How to build an evolutionary architecture

oreilysacon.com
#OReillySACon
Agenda

• Giraffes
• Coffee
• A guy who knows a lot
• ...
• Software Architectures!
Personal introduction

Antonio Jiménez González

- Solutions Architect @The Workshop
- Bassist
- Takes a picture of himself in a basketball shirt in every new country he sets foot in
Personal introduction

Pedro Javier Martos Velasco

• Tech Lead @ The Workshop
• Guitarist
• Book lover
• CD and vinyl lover
The problem
5 years ago...
The monolith
Monolith issues

- Big and costly
- Hard to understand
- Hard to CHANGE

Complexity was killing us
All Architectures need to change
3 years later...
Letter to santa

- Incremental Changes
  - Event driven Architecture
  - Microservices
  - ...
- Shorter Cycle
  - Continuous Delivery
  - Embracing DevOps Culture
  - ...
New platform

- 30 microservices
- Event driven
- CD
- Contract testing
- ...

Icons by Freepik
The honeymoon

Designed by Freepik
1 year later...
The platform has grown big!

- 100+ microservices
- Lots of new tech
- Lots of devs
- Lots of changes
- ...

Icons by Freepik
New problem
Degradation

Beyond the coffee cup
We didn’t see it coming
We need to see
Hypothesis

• If we know what to measure
• And how to do it
• We can compare
All Architectures need to change. Evolutionary Architectures evolve.
Survival of the fittest

Lamarck’s Giraffe

Original short-necked ancestor

Keeps stretching neck to reach leaves higher up on tree

And stretching

And stretching until neck becomes progressively longer
What’s an evolutionary architecture?

“An evolutionary architecture supports guided, incremental change across multiple dimensions.”

*Building Evolutionary Architectures*
2017 O’Reilly
Ford, Parsons, Kua
Hypothesis: revisited

- What are going to measure?
- How are we going to measure it?
- What are going to do with that data?
Architectural dimensions

- Maintainability
- Auditability
- Security
- ...

{-ilities}
Our -ilities

The Workshop's architecture principles:

- Resilience
- Simplicity
- Observability
- Security
- Consistency
- Efficiency
- Technology Independence
- Disposability
Fitness functions

A metric about some relevant aspect of your architecture
## Our Architectural dimensions

<table>
<thead>
<tr>
<th>Load Test</th>
<th>Complexity</th>
<th>Duplication Density</th>
<th>Average # of code committed</th>
<th>% entrypoints instrumented</th>
<th>Vulnerabilities</th>
<th>Coverage</th>
<th>Code smells</th>
<th>Latent objects</th>
<th>Build &amp; deploy Time</th>
<th>#Licences Open Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resilience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simplicity</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Consistency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Efficiency</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Tech Ind.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Tools we reviewed

- Hygieia
- ArchUnit
- Sonar
- ...
The product
It's demo time!
## Fitness Functions (new features)

<table>
<thead>
<tr>
<th>Resilience</th>
<th>Simplicity</th>
<th>Observability</th>
<th>Security</th>
<th>Disposability</th>
<th>Consistency</th>
<th>Efficiency</th>
<th>Tech Ind.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>☒ ☒</td>
<td>☒</td>
<td>☒ ☒ ☒ ☒ ☒ ☒</td>
<td>☒</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dataset</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

• No change is bad

**Yes change is good**

Too many changes... it depends

• Evolutionary Architectures prevent degradation

• It’s not easy
We believe...
evolutionary architectures will be to architects as unit tests are to developers
Cyberconflict: A new era of war, sabotage, and fear

9:55am - 10:10am Wednesday, March 27, 2019
Location: Ballroom

We're living in a new era of constant sabotage, misinformation, and fear, in which everyone is a target, and you're often the collateral damage in a growing conflict among states. From crippling infrastructure to sowing discord and doubt, cyber is now the weapon of choice for democracies, dictators, and terrorists.

David Sanger explains how the rise of cyberweapons has transformed geopolitics like nothing since the invention of the atomic bomb. Moving from the White House Situation Room to the dens of Chinese, Russian, North Korean, and Iranian hackers to the boardrooms of Silicon Valley, David reveals a world coming face-to-face with the perils of technological revolution—a conflict that the United States helped start when it began using cyberweapons against Iranian nuclear plants and North Korean missile launches. But now we find ourselves in a conflict we're uncertain how to control, as our adversaries exploit vulnerabilities in our hyperconnected nation and we struggle to figure out how to deter these complex, short-of-war attacks.

David Sanger
The New York Times

David E. Sanger is the national security correspondent for the New York Times as well as a national security and political contributor for CNN and a frequent guest on CBS This Morning, Face the Nation, and many PBS shows.

O'Reilly Events App
Any questions?
Thank you!

Antonio Jiménez González

- LinkedIn: https://es.linkedin.com/in/ayimgo
- Twitter: http://www.twitter.com/ayimgo

Pedro Javier Martos Velasco

- LinkedIn: https://www.linkedin.com/in/pjmartos
- Twitter: http://www.twitter.com/pjmartos