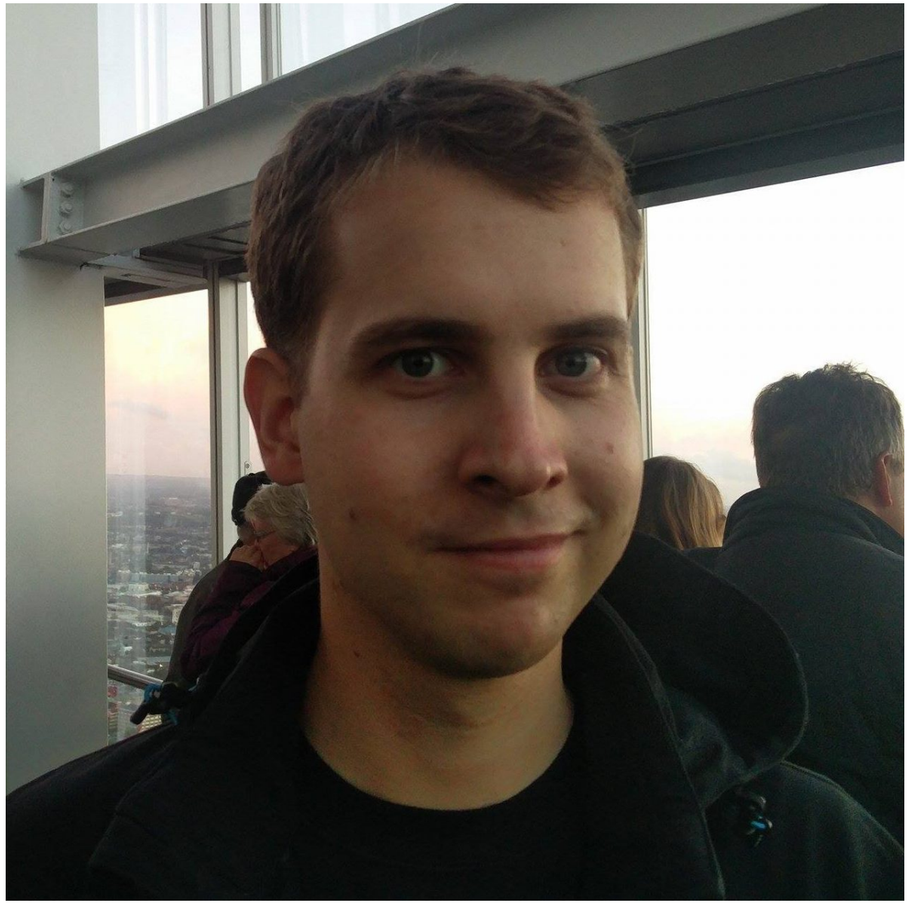
Testing APIs Hypermedia way

Tomasz Pluskiewicz :: tpluscode :: API Days Barcelona :: 2019

About me

- Tomasz Pluskiewicz
- Zazuko GmbH
- Interests
  - Semantic Web
  - REST APIs
  - Hydra CG

/tpluscode
@tpluscode



Agenda

- /Testing(Hypermedia)?(APIs)?/
- Domain-Specific Language
- Lessons learned
- Roadmap

REST Fest

- 9th year in Greenville, SC
- Second time in Europe
- restfest.org and /@restfest

Midwest US

May 31st - June 1st

Grand Rapids, MI USA

Central EU

May 31st - June 1st

Wroclaw, Poland EU

East US

September 25 + 26-28th

Greenville, SC USA

Kinds of tests

Kinds of tests

	Unit	E2E
"Code"	jUnit, Mocha	Selenium, Protractor
APIs	REST Assured, Postman, Karate	REST Assured, Karate
Hypermedia	N/A	?

Tester's first rule

Tests should mimic consumer behavior

Hypermedia aka REST architectural style

- Linked resources
- Self-descriptive messages (follow your nose)
- Resource representations

How to test hypermedia?

1. Start from a single resource
2. Follow links
3. Perform only requests described in representations
4. Refrain from referencing concrete URLs
5. Do not rely on concrete message format

Hypertest DSL

https://testing.hypermedia.app/

Hypertest DSL

```
With Class ex:Employee {
    Expect Property ex:salary
    Expect Link ex:manager

    Expect Property ex:contract {
        Expect Operation api:TerminateContract {
            Invoke {
                Expect Status 204
            }
        }
    }
}

With Link ex:manager {
    Expect Link api:subordinates
}
```

```
{
  "@id": "/tomasz",
  "@type": "ex:Employee",
  "ex:salary": "NaN",
  "ex:manager": "/adrian",
  "ex:contract": {
    "@id": "/contract/foo",
    "hydra:operation": {
      "@type": "api:TerminateContract"
    }
  }
}

{
  "@id": "/adrian",
  "@type": "ex:Person",
  "api:subordinates": {
    "@id": "/adrian/subordinates"
  }
}
```

Hypertest DSL

- Core language
- Media-type-specific dialects
  - Currently only Hydra
- Built with Eclipse Xtext
- Language Server Protocol

Language Server Protocol

The problem: "The Matrix"

	Go	Java	TypeScript	...
Emacs				
Vim				
VSCode				
...				

The solution: lang servers and clients

Go	✔
Java	✔
TypeScript	✔
...	

Emacs	✔
Vim	✔
VSCode	✔
...	

Web editor

Lessons learned

Lessons learned

Test-first to drive design

Test-first to drive design

- Design complex interactions so that they are discoverable by the test runner
- That way they will be discoverable by the client

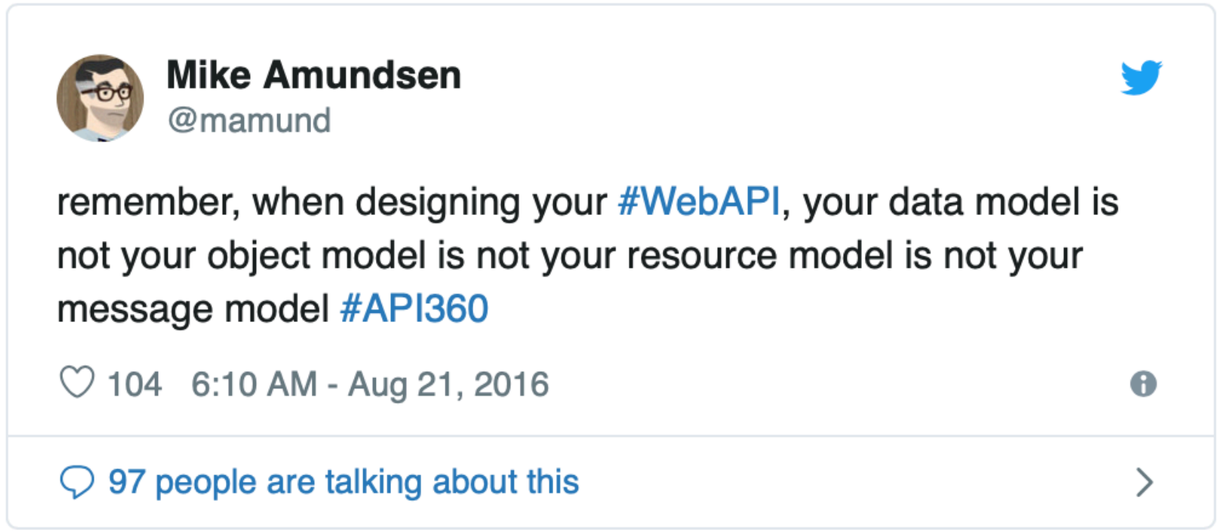
How the API can guide a client through its resources?

🤓 Demo time[1] 🤓

[1] https://gist.github.com/tpluscode/78b8214ab6df6bd9be5be8859a50e0e2

Lessons learned

- API graph !== data graph [2]



[2] https://twitter.com/mamund/status/767212233759657984

So is it any good?

- Limited "programming" model
- Not interpreted, unless using Java
- Potential false positives
- Not a replacement for other approaches

What's next for hypertest?

- Language features
- "Code" coverage
- Graphical report
- Editor plugins
- Dialects for more media types
  - Better runner

Learn more

https://testing.hypermedia.app/dsl/

https://github.com/hypermedia-app/hypertest

Web editor: https://hypertest.zazukoians.org/

/HypermediaApp

Thank you