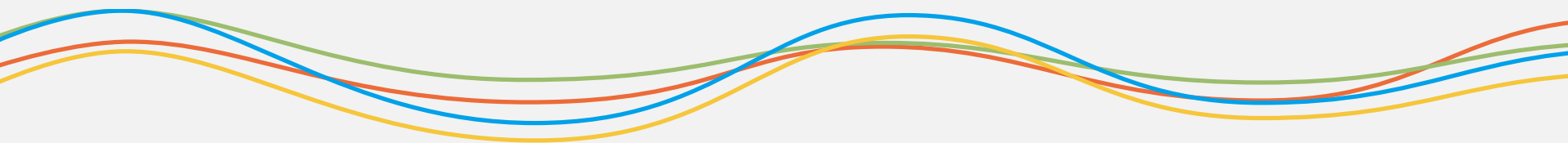


微服务在云上的架构演进

代闻

AWS解决方案架构师 | 团队主管



- 微服务概要
- 云上的架构的演进
 - 服务发现与访问
 - 数据存储与管理
 - 自动化部署
 - 监控与日志
- Q&A



微服务概要

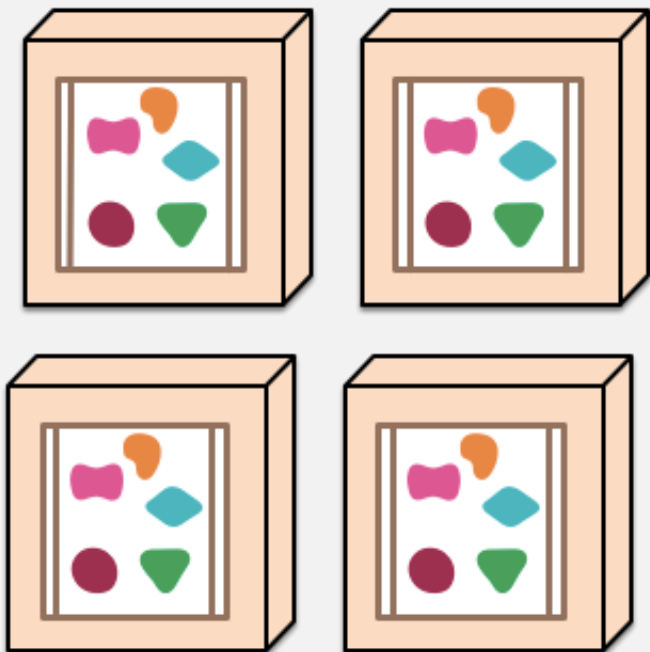
微服务概要

从广义概念上来看，微服务是SOA的子集

A monolithic application puts all its functionality into a single process...



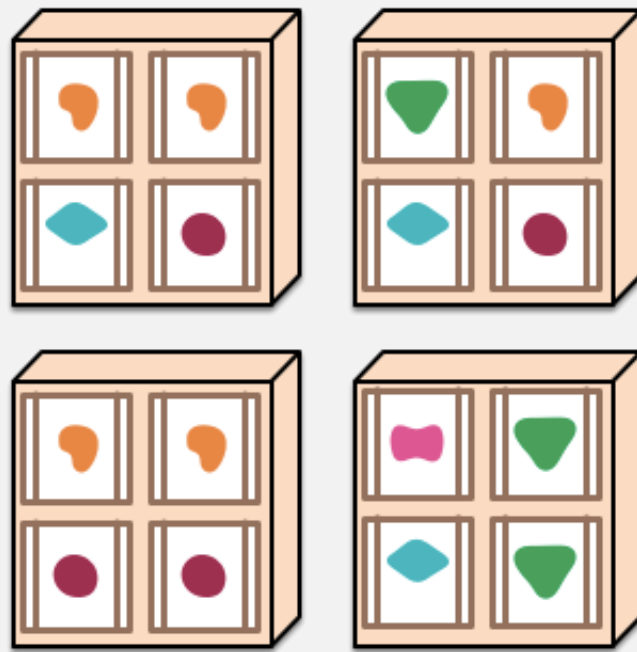
... and scales by replicating the monolith on multiple servers



A microservices architecture puts each element of functionality into a separate service...

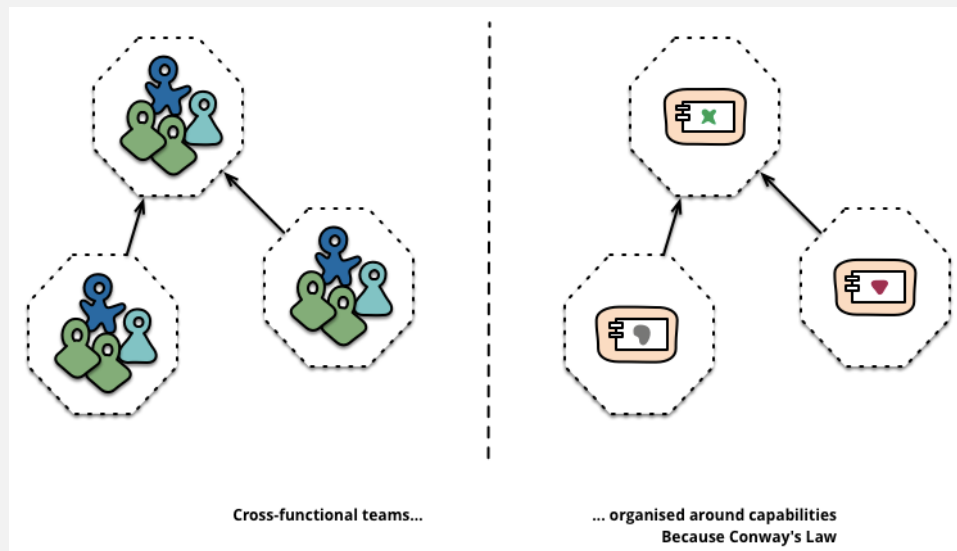
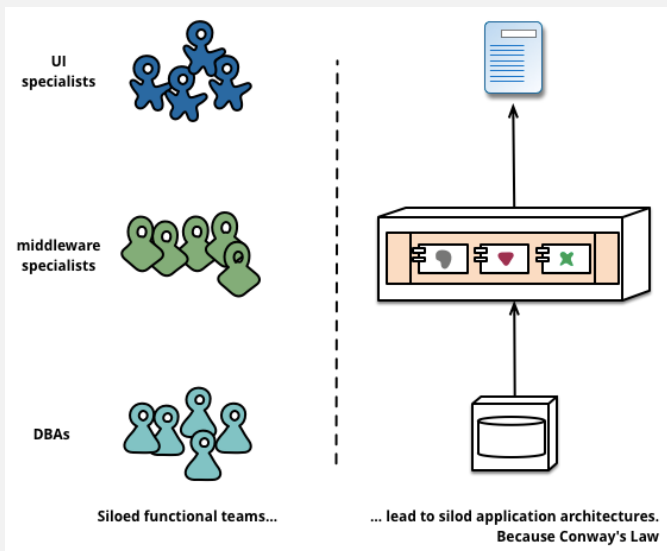


... and scales by distributing these services across servers, replicating as needed.



但是，你确定需要微服务吗？

微服务带来的变化



Project

→ Product

Shared Data

→ API or Nothing

Dev and Ops

→ DevOps

Everyone exists on a “service team” focused on their primitive(s):

- SDE's focused on developing
- PM's focused on product direction
- TPM's help drive development
- SE's focused on infra/tooling
- SDET's focused on test excellence throughout the organization

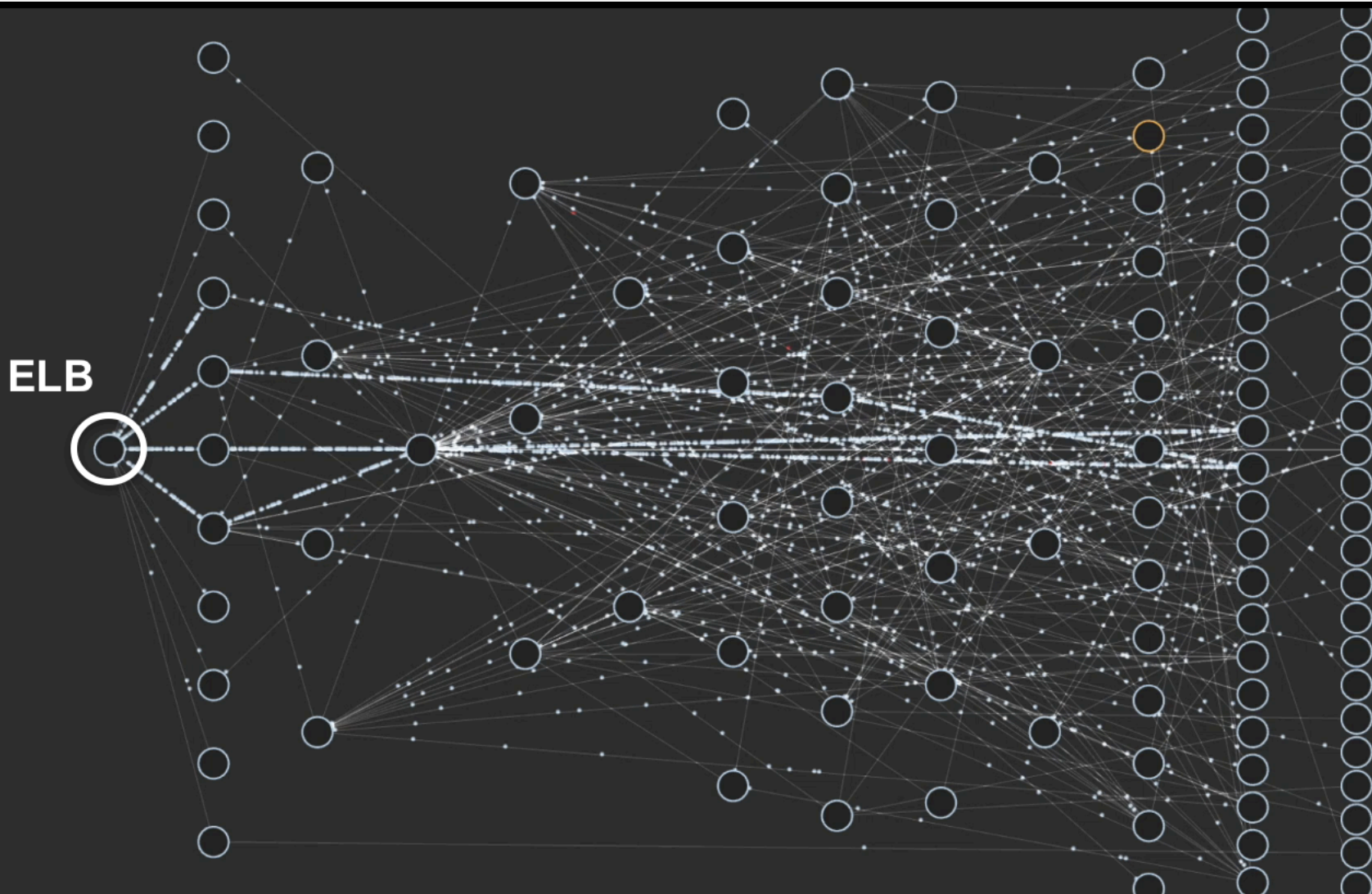


Most “2 pizza” teams are just these 2 roles

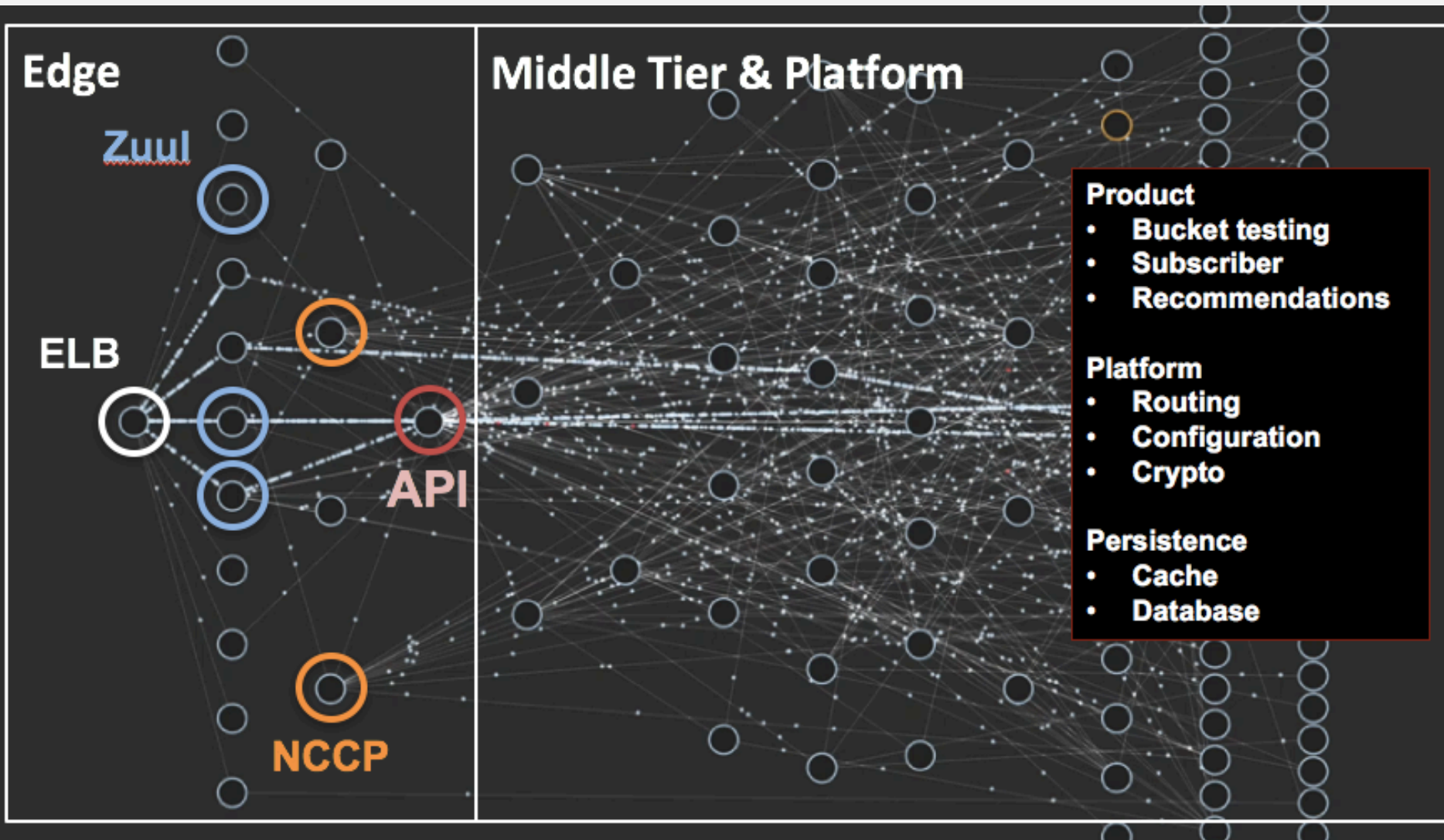
Some folks are shared across the org, some on individual teams

- 以产品功能划分服务 (You build it, you run it.)
- 决策权交给各个服务 (而不是类似ESB的集中决策)
- 服务之间只能通过API交互 (不可以直接访问或修改其他服务的数据)
- 面向失效的设计
- 基础架构自动化
- 不断演进 (Evolutionary Design)

2016年，Netflix在AWS上的微服务架构



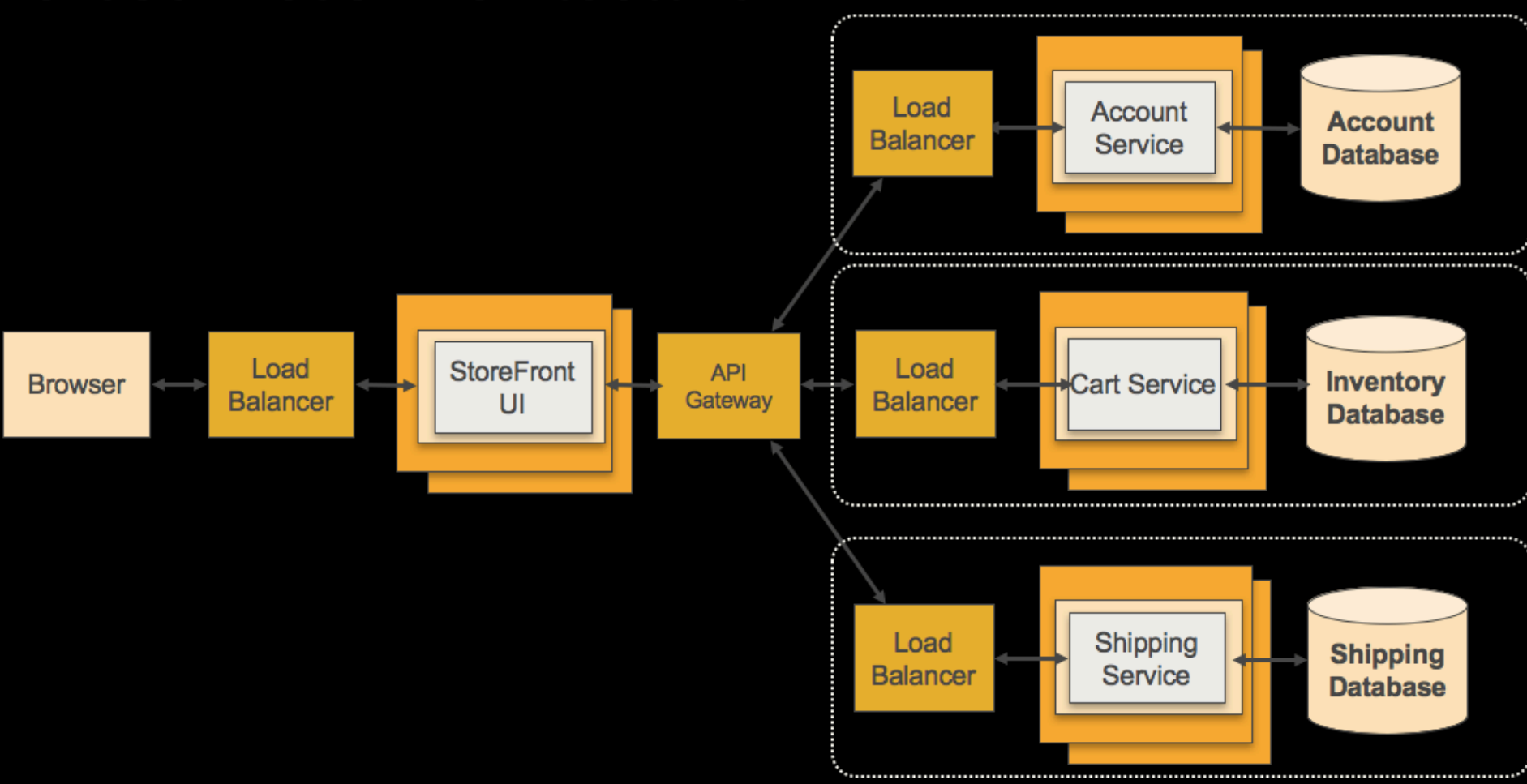
2016年，Netflix在AWS上的微服务架构



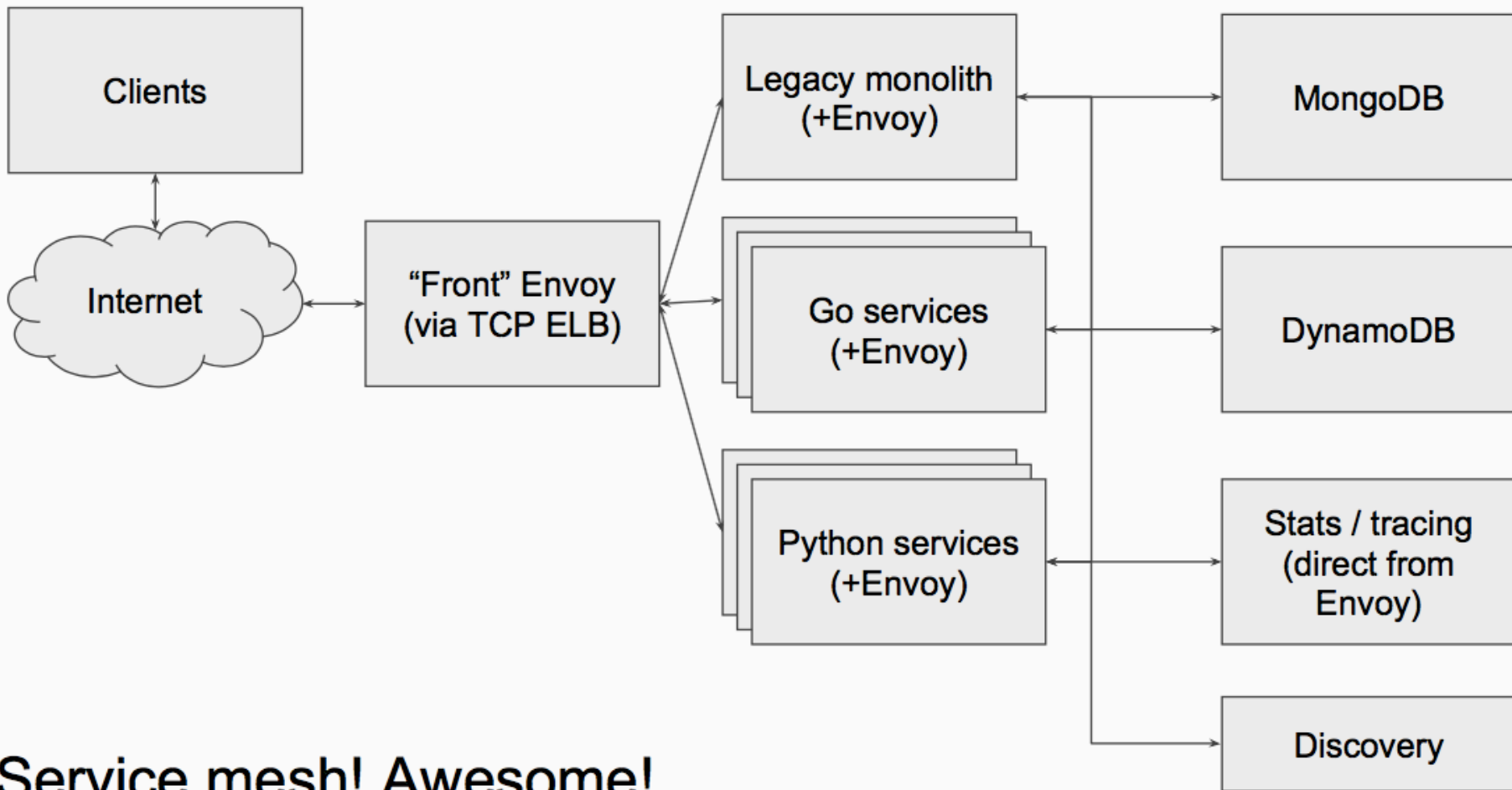
Netflix OSS: <http://netflix.github.io/>

参考: <https://www.infoq.com/presentations/netflix-chaos-microservices>

2017年，GILT在AWS上的微服务架构



2017年，Lyft结合AWS服务部署的微服务



Service mesh! Awesome!

开源项目Envoy地址：<https://github.com/lyft/envoy>

资料参考：<https://www.microservices.com/talks/lyfts-envoy-monolith-service-mesh-matt-klein/>

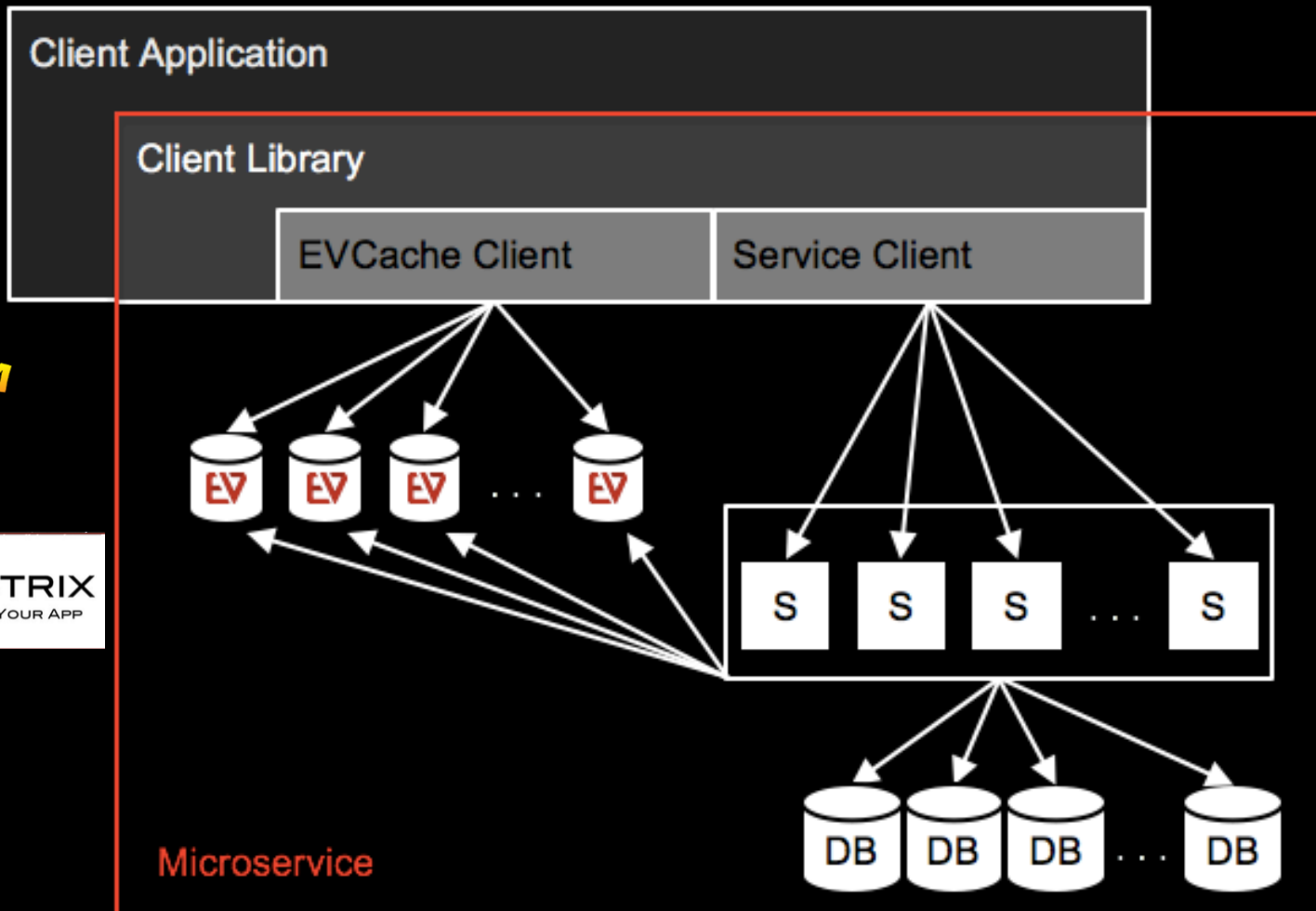
云上微服务架构的演进

- 服务发现与访问
- 数据存储与管理
- 自动化部署
- 监控与日志

服务发现与访问 (基于EC2)

方法一：基于Client Library

Netflix:



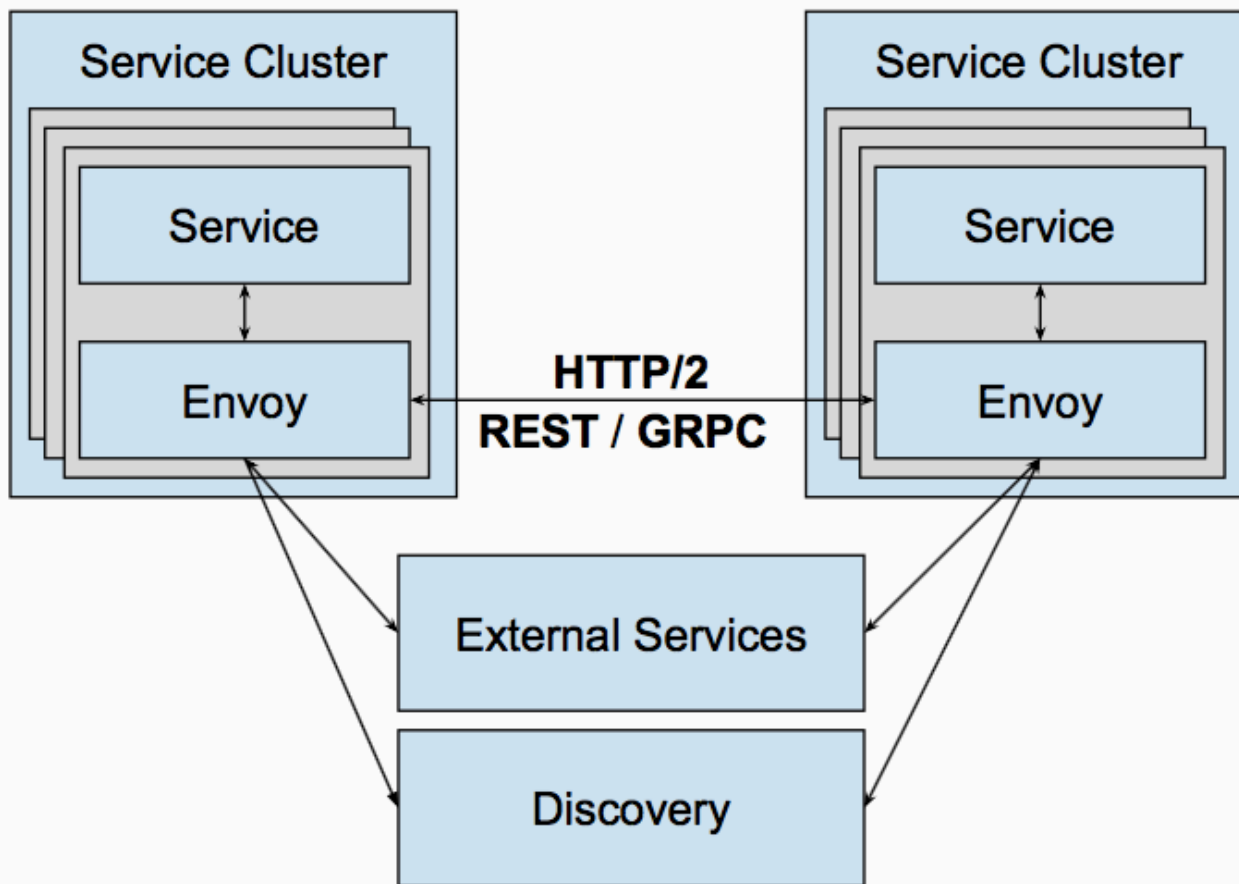
Eureka : 服务发现

Hystrix : 断路器 (Lib)

服务发现与访问 (基于EC2)

方法二：基于Proxy

Lyft Envoy:



服务发现与访问（基于托管服务）

基于Serverless的服务发现



+



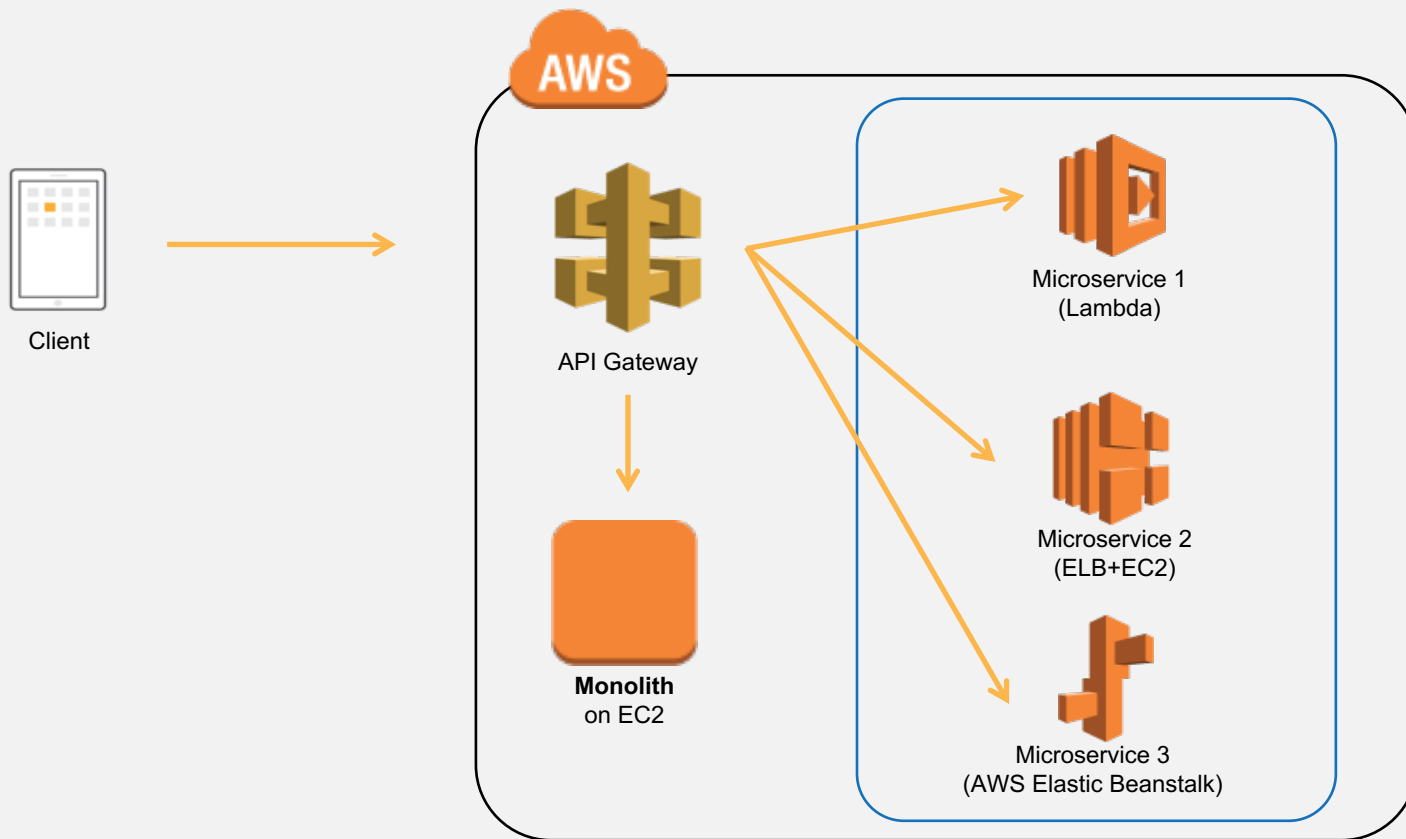
+



服务发现与访问（基于托管服务）

API Gateway：Edge Proxy的无服务器化

GILT:



Amazon API Gateway

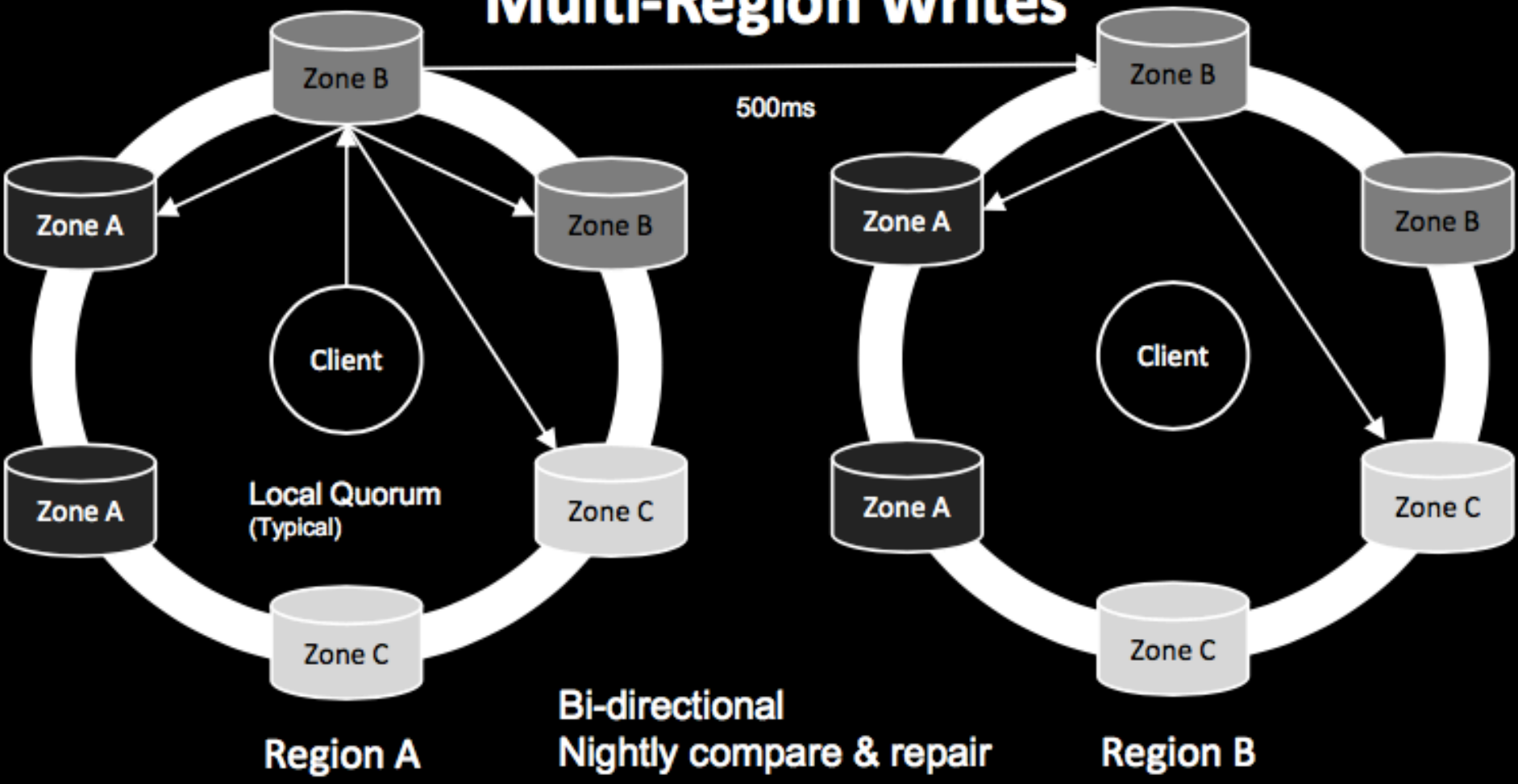


- 加强API的一致性 (Swagger)
- 监控关键指标
- API调用缓存
- 提供认证和鉴权 (IAM)
- 计数和限流
- 访问加速

数据存储与管理 (基于EC2)

高可用架构与最终一致性

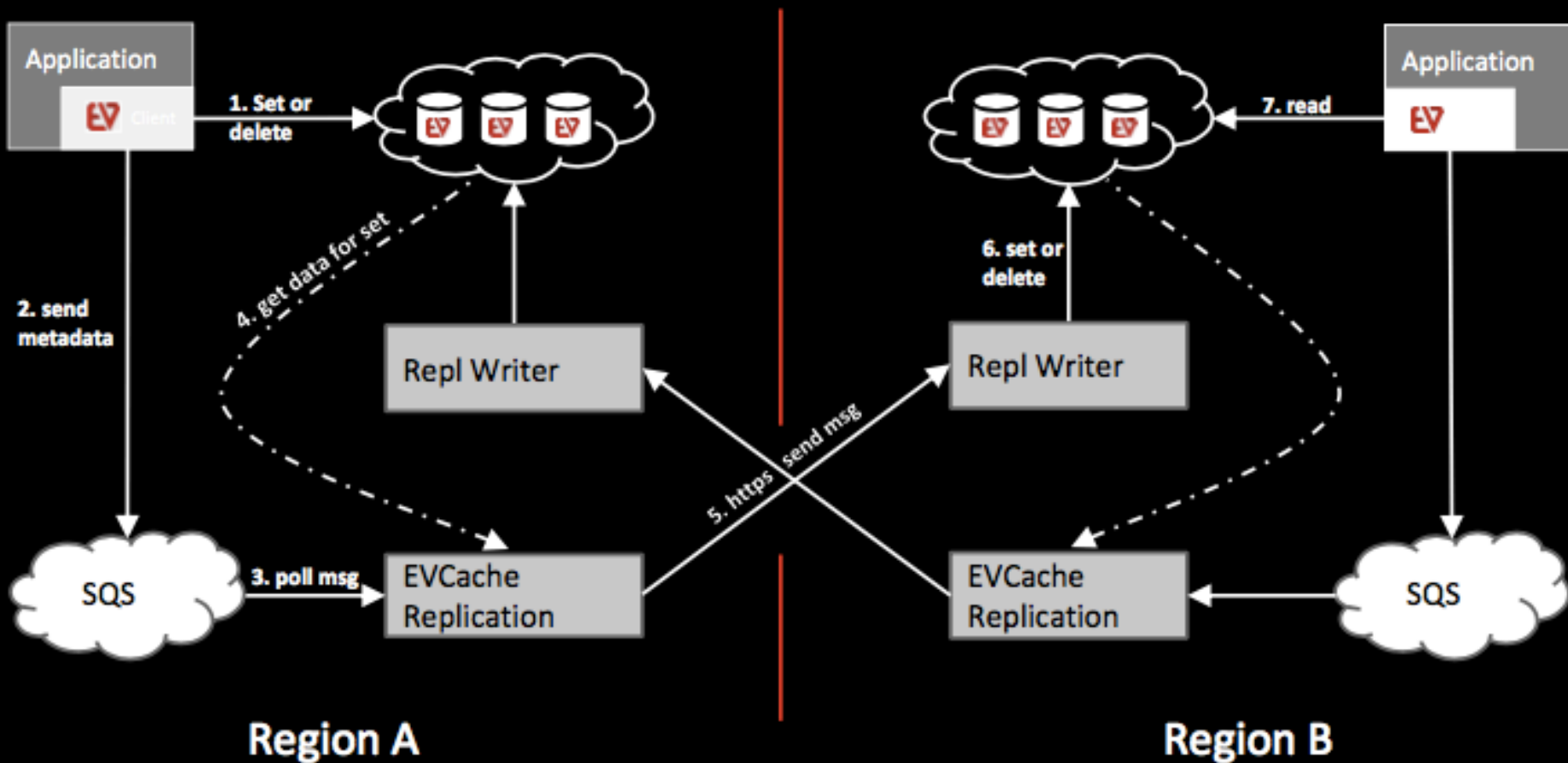
Multi-Region Writes



数据存储与管理（基于EC2）

高可用架构与最终一致性

EVCache Cross-Region Replication



数据存储与管理（基于托管服务）

Cache



Amazon
ElastiCache

NoSQL



Amazon
DynamoDB

SQL



Amazon
RDS Amazon
Redshift

Object



Amazon
S3 Amazon
Glacier

Search



Amazon
Elasticsearch
Service

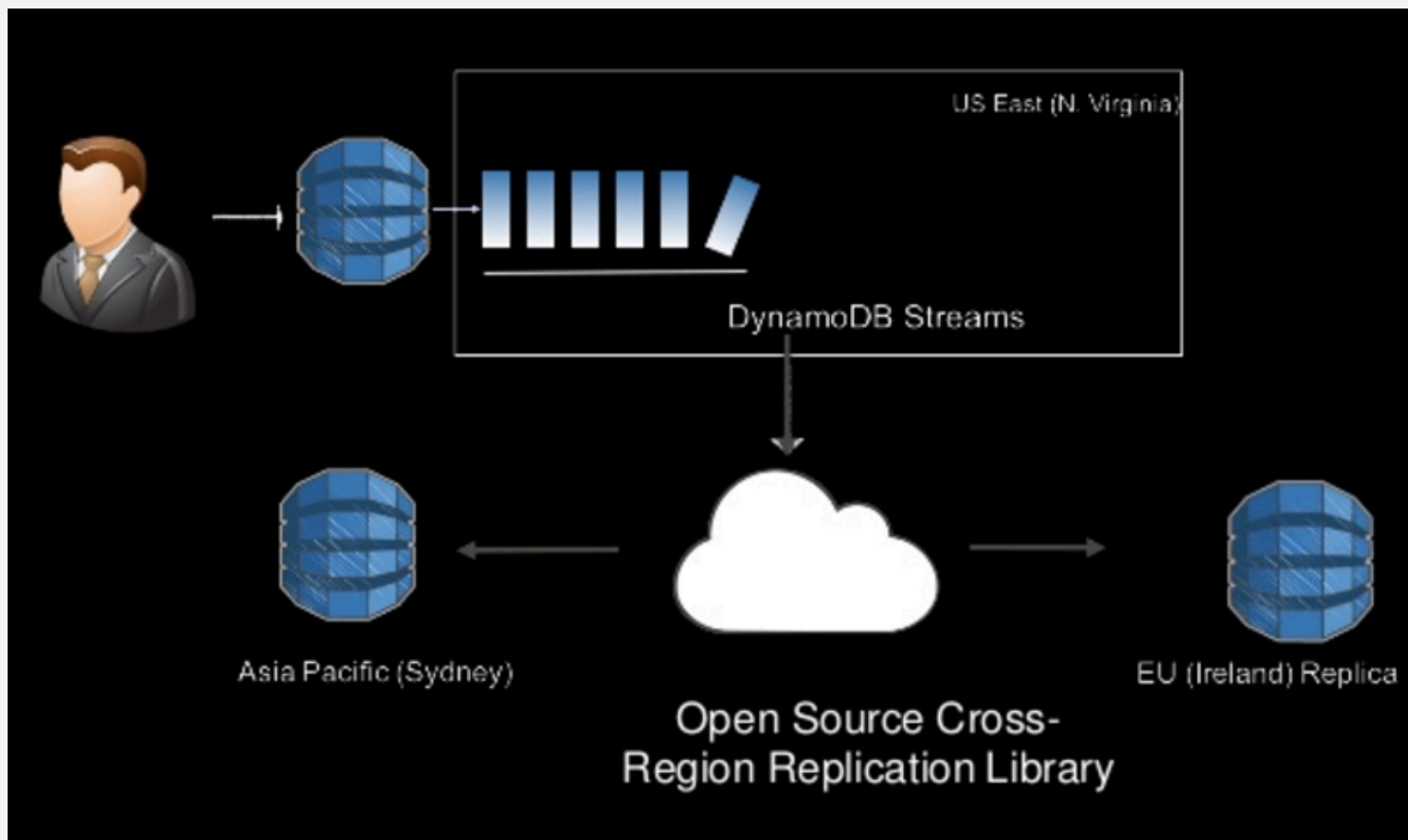
Streaming



Amazon
Kinesis

数据存储与管理（基于托管服务）

高可用与最终一致性



DynamoDB: 托管NoSQL，一个region内支持强一致性或最终一致性

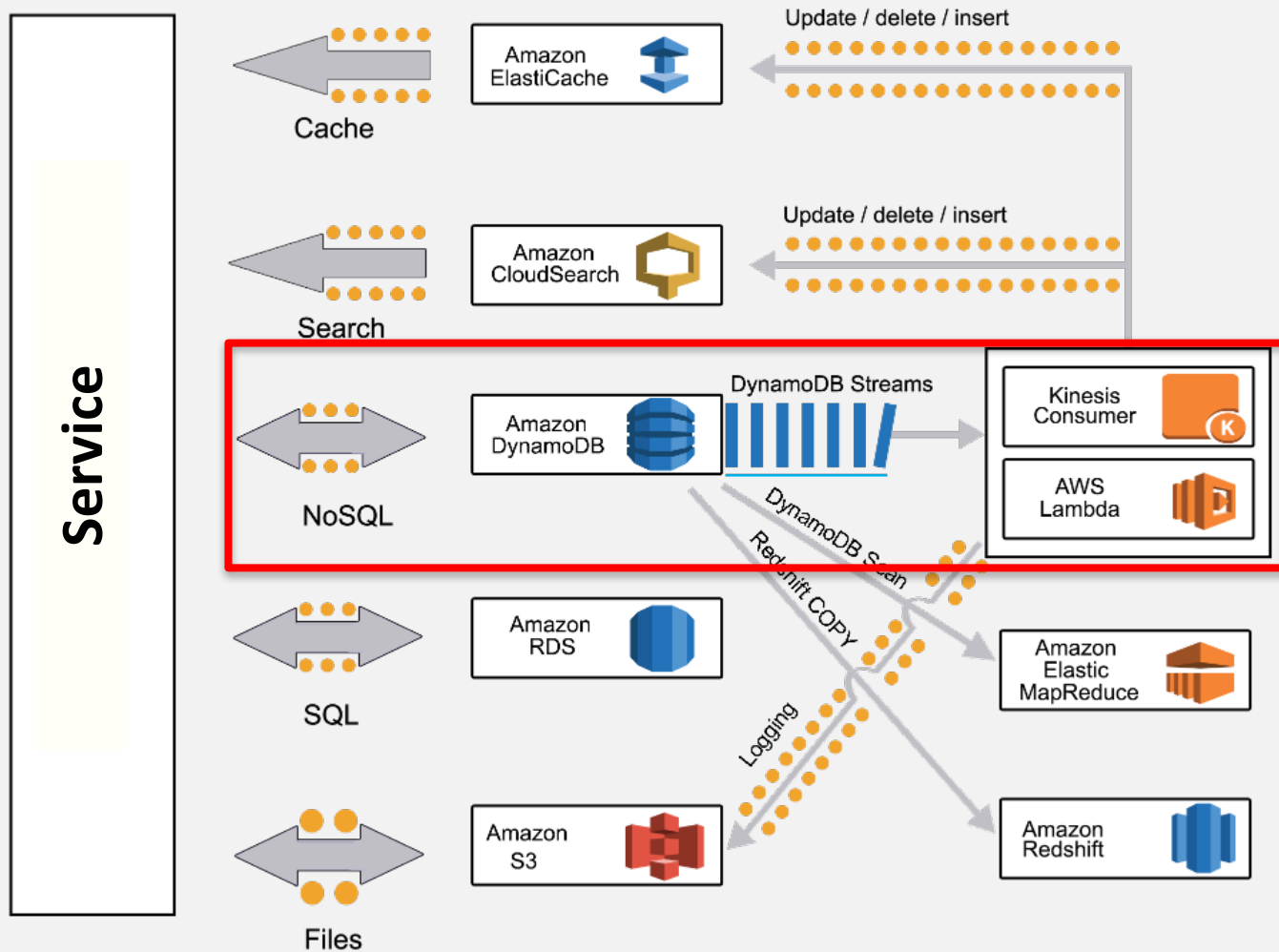
DAX：DynamoDB的托管缓存

DynamoDB Stream：严格顺序的数据库操作流

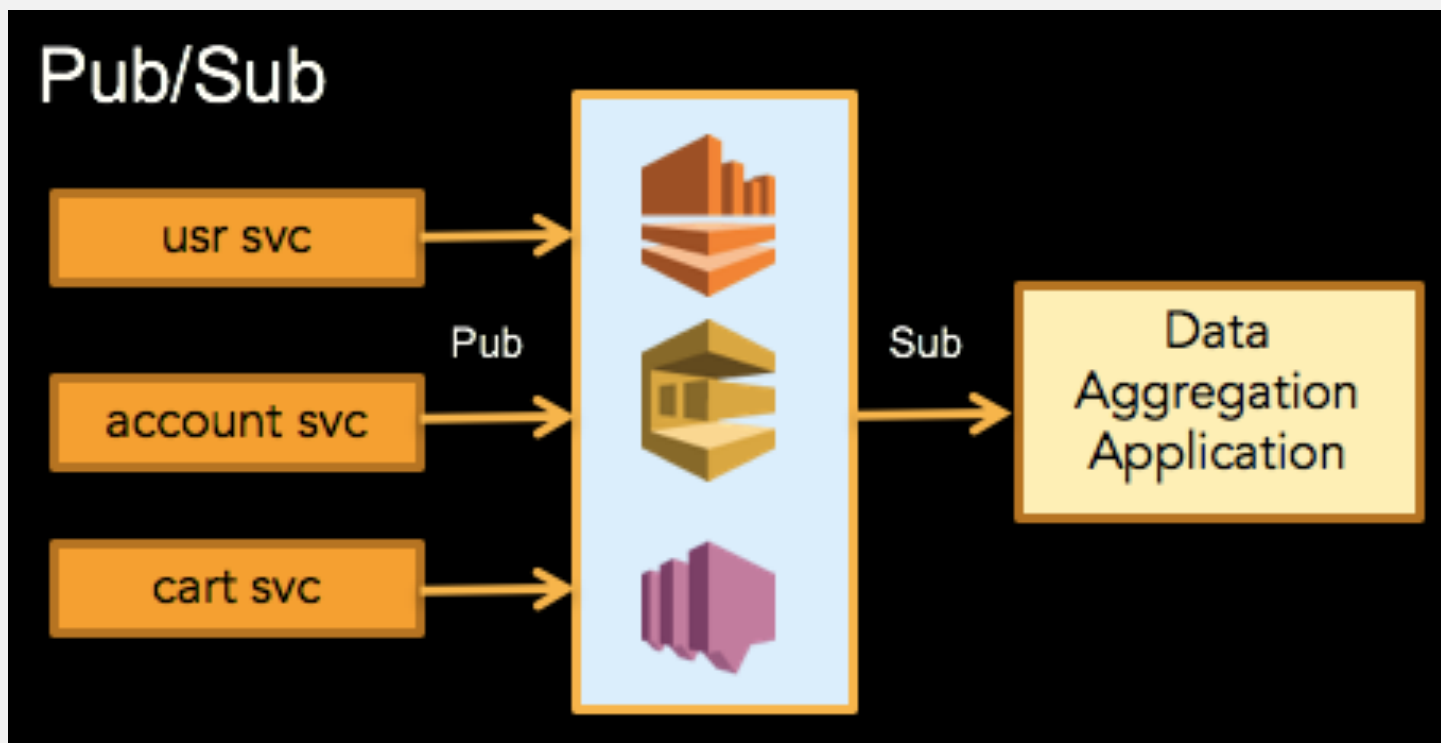
DynamoDB Stream + Lambda：数据复制无服务器化

数据存储与管理（基于托管服务）

GILT:

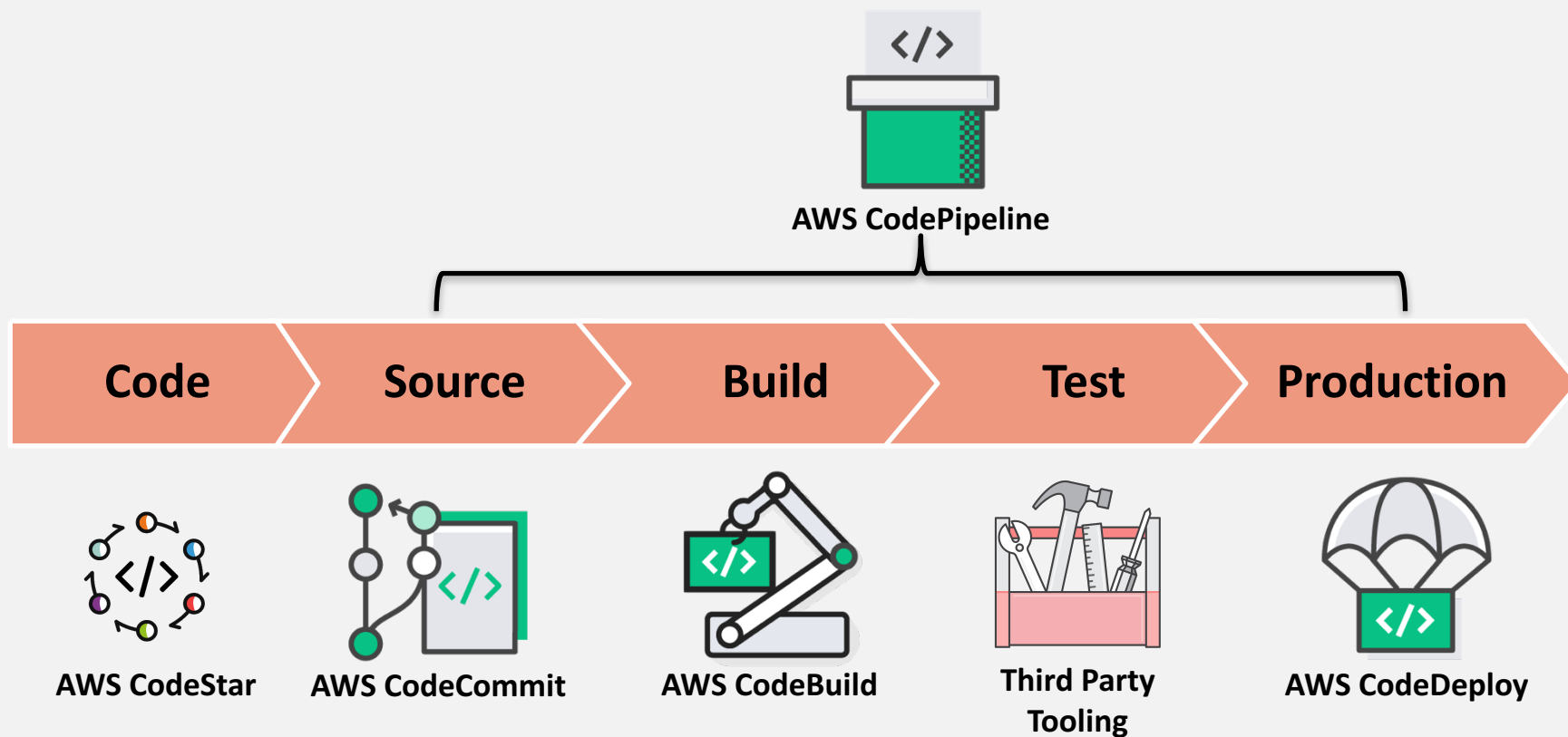


事件驱动的数据访问（基于托管服务）



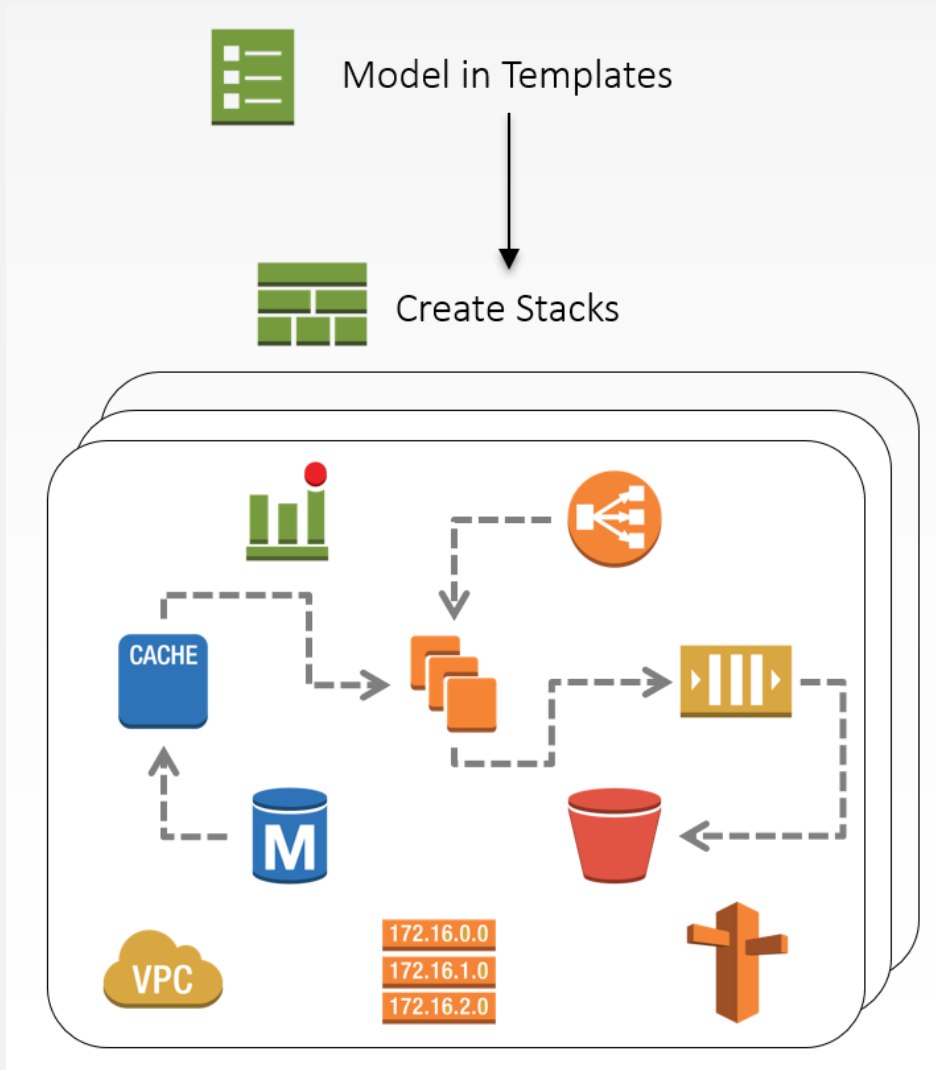
Event with/without state

DevOps - AWS持续集成和部署服务



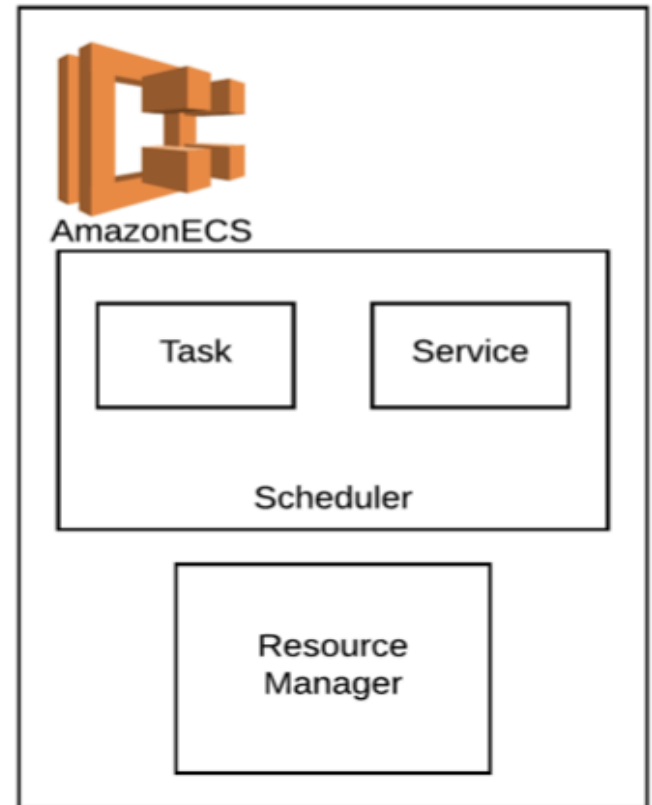
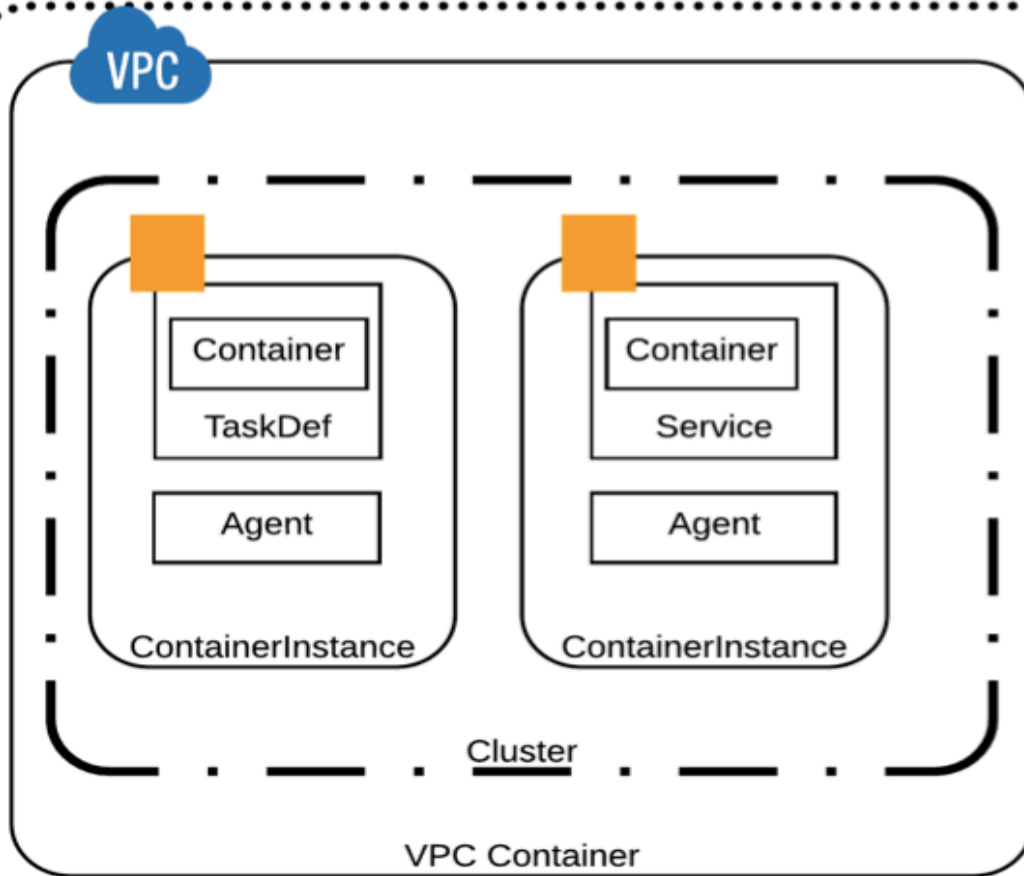
DevOps - 基础设施自动化

Cloudformation: Infrastructure as Code, 让基础架构可以像代码一样版本化



```
{
  "Description": "Create an EC2 instance running the Amazon Linux 32 bit AMI.",
  "Parameters": {
    "KeyPair": {
      "Description": "The EC2 Key Pair to allow SSH access to the instance",
      "Type": "String"
    }
  },
  "Resources": {
    "Ec2Instance": {
      "Type": "AWS::EC2::Instance",
      "Properties": {
        "KeyName": { "Ref": "KeyPair" },
        "ImageId": "ami-75g0061f",
        "InstanceType": "m1.medium"
      }
    }
  },
  "Outputs": {
    "Instanceld": {
      "Description": "The Instanceld of the newly created EC2 instance",
      "Value": { "Ref": "Ec2Instance" }
    }
  }
}
```

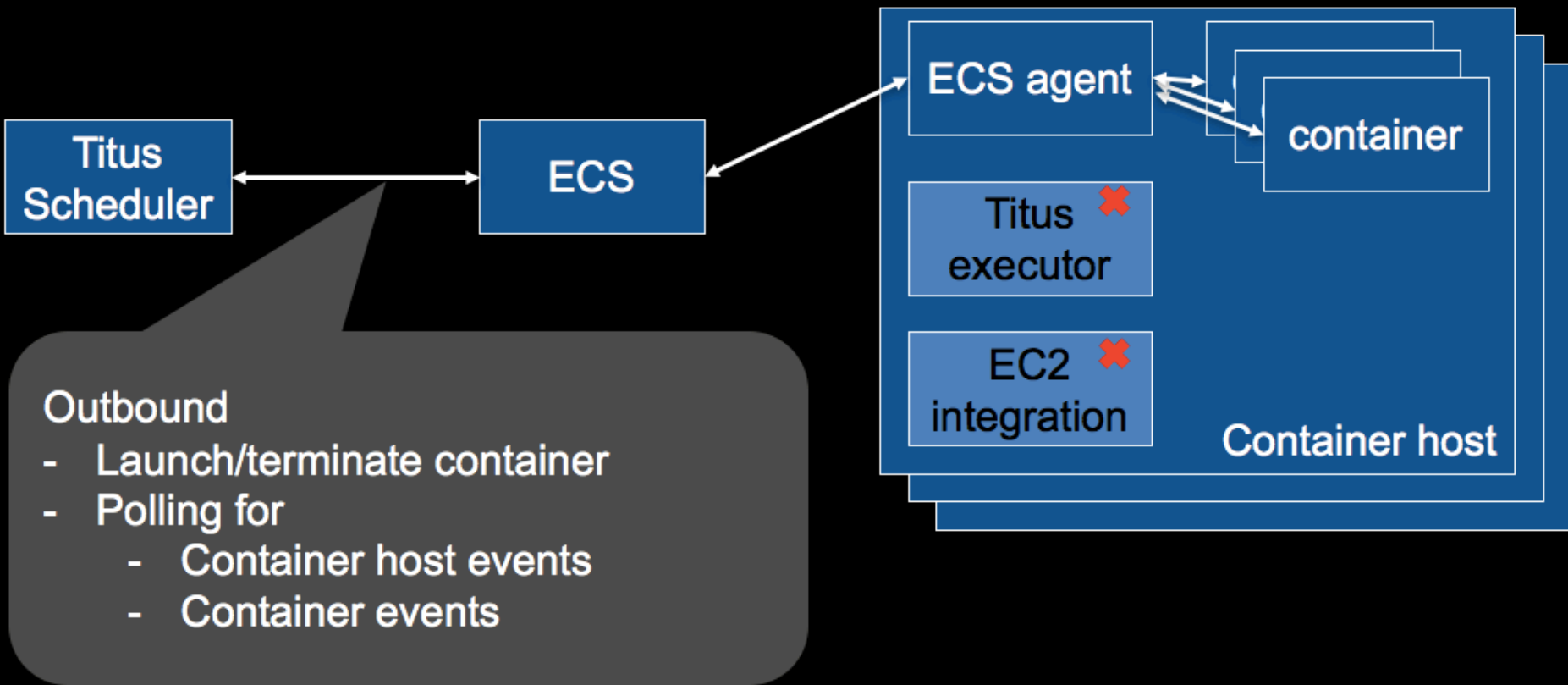
DevOps – 容器管理平台ECS



Region



Netflix使用ECS部署容器集群



DevOps on AWS – 第三方工具支持



监控（托管服务+第三方）

- Instance level: Memory usage, GC Cycles
- Service level: RPMs, Latency, Error rate
- Universe level: Endpoint response times

CloudWatch



AWS X-Ray



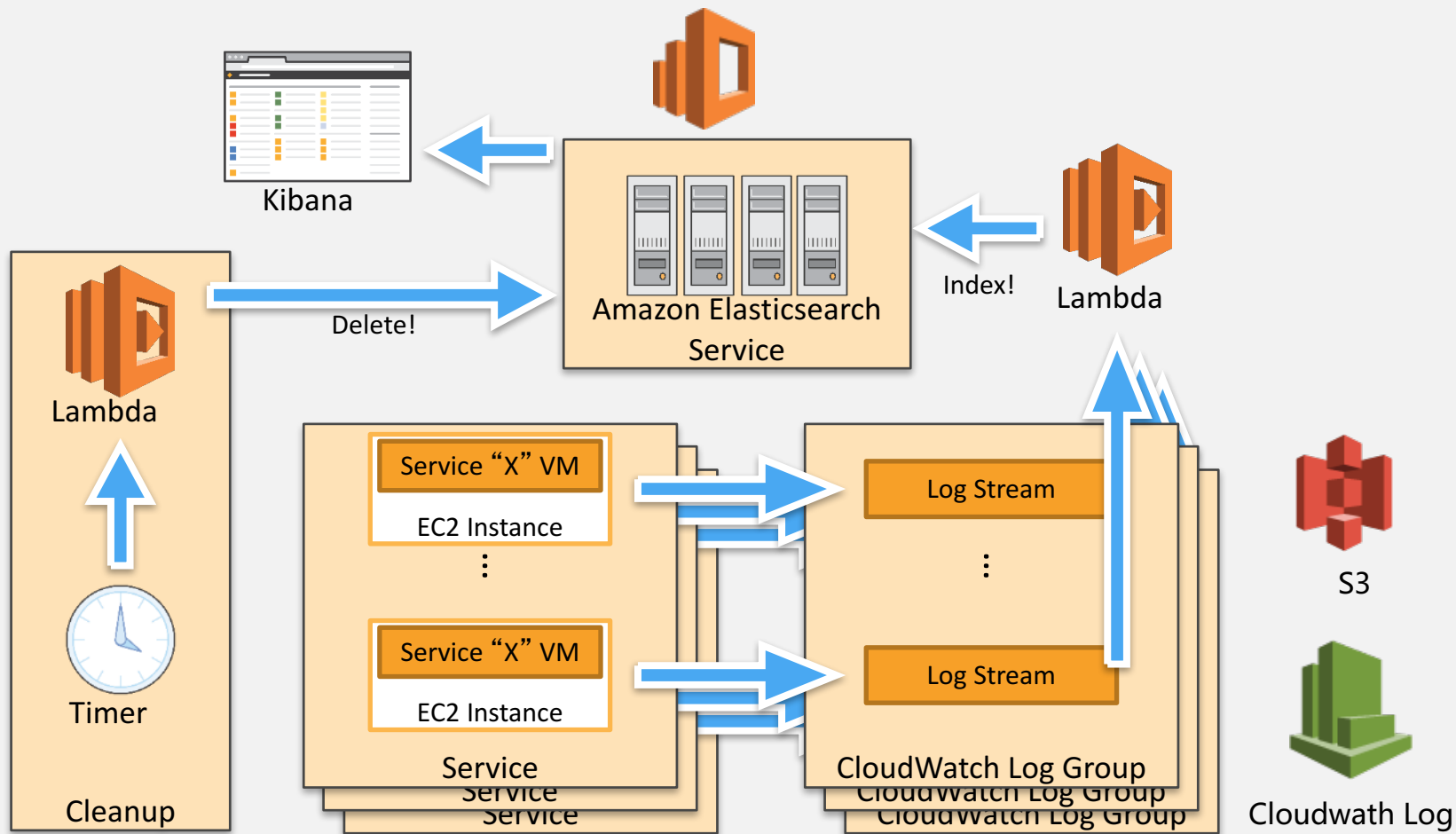
APM Services



Open Source



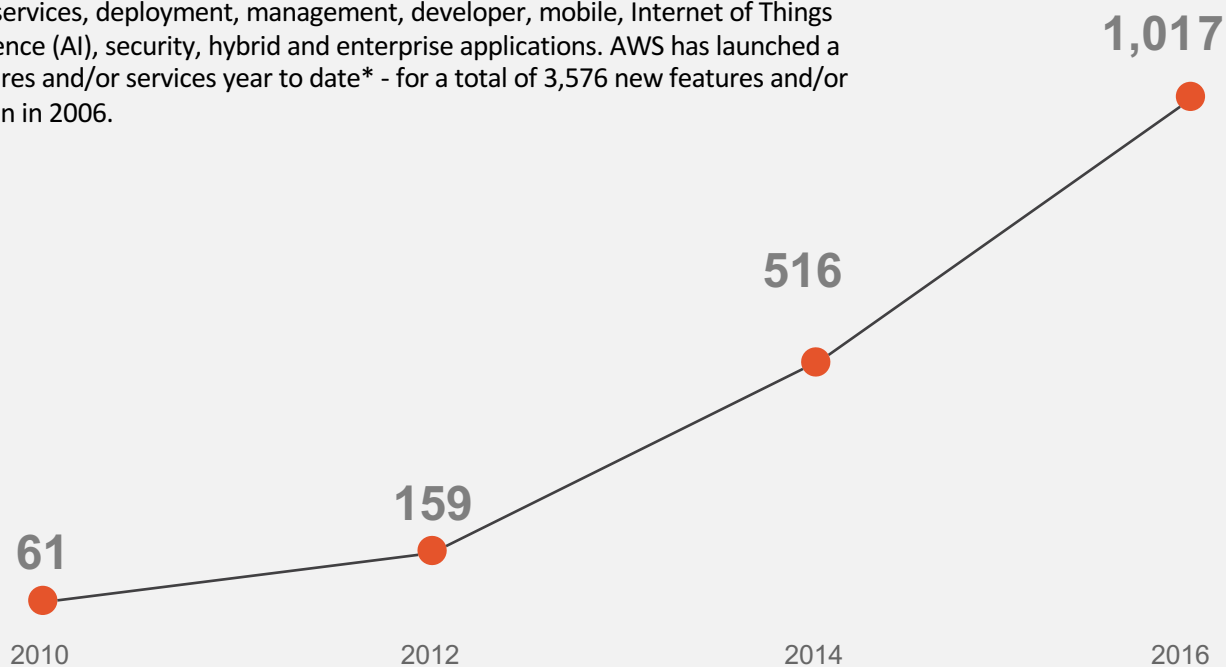
日志（基于托管服务）



后发优势 与不断演进的AWS服务

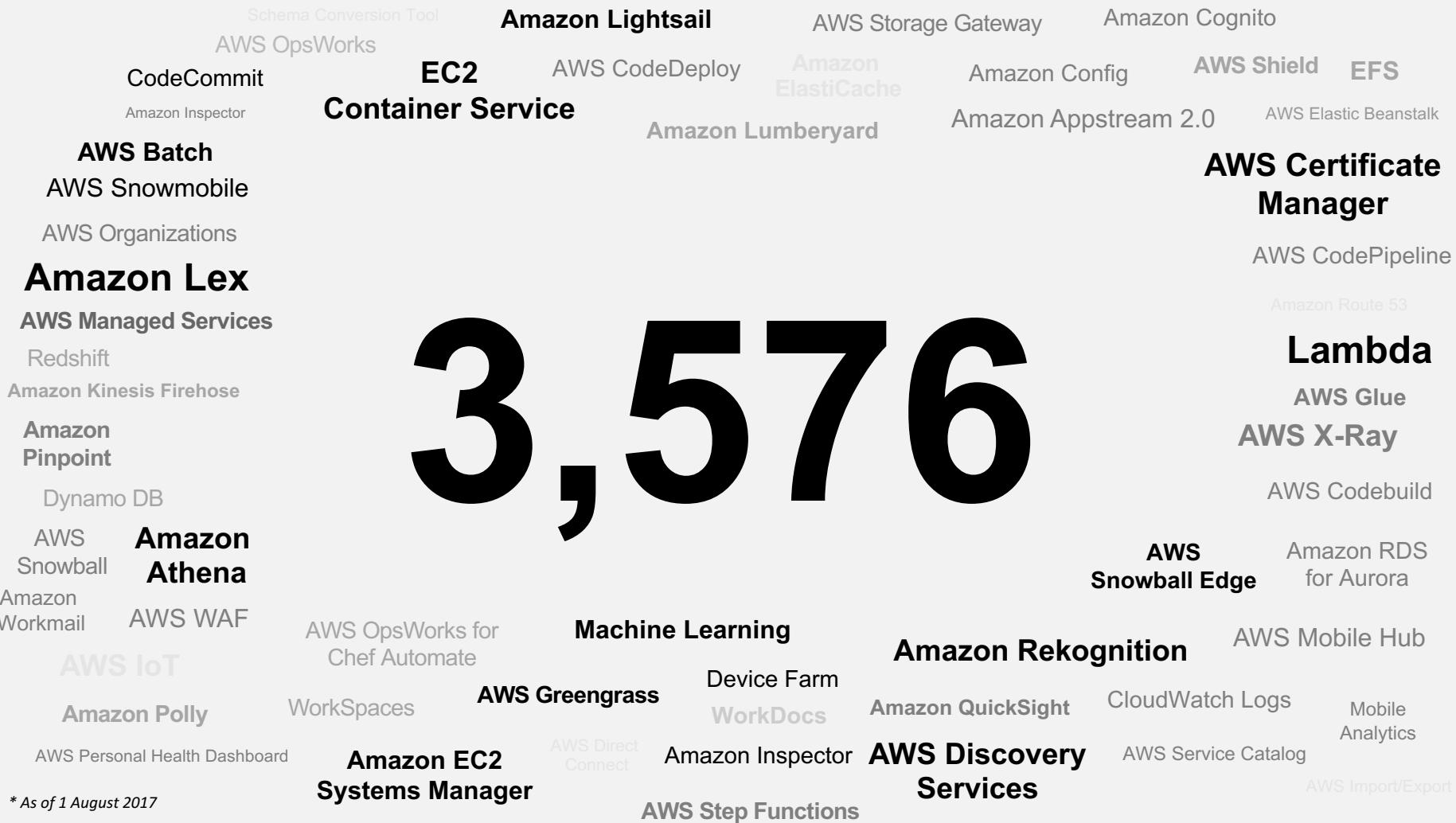
AWS每年发布的新功能数量统计

AWS has been continually expanding its services to support virtually any cloud workload, and it now has more than 90 services that range from compute, storage, networking, database, analytics, application services, deployment, management, developer, mobile, Internet of Things (IoT), Artificial Intelligence (AI), security, hybrid and enterprise applications. AWS has launched a total of 663 new features and/or services year to date* - for a total of 3,576 new features and/or services since inception in 2006.



* As of 1 August 2017

AWS目前的功能总数 (2017-08-01)



* As of 1 August 2017

中国初创用户



中国企业用户



THANK YOU

