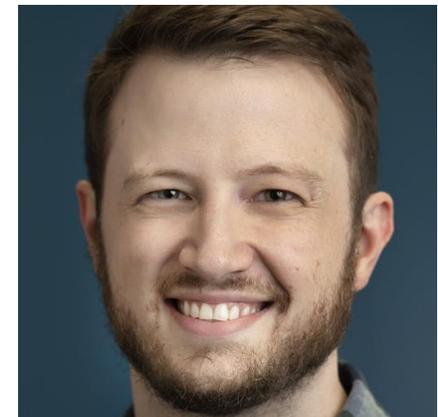# How to Write Contract Tests in .NET With Pact

Daniel Ward

Me

- Software developer, consultant
- Co-organizer San Antonio/Austin .NET User Group
- Microsoft MVP .NET
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Overview

- What is contract testing?
- Why use it over current testing methods?
- Microservices implications
- How to contract test
- Coding demo with Pact

What is Contract Testing?

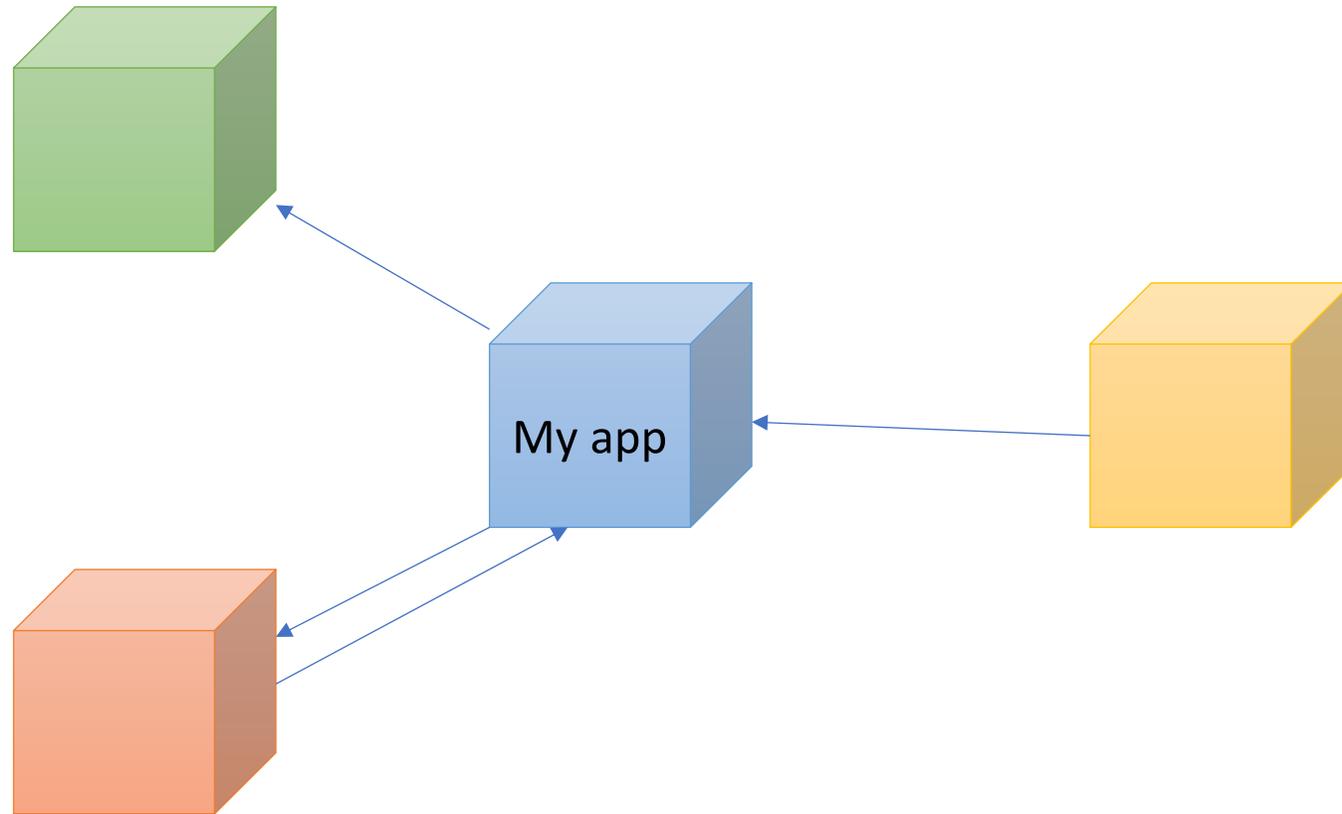Integration tests that produce a contract (JSON file) describing the expectations of an API
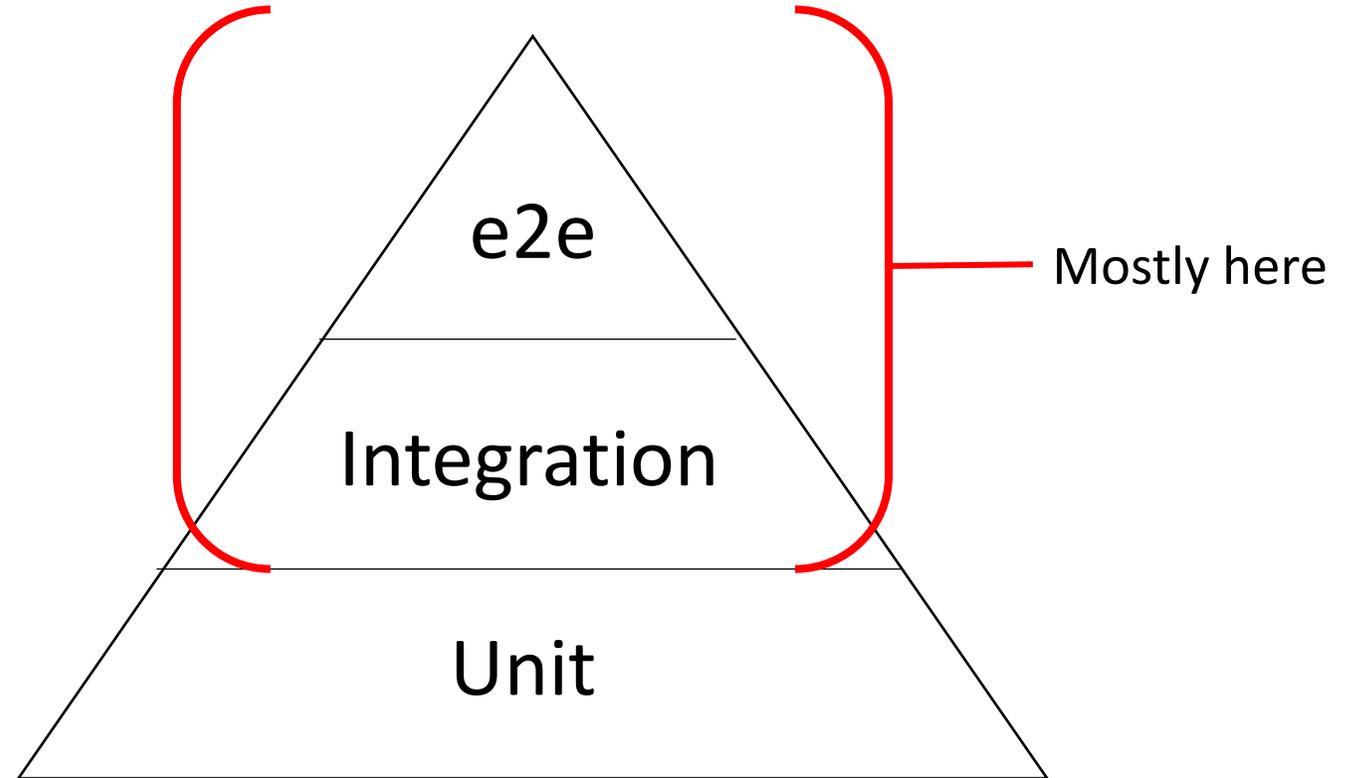
Why Contract Testing?

1. Do you set your house on fire to test your smoke alarm?

2. Facilitates discussion between teams

Microservices

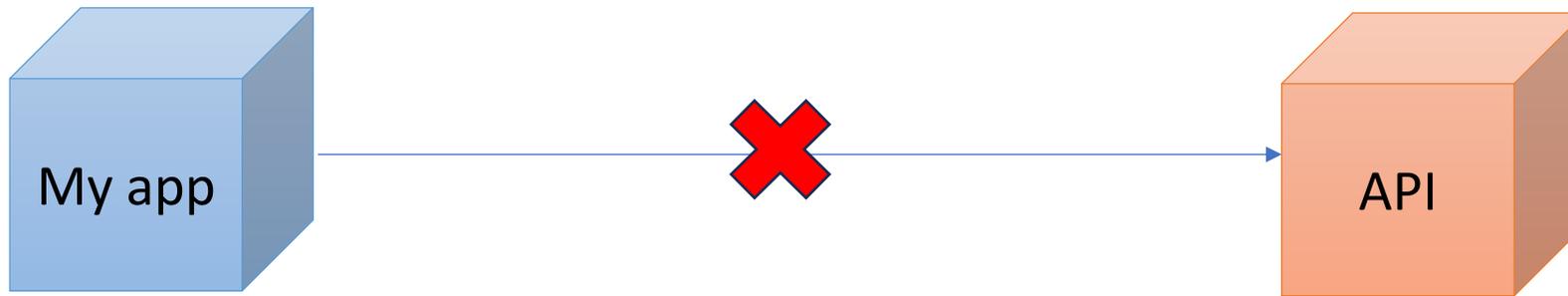My app

Now we need more tests!

e2e

Integration

Unit

Mostly here

Integration/e2e tests

⌛ Slow to write, slow to run

💲 Slow to diagnose

🥖 Brittle (how many times have you used [Skip]?)
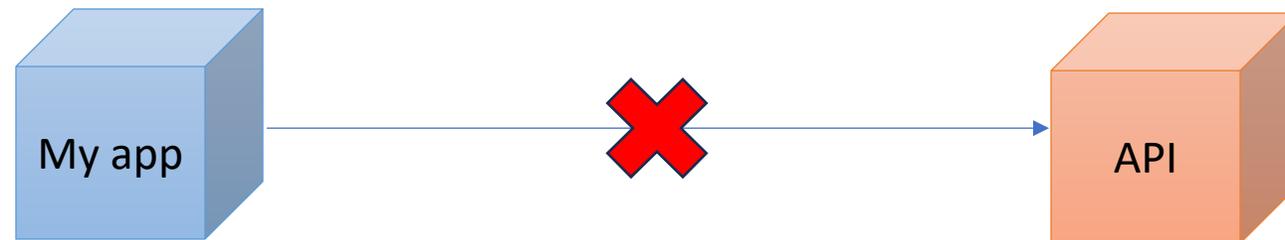
My app ❌ API
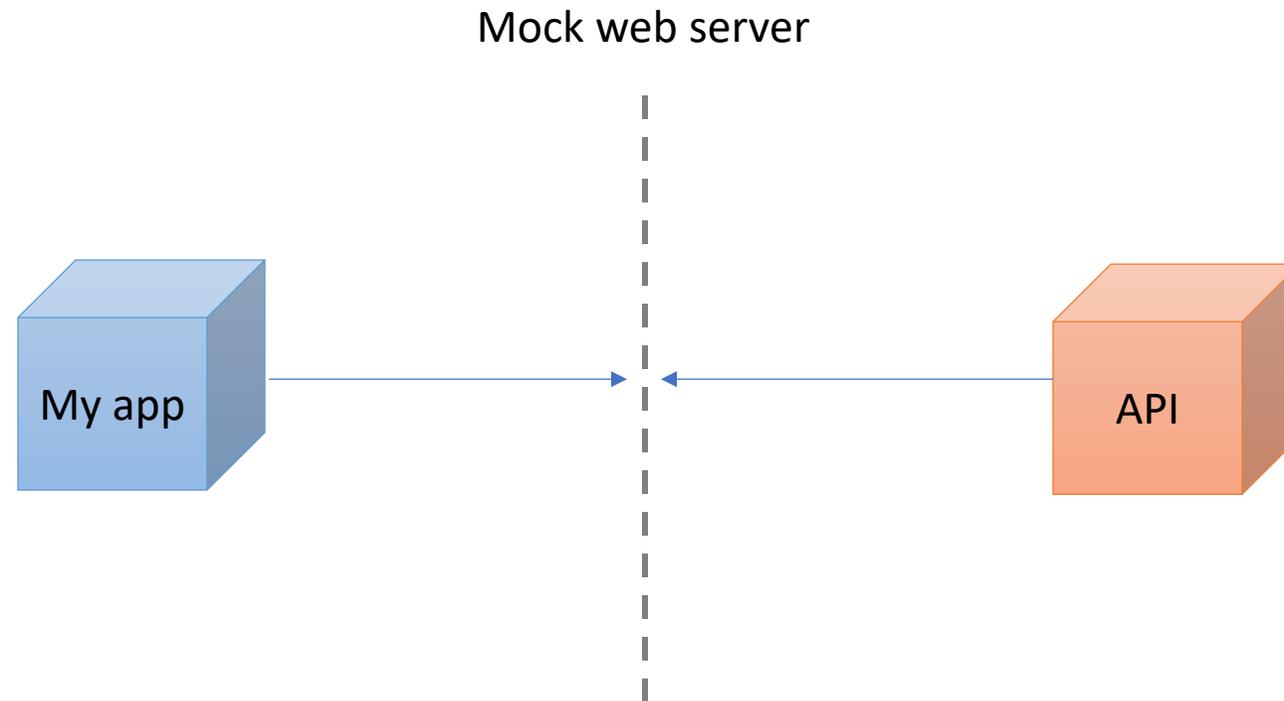
Contract Testing

- Martin Fowler
- Microservices communicate through each others' interfaces
  - REST
  - gRPC
  - Queues, pub/sub, events
- Test with the interfaces instead of the real services

Contract Testing

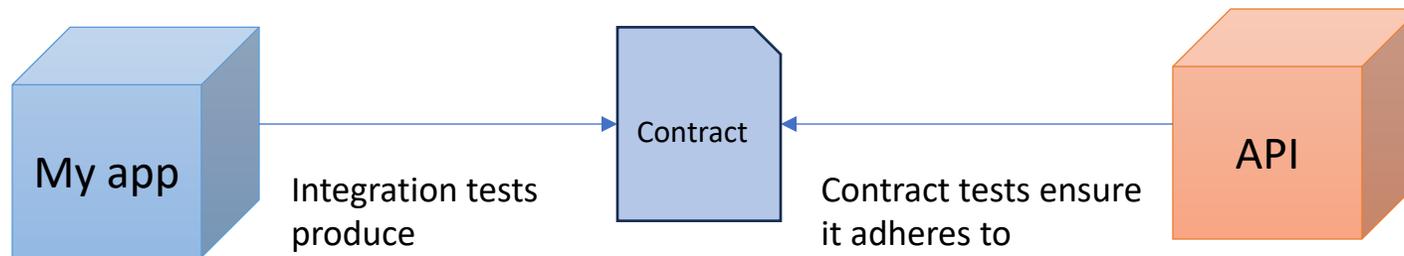# Contract Testing

Mock web server

My app → ← API

Producing a Contract

GET /product/1
If a product with id 1 exists
Return 200 with this body: {…}
etc.

My app → Contract ← **API**

Integration tests
produce

Contract tests ensure
it adheres to

Consumer-Driven Contracts

Slides and repo at daninacan.com
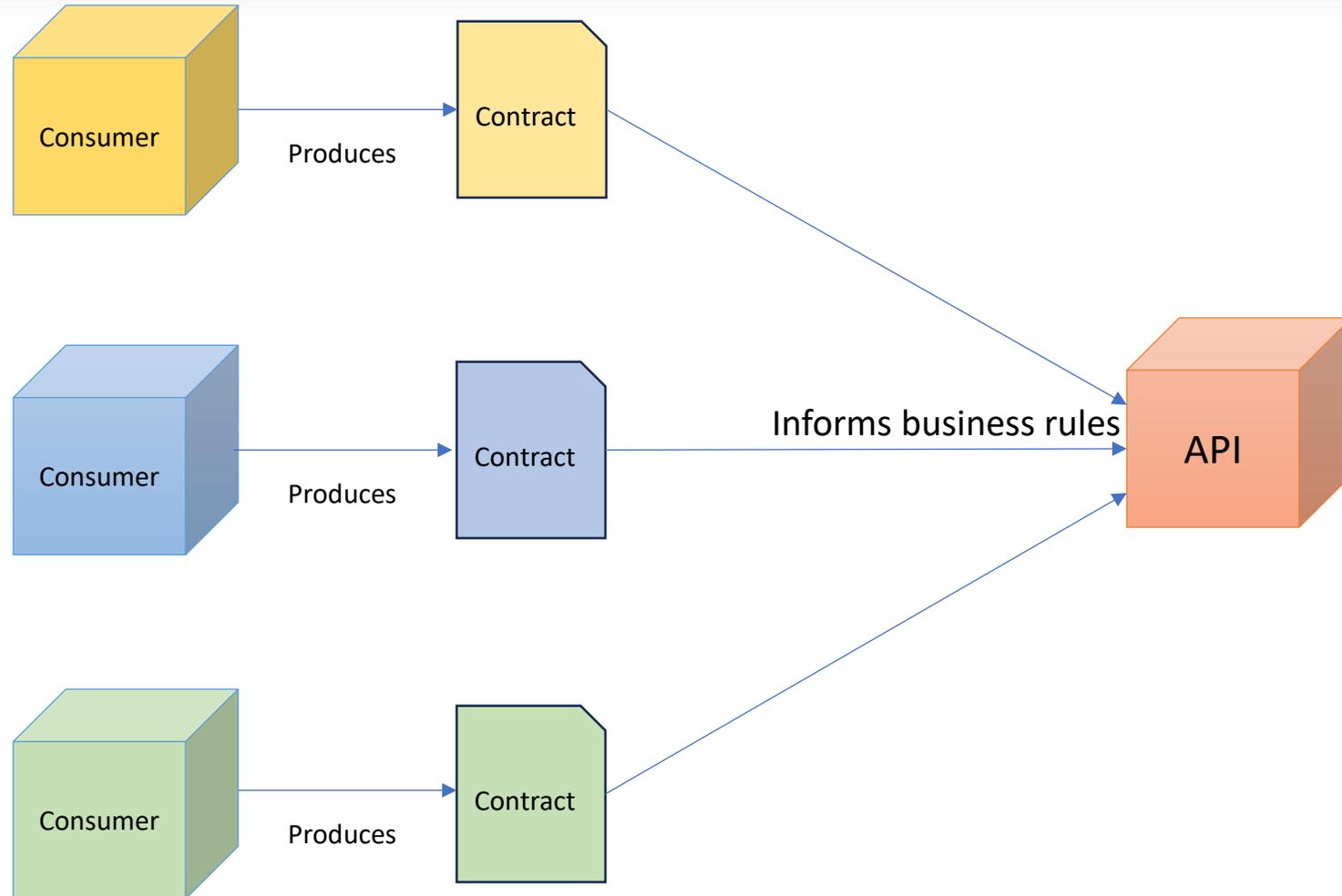
Why Consumer-Driven Contracts?

- ✅ Suitable for internal APIs with known consumers
- ❌ NOT suitable for public APIs with thousands/millions of consumers
- Facilitates team communication
- Customer-driven

Why not OpenAPI?

Tell you all valid requests and responses, but not which ones map to which

Pact

Library for writing contract tests

Javascript, Java, .NET, Go, Python, Swift, Scala, PHP, Ruby, Rust, C++

Backend written in Rust

Coding demo

Recap

What is contract testing?

Why use it over current testing methods?

Microservices in modern organizations

More services requires more tests, more team communication

How to contract test, what problems it solves

Coding demo

Further Reading

- https://martinfowler.com/articles/practical-test-pyramid.html#ContractTests
- https://testing.googleblog.com/2015/04/just-say-no-to-more-end-to-end-tests.html
- https://pactflow.io/what-are-the-benefits-of-contract-testing/

Thank you!