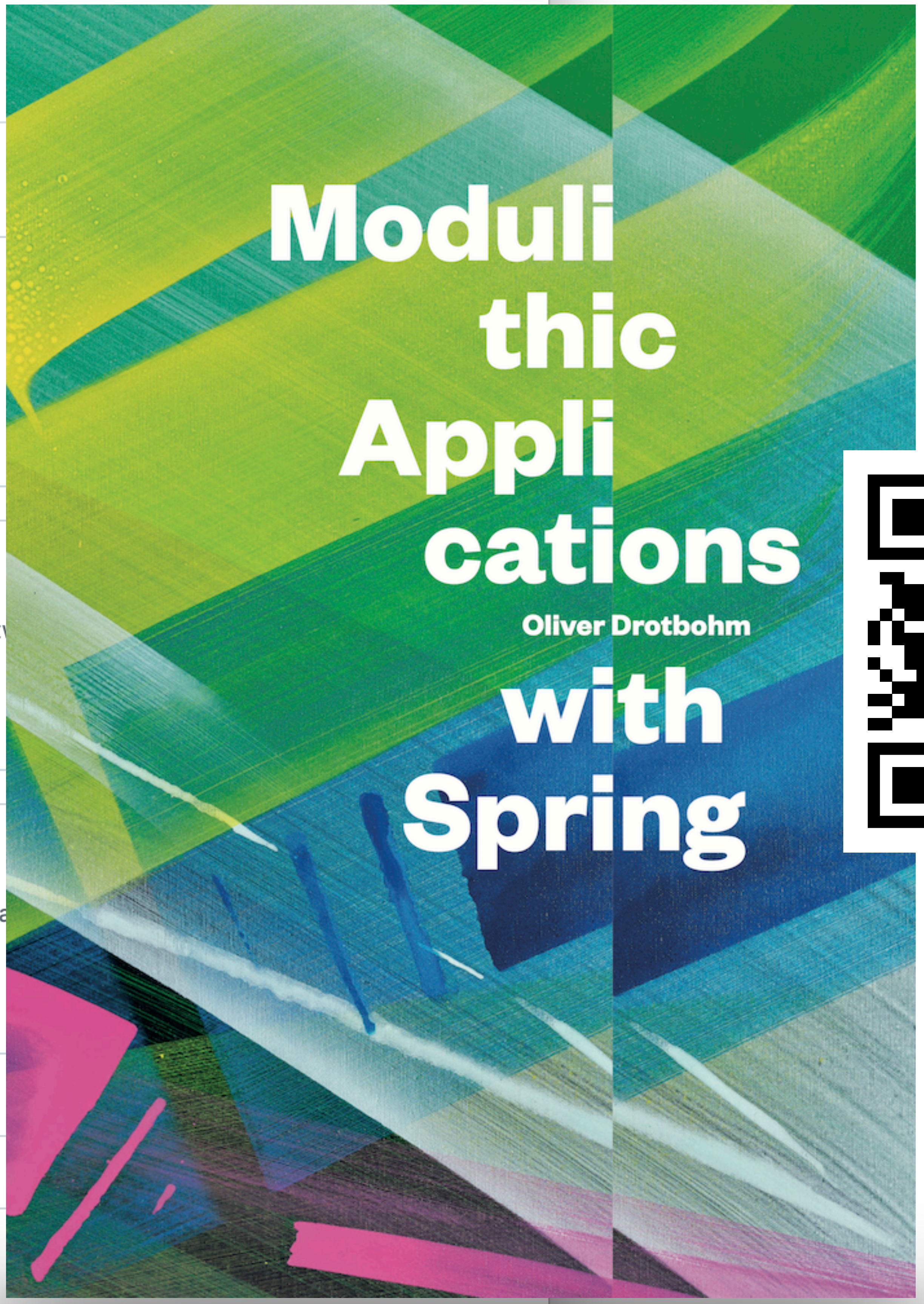
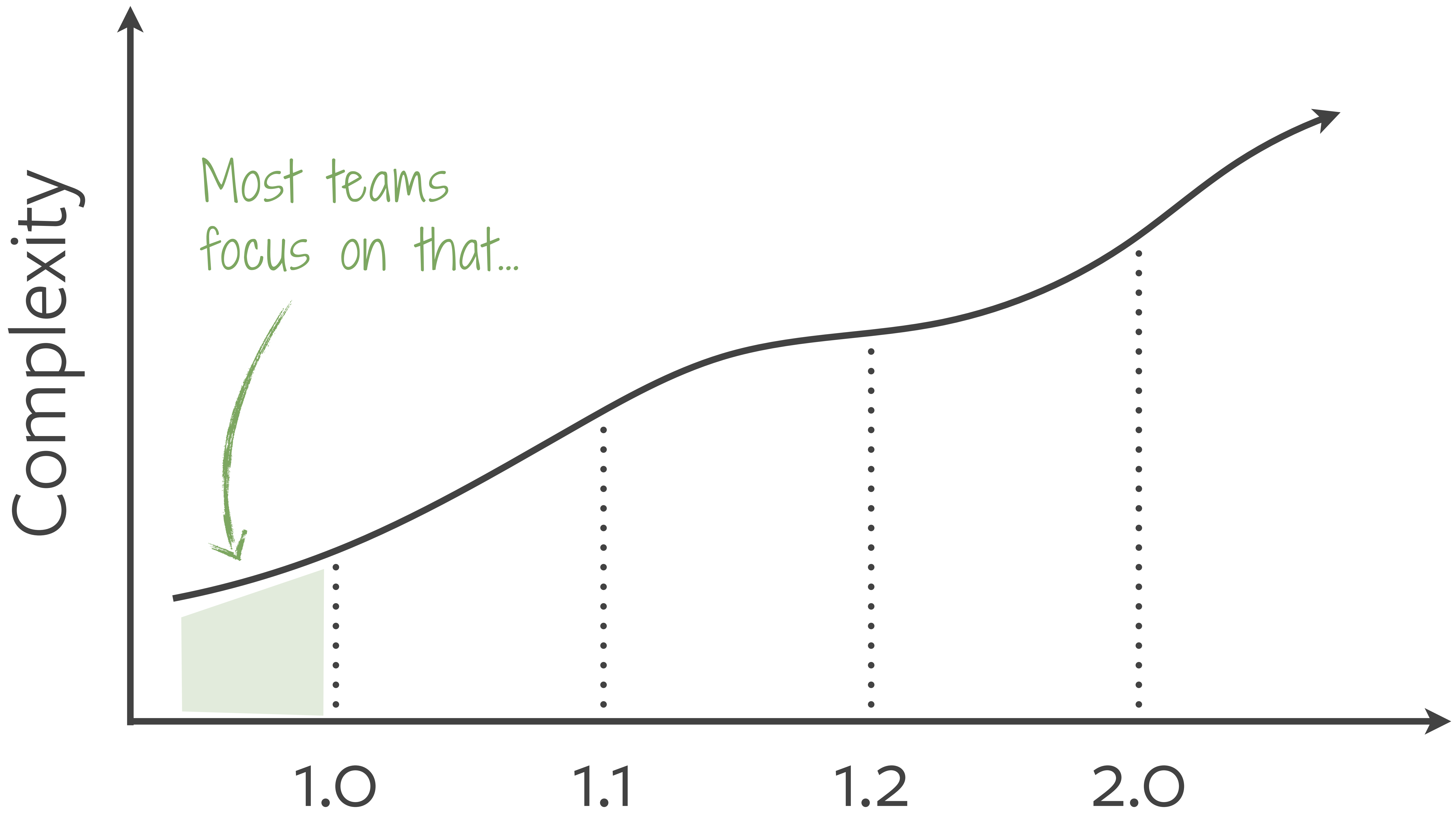
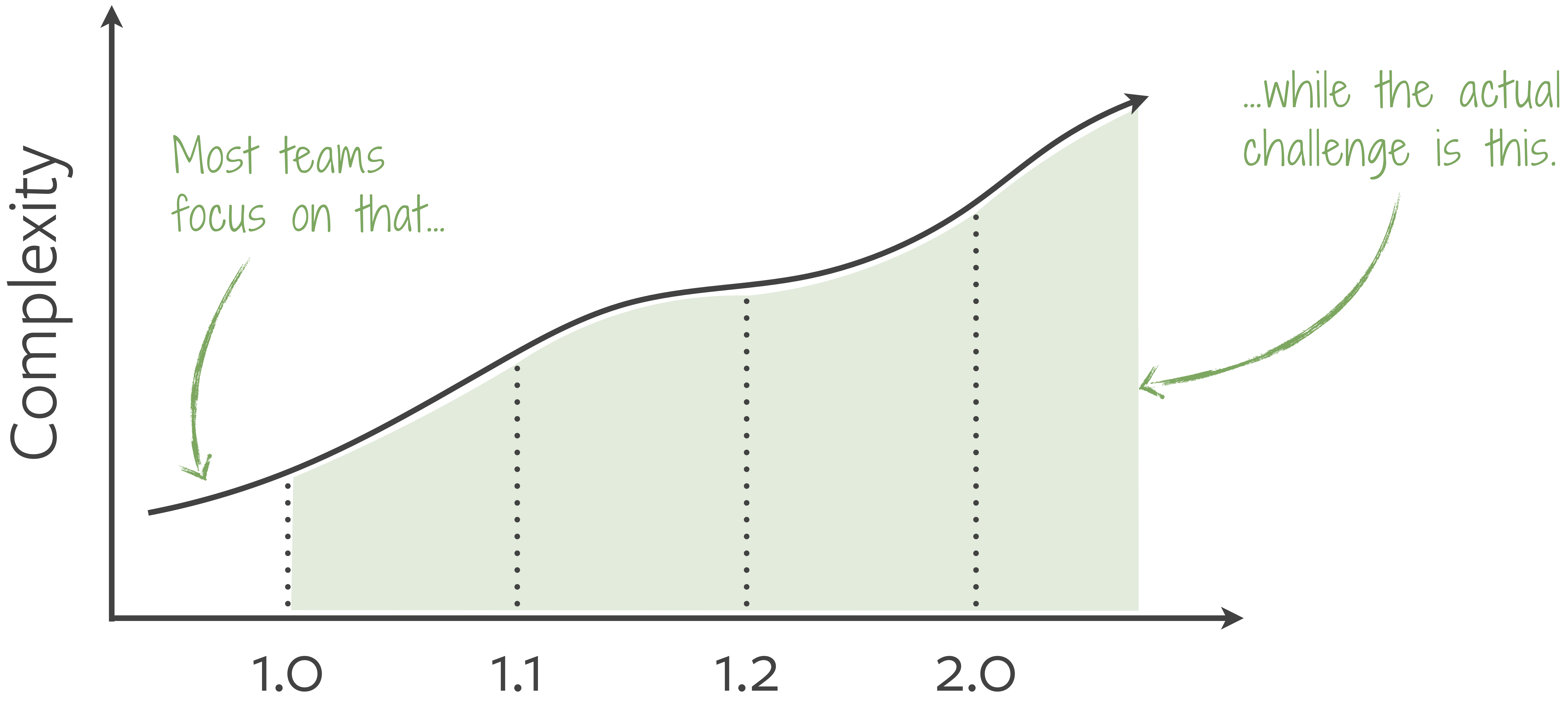


Coming in 2023…

Follow @mawspring on

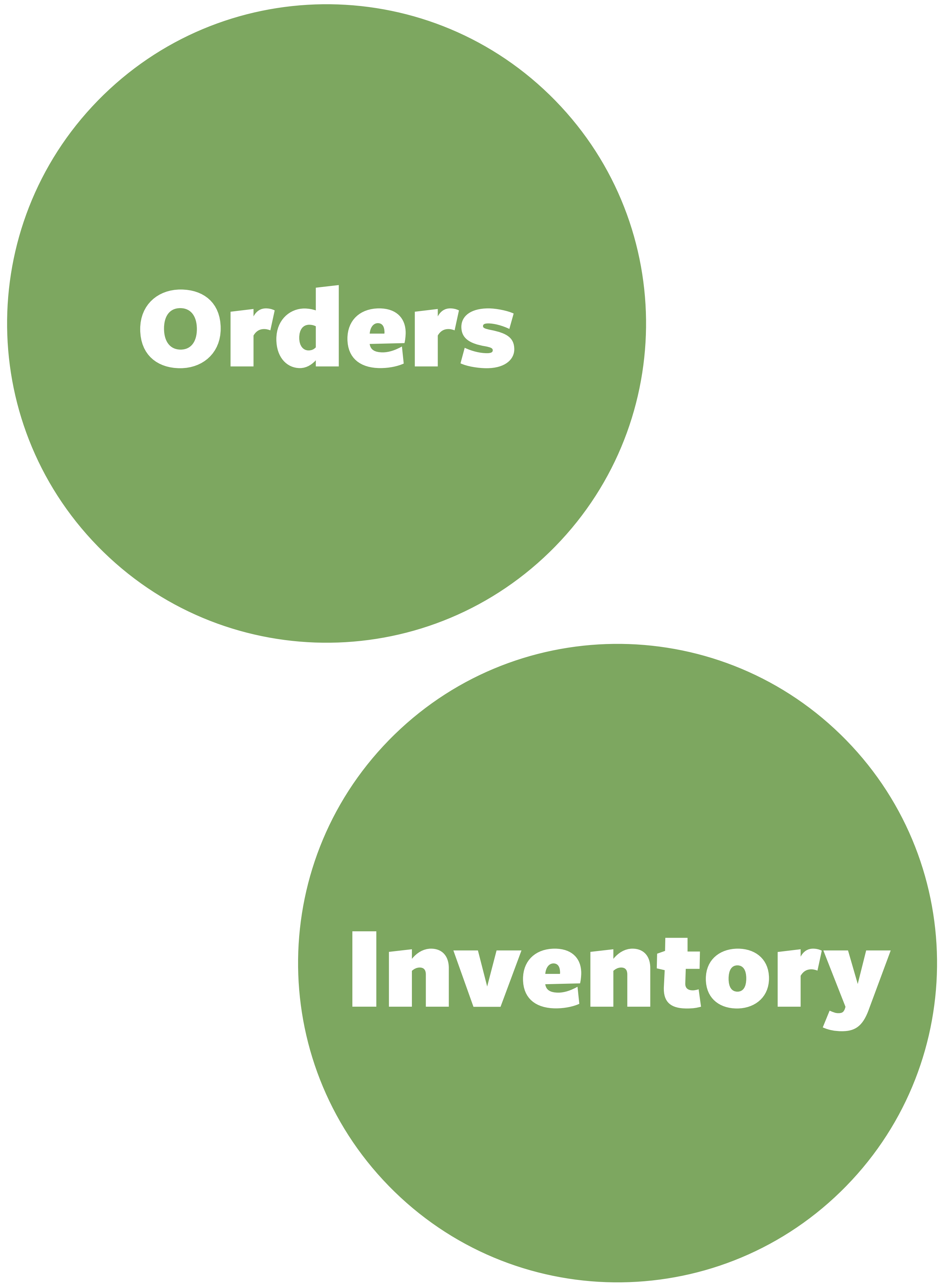

Complexity
Most teams focus on that...
1.0
1.1
1.2
2.0


Complexity
Most teams focus on that...
...while the actual challenge is this.
1.0
1.1
1.2
2.0

Understandability

Changeability

The Domain



Order
Line items

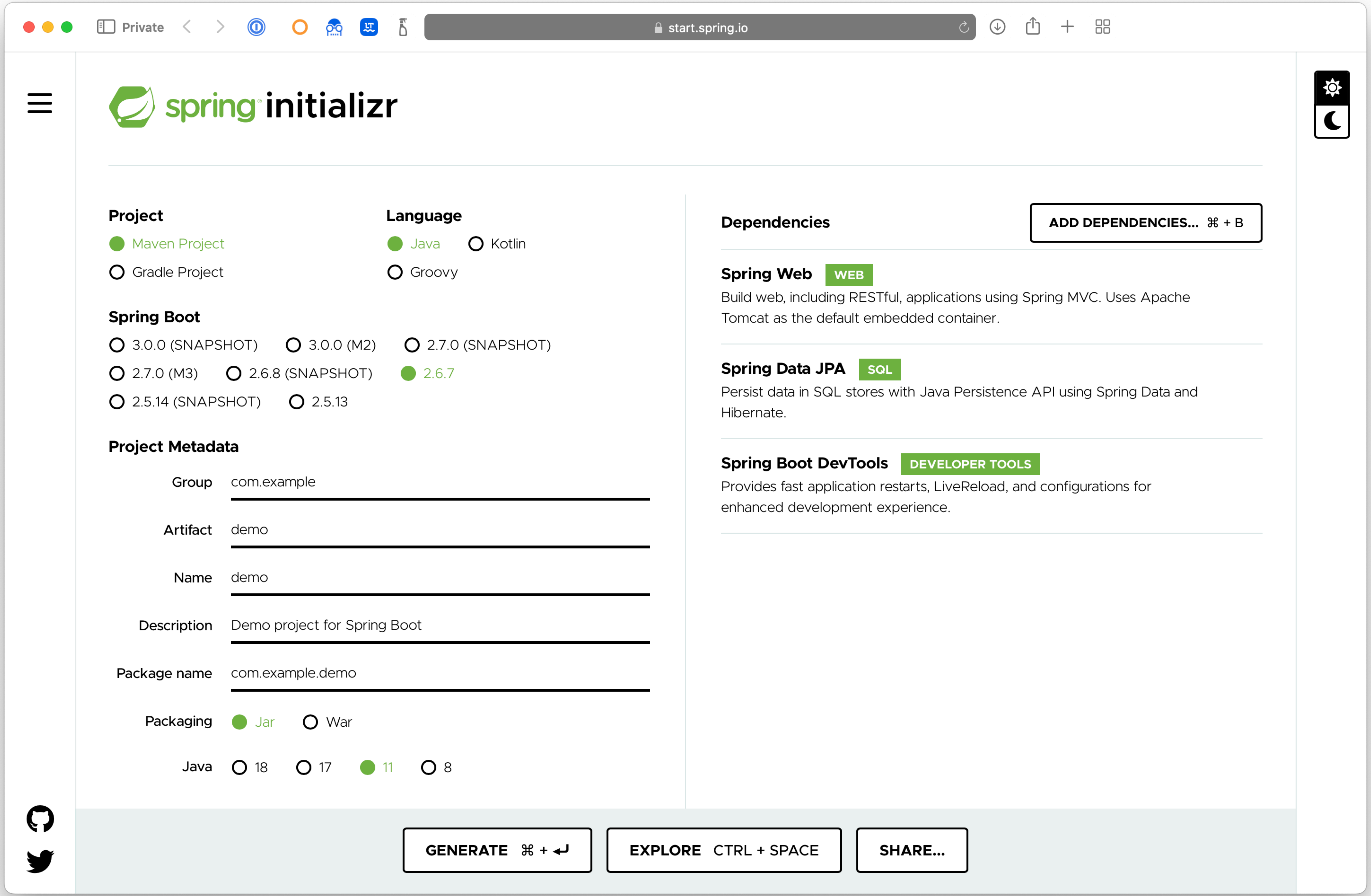
Orders

Inventory

Stock
Inventory items

Unfortunately, Post-its don´t run in production…

… except you work at Miro.



Project

● Maven Project
○ Gradle Project

Language

● Java ○ Kotlin
○ Groovy

Spring Boot

○ 3.0.0 (SNAPSHOT) ○ 3.0.0 (M2) ○ 2.7.0 (SNAPSHOT)
○ 2.7.0 (M3) ○ 2.6.8 (SNAPSHOT) ● 2.6.7
○ 2.5.14 (SNAPSHOT) ○ 2.5.13

Project Metadata

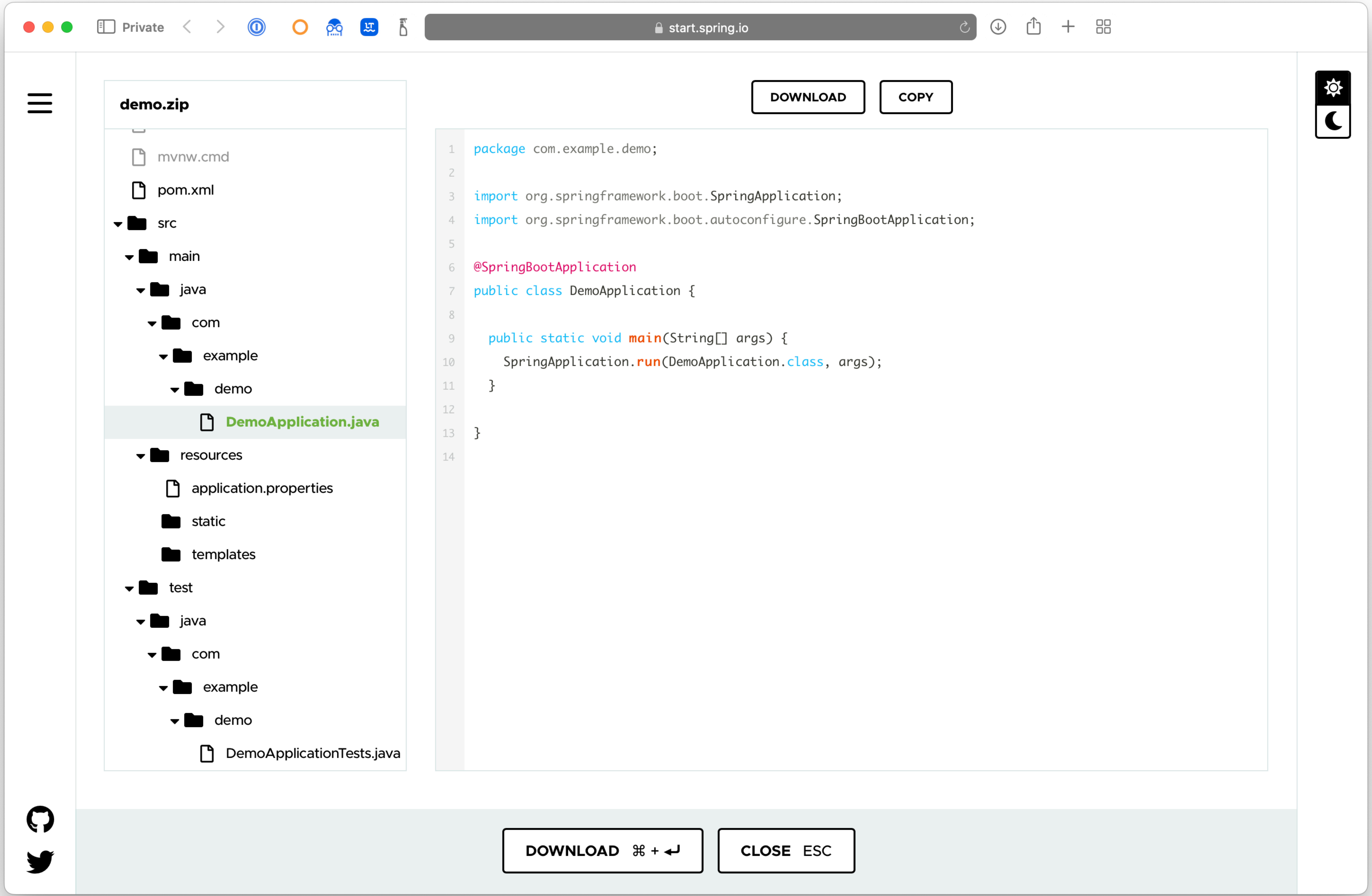
Group	com.example
Artifact	demo
Name	demo
Description	Demo project for Spring Boot
Package name	com.example.demo
Packaging	● Jar ○ War
Java	○ 18 ○ 17 ● 11 ○ 8

Dependencies ADD DEPENDENCIES... ⌘ + B

Spring Web WEB
Build web, including RESTful, applications using Spring MVC. Uses Apache Tomcat as the default embedded container.

Spring Data JPA SQL
Persist data in SQL stores with Java Persistence API using Spring Data and Hibernate.

Spring Boot DevTools DEVELOPER TOOLS
Provides fast application restarts, LiveReload, and configurations for enhanced development experience.



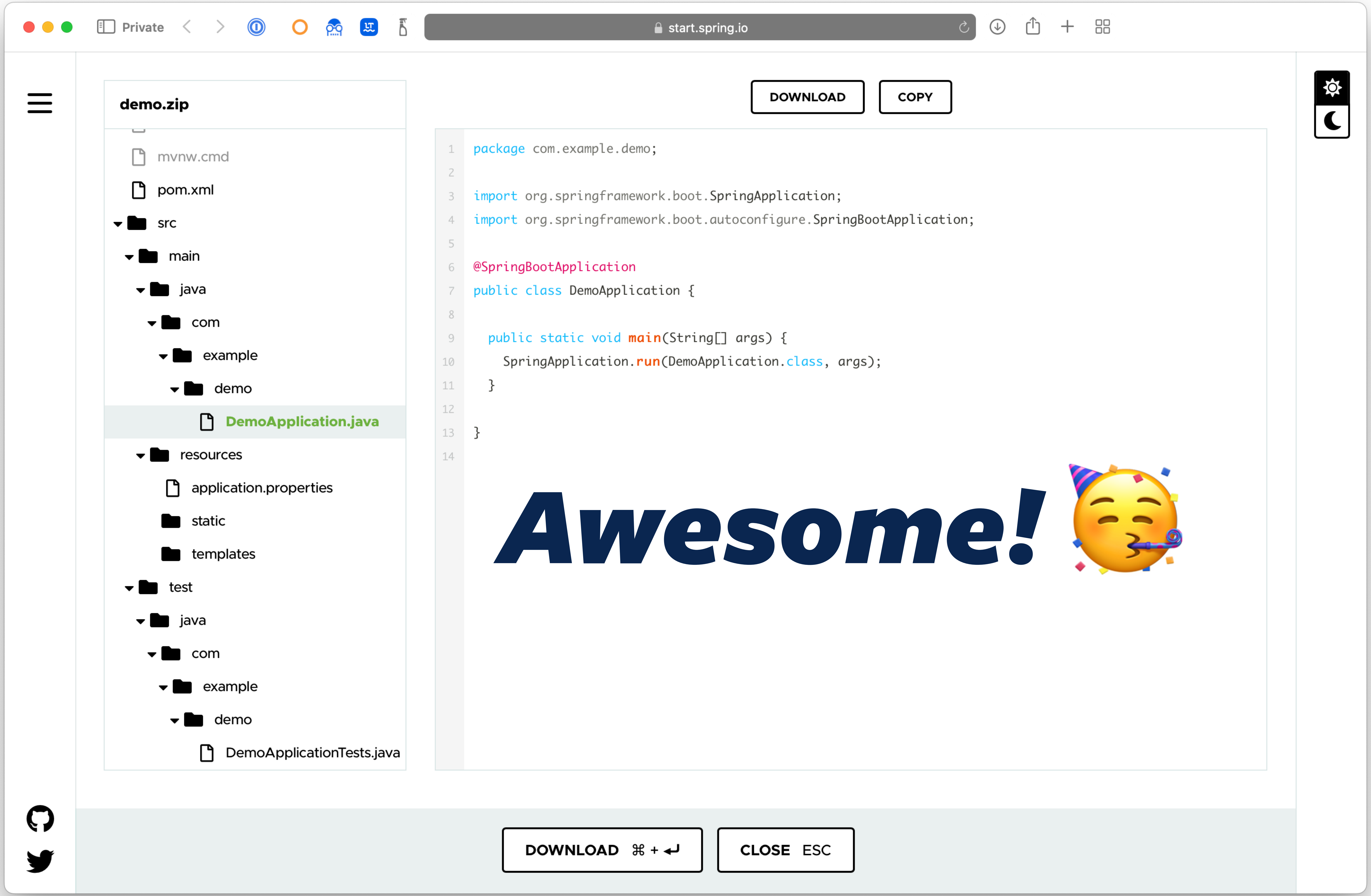
```java
package com.example.demo;

import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;

@SpringBootApplication
public class DemoApplication {

  public static void main(String[] args) {
    SpringApplication.run(DemoApplication.class, args);
  }

}
```



demo.zip

```
mvnw.cmd
pom.xml
src
  main
    java
      com
        example
          demo
            DemoApplication.java
    resources
      application.properties
      static
      templates
  test
    java
      com
        example
          demo
            DemoApplicationTests.java
```

```java
package com.example.demo;

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@SpringBootApplication
public class DemoApplication {

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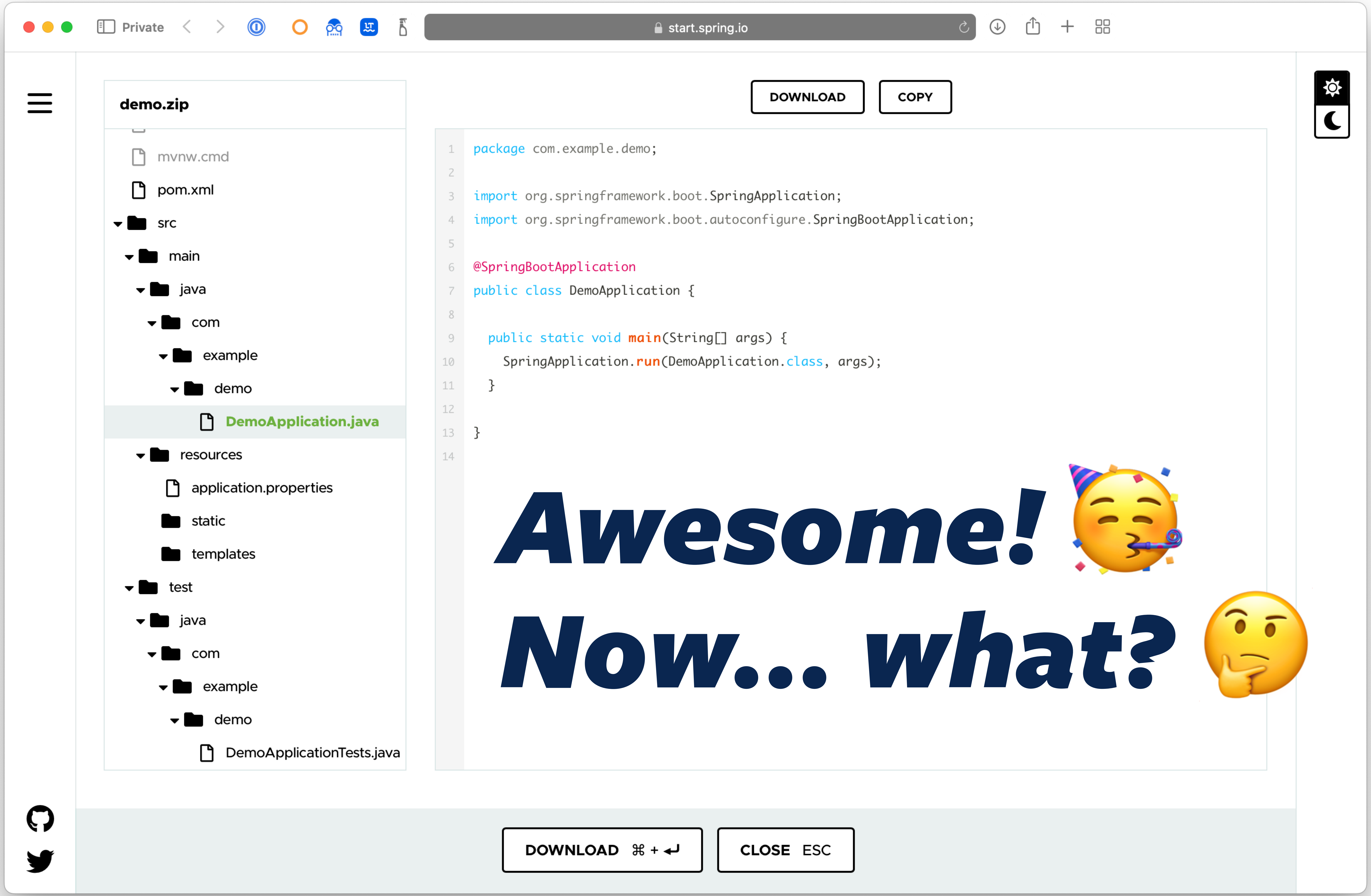
  }

}

```

Awesome! 🥳



demo.zip

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  main
    java
      com
        example
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            DemoApplication.java
    resources
      application.properties
      static
      templates
  test
    java
      com
        example
          demo
            DemoApplicationTests.java
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import org.springframework.boot.SpringApplication;
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@SpringBootApplication
public class DemoApplication {

  public static void main(String[] args) {
    SpringApplication.run(DemoApplication.class, args);
  }

}
```

Awesome! 🥳

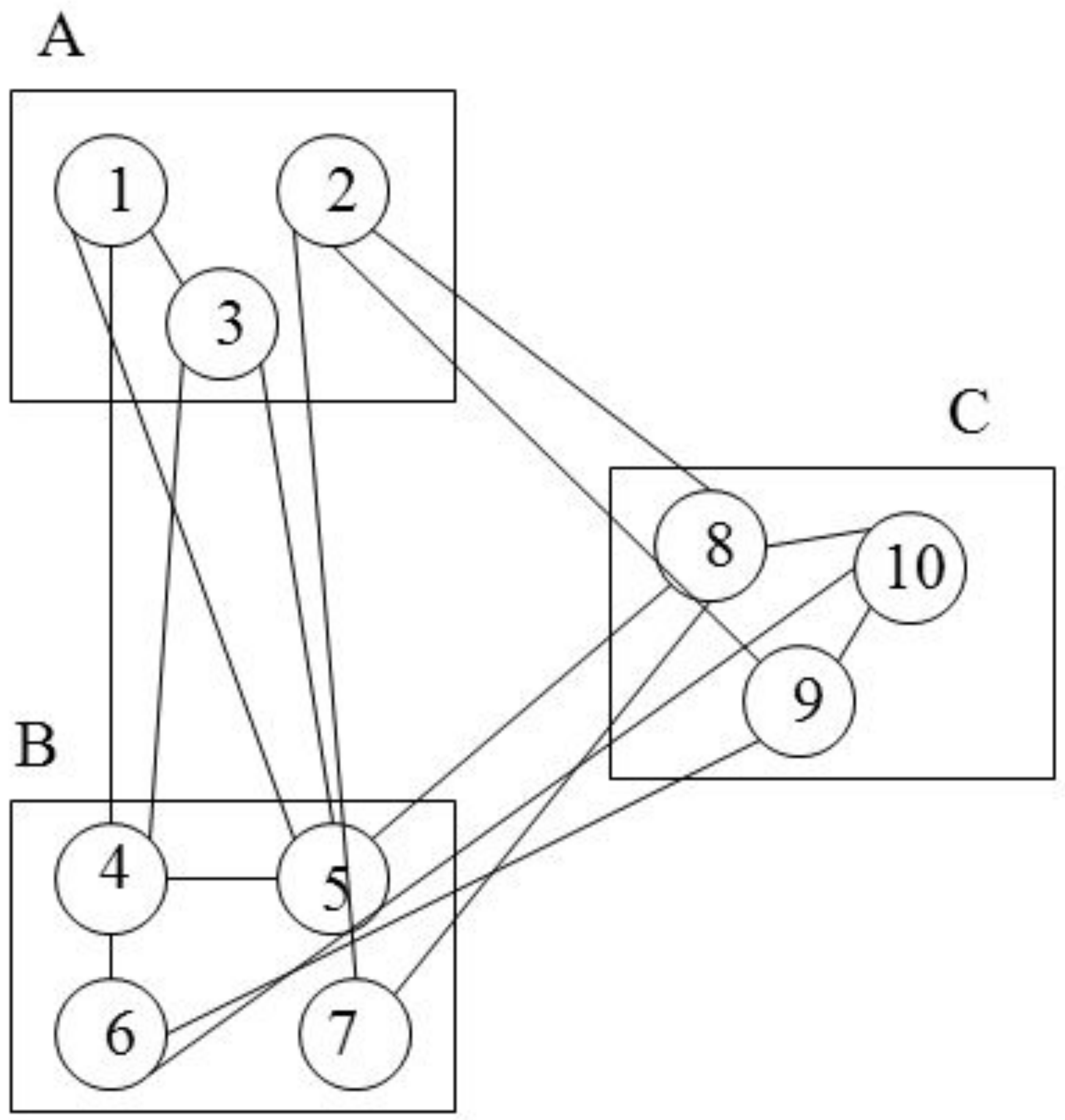
Now... what? 🤔

“How do we represent functional architecture in a codebase?

Let’s get started…

- 🗁 src/main/java
  - 📦 ….acme.myproject
  - 📦 ….acme.myproject.domain
  - 📦 ….acme.myproject.persistence
  - 📦 ….acme.myproject.service
  - 📦 ….acme.myproject.web

🙀 🙈



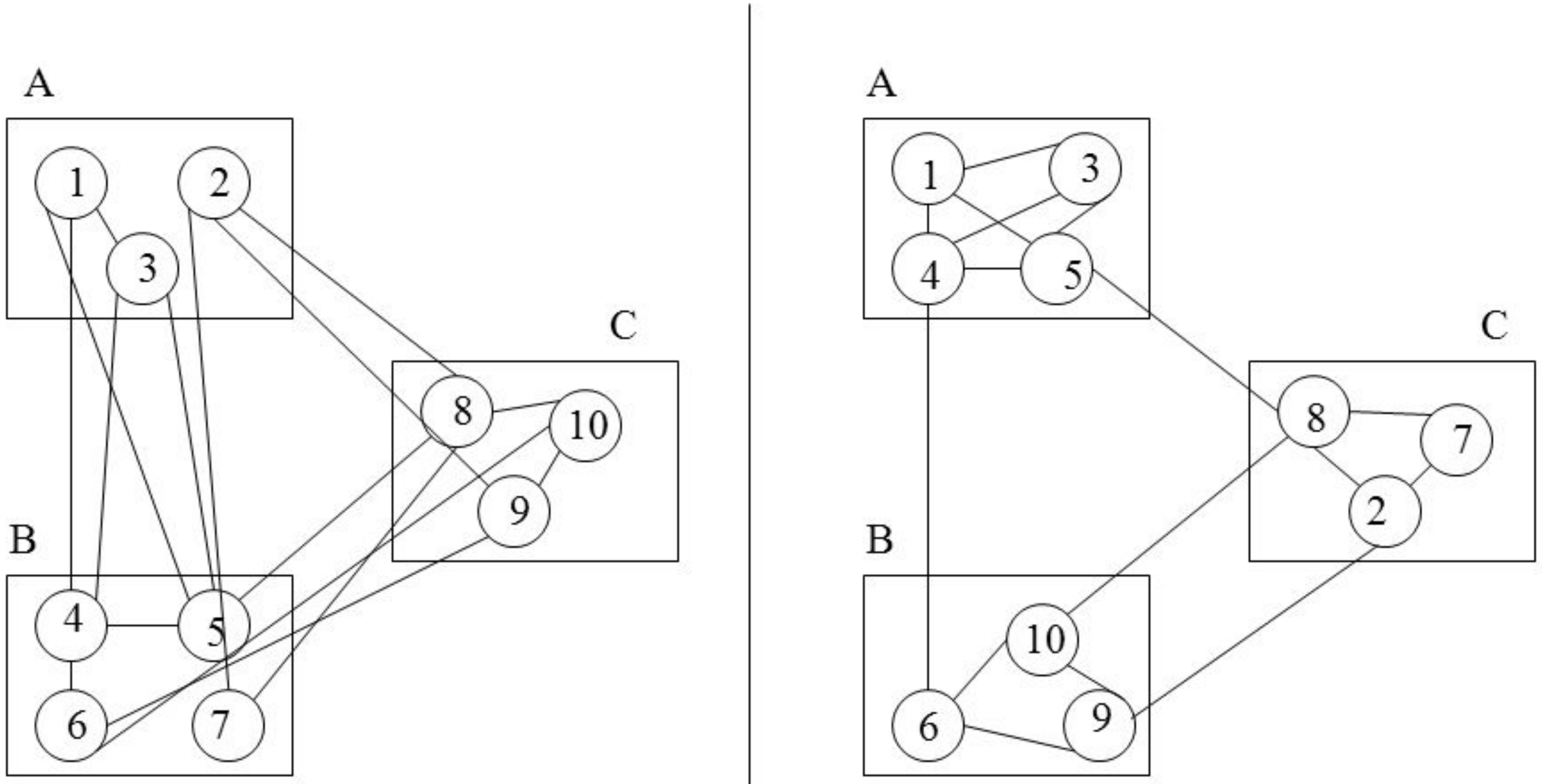
Bad modularization:
low cohesion, high coupling

via https://devopedia.org/cohesion-vs-coupling

Much better…

- 🗁 **src/main/java**
  - **….acme.myproject**
  - **….acme.myproject.customer**
  - **….acme.myproject.inventory**
  - **….acme.myproject.order**

😻🥳



Bad modularization:
low cohesion, high coupling

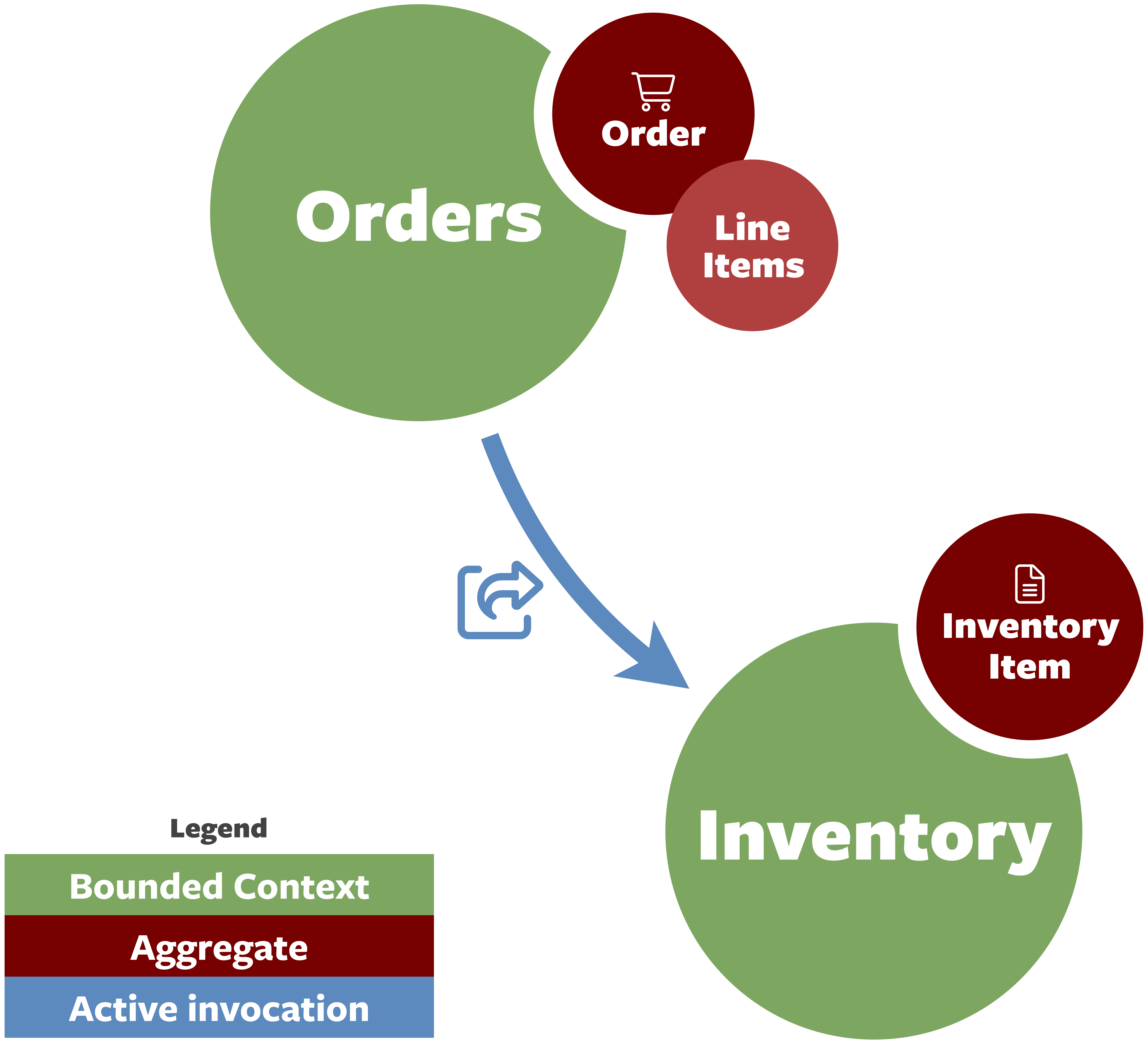
Good modularization:
high cohesion, low coupling

via https://devopedia.org/cohesion-vs-coupling

Sample code

https://github.com/odrotbohm/arch-evident-spring

Demo time! 🧑‍💻🥳



Orders

Order

Line Items

Inventory

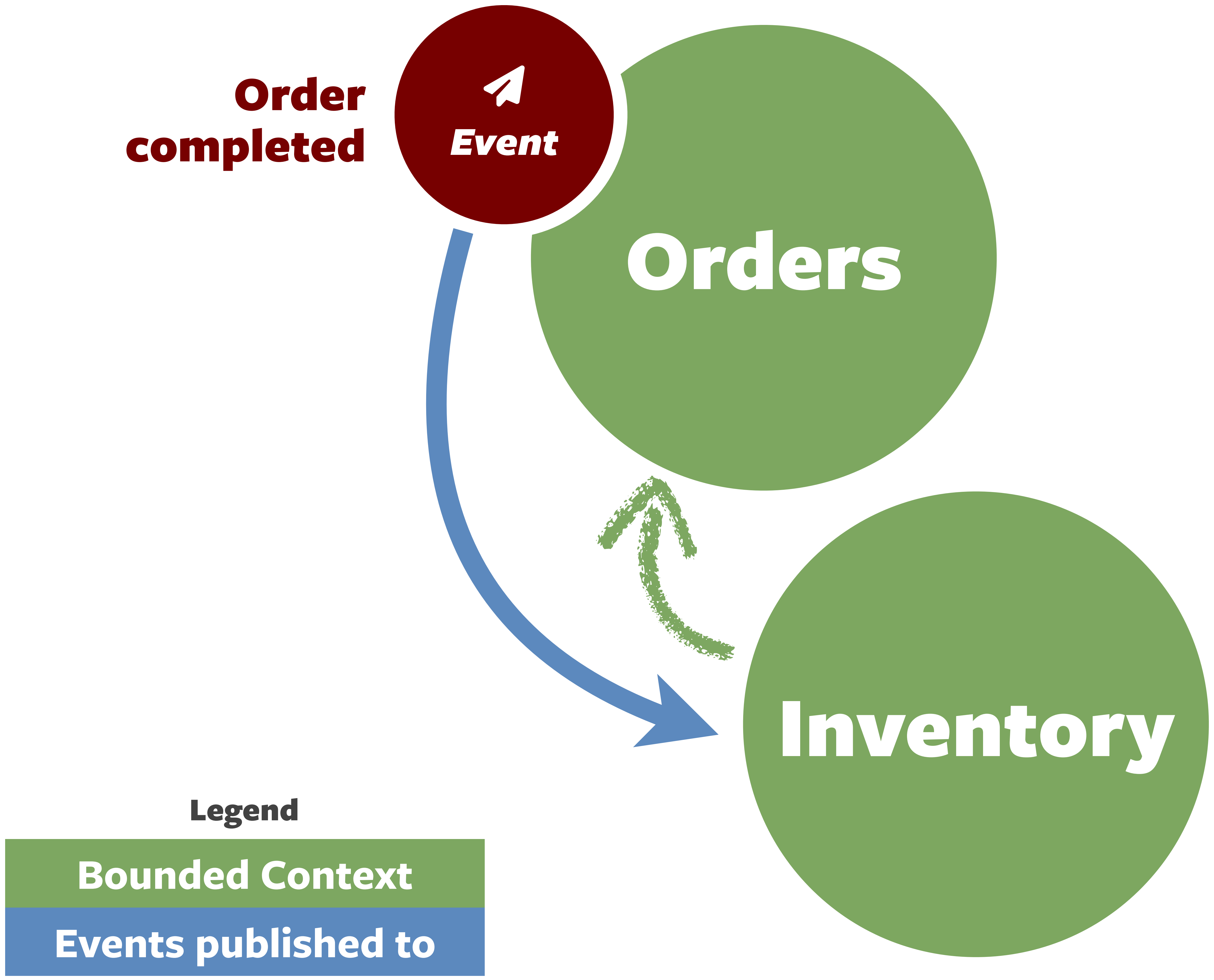
Inventory Item

Legend

Bounded Context

Aggregate

Active invocation



Order completed

Event

Orders

Inventory

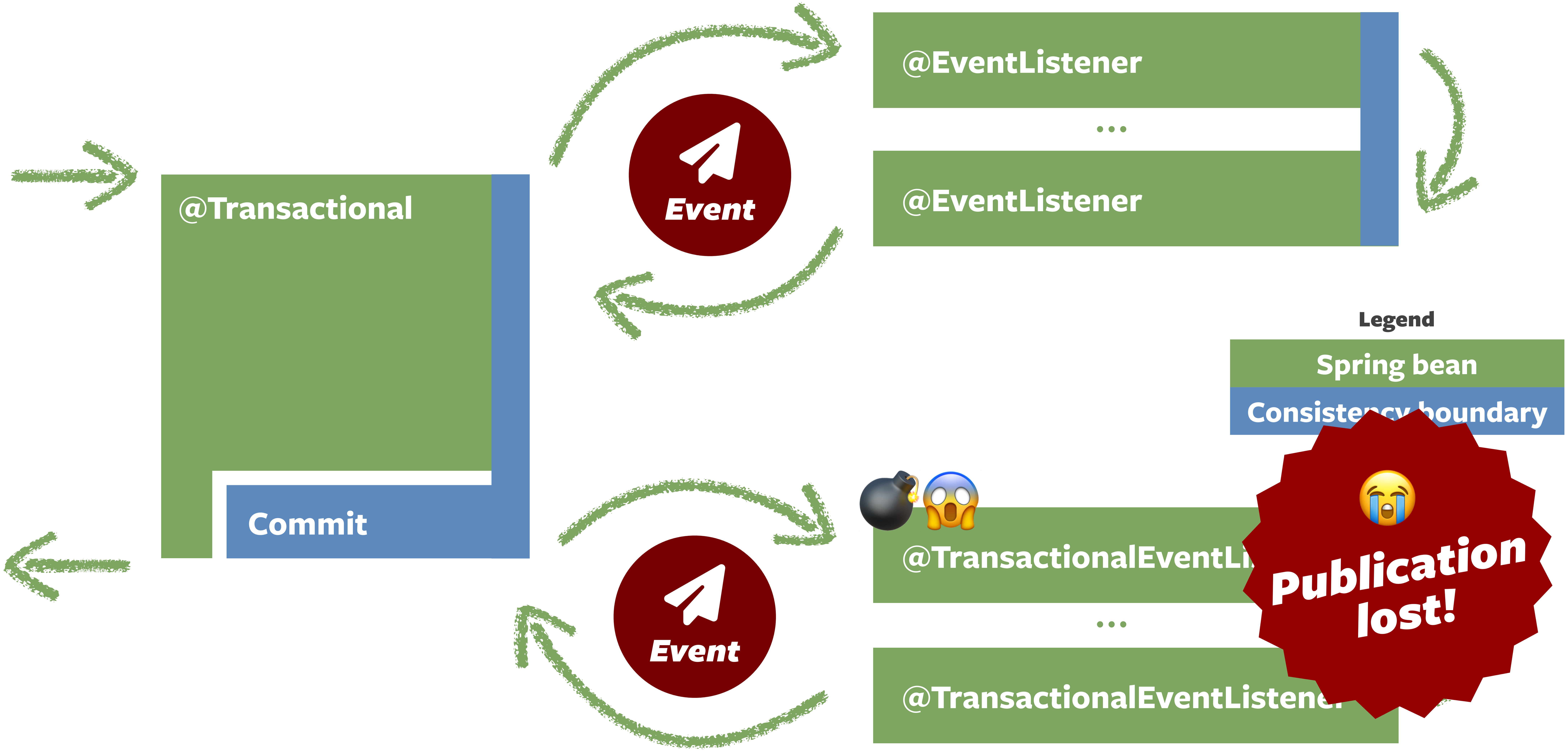
Legend

Bounded Context

Events published to

Error scenarios

What if a transactional event listener fails? 🤔



@Transactional

Commit

Event

@EventListener

...

@EventListener

Event

💣😱

@TransactionalEventLi

...

@TransactionalEventListene

Legend

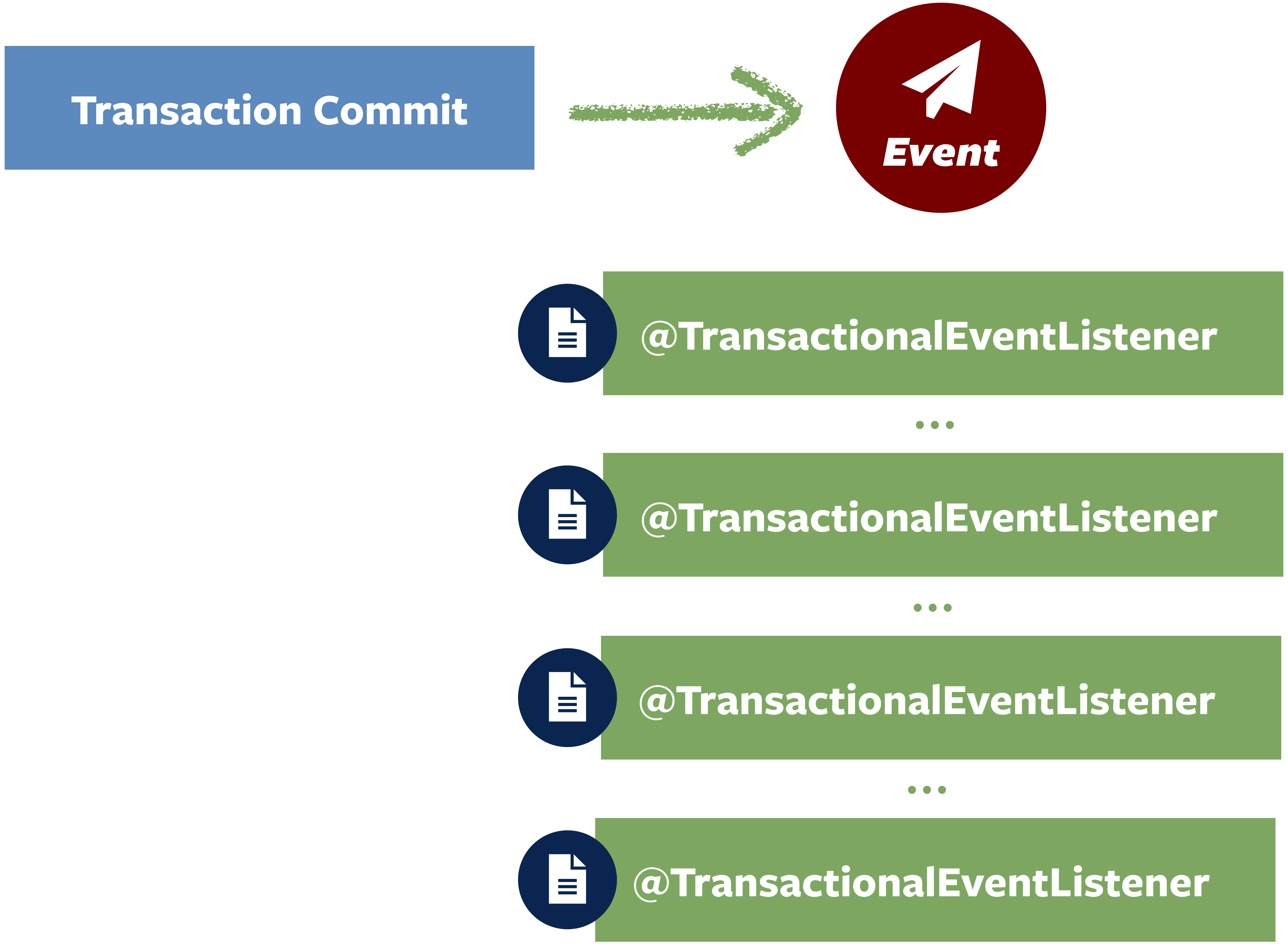
Spring bean

Consistency boundary

😭

Publication lost!

Event Publication Registry



Transaction Commit

Event

@TransactionalEventListener

•••

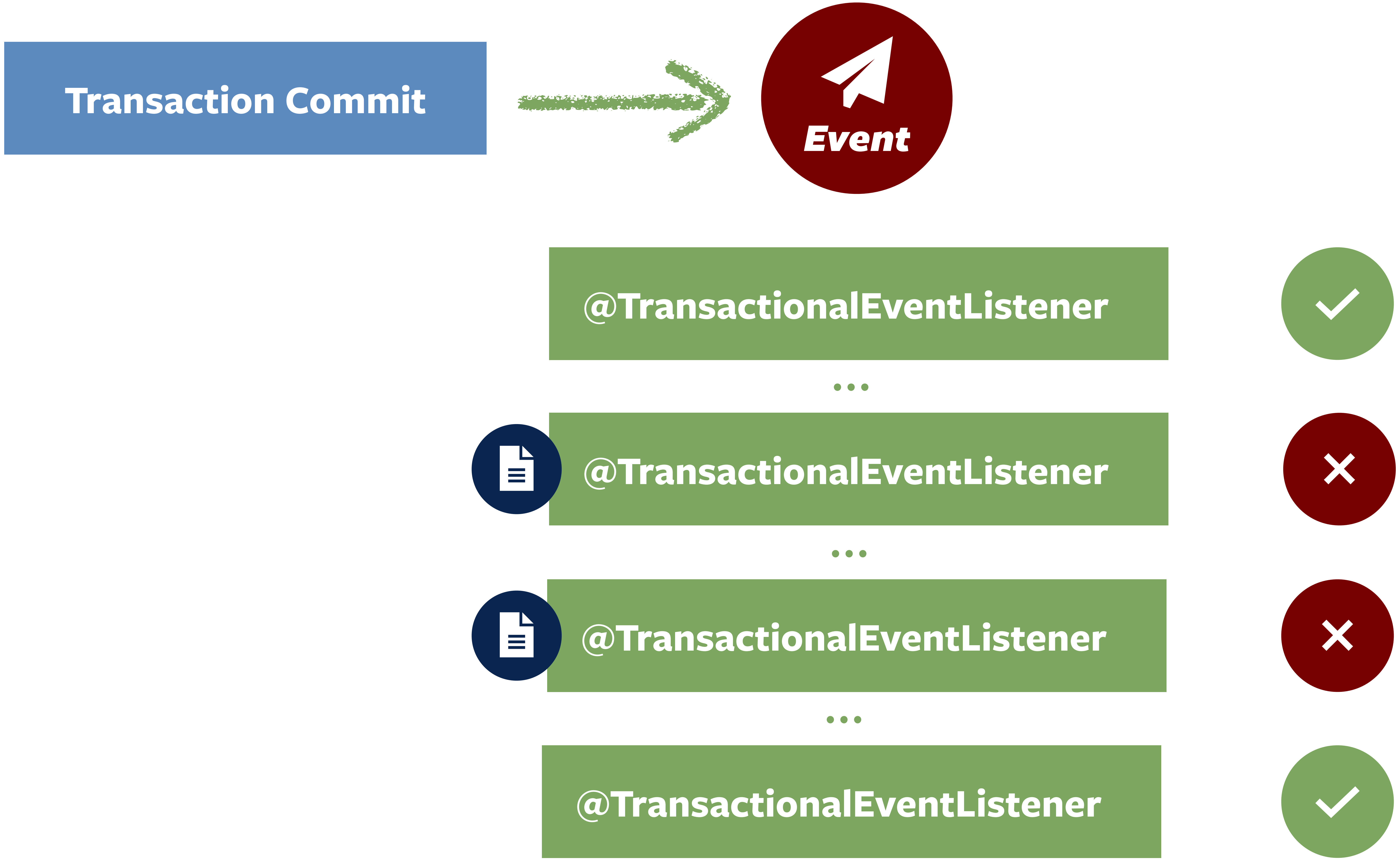
@TransactionalEventListener

•••

@TransactionalEventListener

•••

@TransactionalEventListener



Transaction Commit

Event

@TransactionalEventListener ✓

...

@TransactionalEventListener ✗

...

@TransactionalEventListener ✗

...

@TransactionalEventListener ✓

Demo time! 🧑‍💻🥳

Spring Modulith

- A convention to map modules to packages
- Simple set of access rules and API to verify
- Test support to bootstrap modules
- Documentation support
- Actuator and observability support

Thank you!
Questions?

Sample Code

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