云平台计算服务进化之路

薛峰
AWS 解决方案架构师

2017年10月19日

主要议题

- 计算服务的进化
- AWS 的计算服务
- 走向无服务器

云计算成为新常态

敏捷

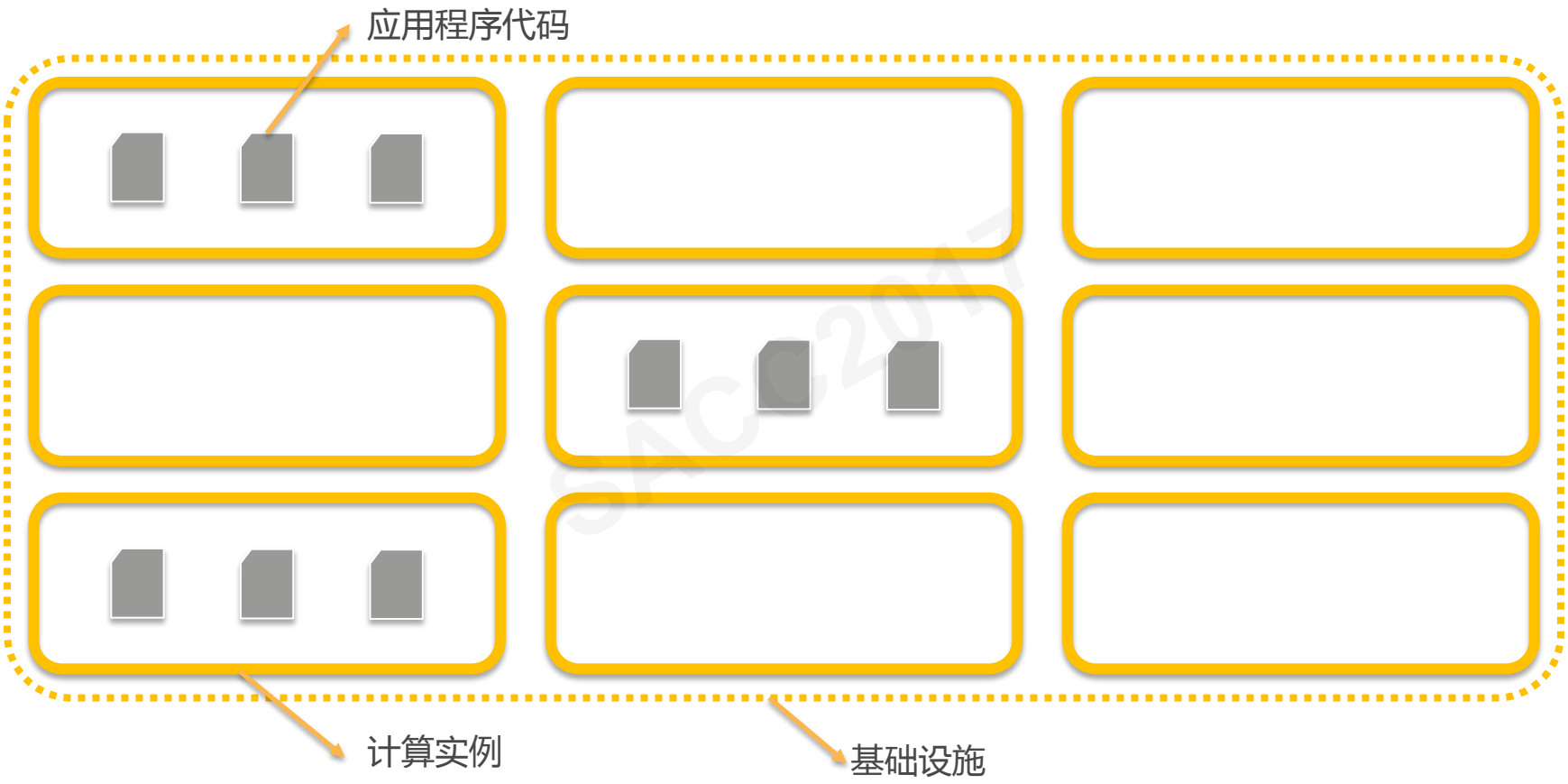
成本优化

弹性

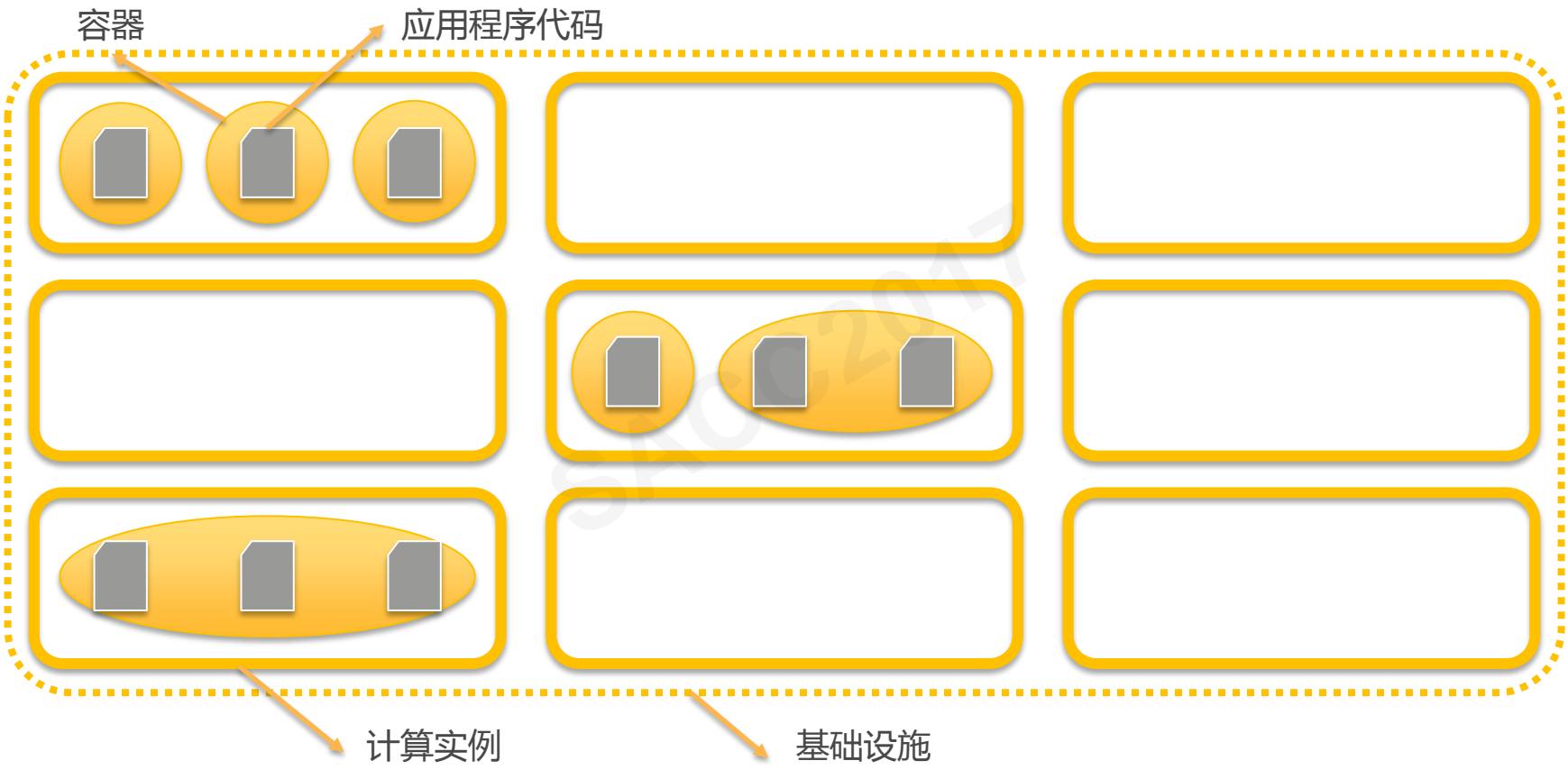
规模经济

全球部署

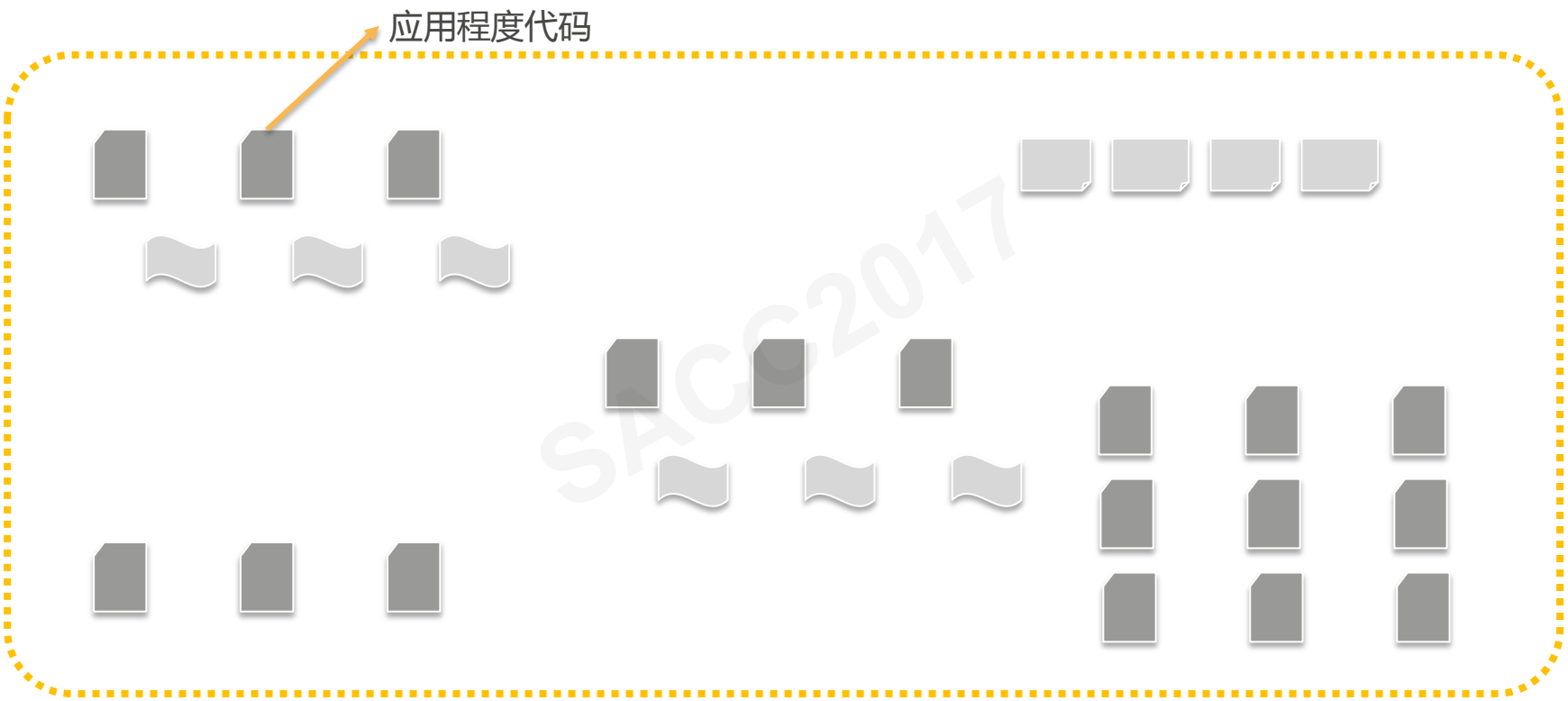
计算服务的演进 – 虚拟机VM



计算服务的演进 - 容器 Containers



计算服务的演进 - 无服务器 Serverless



Amazon EC2 Beta

by Jeff Barr on 25 AUG 2006 | in Announcements | Permalink | Share

Innovation never takes a break, and neither do I. From the steaming hot beaches of Cabo San Lucas I would like to tell you about the Amazon Elastic Compute Cloud, or Amazon EC2, now open for limited beta testing, with more beta slots to open soon.

Amazon EC2 gives you access to a virtual computing environment. Your applications run on a "virtual CPU", the equivalent of a 1.7 GHz Xeon processor, 1.75 GB of RAM, 160 GB of local disk and 250 Mb/second of network bandwidth. You pay just 10 cents per clock hour (billed to your Amazon Web Services account), and you can get as many virtual CPUs as you need. You can learn more on the EC2 Detail Page. We built Amazon EC2 using a virtual machine monitor by the name of Xen.

Amazon EC2 works in terms of AMIs, or Amazon Machine Images. Each AMI is a pre-configured boot disk — just a packaged-up operating system stored as an Amazon S3 object. There are web service calls to create images, and to assign them to virtual CPUs to run your application. If your application consists of the usual web server, business logic, and database tiers, you can built distinct AMIs for each tier, and then spawn one or more instances of each type based on the load.

2008年

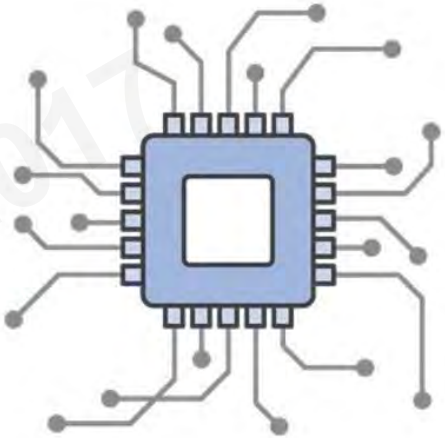
M1

C1

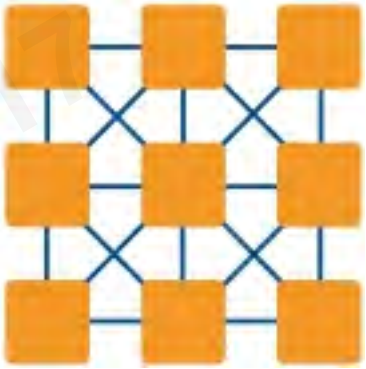
2017年

C5

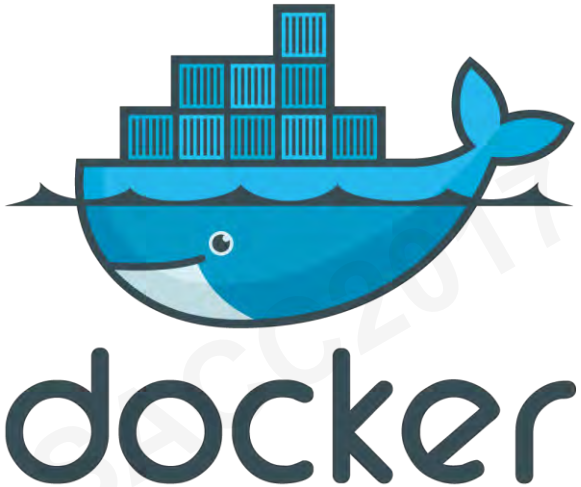
新一代计算优化实例
使用 Intel “Skylake” 架构



VPC
增强网络
置放群组



Amazon 系统映像 (AMI)



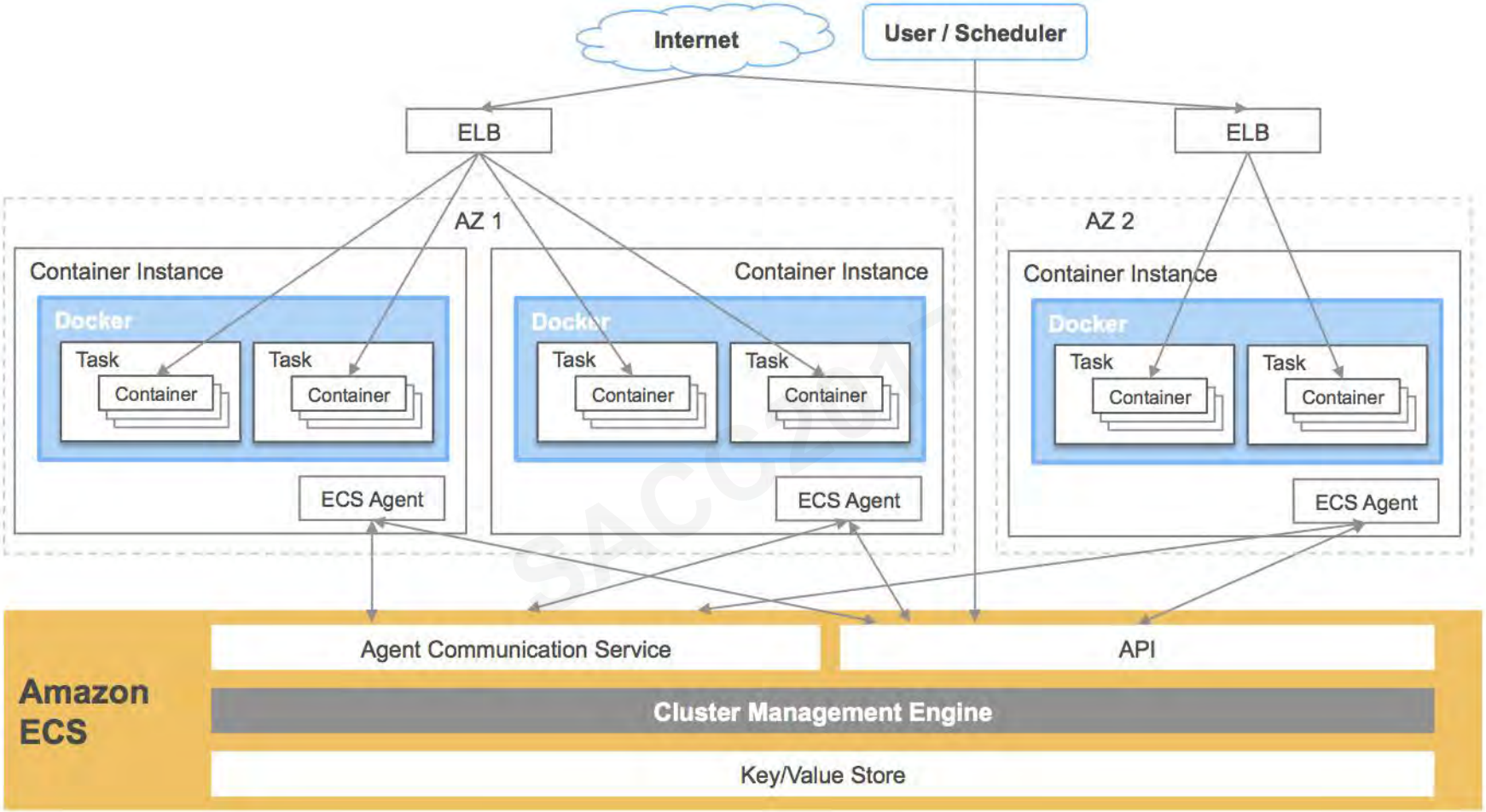
AWS Case Study: Yelp Cuts Test-Run Times by 90% Using AWS

About Yelp

Yelp.com provides consumers with crowd-sourced reviews about local businesses. It connects its data centers to the cloud using AWS Direct Connect to access a range of AWS services for its Dev & Test, Automated Testing systems, staging areas, and production workloads. Using AWS, Yelp dramatically improved its development productivity by reducing test-run times by as much as 90 percent.

Yelp Cuts Test-Run Times by 90% Using AWS (3:34)

AWS中国（北京）区域由光环新网运营


Internet
User / Scheduler
ELB
ELB
AZ 1
AZ 2
Container Instance
Container Instance
Container Instance
Docker
Task
Container
ECS Agent
Amazon ECS
Agent Communication Service
API
Cluster Management Engine
Key/Value Store

https://github.com/aws/amazon-ecs-agent

aws / amazon-ecs-agent

Watch 157 | Star 998 | Fork 262

Code | Issues 121 | Pull requests 10 | Projects 0 | Insights

Amazon EC2 Container Service Agent http://aws.amazon.com/ecs/

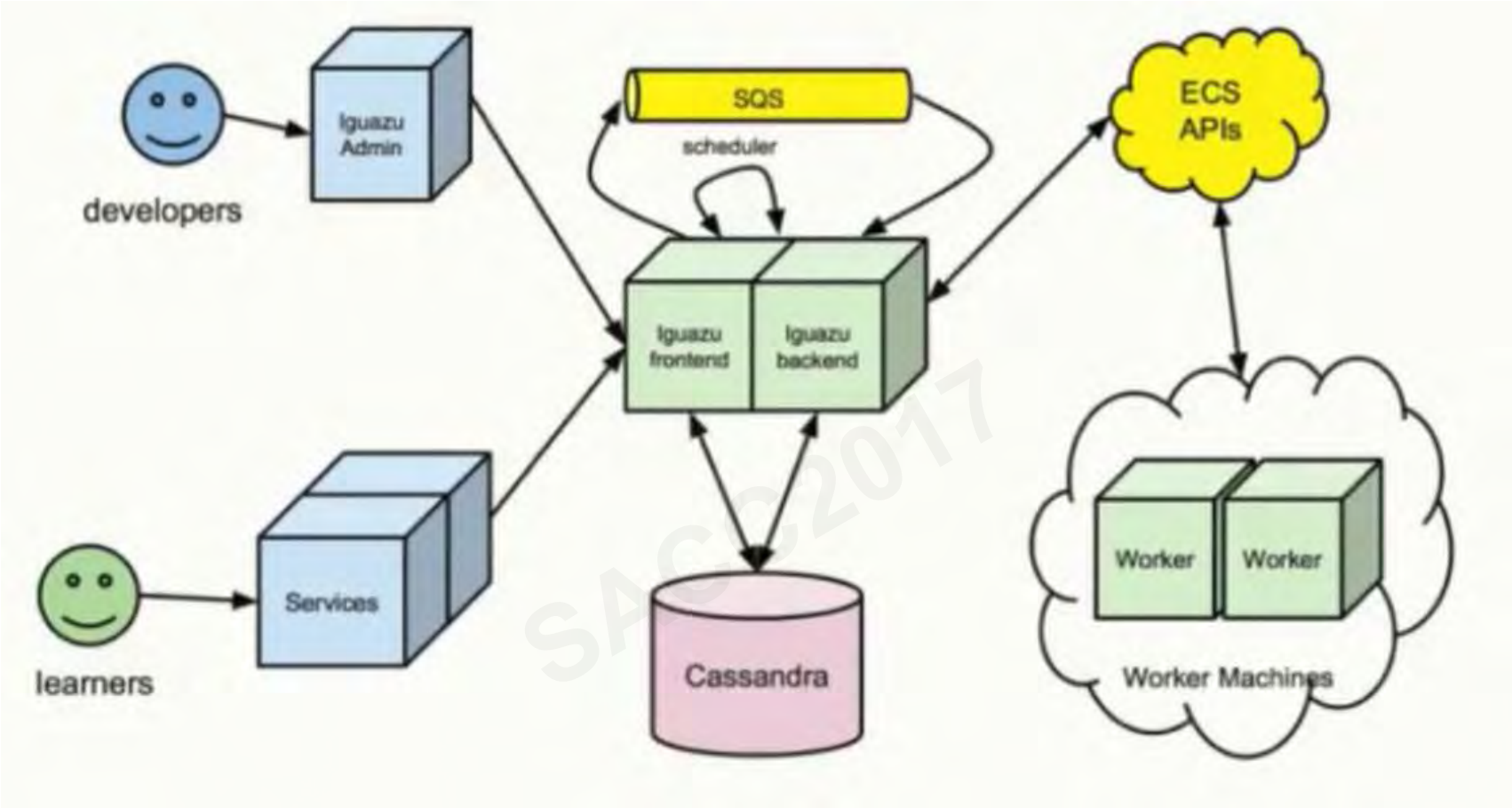
go | amazon-ecs-agent | amazon-ec2 | docker-container | amazon-linux-ami

852 commits | 4 branches | 31 releases | 43 contributors

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

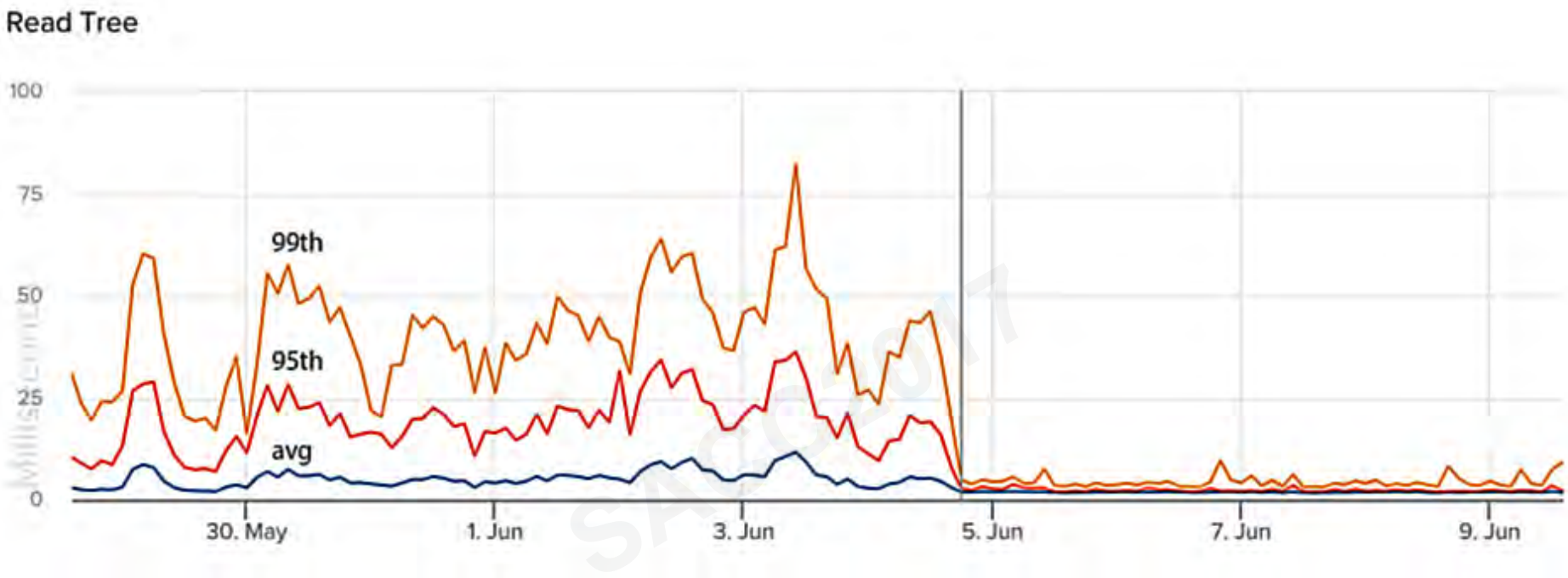
jhaynes update to agent version 1.14.4. Latest commit f94beb4 on 23 Aug

.github	Adding ISSUE_TEMPLATE	2 months ago
agent	update to agent version 1.14.4.	a month ago
misc	Merge branch 'windows-api-versioning' into dev	3 months ago
scripts	Integration test: enable race detector for integration test	2 months ago
.dockerignore	Improve the build process	2 years ago
.gitignore	windows-iam: Share setup with windows-deploy	11 months ago
.travis.yml	travis: remove hacky symlinking	8 months ago



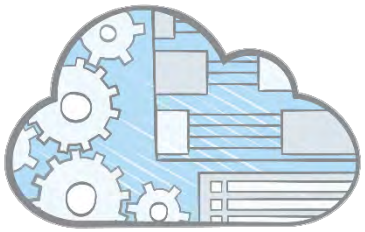
Frank Chen
软件工程师
coursera

借助 Amazon ECS，Coursera 可以集中精力发布新软件，无需花时间管理群集。



Jason Fischl
工程副总裁
remind

迁移到 Amazon ECS 后，我们服务的性能得到了显著提升。
我们将服务响应时间的第 99 个百分位降低了 50%。

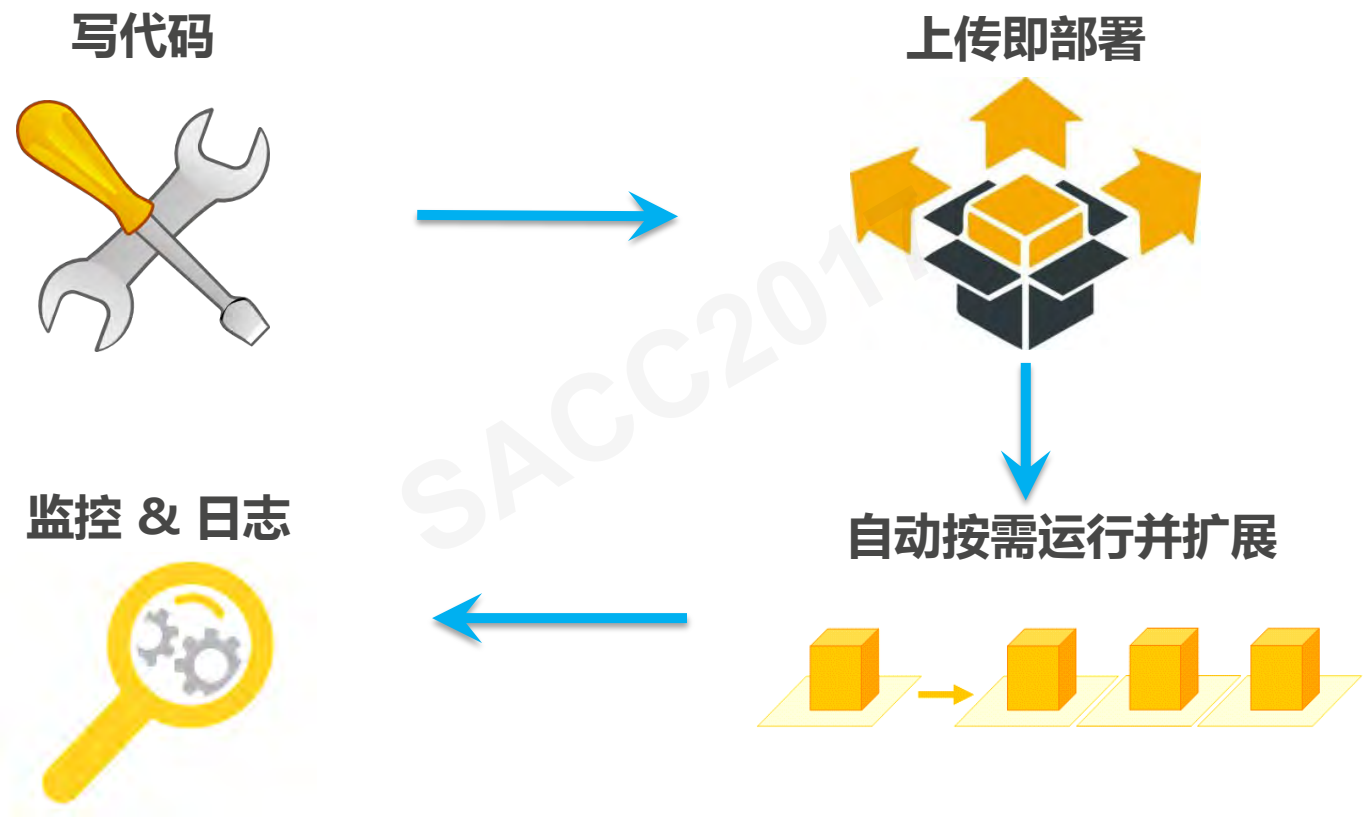


无需管理服务器

持续扩展

次秒级计量

AWS Lambda – 如何使用



为什么这么方便？

这种架构模式，不再考虑：

- 服务器
- 按实际使用量自动匹配计算资源
- 高可用架构
- 扩展能力、冗余问题
- 操作系统与语言的更新
- 记录状态和日志

可轻松做到：

- 使用自己的代码（BYOC）
- 并行运行代码，低延时同步调用
- 创建后端，事件处理引擎，数据处理系统
- 不会有资源闲置浪费
- 启动成本很低
- 按需付费

AWS Lambda 到底是什么？

- 定制的 Linux 容器
- 大规模的装箱算法
- 前瞻性的容量管理

还不够简单？- 蓝图来帮忙

步骤 1
选择蓝图

步骤 2
配置触发器

步骤 3
配置函数

步骤 4
审核

选择蓝图

蓝图是事件源和 Lambda 函数的示例配置。选择一个最适合您所需场景的蓝图并根据需要进行自定义，如果您想创作一个 Lambda 函数并单独配置一个事件源，则单击**从头开始创作**。除非另有说明，否则蓝图在 CC0 下授予许可。

蓝图 信息

导出 | 从头开始创作

添加筛选条件

keyword : S3

1

splunk-elb-application-access-logs-processor

Stream Application ELB access logs from S3 to Splunk's HTTP event collector

nodejs6.10 · splunk · elb · s3 · application-elb

s3-get-object-python

An Amazon S3 trigger that retrieves metadata for the object that has been updated.

python2.7 · s3

rekognition-python

An Amazon S3 trigger that uses rekognition APIs to detect faces

python2.7 · rekognition · s3

s3-get-object

An Amazon S3 trigger that retrieves metadata for the object that has been updated.

nodejs6.10 · s3

版本和别名

- 随时可以修改代码
- 每次的修改以版本的形式保留下来
- 最新的修改默认生效
- 可以增加别名

```
exports.handler =
function(event,context)
{context.succeed("hi");}
```

```
exports.handler =
function(event,context)
{context.succeed("bye");}
```

Versions	Alias
1	Prod
2 $LATEST	Dev

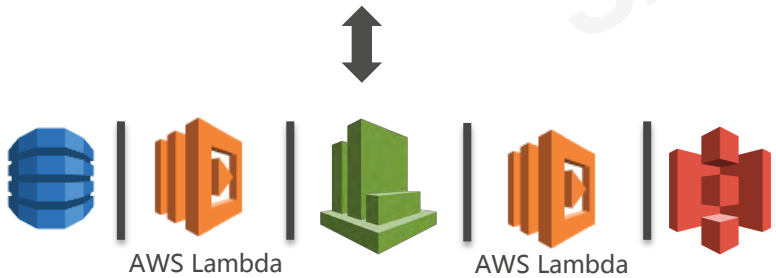
AWS Lambda可以与多种AWS服务集成

AWS Lambda和其他服务结合后的威力

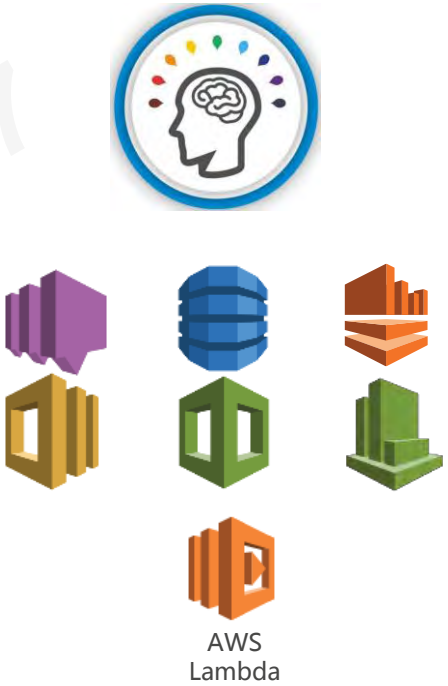
服务粘合剂

- 各种服务能通过 AWS Lambda 串联起来
- 想象一下Unix/Linux的管道技术

cat poorly_formatted_report.txt | fmt | pr | lpr



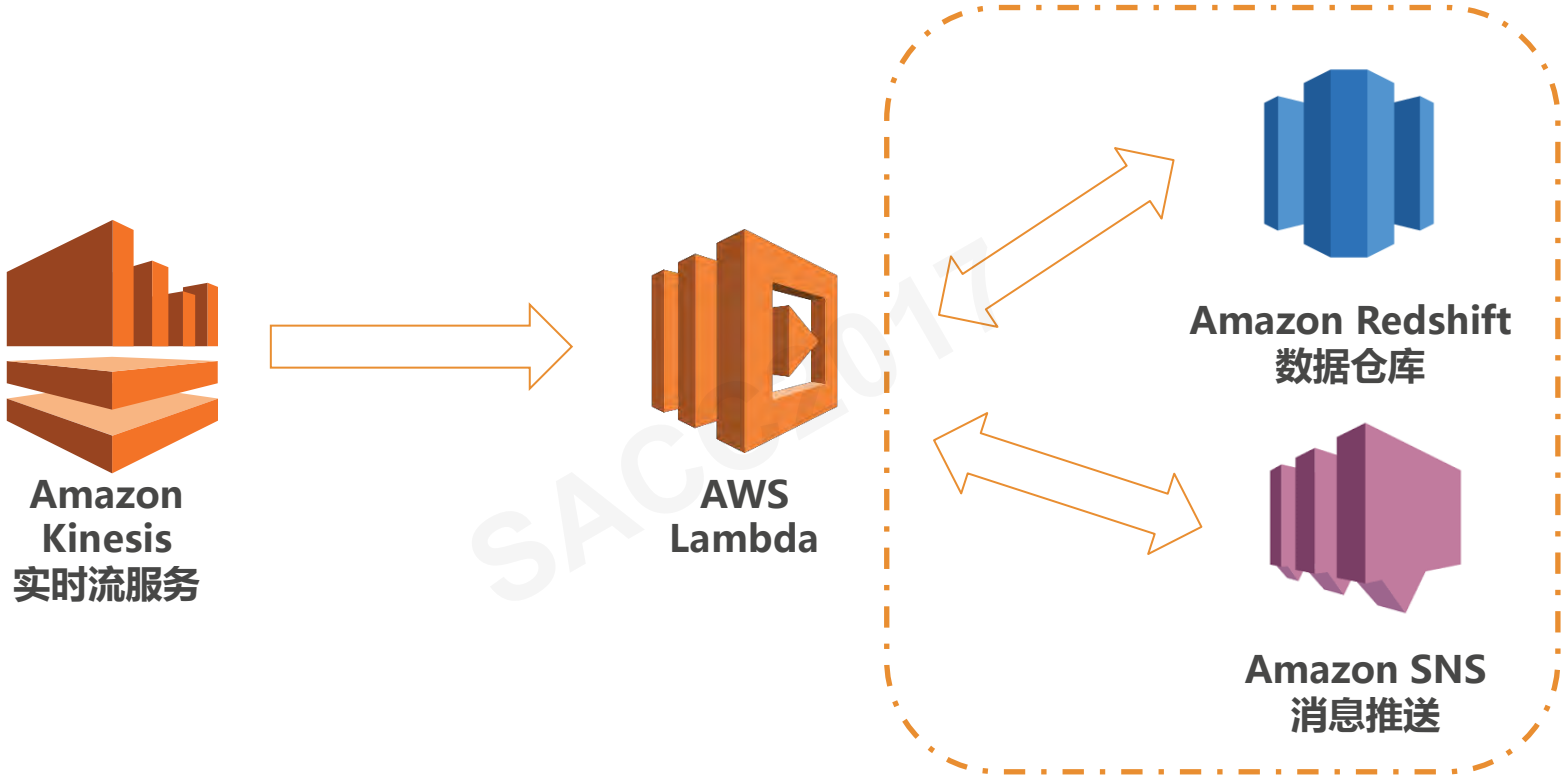
让其他服务更智能



典型使用场景

异步缩略图生成

实时流数据处理



操作日志审查

基于监控的自动化运维

Amazon
CloudWatch
Alarm
监控报警

Amazon
SNS
消息推送

AWS
Lambda

ec2
runInstance

ecs
startTask

beanstalk
updateApp

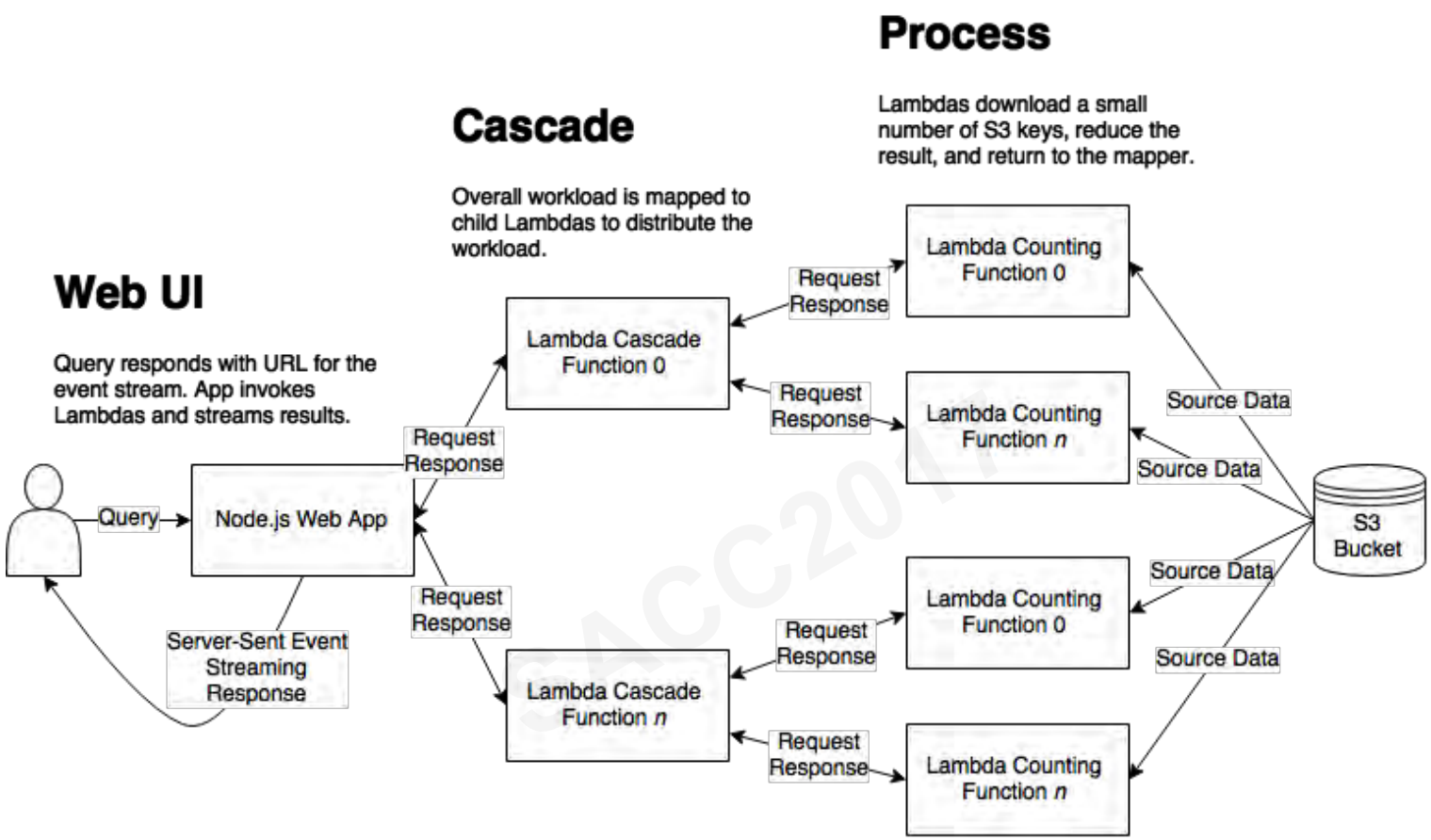
kinesis
splitShard

Any API call

https://aws.amazon.com/blogs/compute/scaling-amazon-ecs-services-automatically-using-amazon-cloudwatch-and-aws-lambda/

Mohit Dilawari
工程总监
Localytics

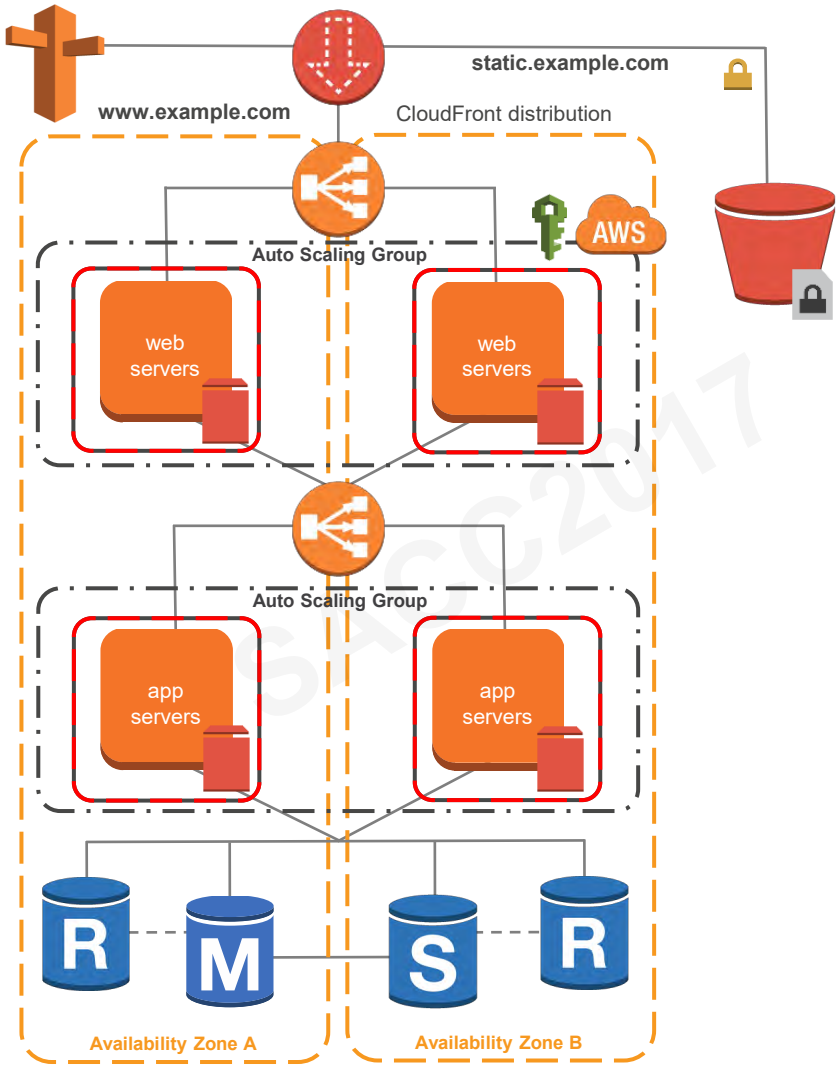
借助 AWS Lambda，我们的各个工程团队可以利用并行数据流来创建微服务， 不需要使用主分析应用程序。这有助于我们以更快的速度将新服务交付给客户。



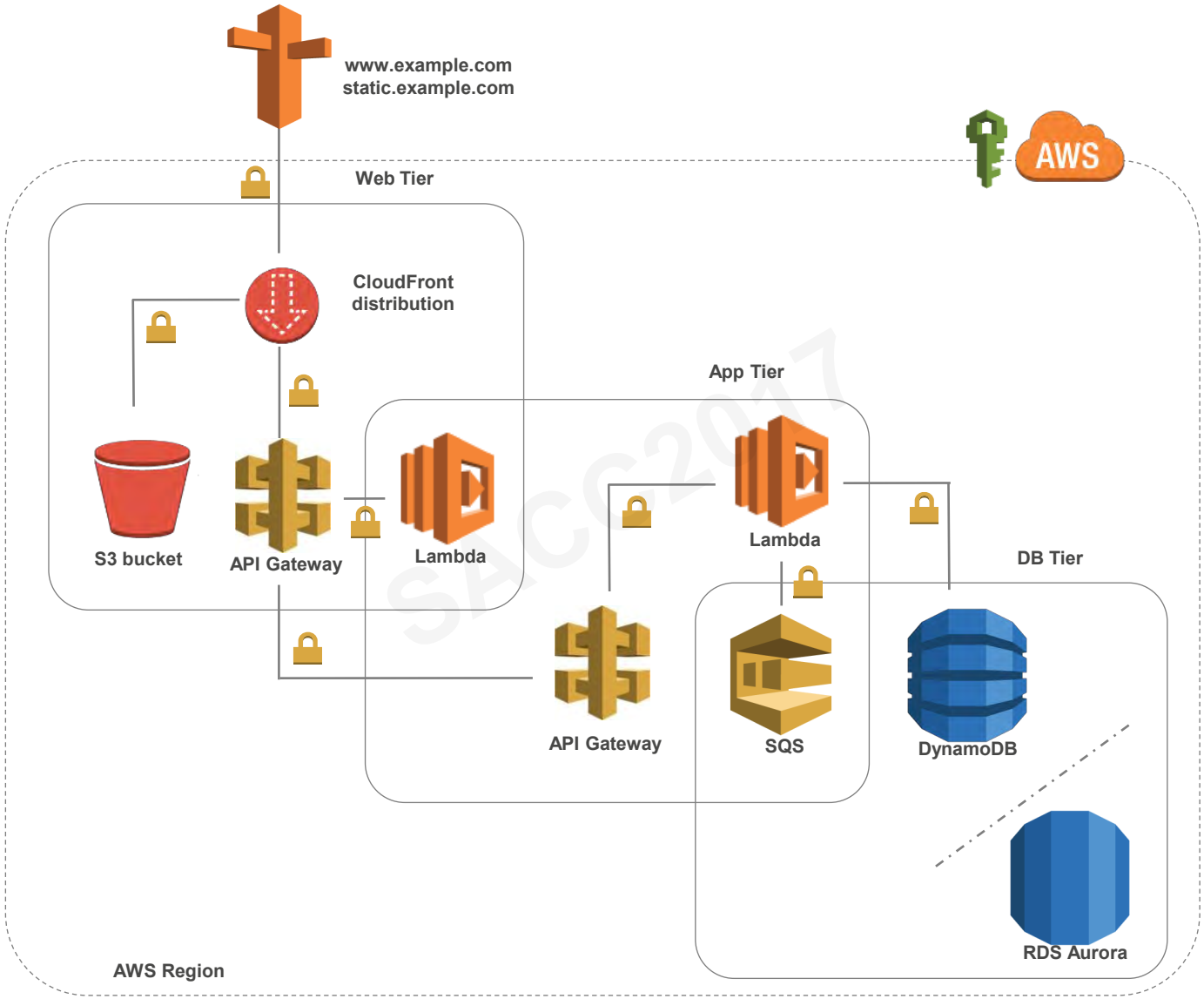
FireEye 使用AWS Lambda构建可扩展的响应式大数据交互

https://aws.amazon.com/blogs/big-data/building-scalable-and-responsive-big-data-interfaces-with-aws-lambda/

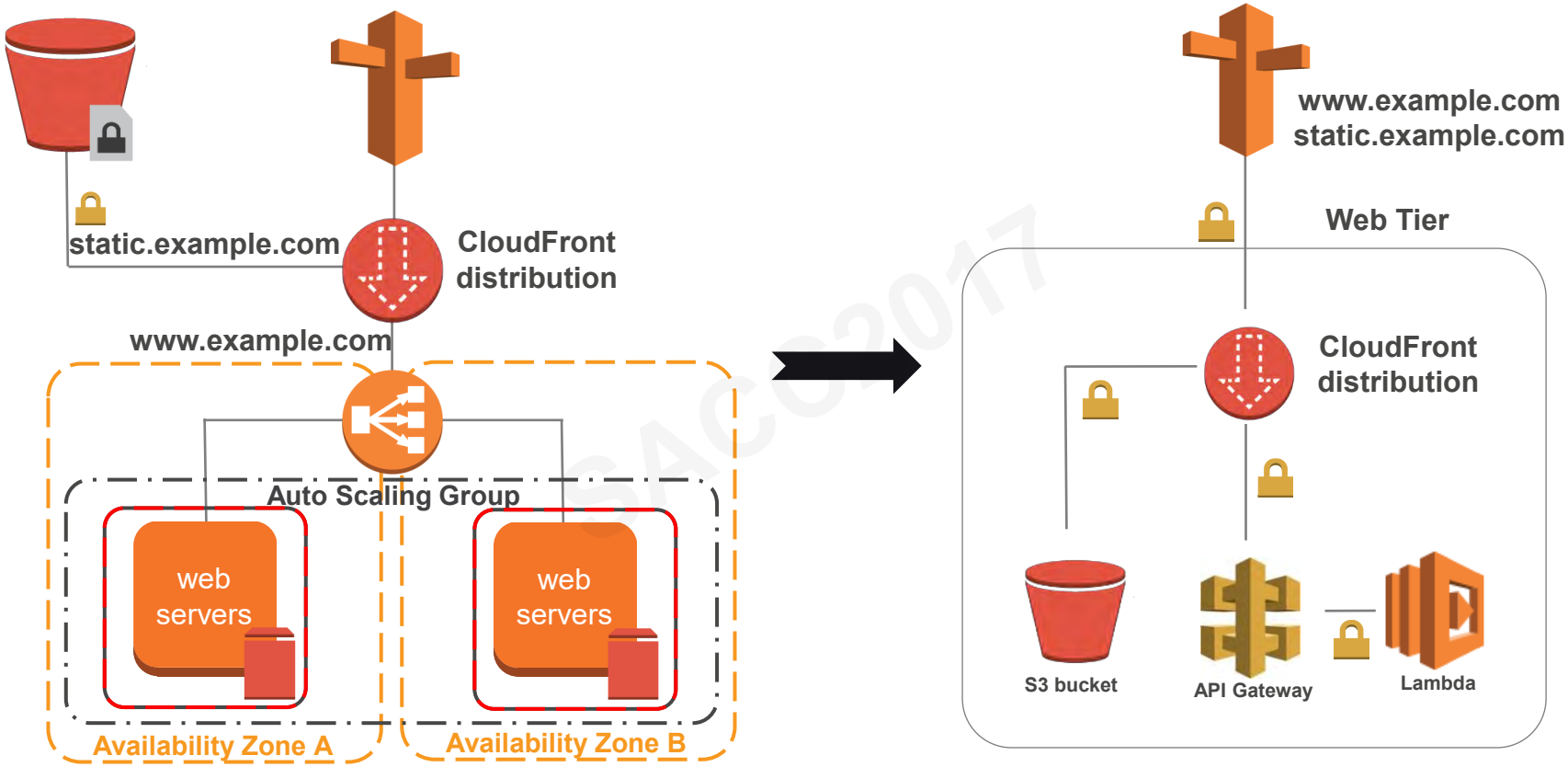
走向无服务器：三层Web应用的改造



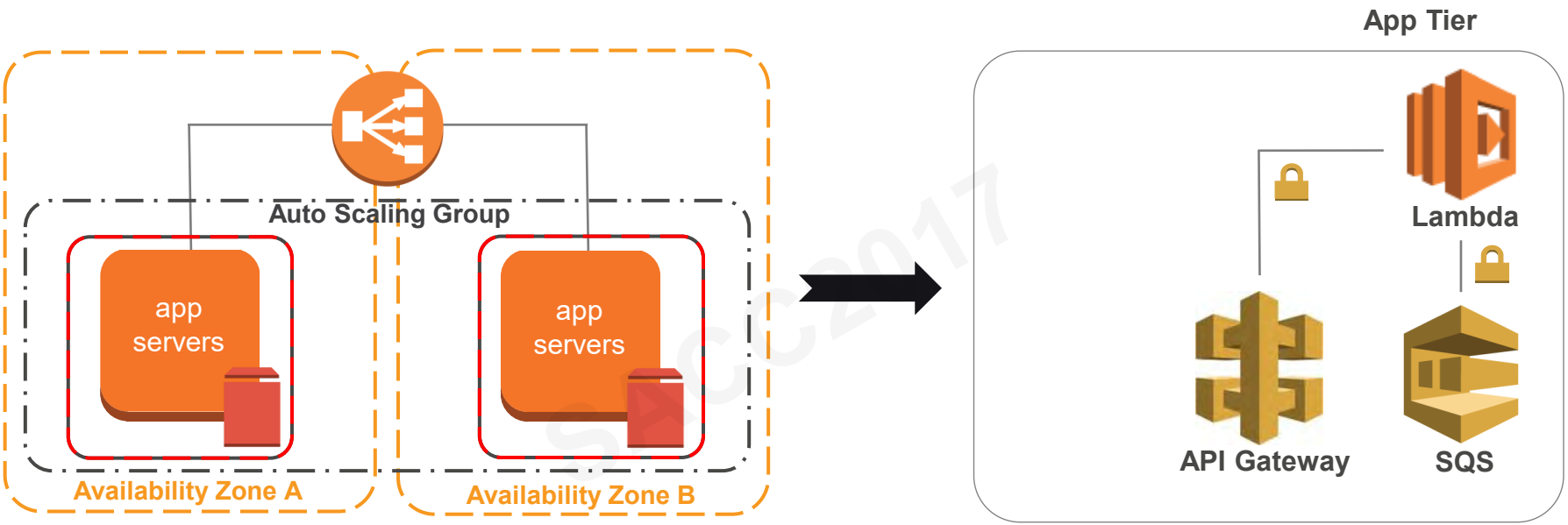
三层Web应用的改造



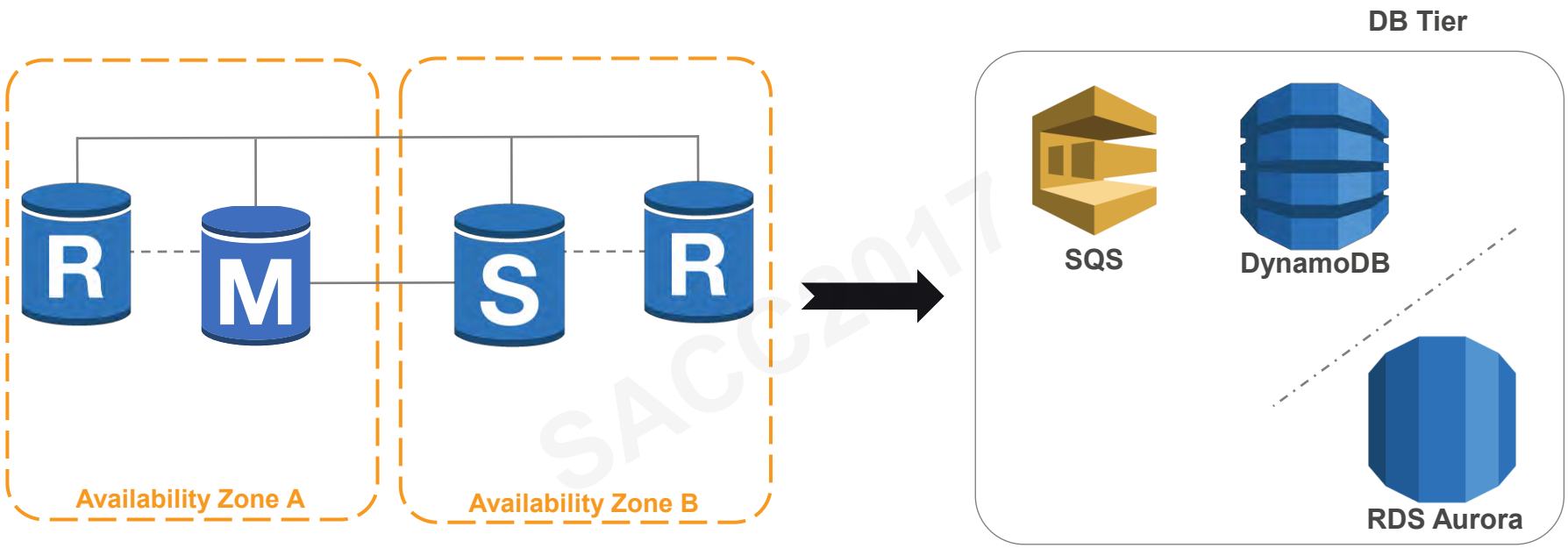
改造Web 层



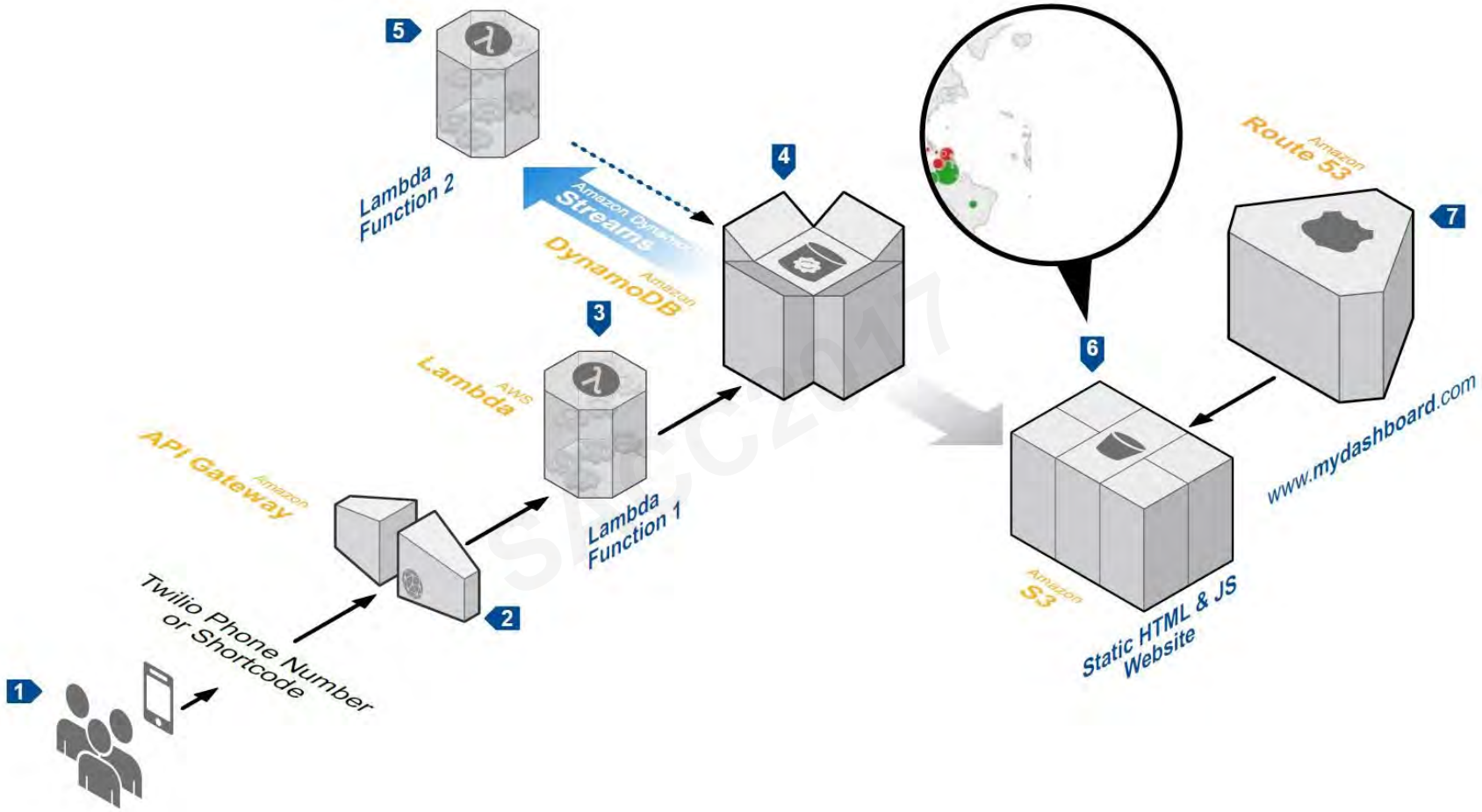
改造业务层



改造数据库层

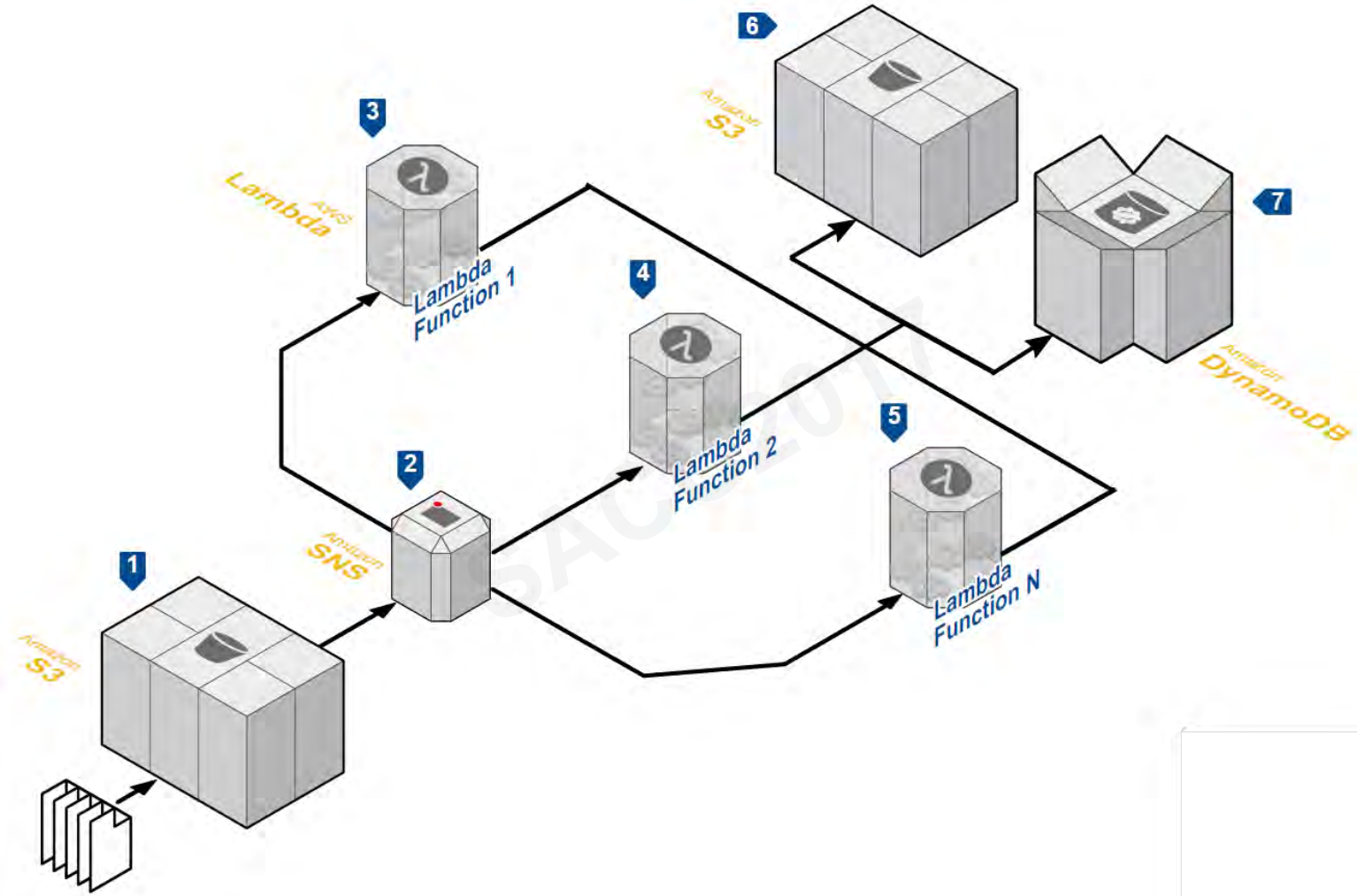


Web应用Serverless参考架构



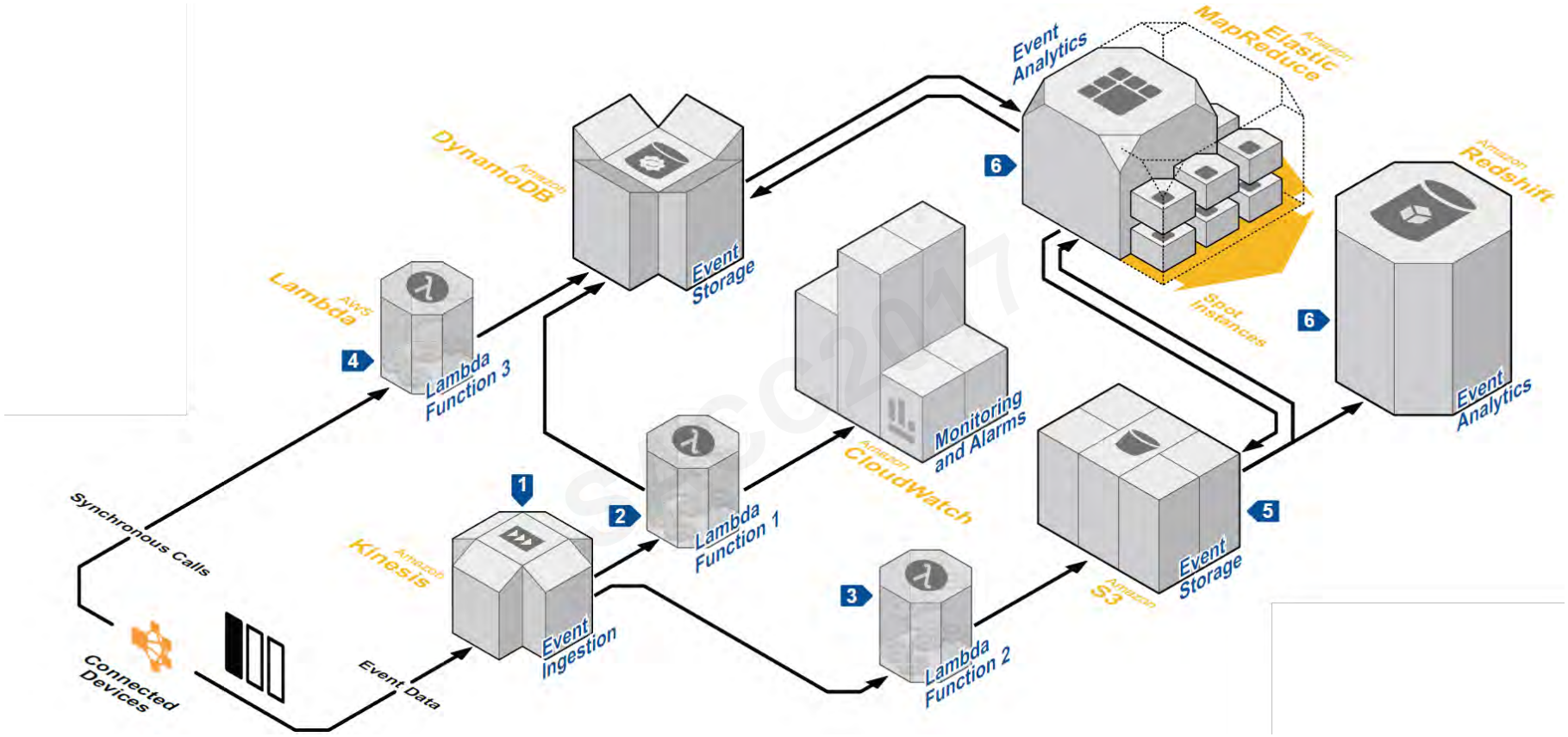
https://github.com/awslabs/lambda-refarch-webapp

实时文件处理Serverless参考架构



https://github.com/awslabs/lambda-refarch-fileprocessing

物联网应用后台参考架构



https://github.com/awslabs/lambda-refarch-iotbackend

Serverless Framework – 服务管理

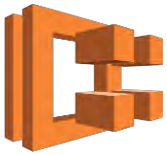
借助AWS Lambda和API Gateway来构建无服务架构应用的**框架**

- 本地运行/测试AWS Lambda
- 自动部署AWS Lambda和API Gateway
- 支持多region和多stage
- 支持project
- 支持插件扩展

AWS计算服务的选择

- 虚机
  - 配置机器、存储、网络和操作系统
- 容器
  - 运行服务器，配置应用，管理扩容
- 无服务器
  - 我只想在需要时运行我的代码

Amazon EC2



Amazon ECS

AWS Lambda

相关资源

Amazon EC2

https://amazonaws-china.com/ec2/

Amazon EC2 实例类型

https://amazonaws-china.com/ec2/instance-types/

Amazon EC2 Container Service

https://amazonaws-china.com/ecs/

AWS Lambda

https://aws.amazon.com/lambda

无服务器计算和应用程序

https://amazonaws-china.com/serverless/

AWS Compute Blog

https://amazonaws-china.com/blogs/compute/

AWS 客户成功案例

https://amazonaws-china.com/solutions/case-studies/

THANKS