

API Re-platforming @ Expedia

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Expedia Affiliate
Network

Trusted brands. Shared Platform



600M+

monthly visits in 75+ countries

20k

employees worldwide

90B usd

yearly travel sales

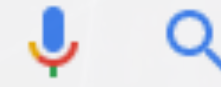
10k

affiliates





expedia



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Find cheap holiday deals, discount

Expedia

Engineering company



Expedia, Inc. is an American travel company that owns and operates several international global online travel brands, primarily travel fare aggregator websites and travel metasearch engines including ...
[Wikipedia](#)

Stock price: [EXPE \(NASDAQ\)](#) US\$105.72 +2.01 (+1.94%)
28 Feb, 12:58 GMT-5 - Disclaimer

Headquarters: [Bellevue, Washington, United States](#)

CEO: [Mark D. Okerstrom](#) (Aug 2017–)

Revenue: 8.774 billion USD (2016)

Owner: [Barry Diller](#)

Number of employees: 20,000 (December 2016)

Subsidiaries: [Travelocity](#), [Orbitz](#), [CheapTickets](#), [Hotwire.com](#), [MORE](#)

500M+

API hotel searches a day

1000

EAN powered partners

30%+

YOY growth

200+

Awesome engineers in EU&US



**Expedia Affiliate
Network**

A few of our Partners





^{EAN}
Rapid

**A new way to connect...
is coming**



Our re-platforming goals



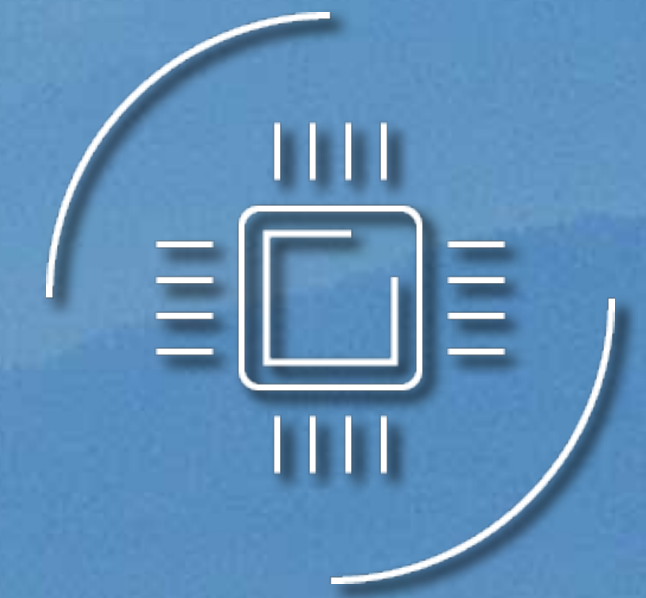
**High
Performance
& Scale**



AWS Native



**Ease of
Integration &
fully traceable**



**Distributed
Development at
max Speed**



**Expedia Affiliate
Network**

Our API design



HATEOS linked transactions



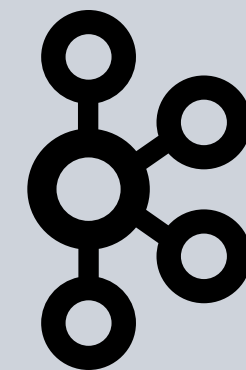
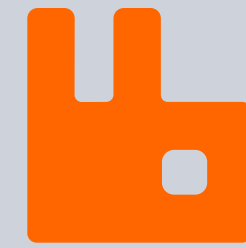
Global Standards
(ISO 8601, 3166, 4217, BCP47)



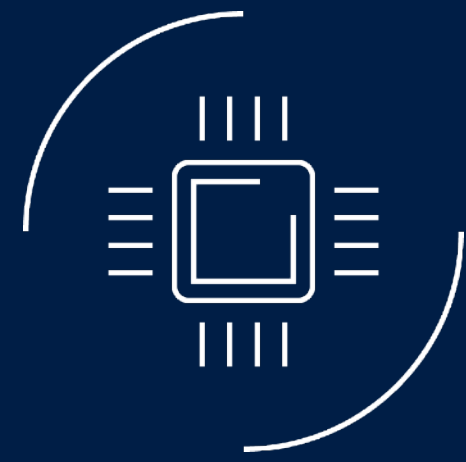
Version in the URL



RESTful + Client tokens



Our API Architecture



MicroServices (& Serverless)



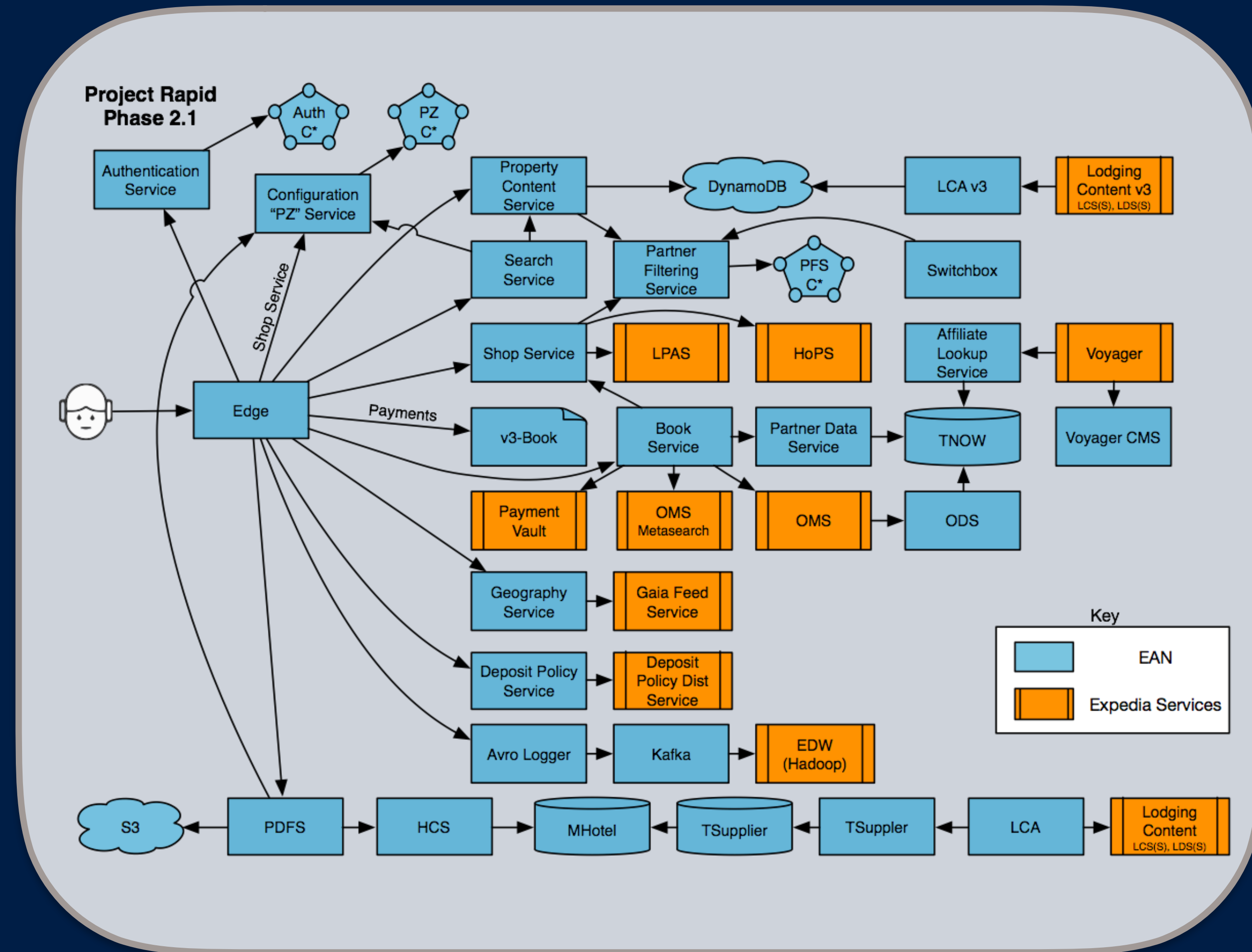
Different levels of orchestration



Event driven where possible



Single Responsibility Principle



Rapid Performance



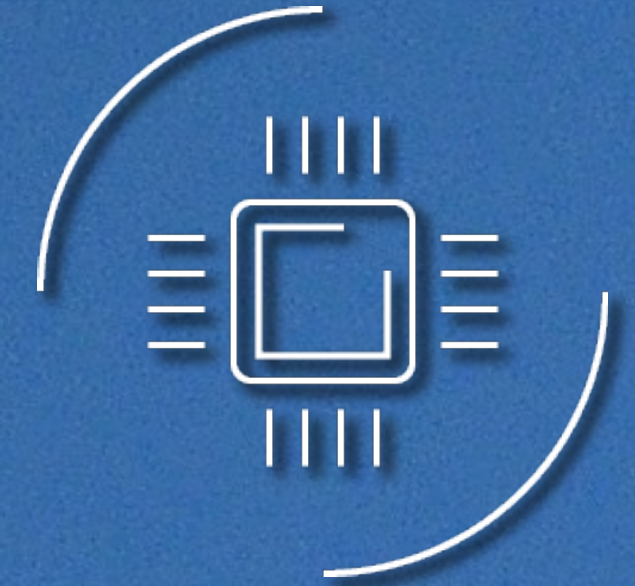
**2x faster
response
time**



**50% overall
hosting
cost
reduction**



**10x Faster
deployment
cycles**



**Significant
improvement in
traceability and
support quality**

Lessons Learned



Want to build great microservices ? Start with a Monolith...

MonolithFirst



Martin Fowler

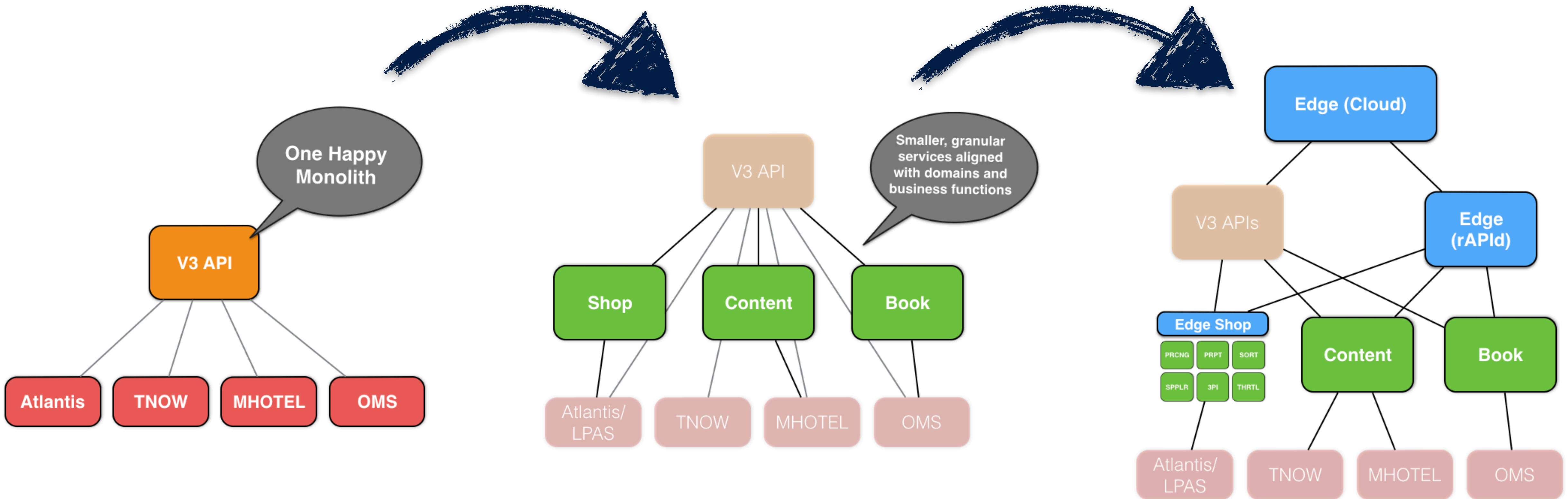
3 June 2015

As I hear stories about teams using a **microservices architecture**, I've noticed a common pattern.

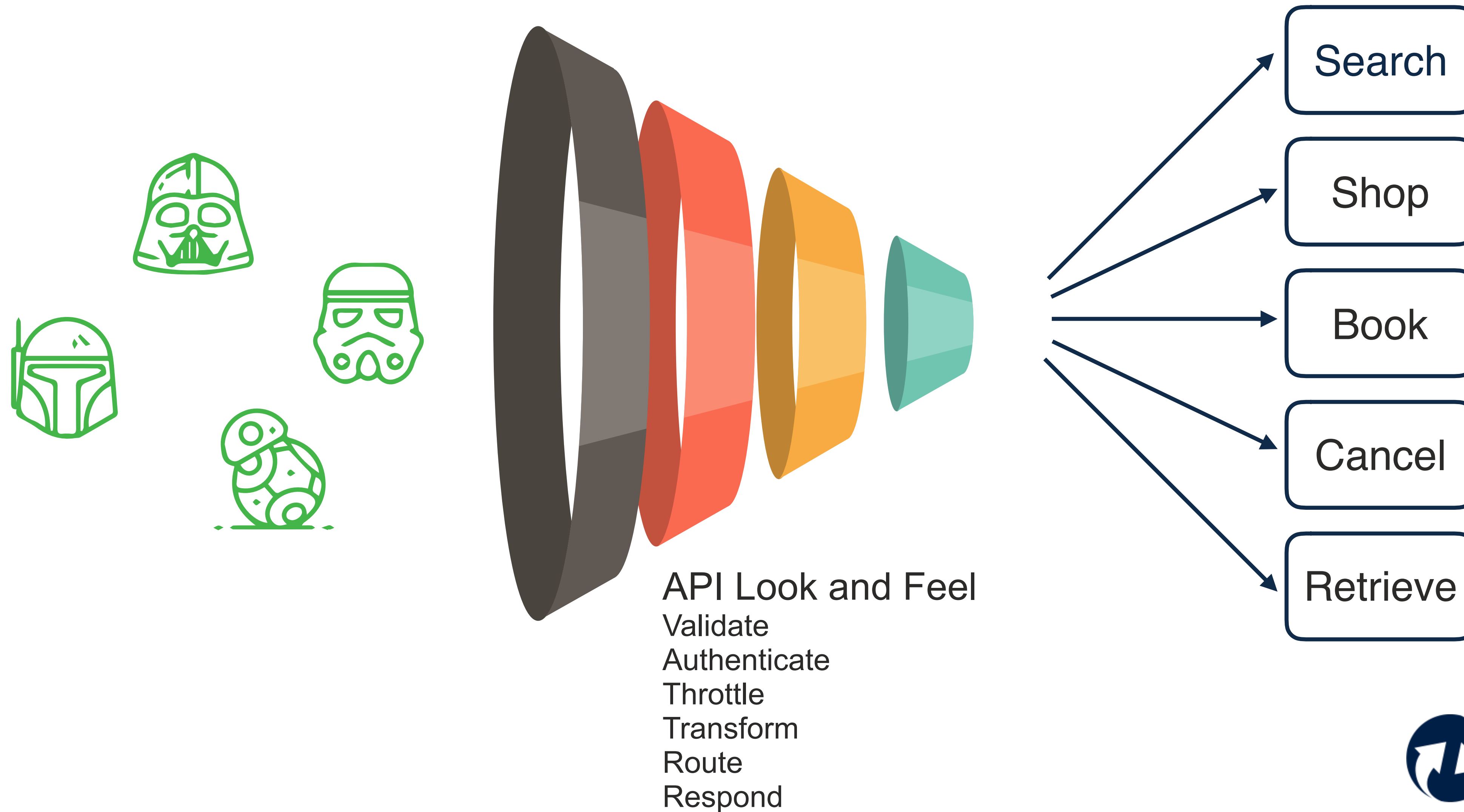
1. Almost all the successful microservice stories have started with a monolith that got too big and was broken up
2. Almost all the cases where I've heard of a system that was built as a microservice system from scratch, it has ended up in serious trouble.

This pattern has led many of my colleagues to argue that **you shouldn't start a new project with microservices, even if you're sure your application will be big enough to make it worthwhile.** .

You don't need to break everything at once



Edge - Orchestration is key



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Programmable, asynchronous, event-based reverse proxy for JVM.

101 commits 11 branches 3 releases 11 contributors Apache-2.0

Branch: master New pull request Create new file Upload files Find file Clone or download

dviato and mikkokar Fixed resource leak in FileBackedRegistry: the FileInputStream wasn't... Latest commit b2efaf7 20 hours ago

STYX

build passing License Apache 2.0 maven-central v0.7.4

Styx is a programmable reverse proxy for JVM (Java Virtual Machine). It can be used as a stand-alone application, or as a platform to build custom networking applications. It is non-blocking, fully asynchronous and event driven therefore very scalable.

Styx Proxies HTTP requests to a configurable set of *Backend Services* typically a cluster of web servers (multiple origins) or load balancers (e.g. AWS ELB).

Requests are subjected to an *interceptor chain* (conceptually a HTTP filter chain), which can respond or modify and pass through the request to the backend services. The interceptor chain can be easily extended by *Plugins* written in Java.

Styx additional capabilities:

- Load balancing
- Origin health checking
- Retry mechanisms
- Connection pooling
- Admin dashboard (inspired and based on [Hystrix Dashboard](#))
- Performance and system metrics collection and reporting (Graphite compatible)

Most additional features can be *extended* via the Java Service Provider Interface (SPI) model.

The plugin and the SPI (Service Provider Interface) model enables developers to build custom HTTP applications easily on top of Styx, which takes care of common proxy server related functionality. Developers can then concentrate on the value-add business logic.

Use cases of Styx Plugins

- [Hotels.com](#) - Built authentication, UI rendering, URL redirection and cookie cleaning plugins in front of backend services.
- [Expedia](#) - Built routing and bot detection capabilities on top of Styx. [More info here.](#)
- [Homeaway](#) - Built various plugins.

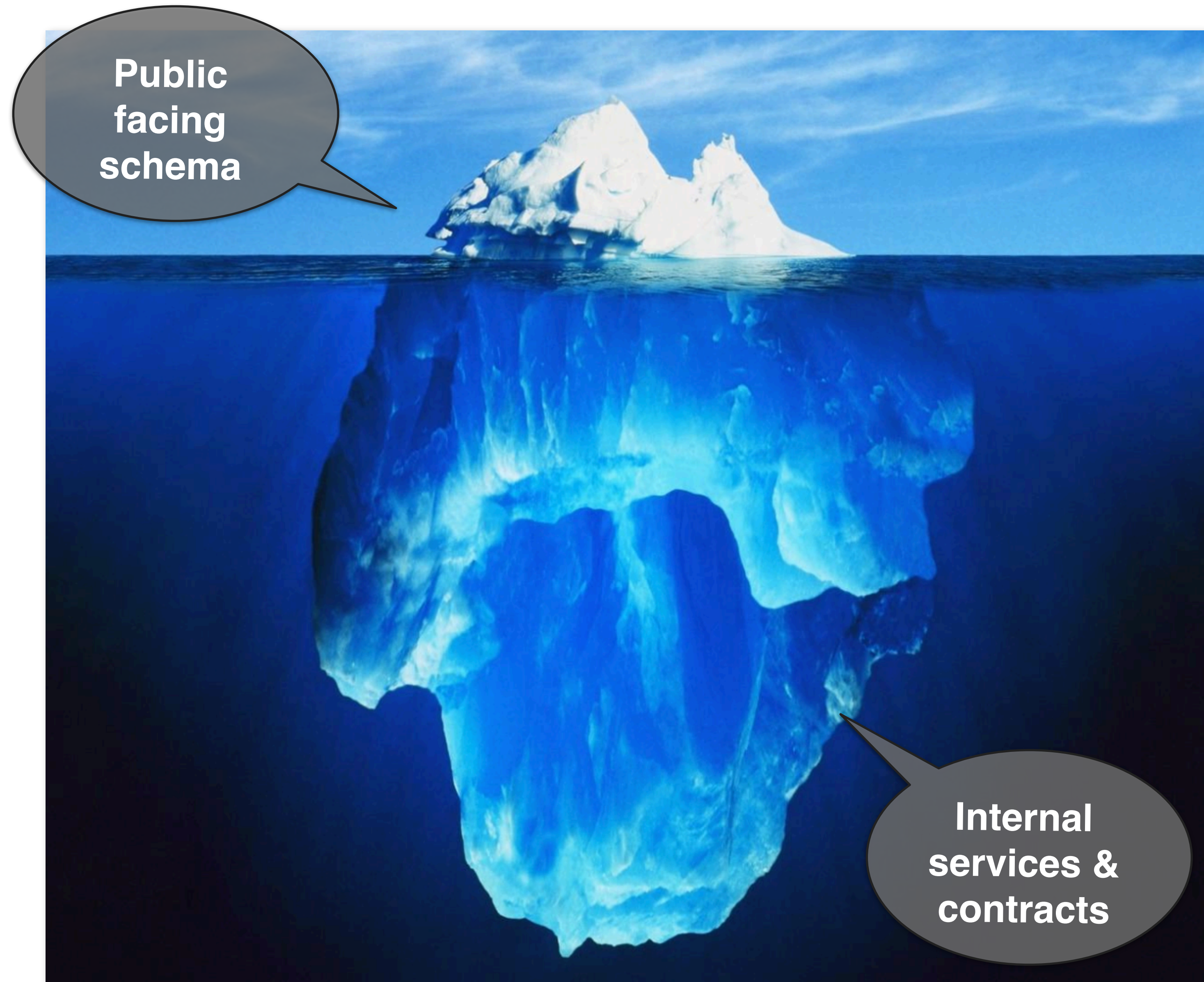
Hotels.com®

- Open sourced Styx in 2017
- Used extensively across Expedia Inc including Expedia.com and HomeAway
- <https://github.com/HotelsDotCom/styx>



Private vs Public contracts

- **Separate public API schema from your internal contracts**
- **Use your orchestrator to avoid versioning every internal change**
- **Keep the public API immutable, evolve the internal services independently**



Know your tradeoffs

Service Discovery

Make Eureka fault tolerant

VPC / Network Segmentation

Dedicated cloud infrastructure team

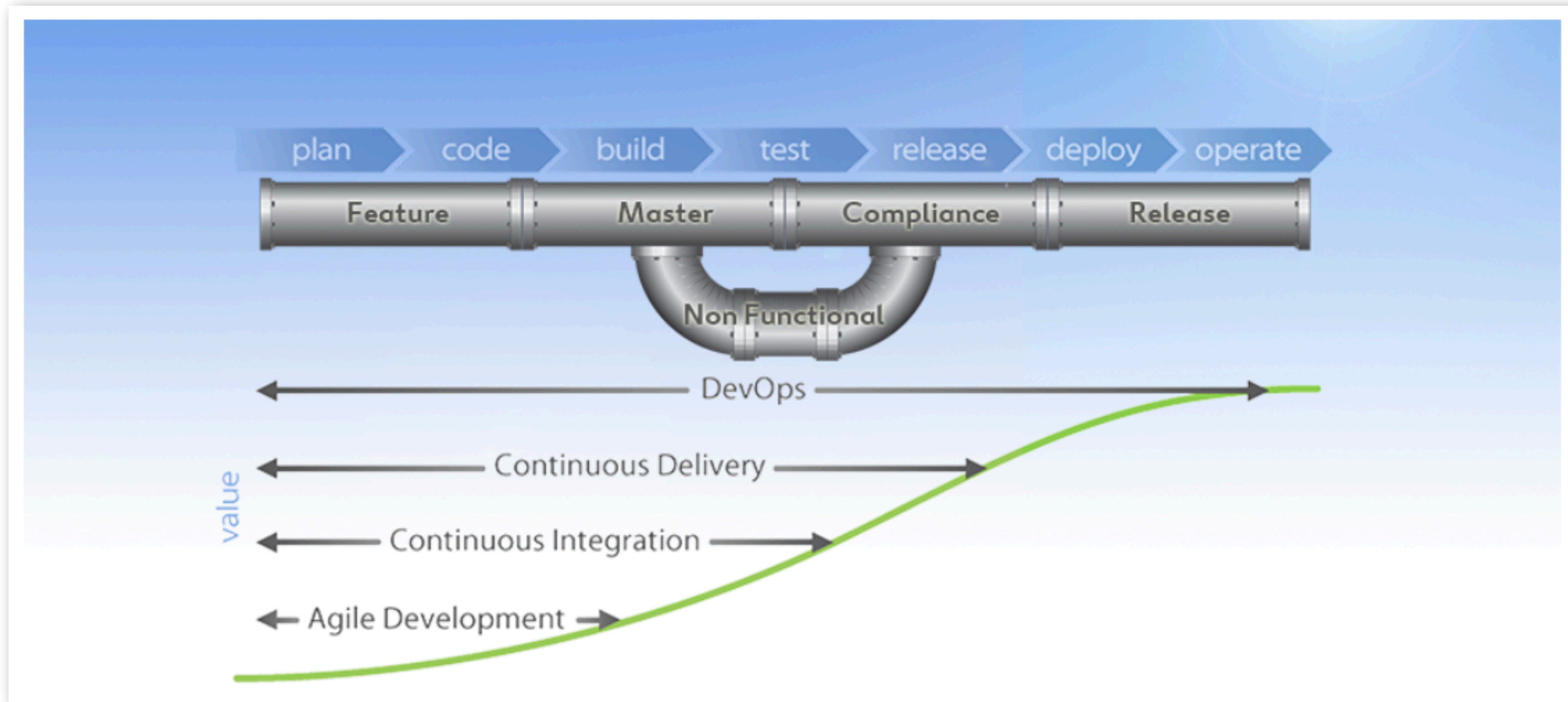
Network Constraints & Usage

Design for an imperfect network

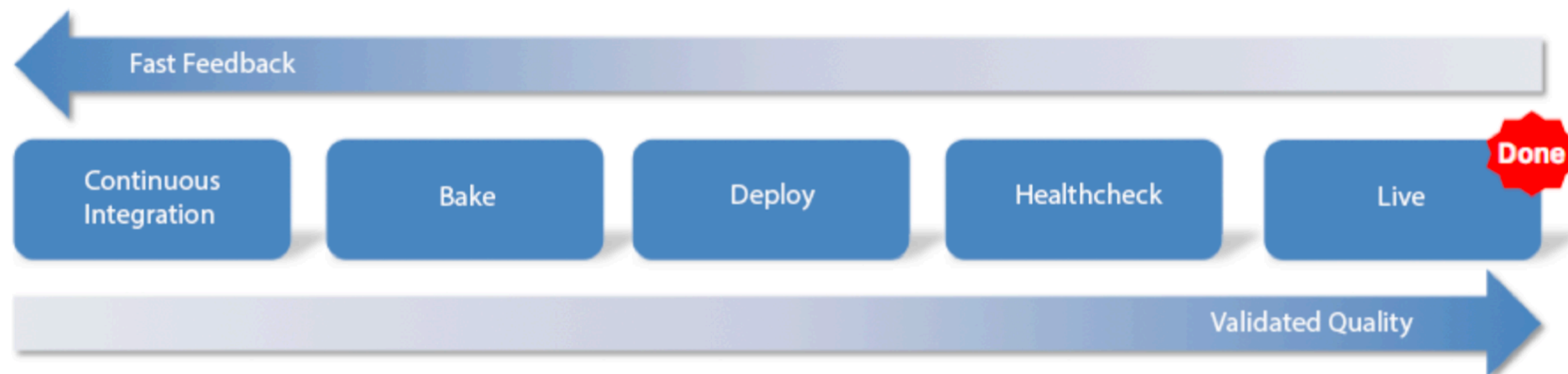
Scaling Groups

The story of the DockerLith

You can't deliver fast if you build slow



- If you are not automating everything you are wasting time
- “Just add code”
- We deploy 300 features a week (150% YOY)



AWS native @ Expedia




AWS S3



AWS Api Gateway



AWS CloudFormation



AWS IAM



AWS SQS



AWS EC2



AWS ECS



AWS Lambda



AWS CloudWatch



AWS CodeDeploy



AWS DynamoDB



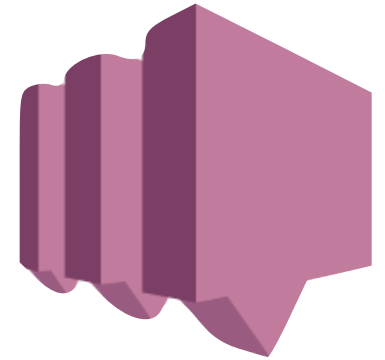
AWS RDS



AWS REDSHIFT



REDIS



AWS SNS

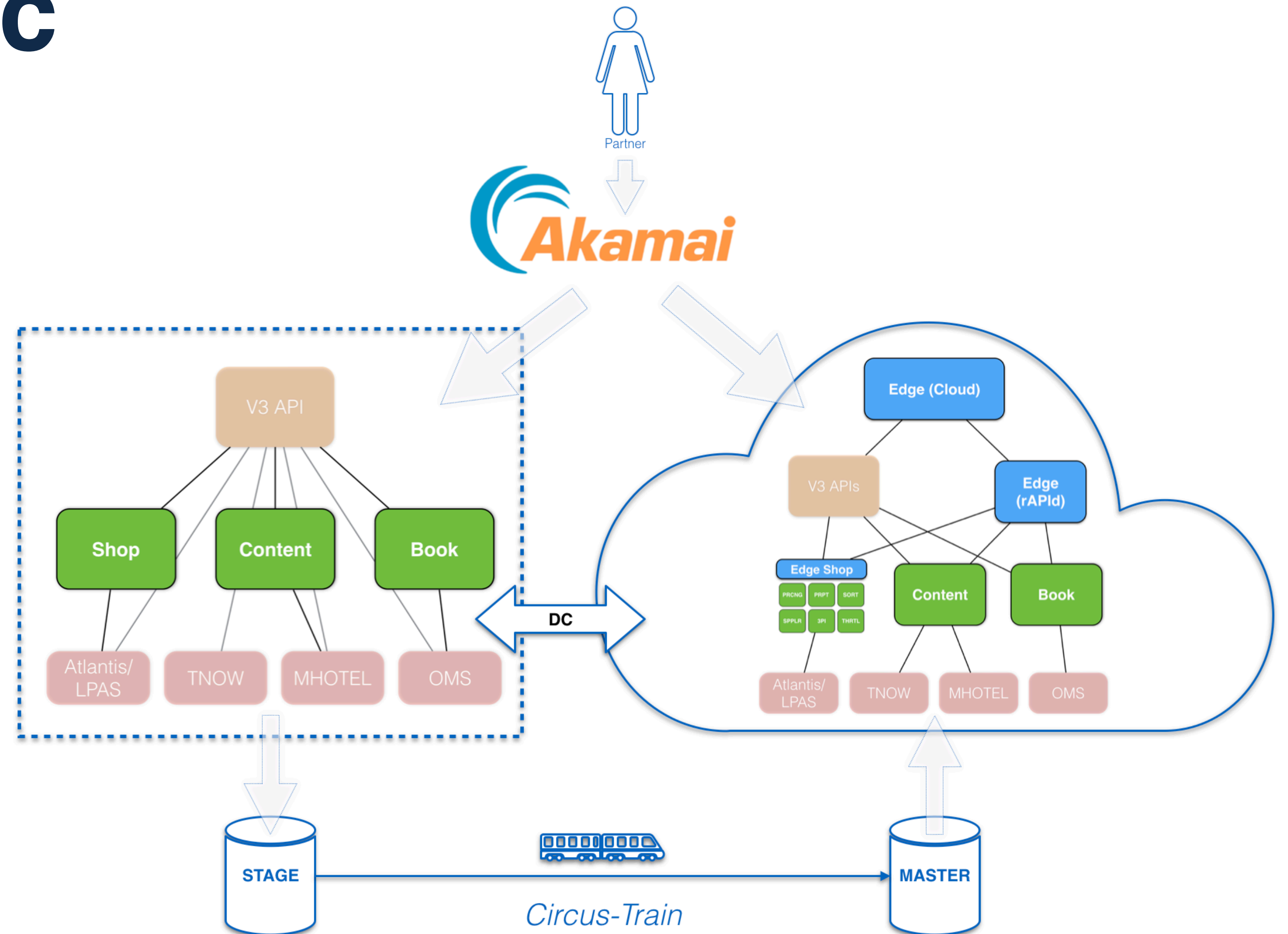


A person is standing on a stage in front of a large screen. The screen displays the text "SO WHAT DOES THE FUTURE LOOK LIKE?" and "ALL THE CODE YOU EVER WRITE IS BUSINESS LOGIC". The background of the screen is a blue, abstract pattern of lines and dots, resembling a network or data flow. The stage is lit with blue light, and there are blue lines on the floor.

SO WHAT DOES THE FUTURE LOOK LIKE?
ALL THE CODE YOU EVER WRITE IS BUSINESS LOGIC

Splitting your Traffic

- Vegas Rules
- Service connections fallback from Edge
- Data consolidation
- Watch your network costs



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Circus Train is a dataset replication tool that copies Hive tables between clusters and clouds.

46 commits 3 branches 6 releases 5 contributors Apache-2.0

Branch: master New pull request Create new file Upload files Find file Clone or download

Jenkins [maven-release-plugin] prepare for next development iteration Latest commit 1b32e25 6 days ago

README.md



Start using

You can obtain Circus Train from Maven Central:

com.hotels:circus-train 11.3.0 build passing coverage 74% license Apache-2.0

Overview

Circus Train replicates Hive tables between clusters on request. It replicates both the table's data and metadata. Unlike many other solutions it has a light touch, requiring no direct integration with Hive's core services. However, it is not event driven and does not know how tables differ between sites; it merely responds to requests to copy (meta-)data. It can copy either entire unpartitioned tables or user defined sets of partitions on partitioned tables. Circus Train employs snapshot isolation to minimise the impact of changing data at the source, and to allow consumers of data in the replica cluster to operate independently of ongoing replication tasks.

Hotels.com®

- Open sourced Circus Train in 2016
- Used extensively across Expedia Inc
- <https://github.com/HotelsDotCom/circus-train>



Thank You

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