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BELLAGIO RESORT & HOTEL
SEPTEMBER 15-17, 2015, LAS VEGAS

Building with containers: How containers will drive cloud services

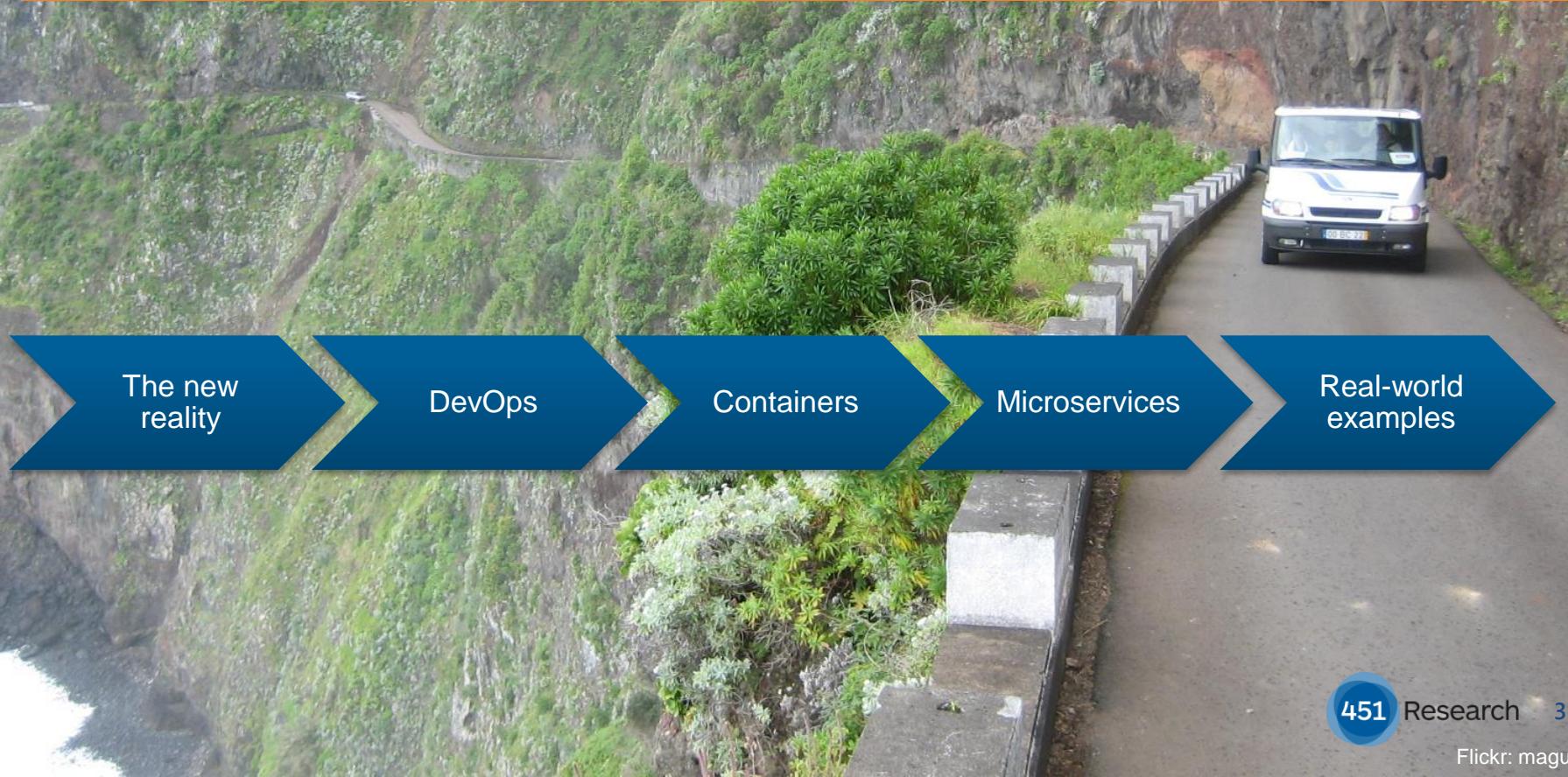
Donnie Berkholz, Ph.D.

Research Director — Development, DevOps, & IT Ops



microservices

Today's roadmap



The new reality

DevOps

Containers

Microservices

Real-world examples



Technology
adoption
is increasingly
bottom-up



App-dev workloads are **quickly** moving to the cloud

On-Premises, Non-Cloud

Off-Premises, Non-Cloud

On-premises Private Cloud

Hosted Private Cloud

Infrastructure-as-a-Service
(IaaS)/Public Cloud

Software-as-a-Service (SaaS)



The new stack?

An **infinite** array of possible stacks.

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DevOps: Putting IT into high gear

The new reality

DevOps

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Microservices

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examples



What in the world is DevOps, anyhow?

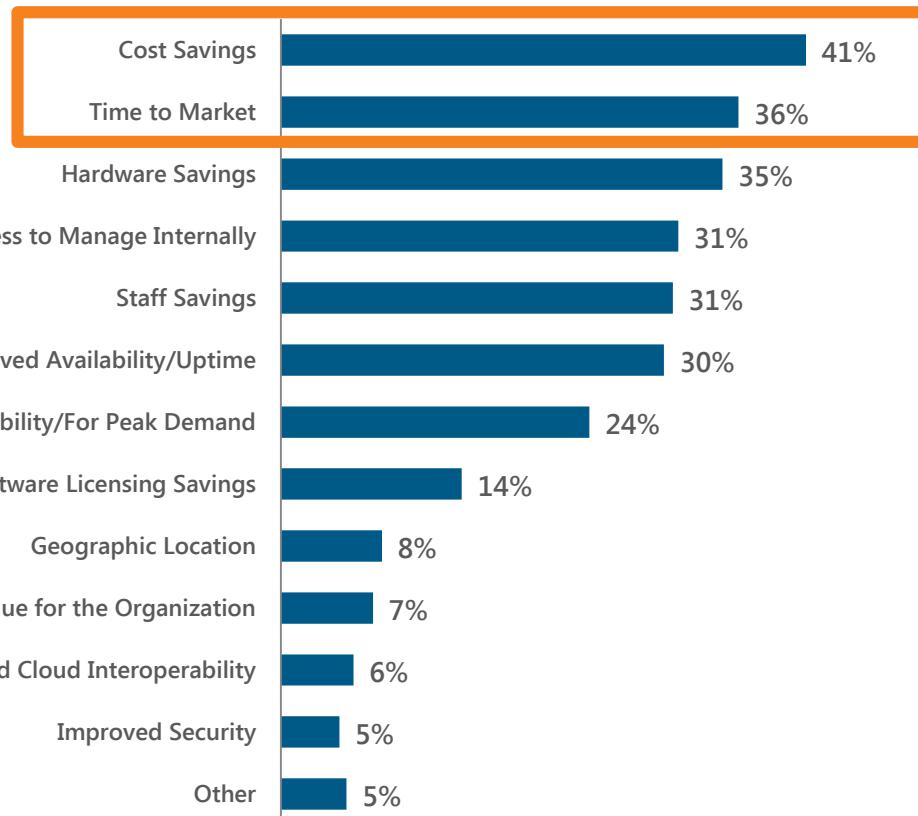


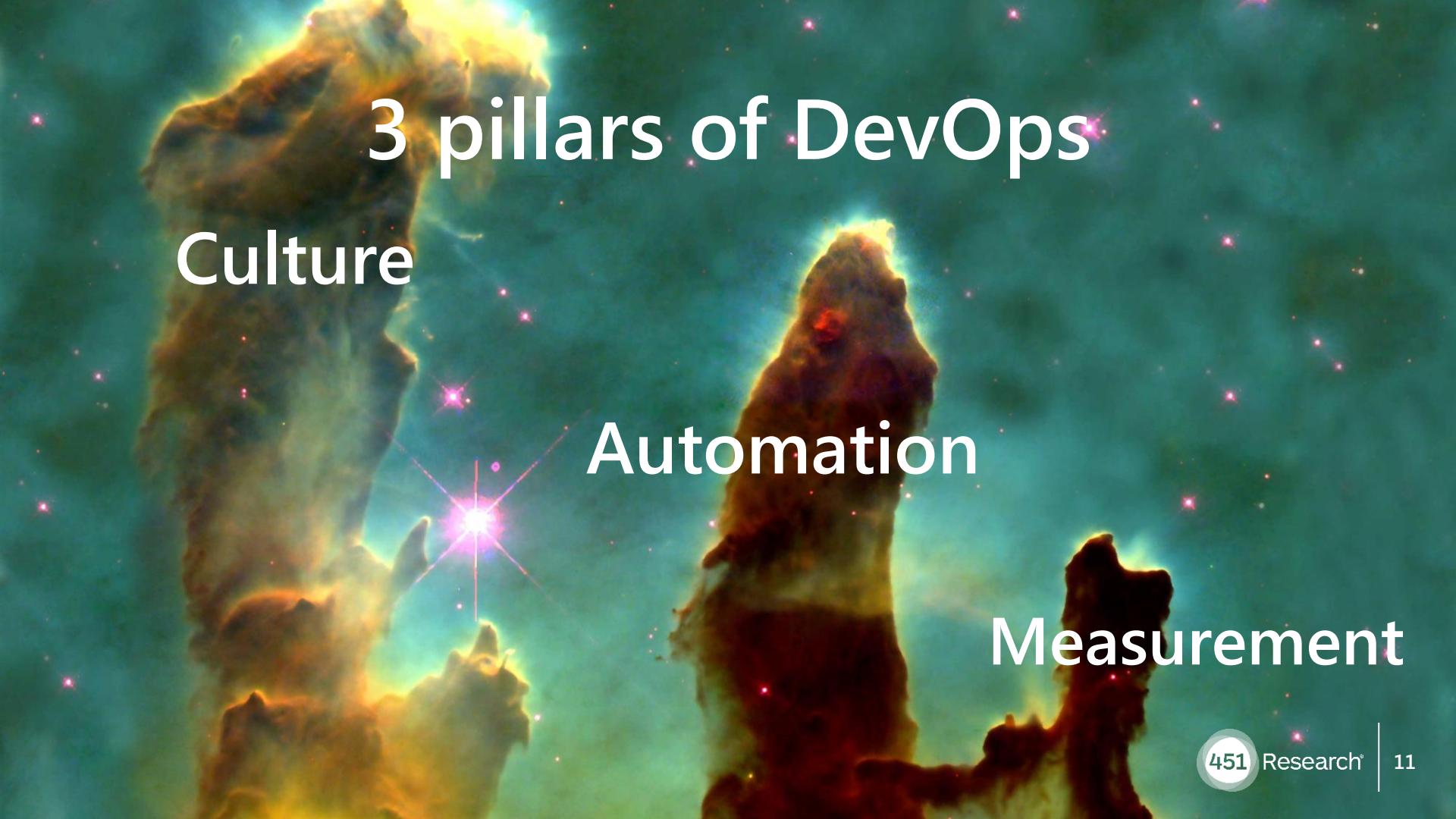
Agile, truly tip to tail



Business to customer

Eerily similar to why orgs are moving to cloud...



A background image of the Eagle Nebula's Pillars of Creation, showing three distinct, jagged rock-like structures composed of reddish-brown and yellowish-orange gas and dust against a dark blue and green nebula.

3 pillars of DevOps

Culture

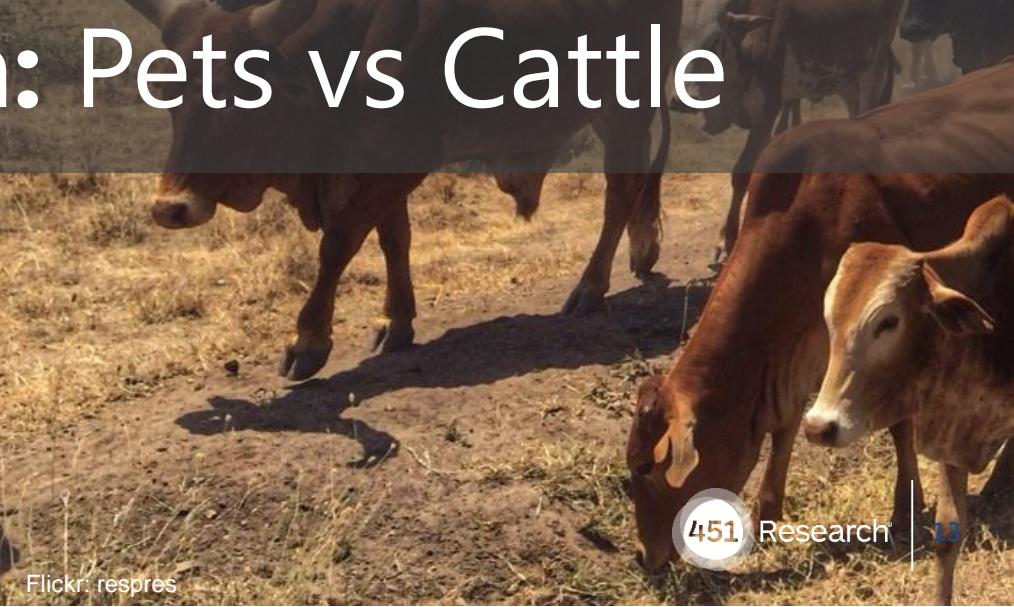
Automation

Measurement

A black and white photograph showing a person from behind, hugging another person. The person being hugged is wearing a dark t-shirt. The person doing the hugging is wearing a light-colored shirt and is holding a spiral-bound notebook with "FREE HUGS" printed in large, bold, capital letters.

**FREE
HUGS**

Culture:
Tear down all the silos



Automation: Pets vs Cattle

Automation: Infrastructure as **code**

CFEngine

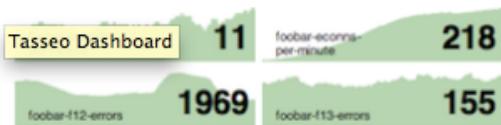




Knight Capital and the \$460 million bug

Measurement #monitoringsucks/monitoringlove

Nagios® graphite



Organizations with high-performing DevOps initiatives were **2x** more likely to exceed profitability, market share and productivity goals...

...and had 50% higher market capitalization growth over 3 years...

DevOps is **crossing** the chasm

Web: Google, Amazon, Netflix, Etsy, Spotify, Twitter, Facebook ...

Vendor: CSC, IBM, CA, SAP, HP, Microsoft, Red Hat ...

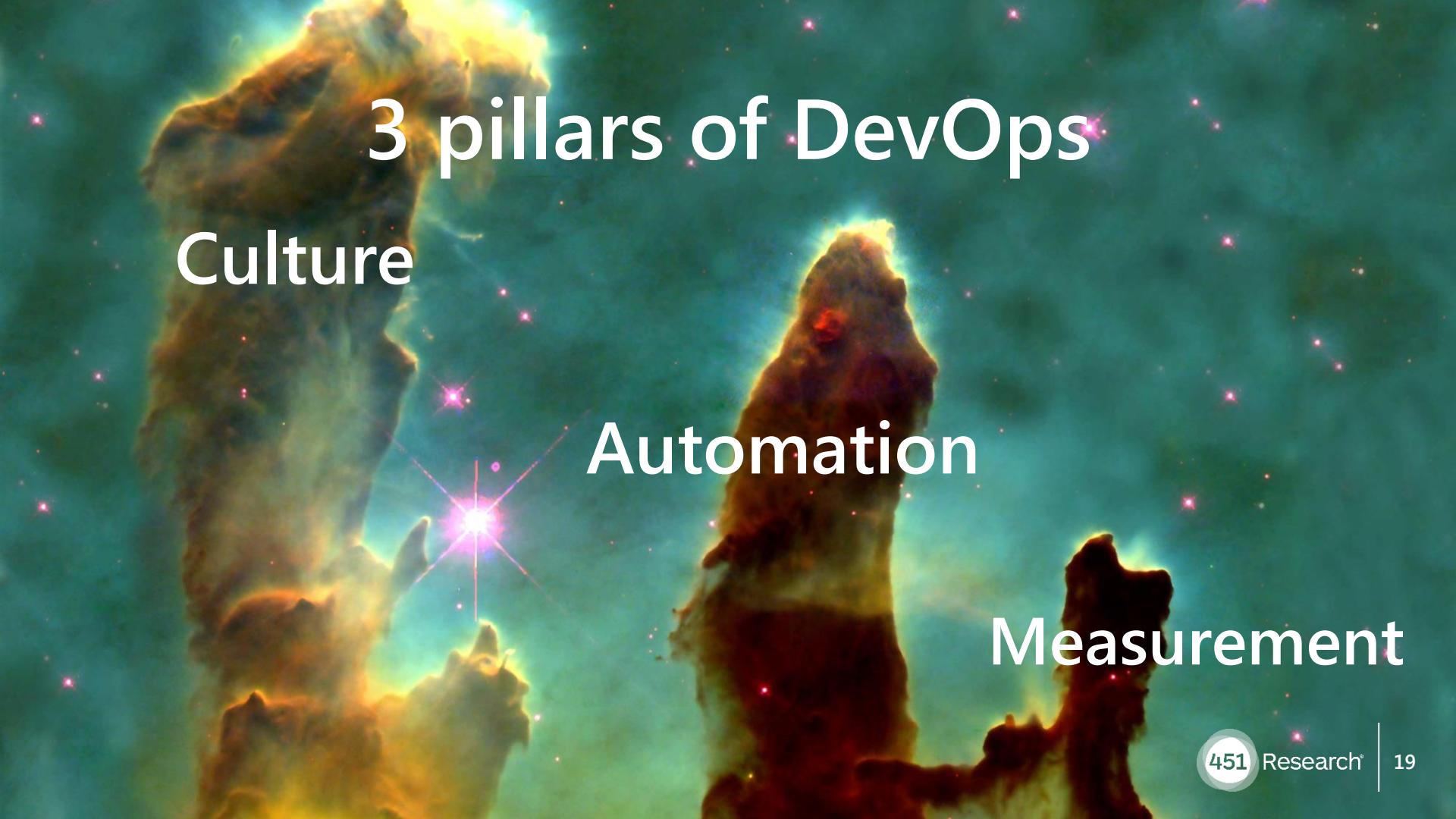
Finance: GE Capital, Nationwide, BNP Paribas, BNY Mellon, World Bank, Paychex, Intuit ...

Retail: The Gap, Nordstrom, Macy's, Williams-Sonoma, Target ...

Manufacturing: General Motors, Northrop Grumman, LEGO, Bosch ...

Govt: UK Government, US Department of Homeland Security ...

Education: Kansas State University...

The background of the slide features a detailed image of the Eagle Nebula's Pillars of Creation, a region of star formation in the Messier 16 nebula. The pillars are dark, columnar structures composed of dense interstellar dust and gas, set against a backdrop of bright, glowing nebulae and numerous small stars.

3 pillars of DevOps

Culture

Automation

Measurement



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Enter **containers**: The future of virtualization

The new reality

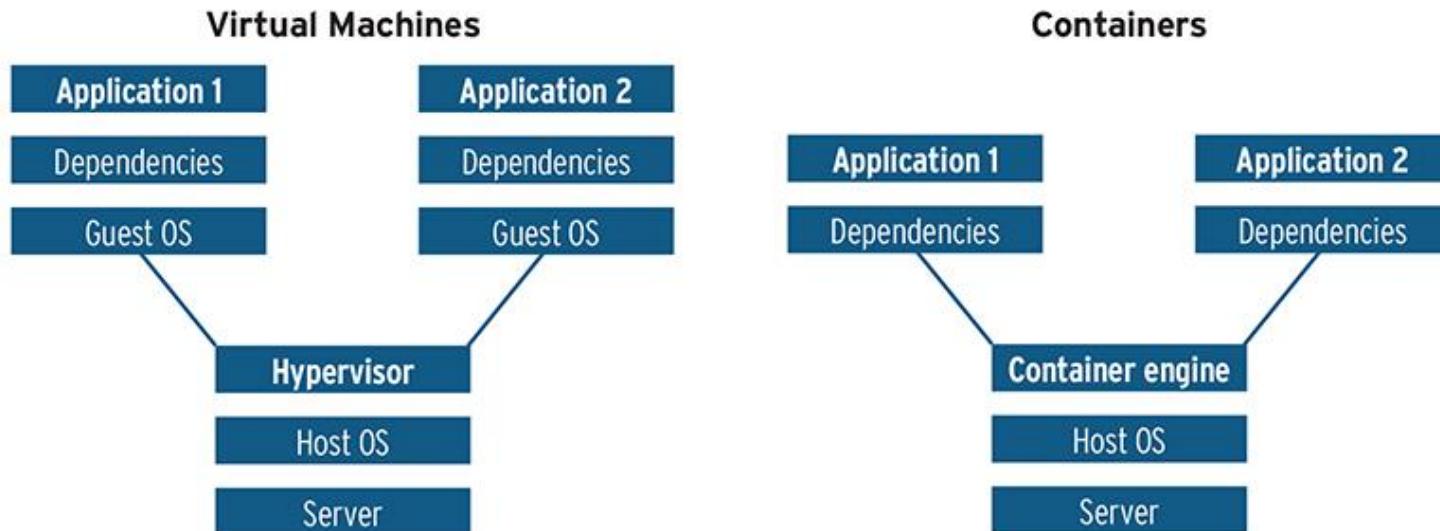
DevOps

Containers

Microservices

Real-world
examples

Aren't they just like VMs? **No.**

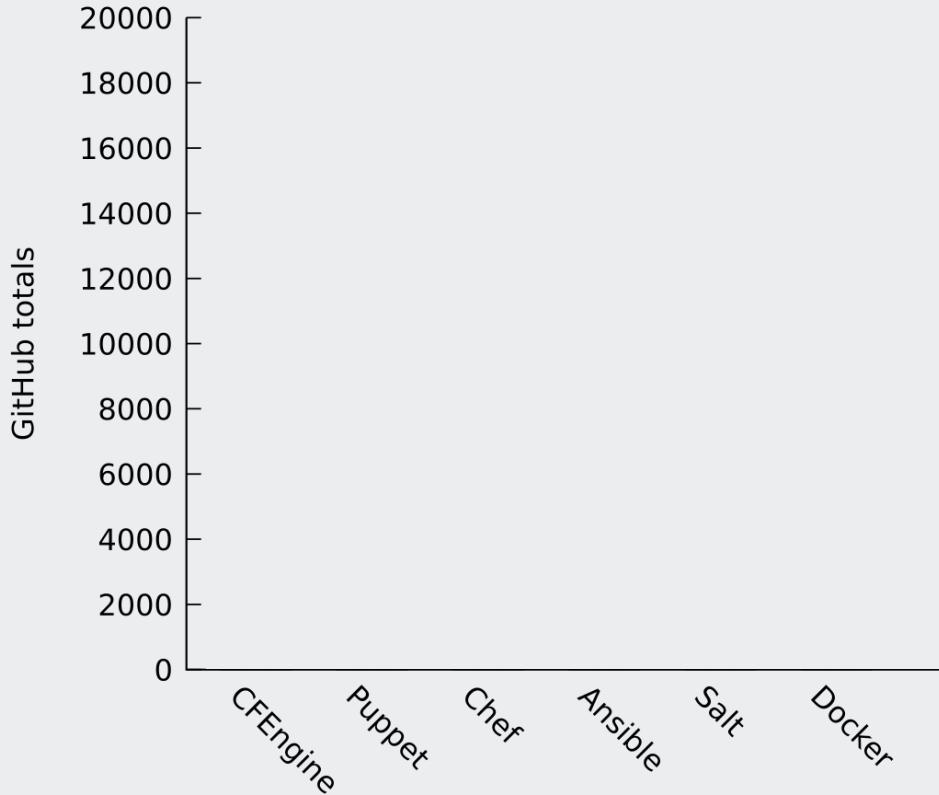


Automation, agility, empathy

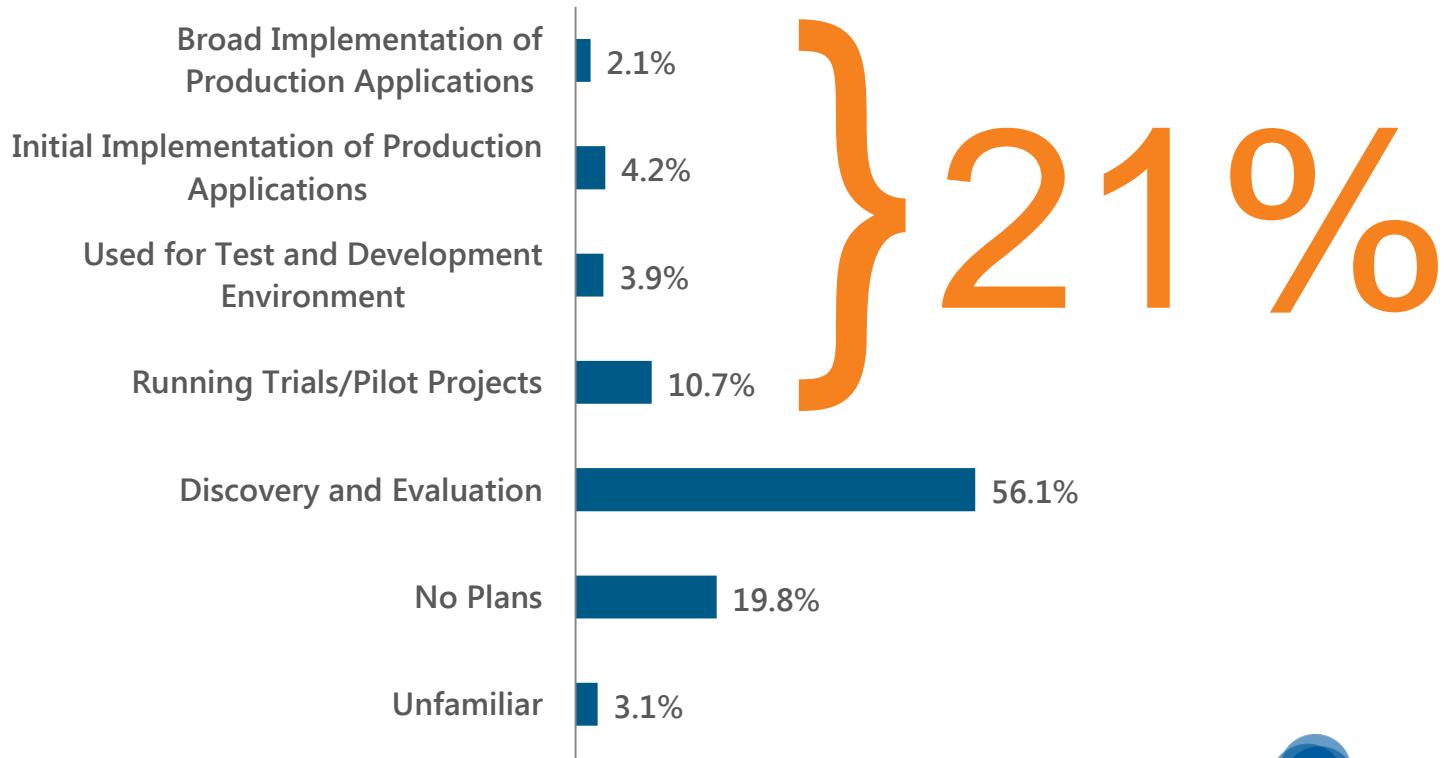


Developers
love
Docker

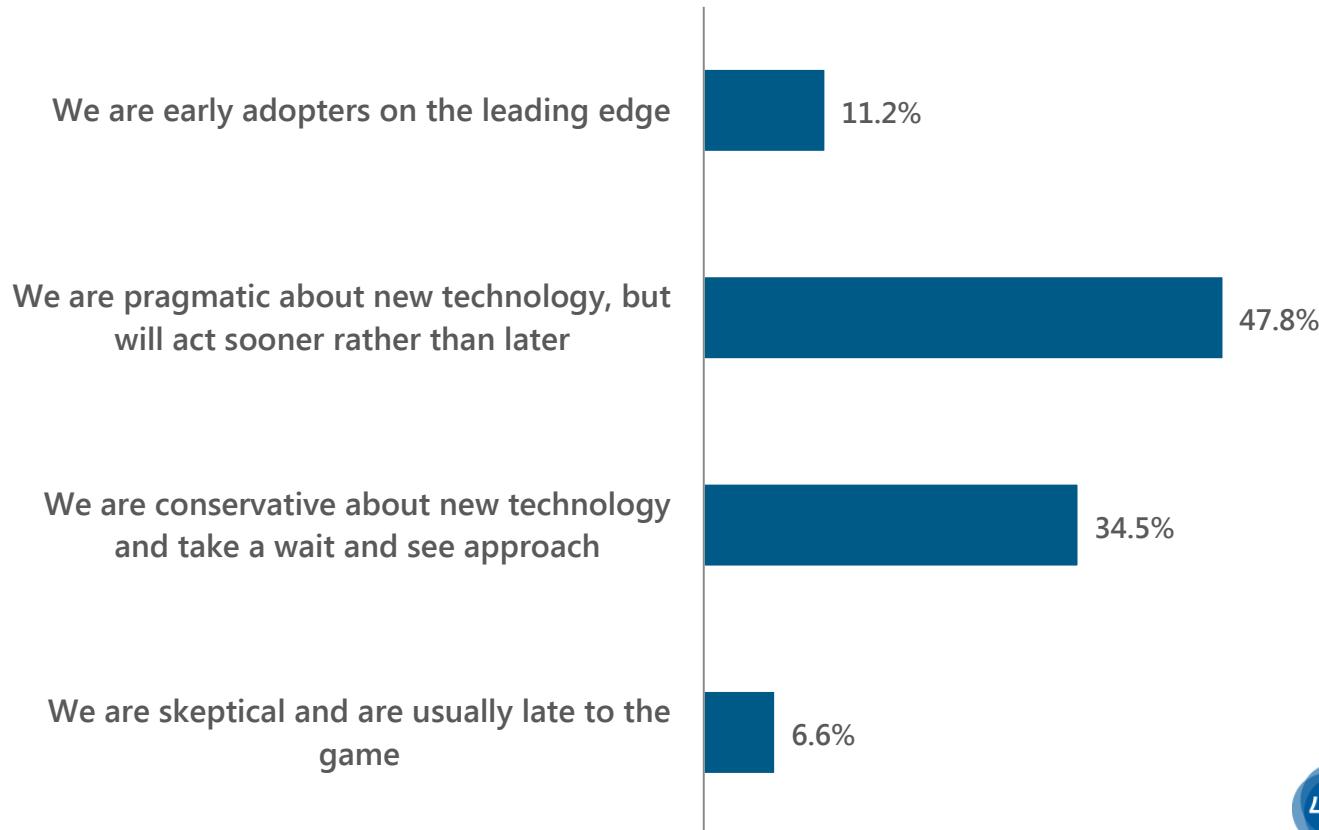
Config mgmt GitHub totals



But it's **not** just a toy



Today, early adopters. Tomorrow, the **majority**.





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Fragmentation drives **microservices** — enabled by containers

The new reality

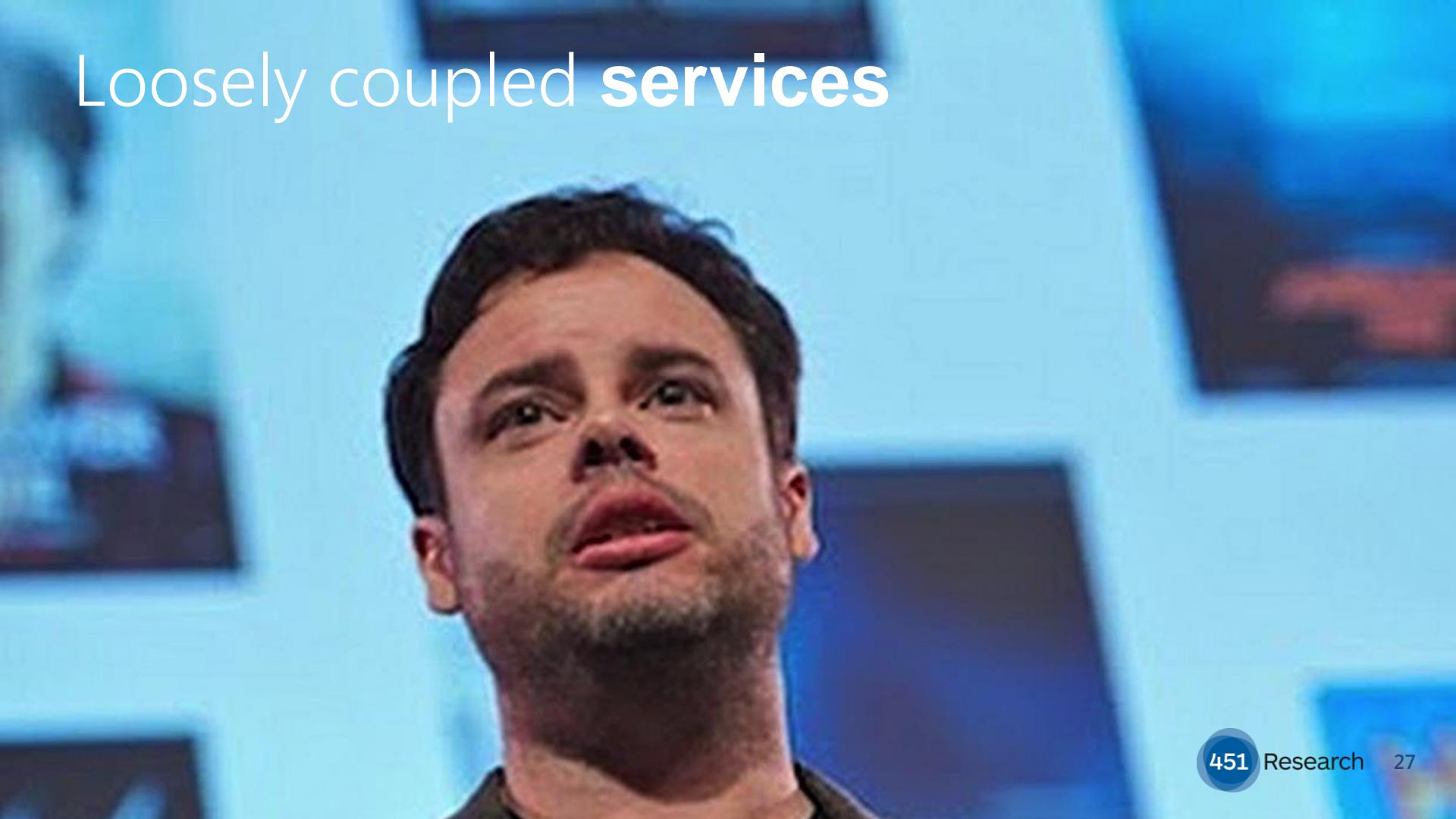
DevOps

Containers

Microservices

Real-world examples

Loosely coupled **services**

A close-up photograph of a man with dark hair and a beard, looking upwards and slightly to his right with a thoughtful expression. He is wearing a dark shirt. The background is blurred, showing what appears to be a stage or presentation environment.

Loosely coupled **teams**

"One of the biggest changes is that we no longer have an official 'architecture' team. Instead, we have made 'architecture' an 'ingredient' on each of our teams."

– Lauri Apple, Gilt Groupe, 14 Nov 2014

The **foundation** of microservices



Capgemini / **Apollo**



Amazon EC2 Container Service

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Four real-world examples

The new
reality

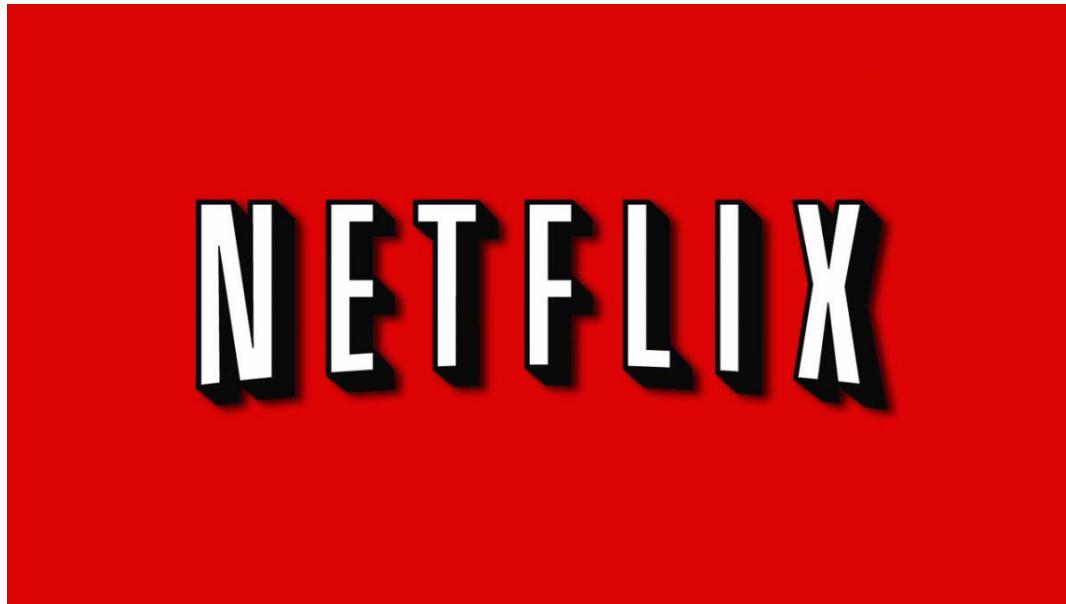
DevOps

Containers

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Real-world
examples

The exemplar



Real-world example #2



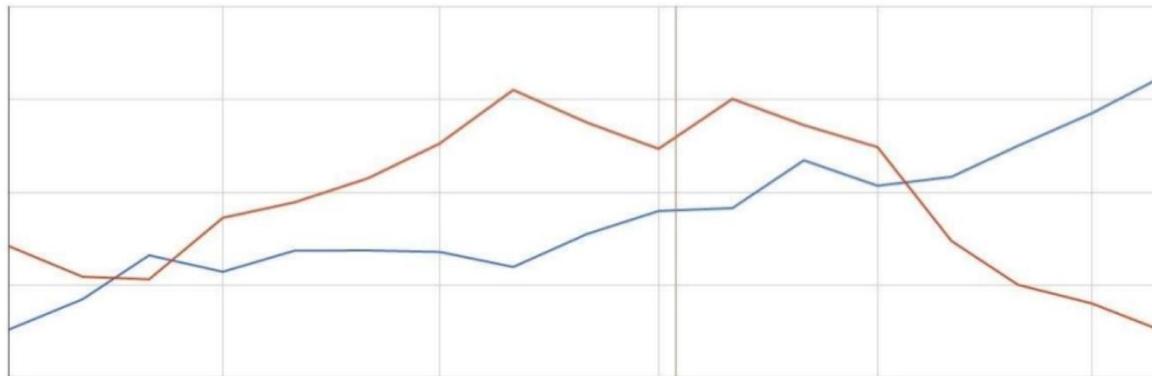
http://www.softwareag.com/blog/reality_check/index.php/integration-insights/microservices-fan-help-adopt/

Real-world example #3

Infrastructure operating cost – a very important KPI

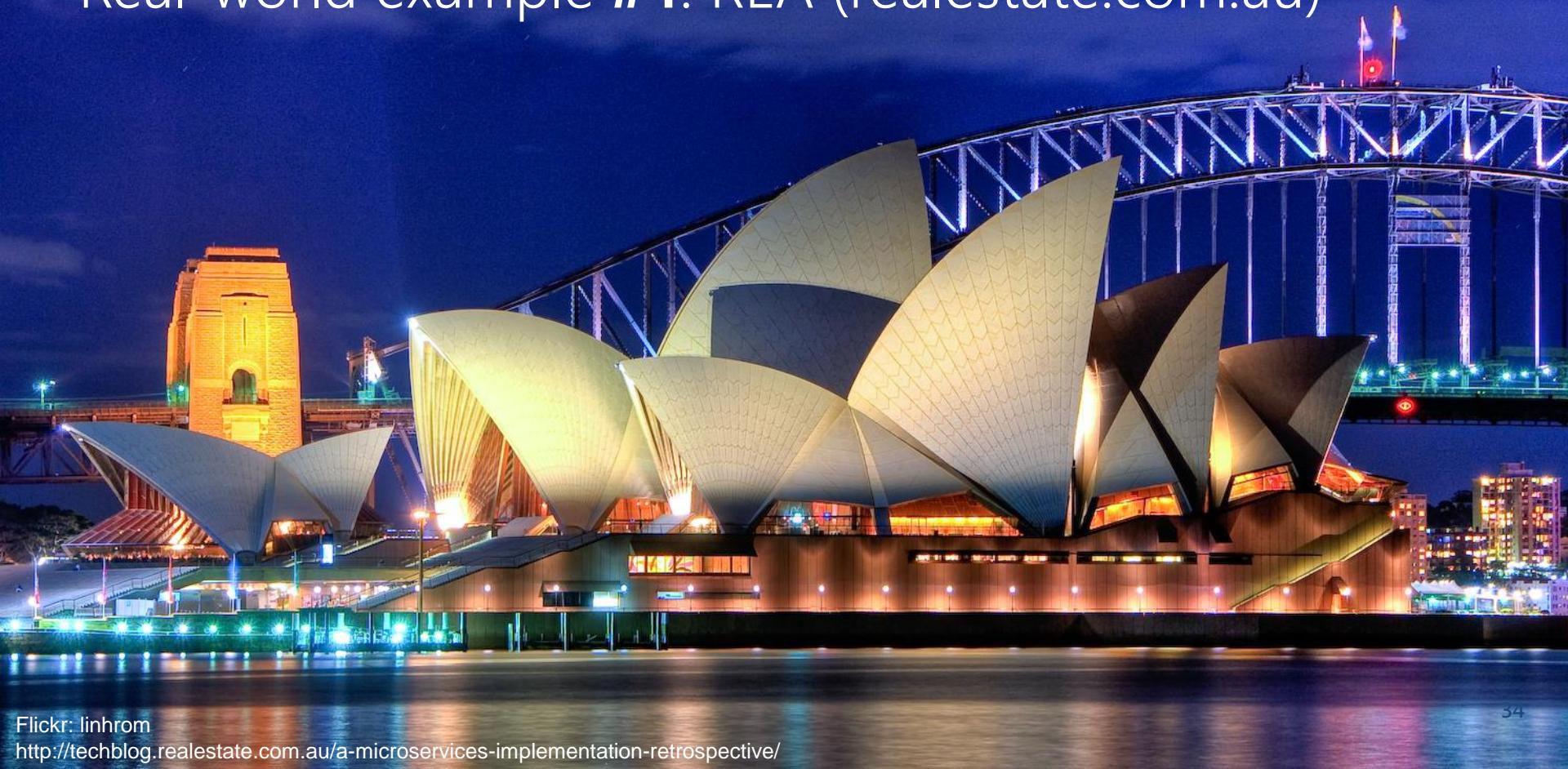


■ global total jobs completed ■ Monthly AWS cost/job



AWS User Group UK 2014

Real-world example #4: REA (realestate.com.au)



Look ma, **no** servers!

The future is now, and it's using AWS Lambda

May 16, 2015

FYI, this is crazy. We just did a backend call with full-on backend logic without setting up any kind of instances. No worrying about starting a new [not-even-free-anymore](#) Heroku Dyno. No choosing machine speed and memory and hard drive sizes. It just works, effortlessly, and scales enormously.

What **you** need to do

- **Yesterday:** Develop a story around DevOps & containers
- **Today:** Begin to create support/services around DevOps
- **Within 6 months:** Support containers in compute, use internally elsewhere
- **Within 18 months:** Enable & encourage microservices migrations, consider Lambda-style approaches & orchestration beyond them

Panelists

Donnie Berkholz,
Research Director, Development, DevOps & IT Ops, 451 Research

Jason Rice
Director, North American Sales



The time for containers is **now**.

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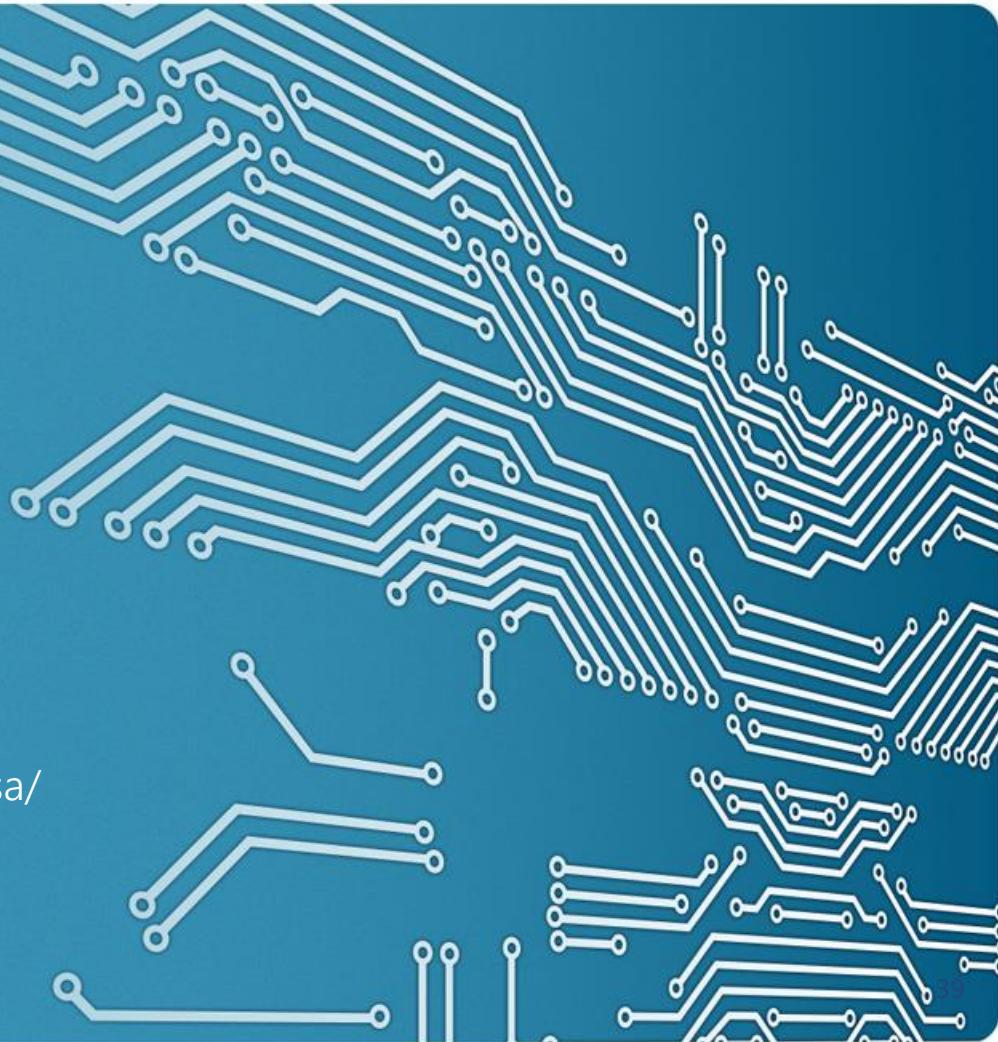
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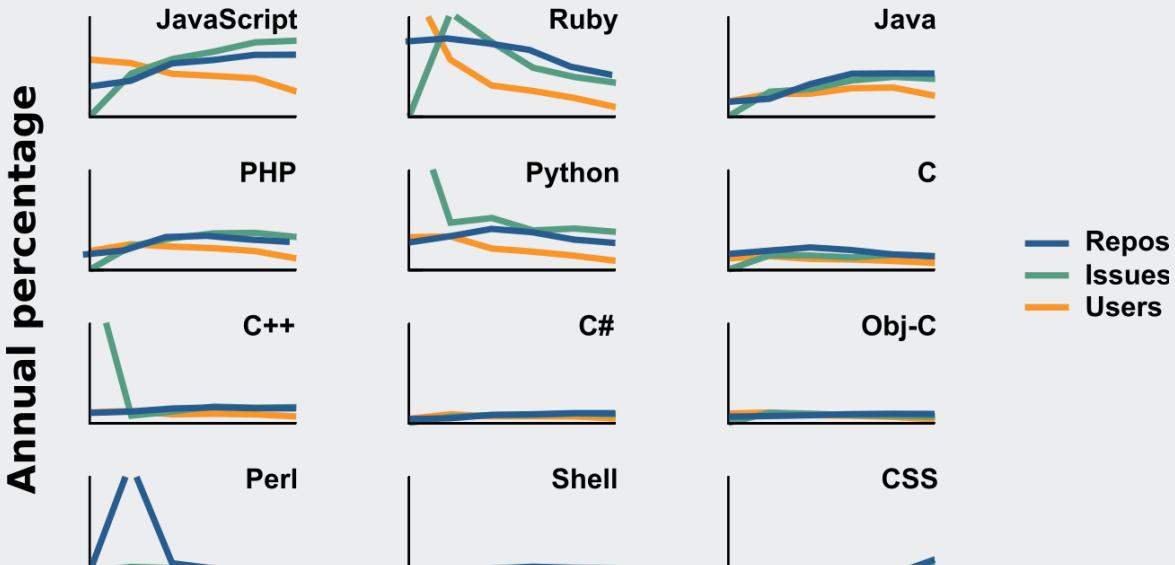
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Polyglot programming

There's no obvious choice for the right language, based on community adoption.

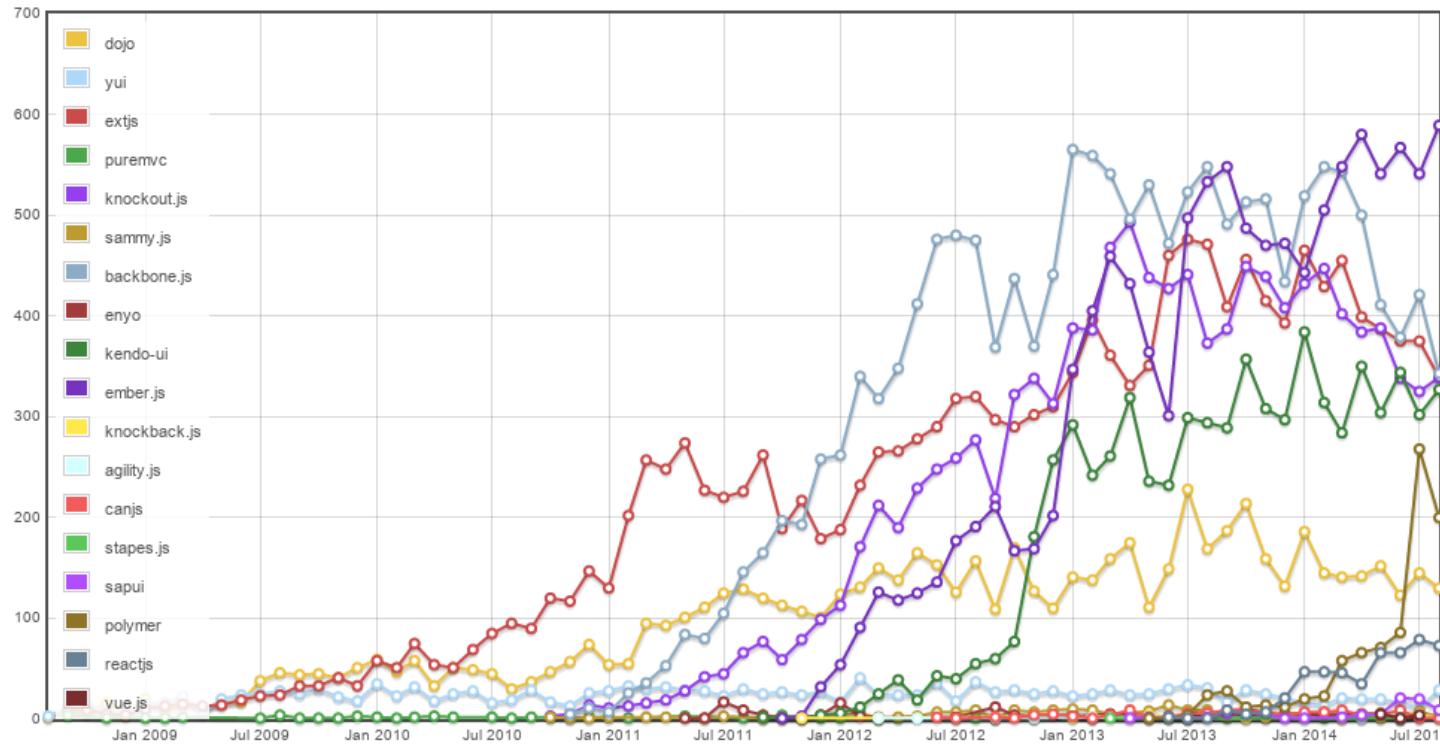
New users, issues, and repos



Polyglot databases

Armed with a handful of new tools, companies have built polyglot systems to contend with the expectations of their users. [Imgur](#) is a simple photo hosting and sharing site. Even with relatively basic needs, it is using 5 different persistent stores, including Redis, ElasticSearch, and MySQL (via Amazon RDS). Facebook ([here](#) and [here](#)) is famous for their use of MySQL, but in addition they use HBase, Lucene, Memcached, and HDFS. [Klout](#), the social impact analysis app, uses HBase, MySQL, ElasticSearch, MongoDB, and HDFS.

Polyglot frameworks



Real-world example #5: Ctrip (Chinese travel site)

New Mobile Backend Arch @Ctrip

