

The background of the slide features a dark blue, textured surface. Overlaid on this are several abstract, colorful shapes in shades of orange, yellow, and blue, which appear to be stylized, overlapping geometric forms. The DevOxx UK logo is prominently displayed at the top. The word 'DEV' is in a white, pixelated font. 'Oxx' is in a larger, white, pixelated font with a small 'TM' trademark symbol to its upper right. 'UK' is in a white, pixelated font to the right of 'Oxx'.

DEVTMOxx UK

Rethinking integration testing with Testcontainers



git

IDE

Docker (including Docker compose for some steps)

Build tool: Maven / Gradle

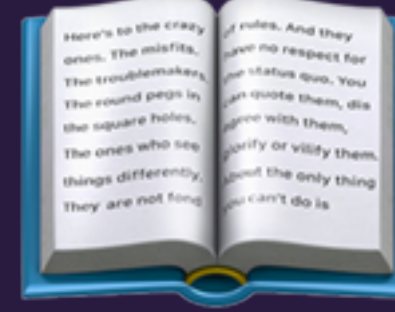
 github.com/testcontainers/workshop

```
docker pull postgres:14-alpine
```

```
docker pull redis:6-alpine
```

```
docker pull openjdk:8-jre-alpine
```

```
docker pull confluentinc/cp-kafka:5.4.3
```



<https://bit.ly/devoxx-uk-2022-TC-lab>

Agenda

Intro & theory – 10 minutes

Setup the project – 15 minutes

Adding the first tests – 10 minutes

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Kafka tests – 15 minutes

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Database initialization setup – 20 min

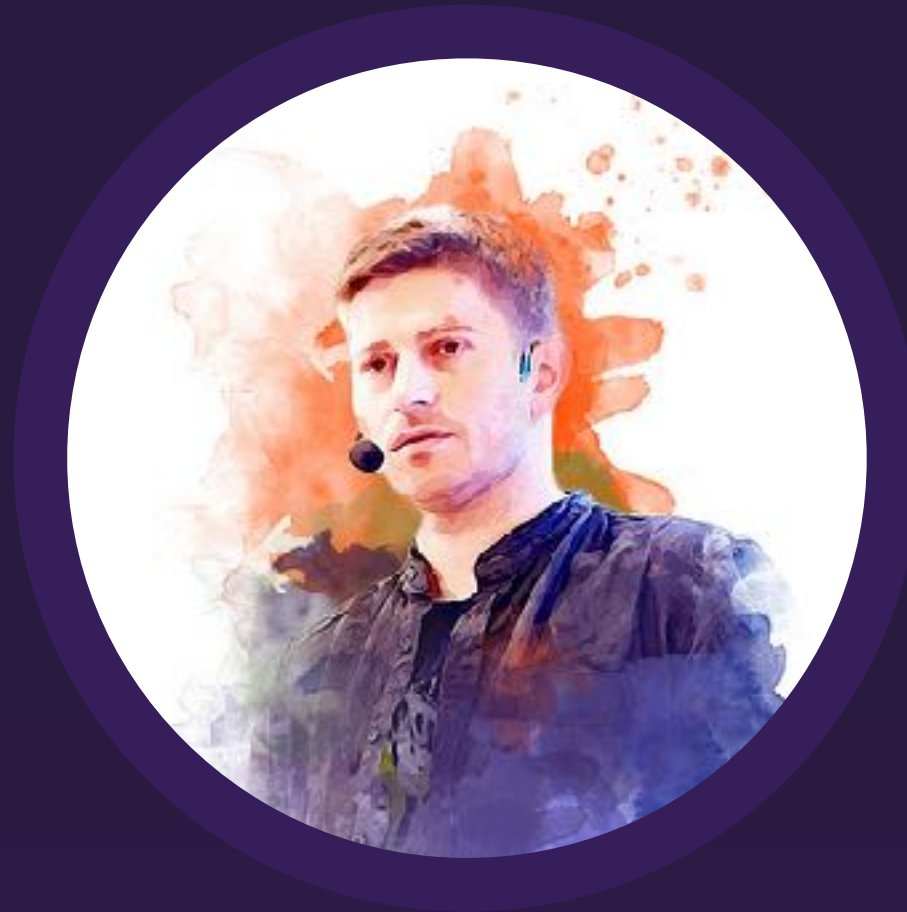
Migrating Docker-compose to Testcontainers – 20 min



Oleg Šelajev
Developer relations



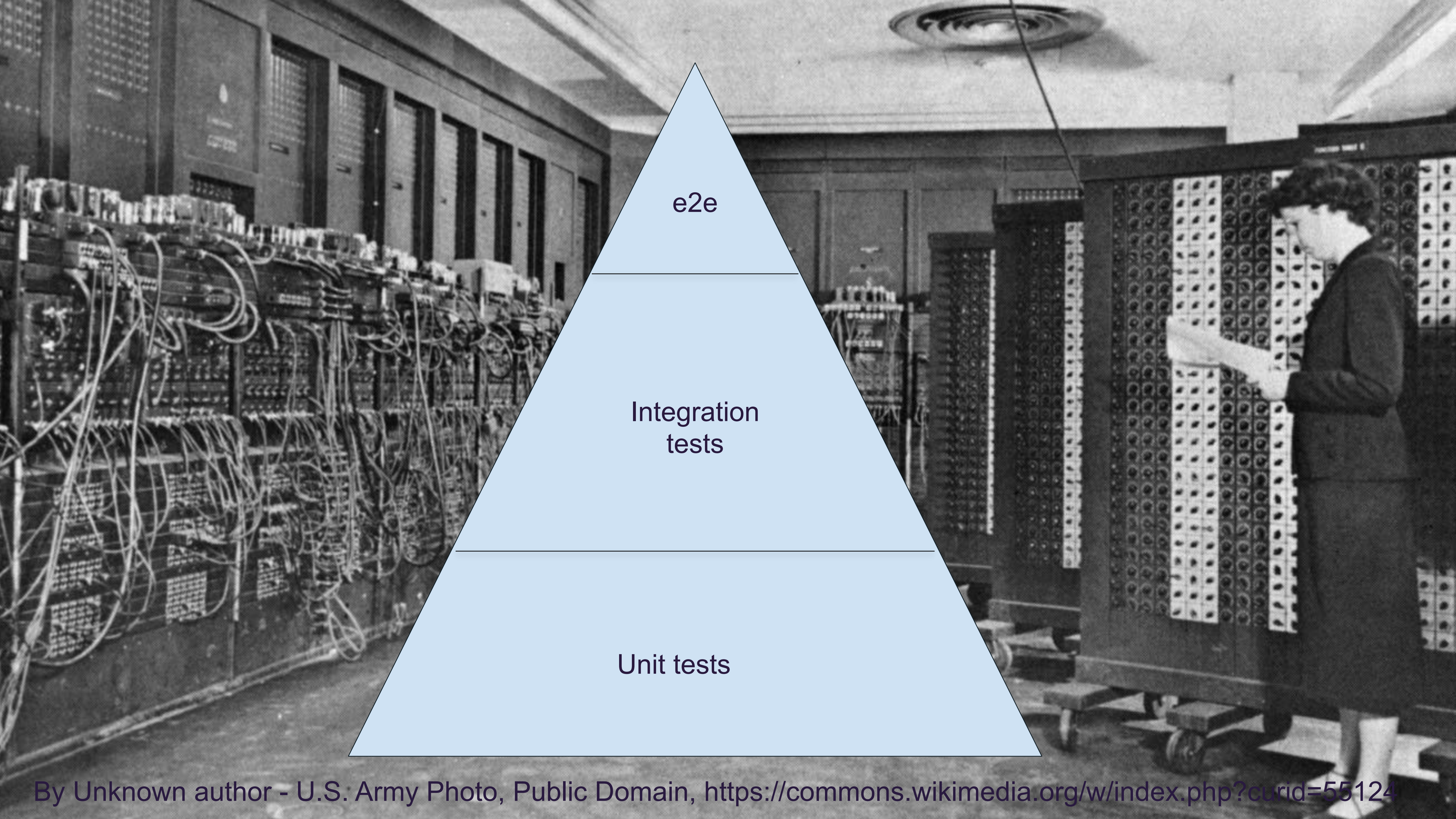
Kevin Wittek
Software engineer



Piotr Przybył
Software engineer / gardener



ATOMICJAR

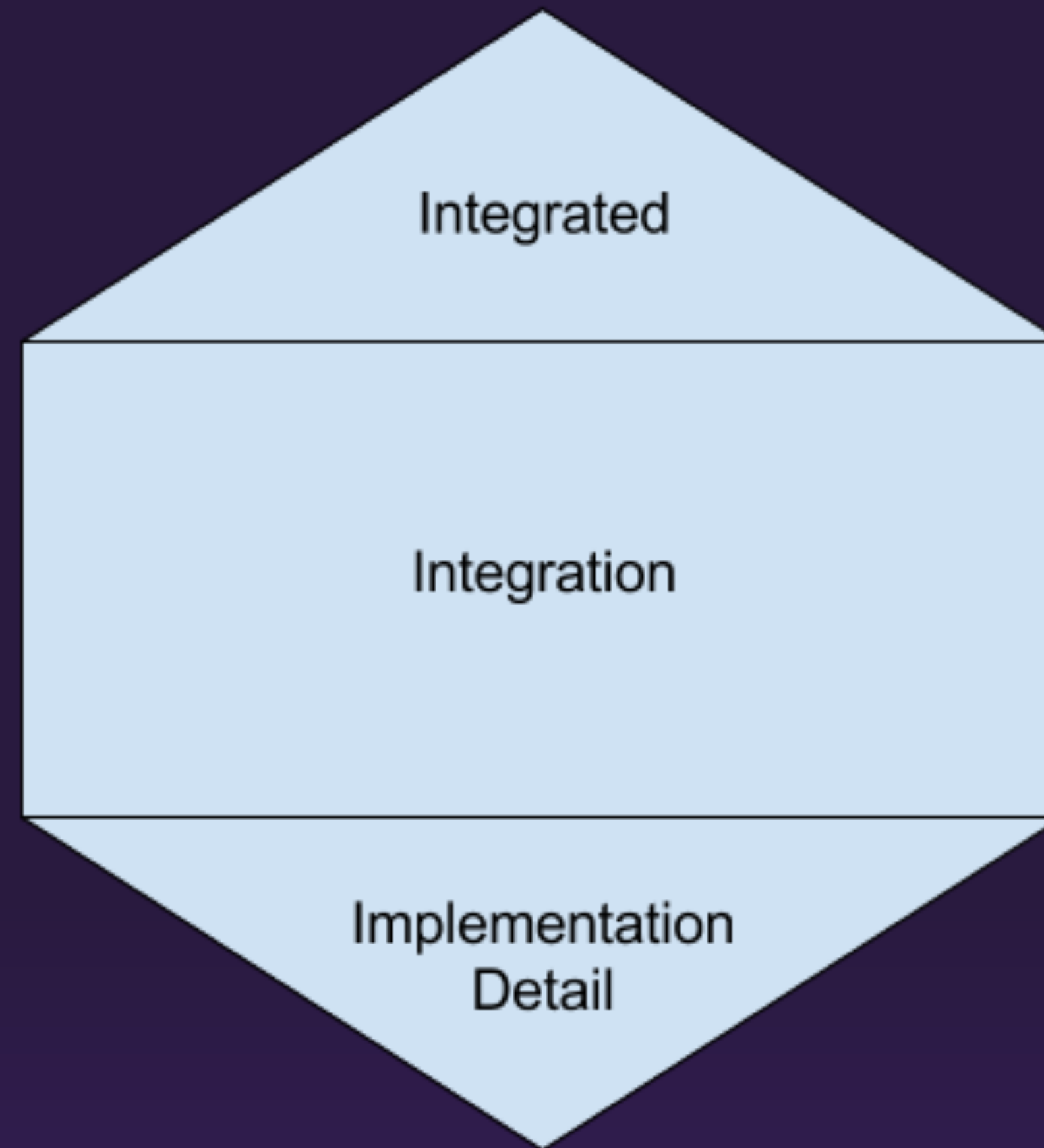


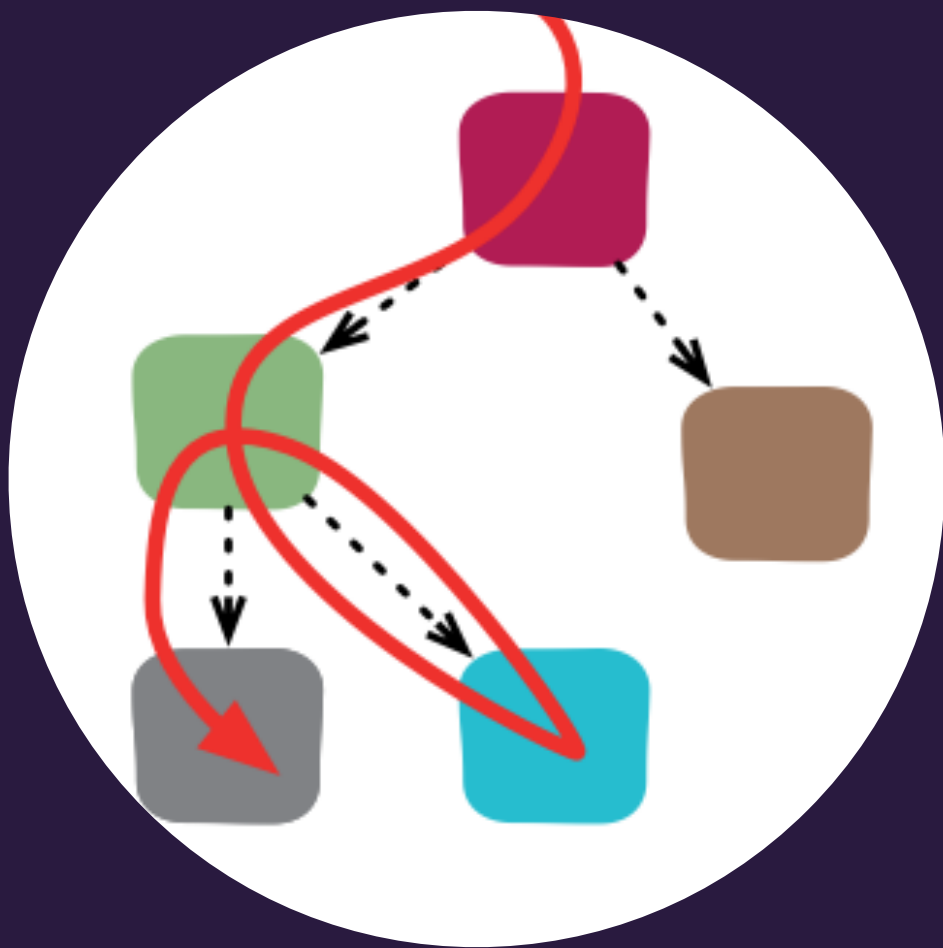
e2e

Integration
tests

Unit tests

Microservices Testing **Honeycomb**







IT WORKS ON MY MACHINE



THEN WE'LL SHIP YOUR MACHINE



AND THAT IS HOW DOCKER WAS BORN



**Installing
apps**

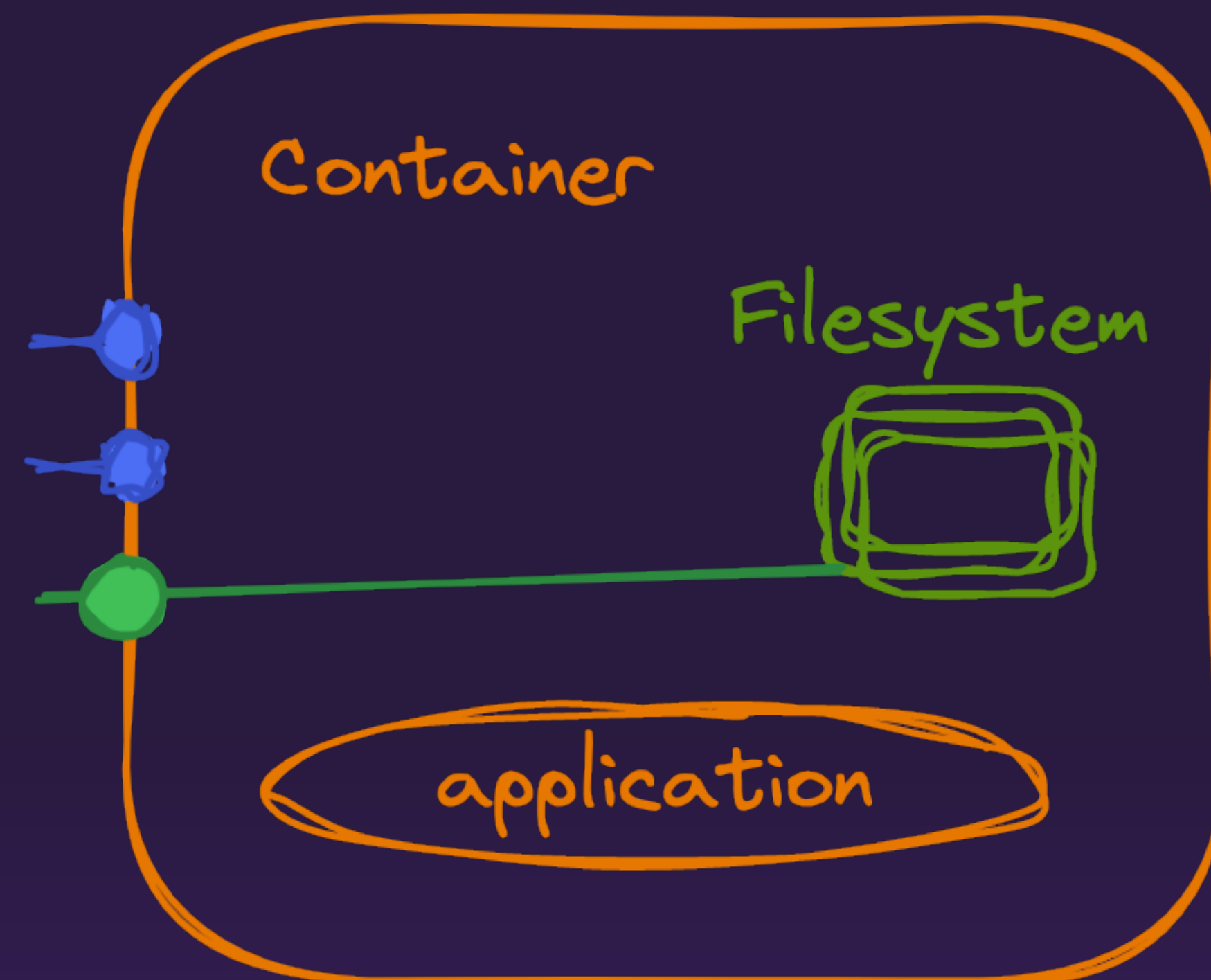


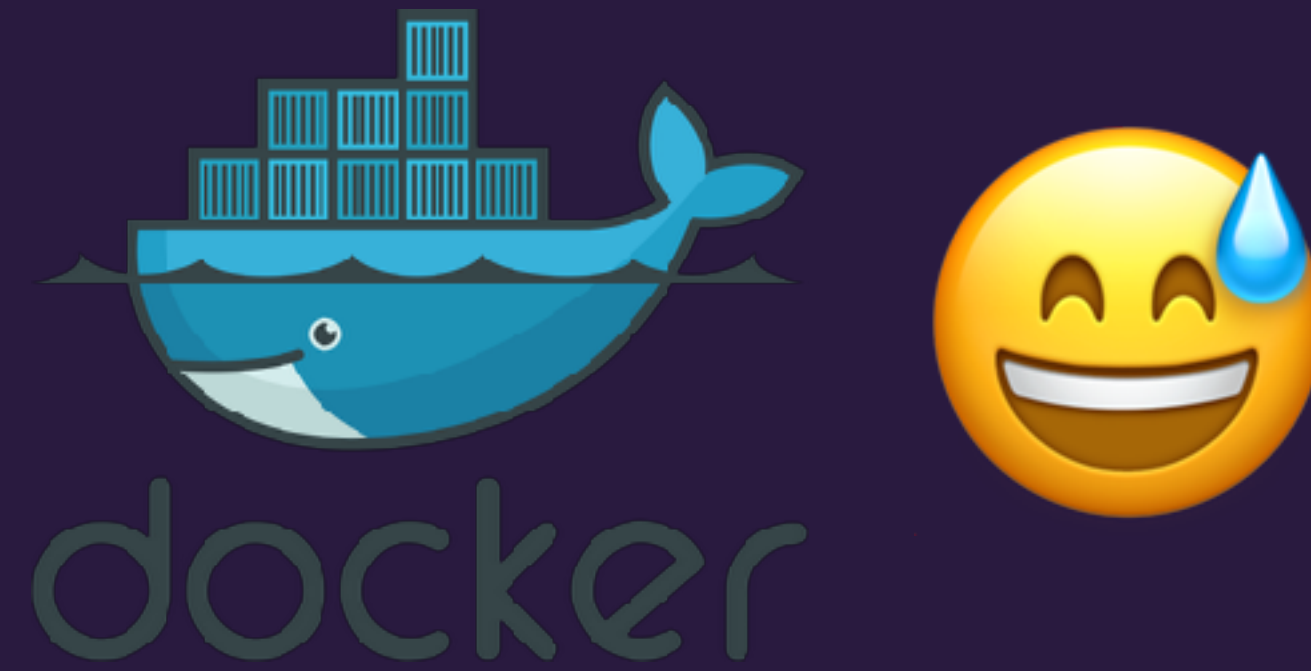
**Running
them
in Docker**


```
docker pull image:tag  
docker run -p port:port name:tag
```



- Process isolation
- FileSystem, Network
- CPU/memory limits





- Configuring **multiple** services simultaneously
- **Flexibility** in creating test data or use-cases
- Separation of production & **test environments**
- **Dynamic configuration** of external mappings
- **Parallel** deployments

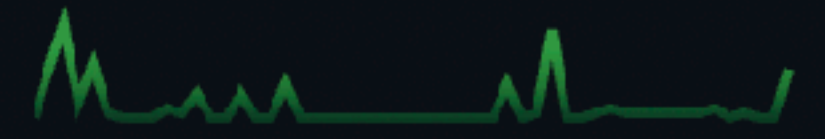


Testcontainers

testcontainers-rs Public

A library for integration-testing against docker containers from within Rust.

 Rust  173  50  23 (5 issues need help)  6 Updated 2 hours ago



testcontainers-java Public

Testcontainers is a Java library that supports JUnit tests, providing lightweight, throwaway instances of common databases, Selenium web browsers, or anything else that can run in a Docker container.

 Java  5,580  MIT  1,100  355 (26 issues need help)  106 Updated 2 hours ago



testcontainers-scala Public

Docker containers for testing in scala

 Scala  479  MIT  83  16  2 Updated yesterday



testcontainers-go Public

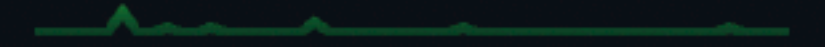
Testcontainers is a Golang library that providing a friendly API to run Docker container. It is designed to create runtime environment to use during your automatic tests.

 Go  1,190  MIT  172  51  20 Updated yesterday



testcontainers-python Public

 Python  452  Apache-2.0  101  20 (3 issues need help)  22 Updated 3 days ago



System checks

i Checking the system...

- ✓ Docker version should be at least 1.6.0
- ✓ Docker environment should have more than 2GB free disk space
- ✓ File should be mountable
- ✓ A port exposed by a docker container should be accessible

During

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS
1d086deb291b	postgres:14-alpine	"docker-entrypoint.s..."	6 seconds ago	Up 4 seconds	0.0.0.0:54663->5432/tcp,
				clever_satoshi	
895dea775351	confluentinc/cp-kafka:5.4.3	"sh -c '#!/bin/bash\n..."	23 seconds ago	Up 20 seconds	9092/tcp, 0.0.0.0:54459->2181/tcp, :::54459->2181/tcp, 0.0.0.0:54460->9093/tcp, :::54460->9093/tcp
				beautiful_shannon	
9ba7b0670e6f	redis:6-alpine	"docker-entrypoint.s..."	35 seconds ago	Up 32 seconds	0.0.0.0:54305->6379/tcp,
				friendly_blackburn	
6594984b1654	testcontainers/ryuk:0.3.3	"/app"	46 seconds ago	Up 44 seconds	0.0.0.0:54131->8080/tcp,
				testcontainers-ryuk-d5041454-dd4f-46ff-845b-7013d55d41d2	

After

The problem

Port conflicts

Hard-coded
scenarios

Slow tests



Extra mile

Port
randomization

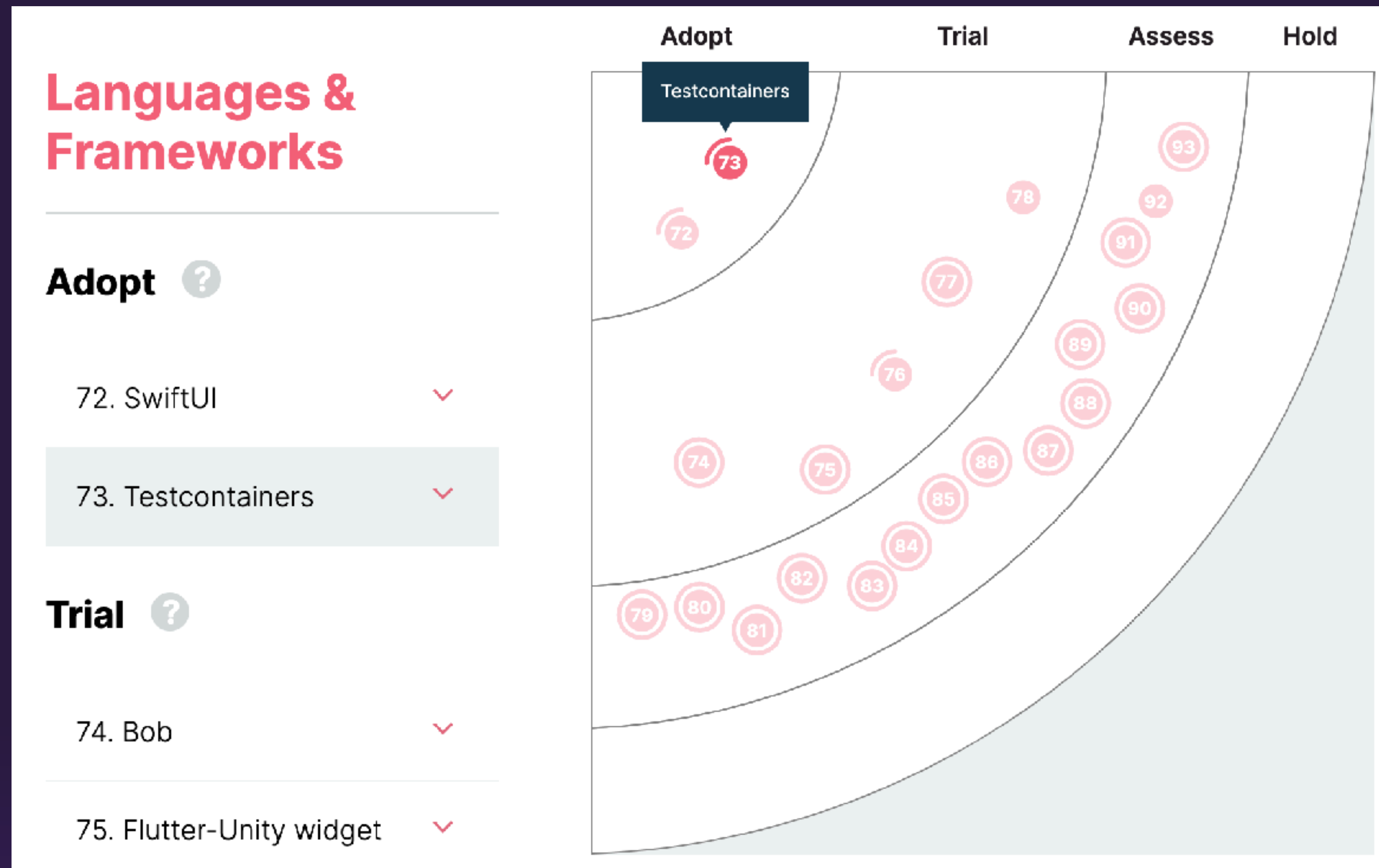
Data-driven tests

Parallelization

We think it's a useful **default option** for creating a **reliable environment** for running tests.

...

Our teams have consistently found this library of **programmable, lightweight** and **disposable** containers to make functional tests more **reliable**.



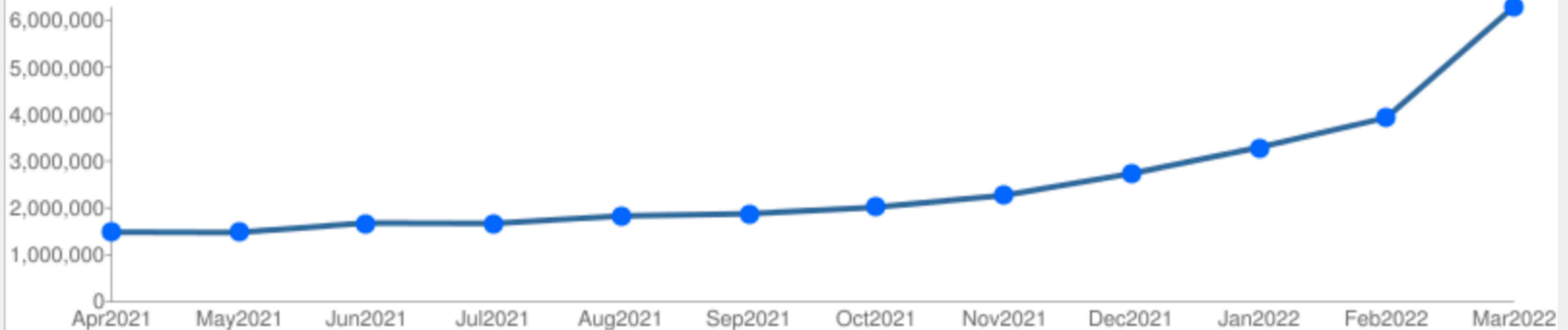
Downloads

Overview

Project: Type:

GroupId: ArtifactId: Version: [Export CSV](#)

Downloads Over the Last 12 Months For org.testcontainers:testcontainers-bom



Unique IPs

Overview

Project: org.testcontainers

Type: Unique IPs

GroupId: org.testcontainers

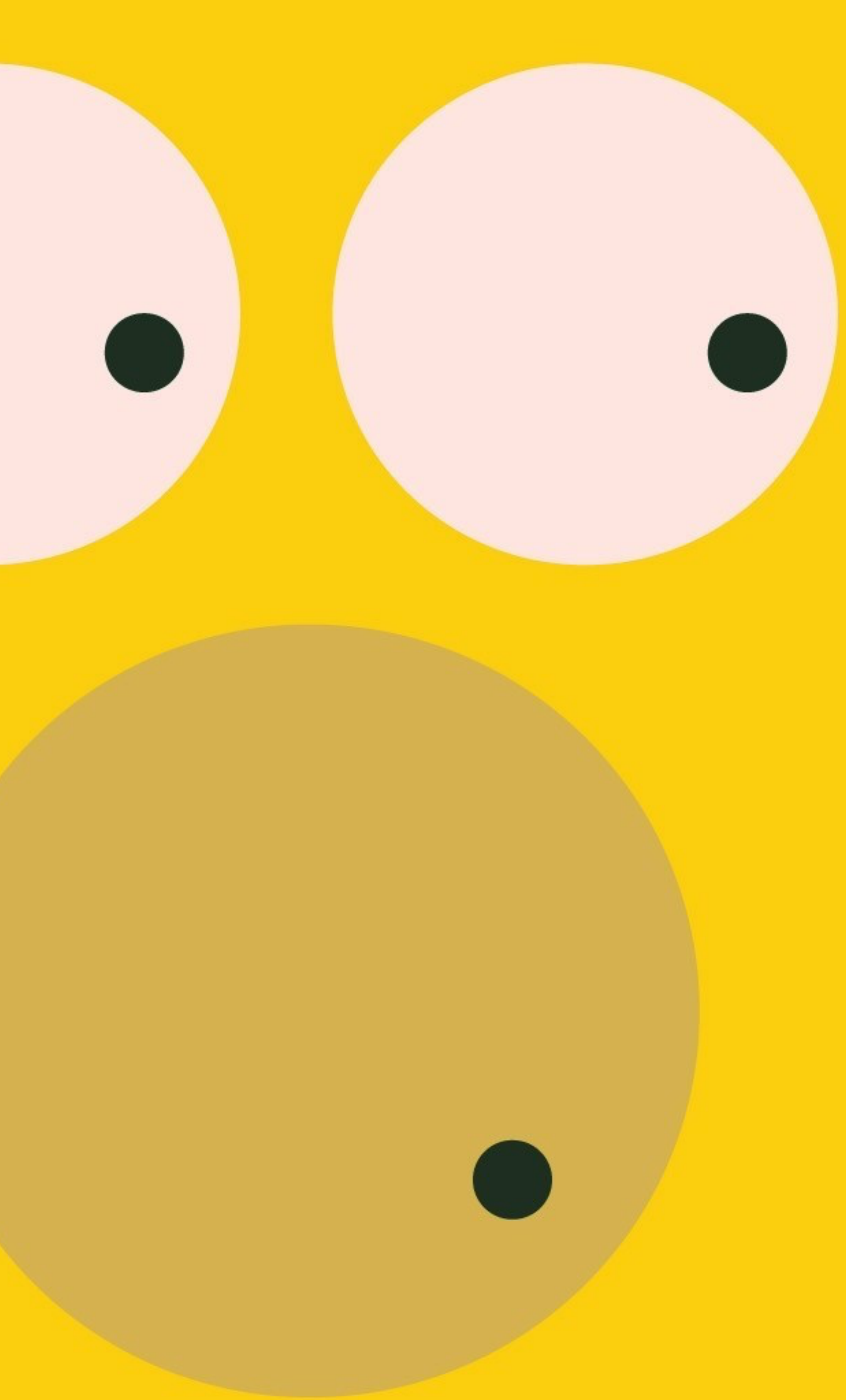
ArtifactId: testcontainers-bom

Version: [Select a version...](#)

[Export CSV](#)

Unique IPs Over the Last 12 Months For org.testcontainers:testcontainers-bom



Three stylized eyes are positioned on the left side of the image. Two eyes are light pink with black pupils, and one eye is a larger, tan color with a black pupil. They are all looking towards the right.

**What to do
if you have
no Docker?**

Docker environments

	Docker Desktop	Docker Machine	Minikube	Podman
Compatibility (more is better)	✓✓✓	✓✓	✓✓✓	?
Effort (less is better)	📦	📦	📦📦	📦📦📦
Performance (1 Kafka, in seconds)	3.81	3.69	3.91	-
Risks & comments		Deprecated		

 **ATOMICJAR**

Testcontainers Cloud



Andy Wilkinson
@ankinson



I had the good fortune of being asked to beta test Testcontainers Cloud. It's the real deal. Drop-in replacement for Docker Desktop and containers now start more quickly, both in Spring Boot's own build and tests of various Boot-based apps that I maintain. Impressive start.



Asaf Mesika
@asafmesika



This a game changer for integration and e2e testing ! Awesome idea !



Marouane Trabelsi
@_tmarwen

One big step ahead in the Integration Testing space, one that haven't seen much innovation in a long time.

Kudos @testcontainers and @AtomicJarInc



peter royal
@osi



Replying to @NayShins and @testcontainers

you may be interested in what @AtomicJarInc is up to!



Michael Simons
@rotnroll666



I have to say, @QuarkusIO dev-services combined with @testcontainers in the cloud via @AtomicJarInc is brilliant.

No load for the containers on the local machine and config-free setup.



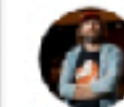
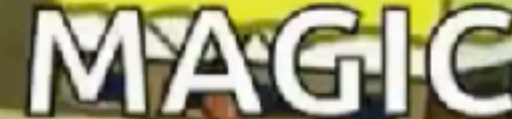
Gerrit Meier
@meistermeier



Friends of Docker wormholes in CI, I have bad news for you: I just threw @AtomicJarInc @testcontainers cloud support into the build config and things(tm) are just working.



GIF



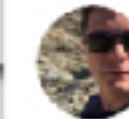
Sébastien Blanc
@sebi2706



Red Hat

Replying to @rotnroll666 @QuarkusIO and 2 others

Is this a real thing or just a (great) idea for now ?



Max Rydahl Andersen
@maxandersen



Red Hat

This should be interesting! Ever since @quarkusio introduced devservices that uses @testcontainers I've wondered how we could make it available for users without the machine power or even access to docker. Testcontainer cloud solves that problem.



James Ward
@_JamesWard



Holy amazing wowzers! The best improvement to developer productivity since docker has landed. I got hands on with Testcontainers Cloud yesterday and it blew me away. Local dev, test, and CI will never be the same. Forever better. Thank you @AtomicJarInc!



Julien Dubois
@juliendubois

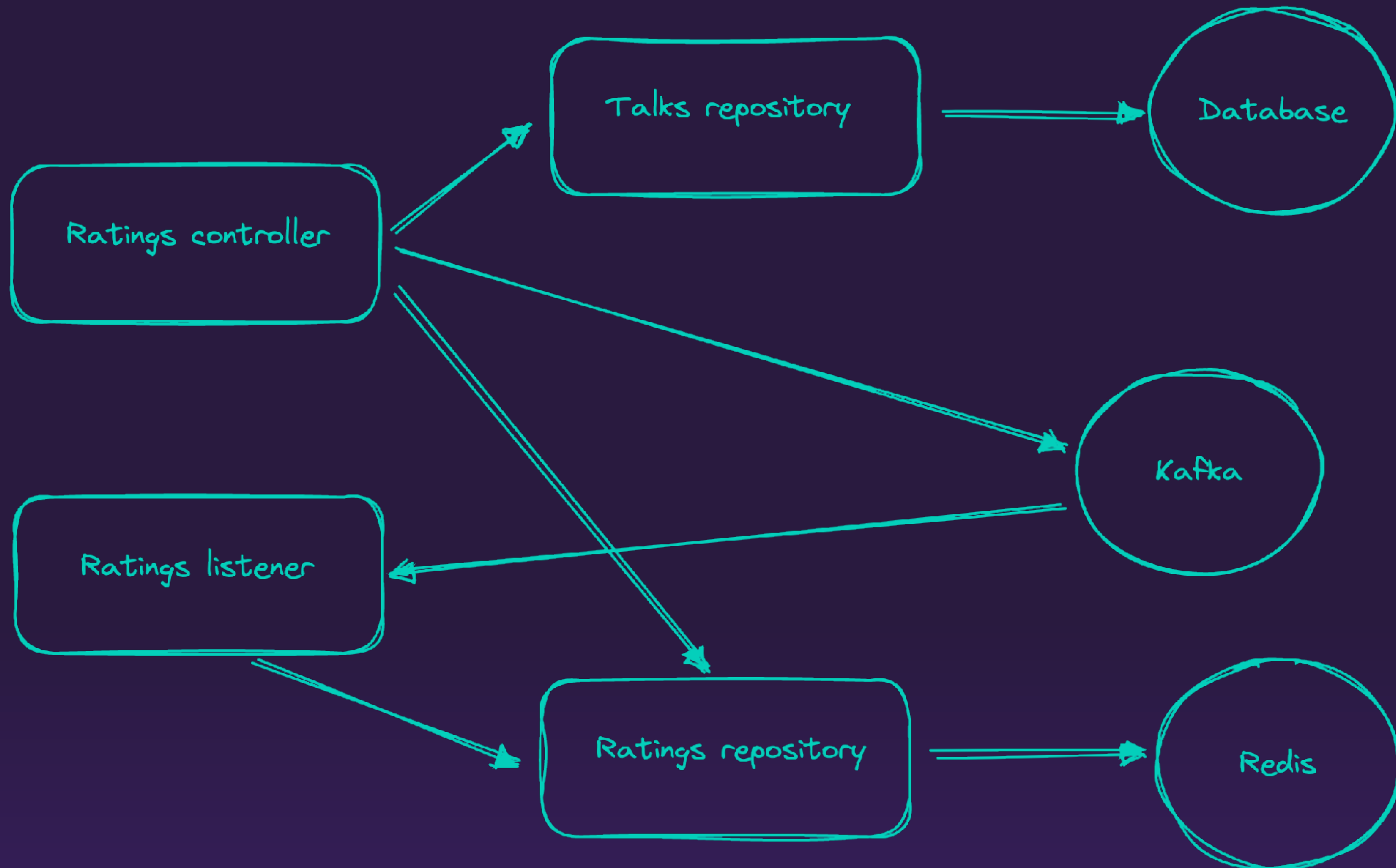


Microsoft

Congrats to the team!! That's a great idea.

Model:

```
record Rating (String talkId, Integer value) {}
```



Resources

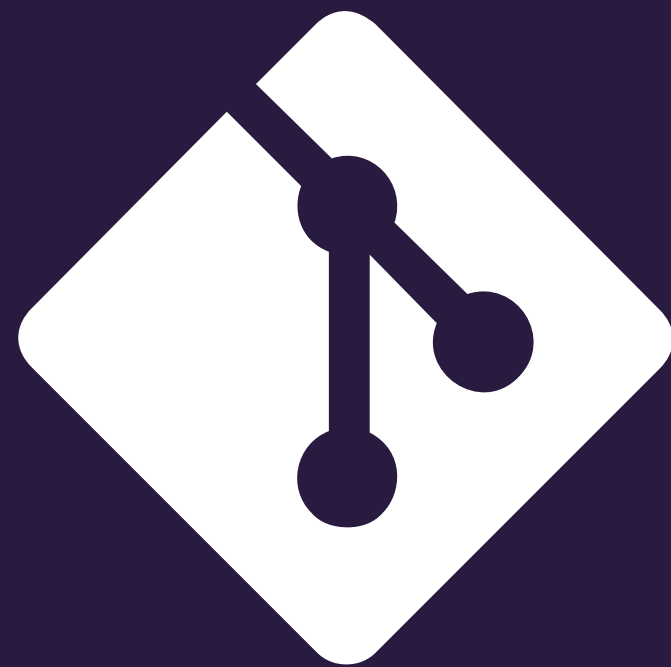


— github.com/testcontainers/testcontainers-java



— www.testcontainers.org

Let's get started



— github.com/testcontainers/workshop

Agenda

[github.com/
testcontainers/
workshop](https://github.com/testcontainers/workshop)

Intro & theory – 

Setup the project: Steps 1 & 2 – 15 minutes

Adding the first tests – 10 minutes

Your first Testcontainers integration – 15 minutes

Redis tests & Redis Generic container – 20 minutes

Kafka tests – 15 minutes

Testcontainers without the framework support – 20 min

Database initialization setup – 20 min

Migrating Docker-compose to Testcontainers – 20 min

Agenda

Intro & theory – ✓

Setup the project – ✓

Adding the first tests: Step 3 – 10 minutes

Your first Testcontainers integration – 15 minutes

Redis tests & Redis Generic container – 20 minutes

Kafka tests – 15 minutes

Testcontainers without the framework support – 20 min

Database initialization setup – 20 min

Migrating Docker-compose to Testcontainers – 20 min

Agenda

Intro & theory – ✓

Setup the project – ✓

Adding the first tests – ✓

Your first Testcontainers integration: Step 4 – 15 minutes

Redis tests & Redis Generic container – 20 minutes

Kafka tests – 15 minutes

Testcontainers without the framework support – 20 min

Database initialization setup – 20 min

Migrating Docker-compose to Testcontainers – 20 min

Agenda

Intro & theory – ✓

Setup the project – ✓

Adding the first tests – ✓

Your first Testcontainers integration – ✓

Redis tests & Redis Generic container: Steps 5 & 6 – 20 minutes

Kafka tests – 15 minutes

Testcontainers without the framework support – 20 min

Database initialization setup – 20 min

Migrating Docker-compose to Testcontainers – 20 min

Agenda

Intro & theory – ✓

Setup the project – ✓

Adding the first tests – ✓

Your first Testcontainers integration – ✓

Redis tests & Redis Generic container – ✓

Kafka tests: Step 7 – 15 minutes

Testcontainers without the framework support – 20 min

Database initialization setup – 20 min

Migrating Docker-compose to Testcontainers – 20 min

Agenda

Intro & theory – ✓

Setup the project – ✓

Adding the first tests – ✓

Your first Testcontainers integration – ✓

Redis tests & Redis Generic container – ✓

Kafka tests – ✓

Testcontainers without the framework support: Step 8 – 20 min

Database initialization setup – 20 min

Migrating Docker-compose to Testcontainers – 20 min

Agenda

Intro & theory – ✓

Setup the project – ✓

Adding the first tests – ✓

Your first Testcontainers integration – ✓

Redis tests & Redis Generic container – ✓

Kafka tests – ✓

Testcontainers without the framework support – ✓

Database initialization setup: Step 9 – 20 min

Migrating Docker-compose to Testcontainers – 20 min

Agenda

Intro & theory – ✓

Setup the project – ✓

Adding the first tests – ✓

Your first Testcontainers integration – ✓

Redis tests & Redis Generic container – ✓

Kafka tests – ✓

Testcontainers without the framework support – ✓

Database initialization setup – ✓

Migrating Docker-compose to Testcontainers: Step 10 – 20 min

Congrats!

Intro & theory – ✓

Setup the project – ✓

Adding the first tests – ✓

Your first Testcontainers integration – ✓

Redis tests & Redis Generic container – ✓

Kafka tests – ✓

Testcontainers without the framework support – ✓

Database initialization setup – ✓

Migrating Docker-compose to Testcontainers – ✓