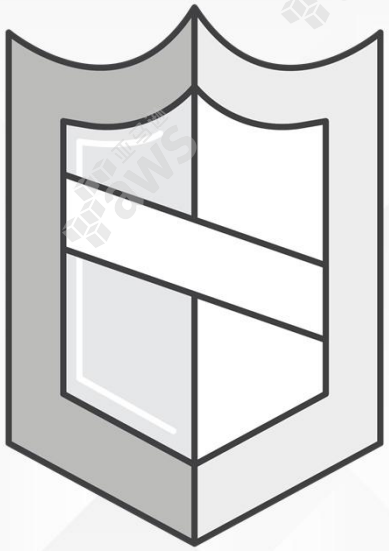

AWS Summit
AWS技术峰会2015 · 上海
亚马逊
aws

ELB应用场景与使用技巧

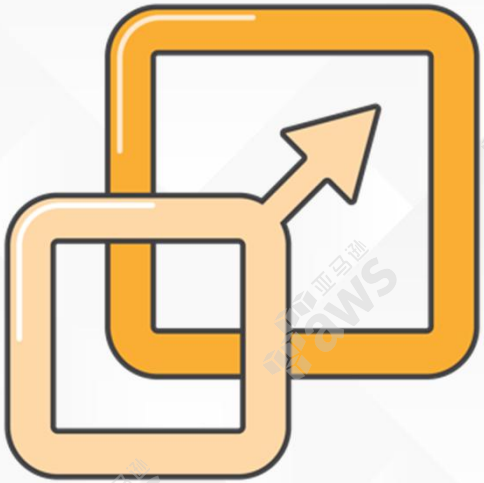
姜可舒

亚马逊 aws

弹性负载均衡 Elastic Load Balancing



安全性

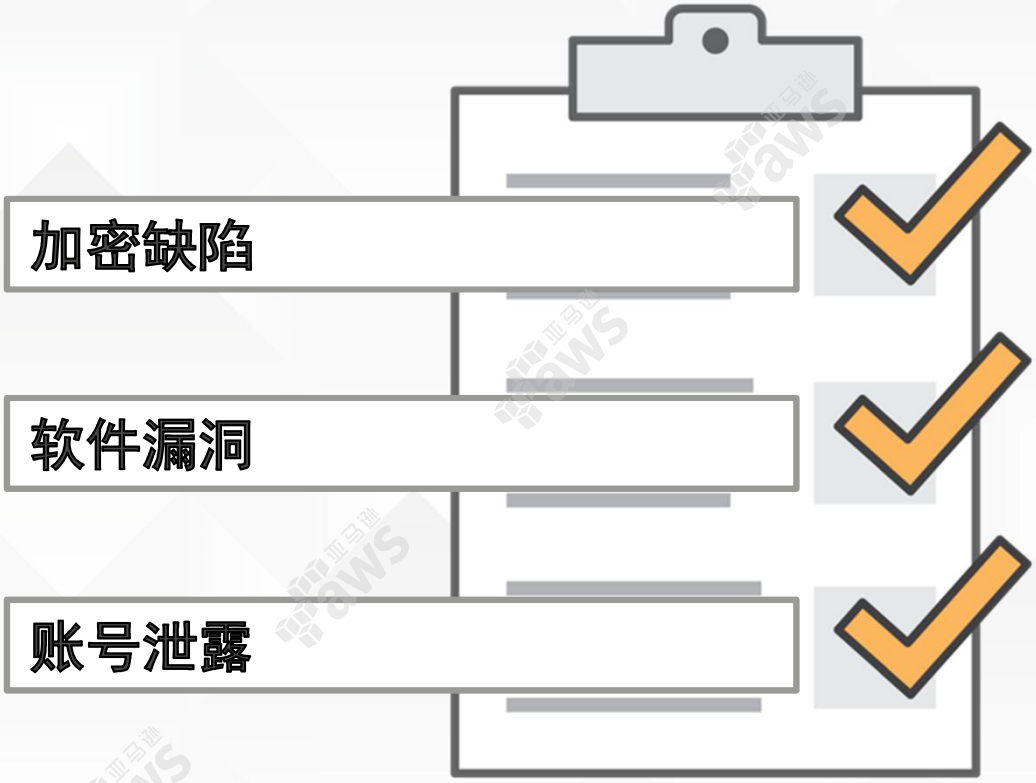


扩展性

高可用

安全性

安全威胁模型分析



SSL/TLS 安全策略

- 同步消除POODLE隐患
- 同步消除LogJam隐患
- 同步消除Heartbleed隐患
- 遵循安全规范更新，移除RC4

SSL/TLS 加密套件

- 完全正向保密(perfect forward secrecy)优先
- 优先级：AES > 3DES > RC4
- 优先级：GCM > CBC + HMAC

SSL/TLS 加密套件

- 向下兼容及折中
  - 较早的固件或者嵌入式系统
  - 控制器，网络爬虫…
- 访问日志分析
- 强烈推荐ELBSecurityPolicy-2015-05及更新版本

ELB访问日志

2015-05-13T23:39:43.945958Z my-loadbalancer
192.168.131.39:2817 10.0.0.1:80 0.000086 0.001048 0.001337
200 200 0 57 "GET https://www.example.com:443/ HTTP/1.1”
"curl/7.38.0" DHE-RSA-AES128-SHA TLSv1.2

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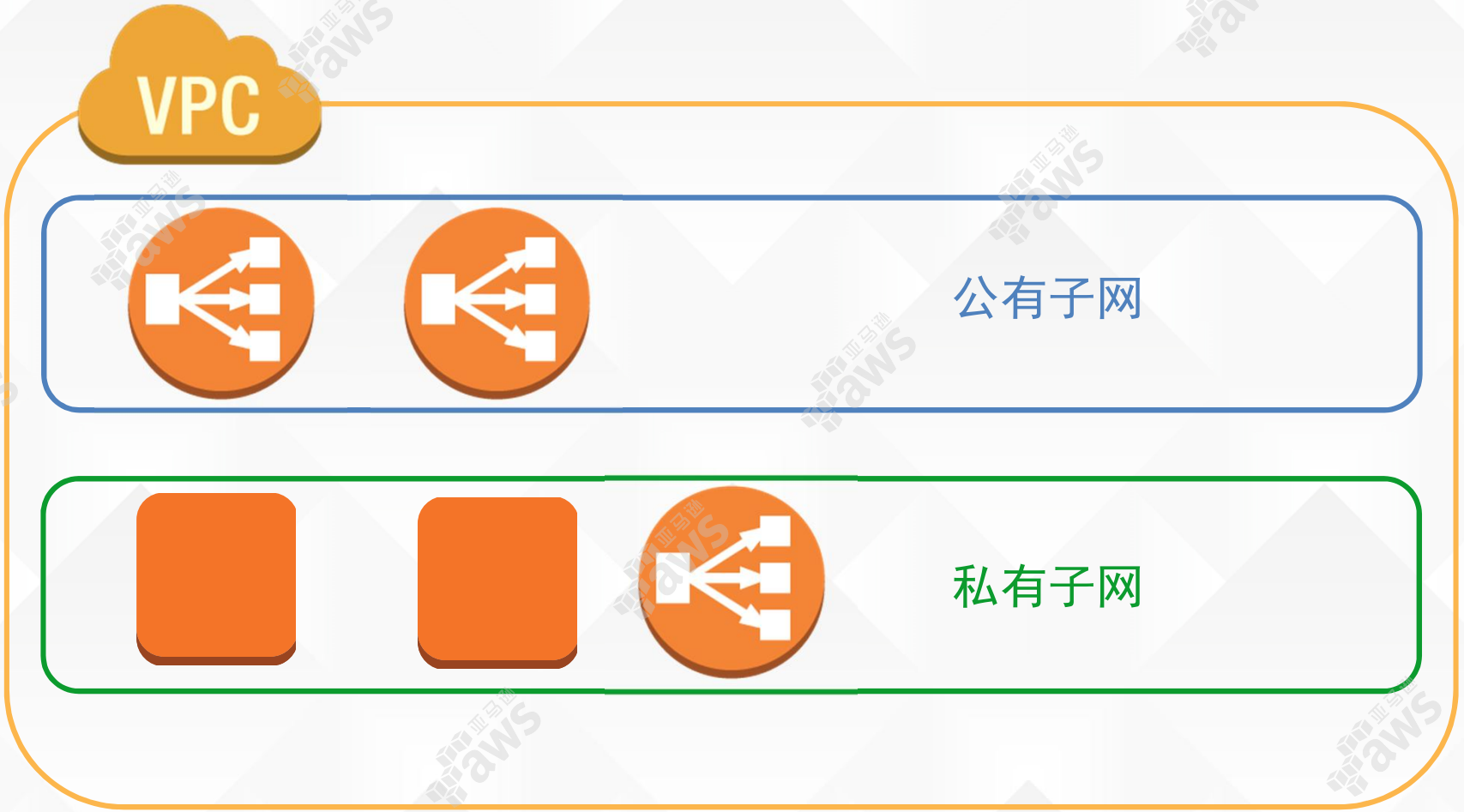
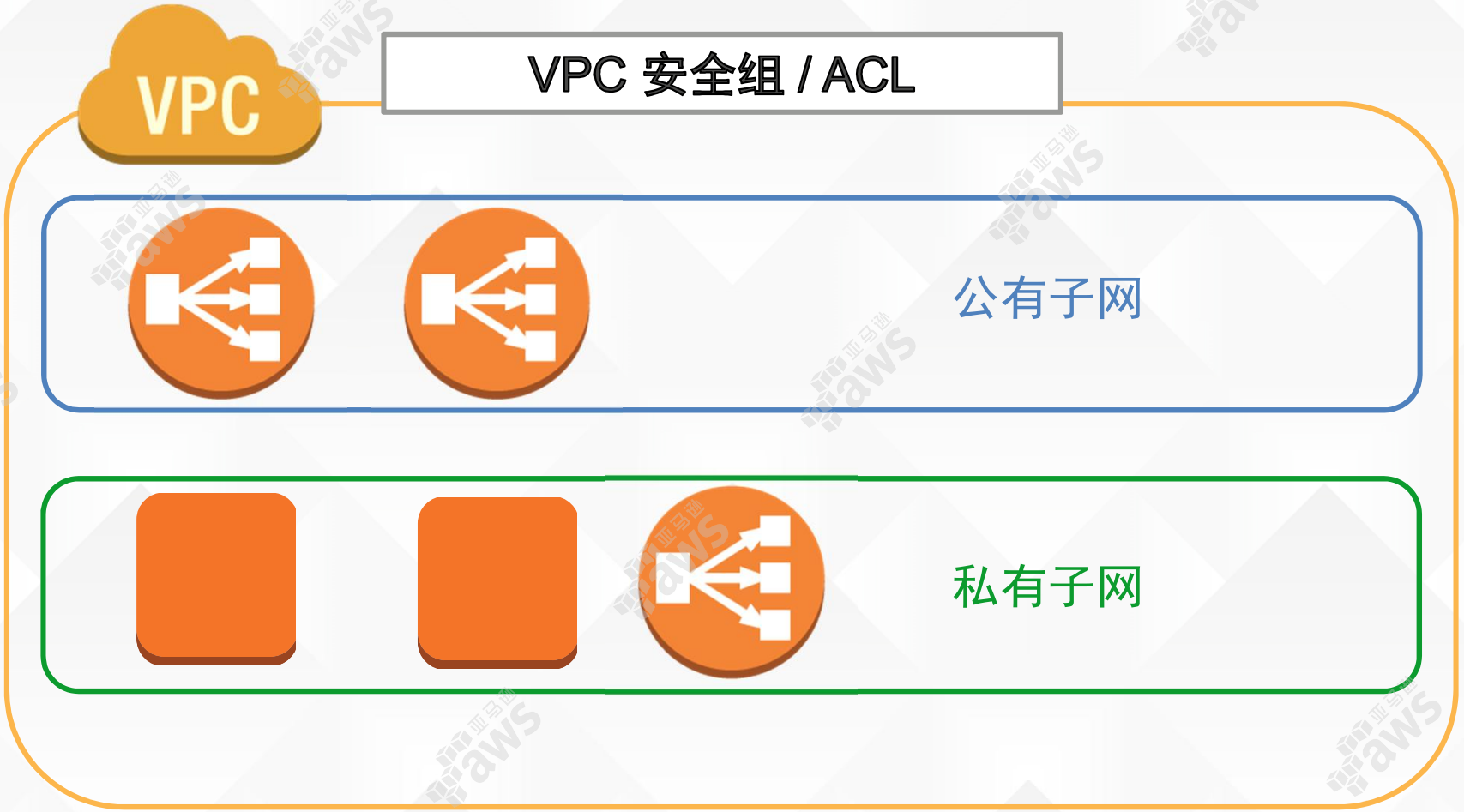
ELB及安全隔离



ELB及安全隔离



ELB及安全隔离

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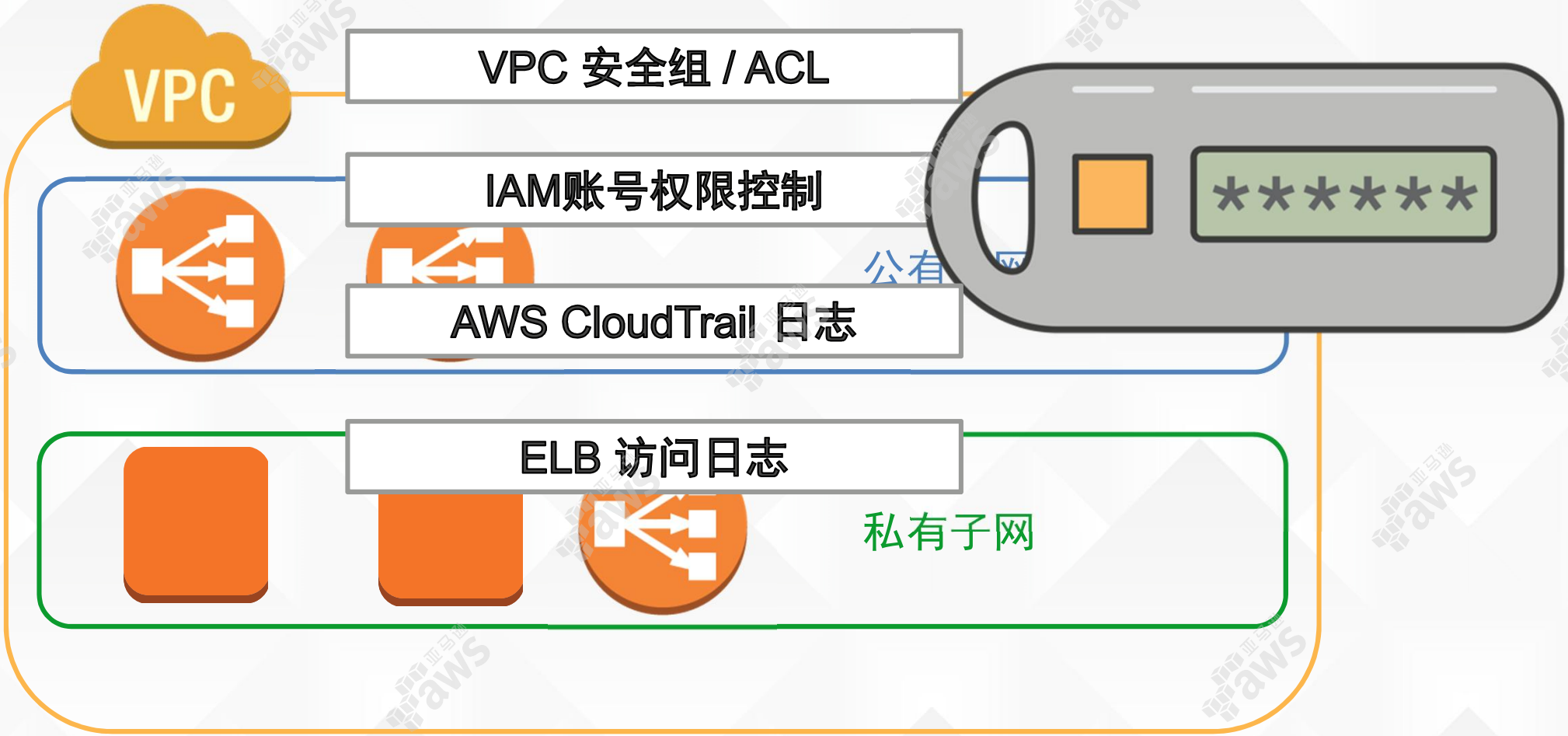
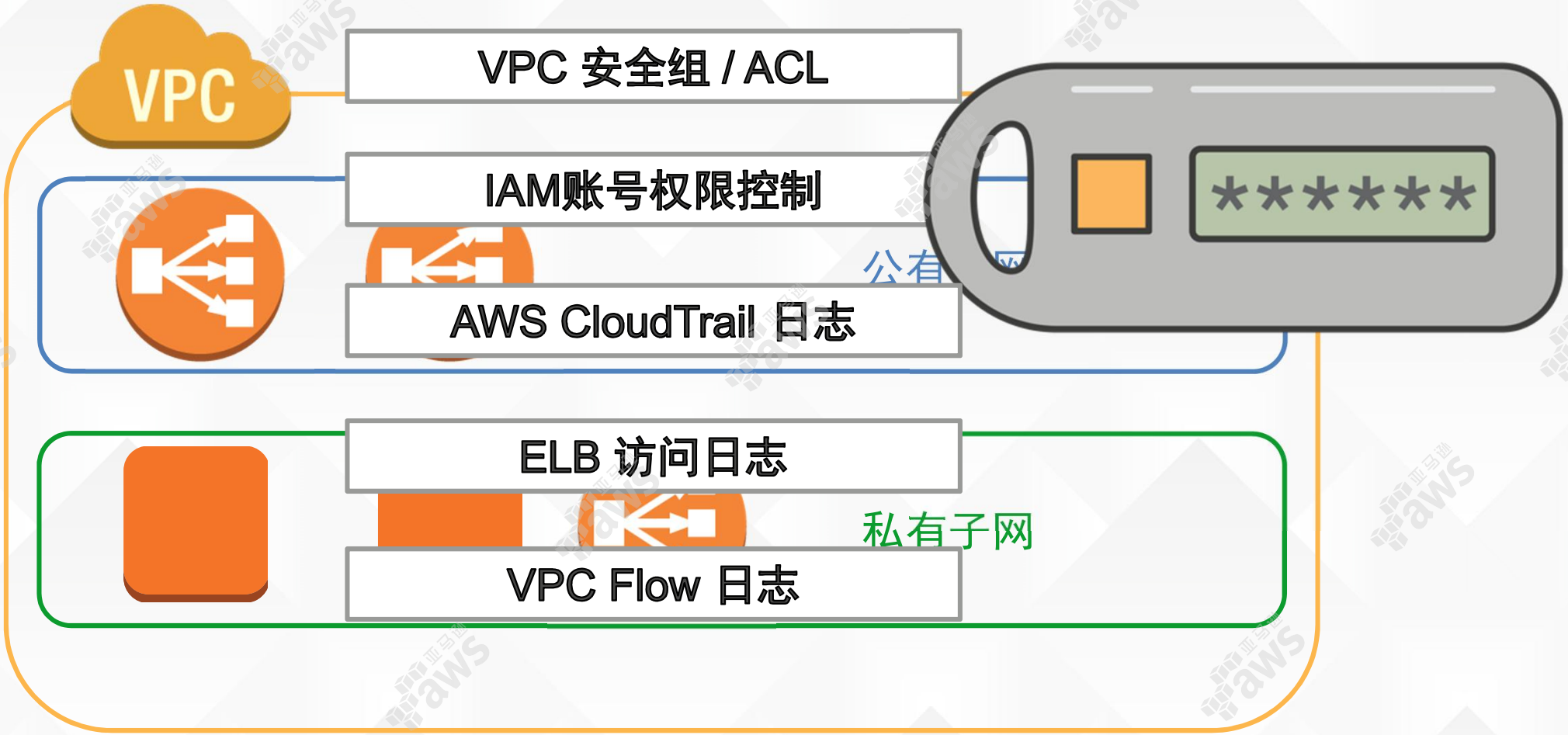


ELB 及安全隔离


VPC
VPC 安全组 / ACL
IAM账号权限控制
AWS CloudTrail 日志
公有
******
ELB 访问日志
VPC Flow 日志
私有子网

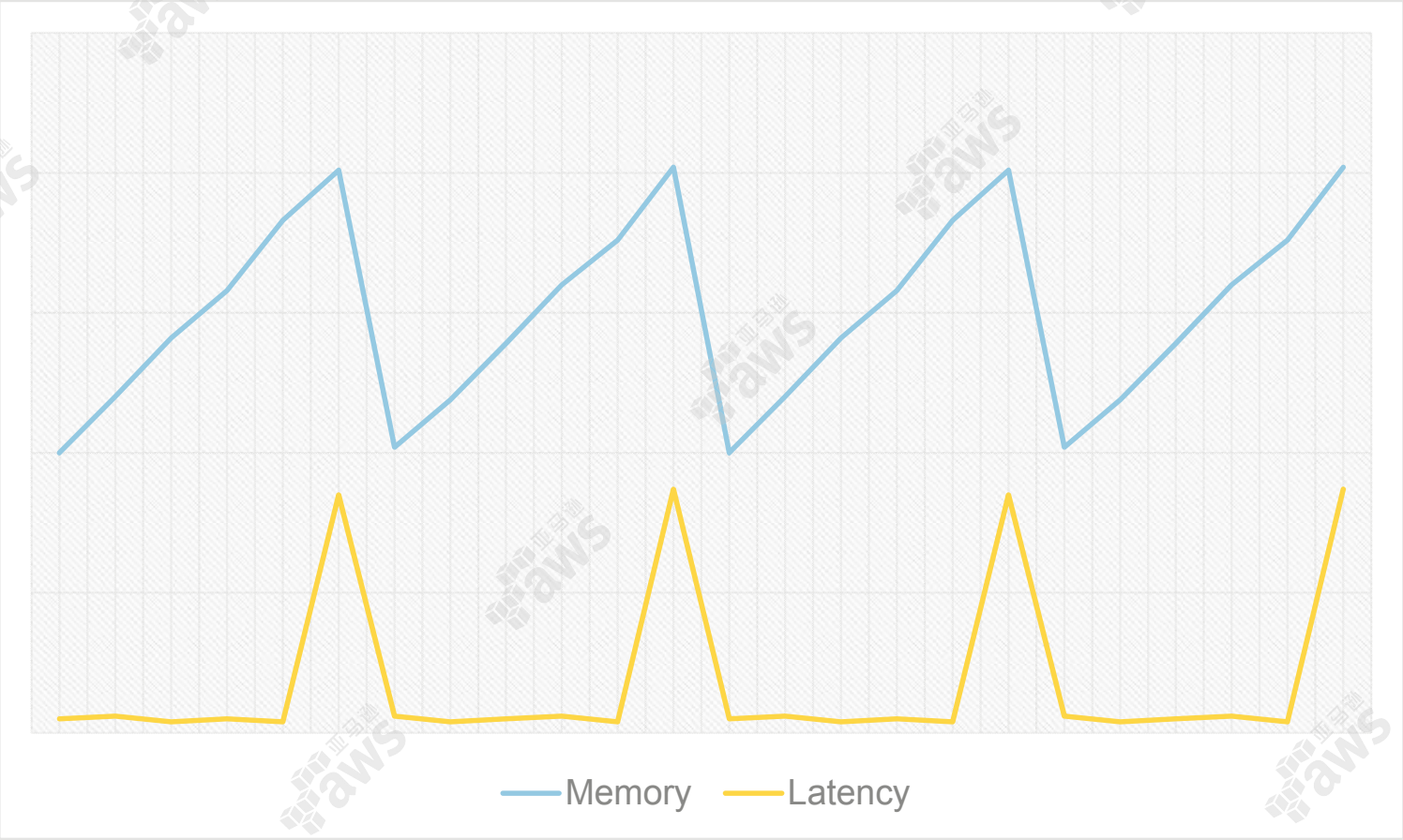
扩展性

扩展性

Latency = Load / Throughput

时延 = 负载 / 吞吐能力

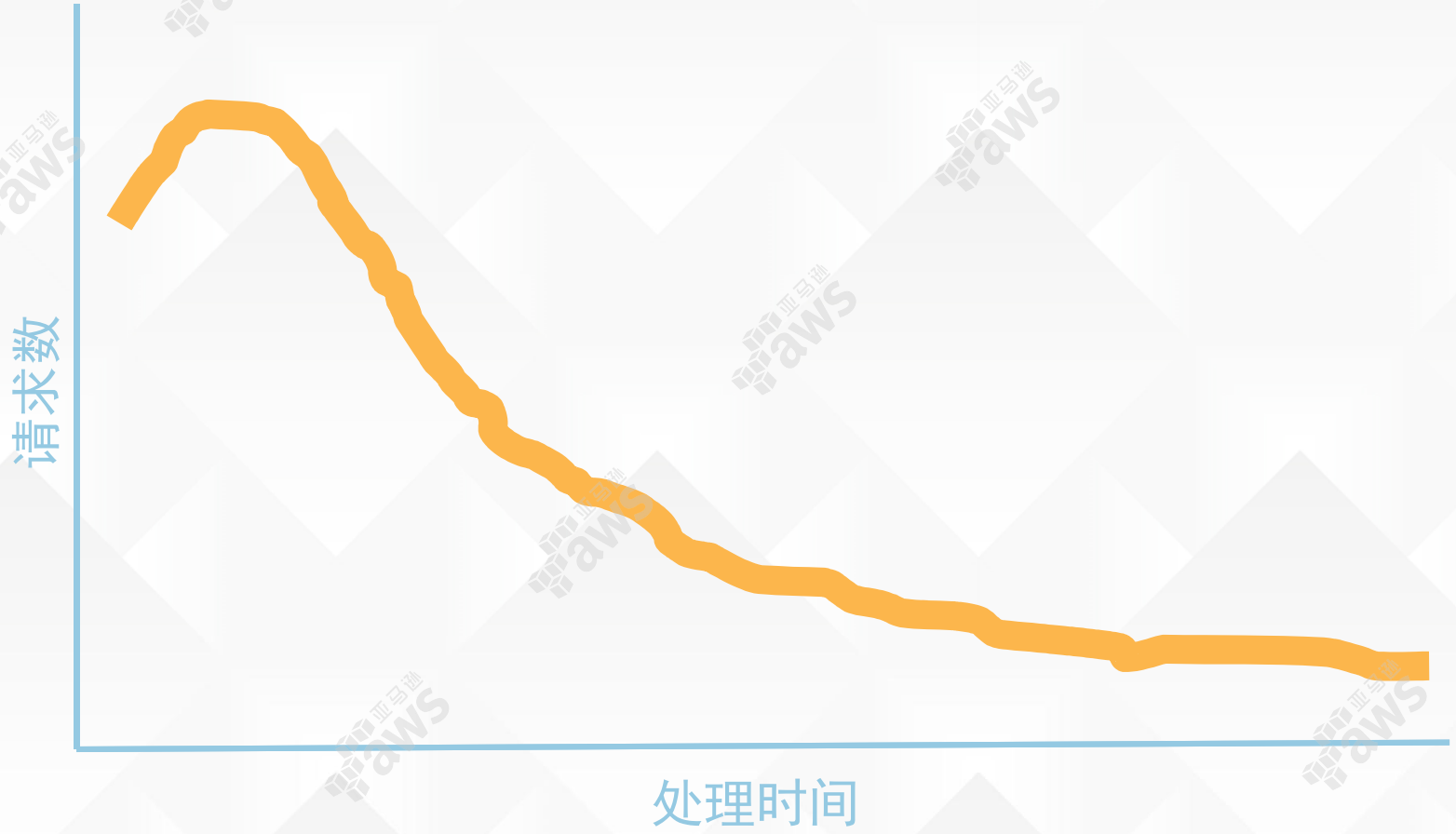
扩展性



扩展性

命中及未命中缓存

扩展性



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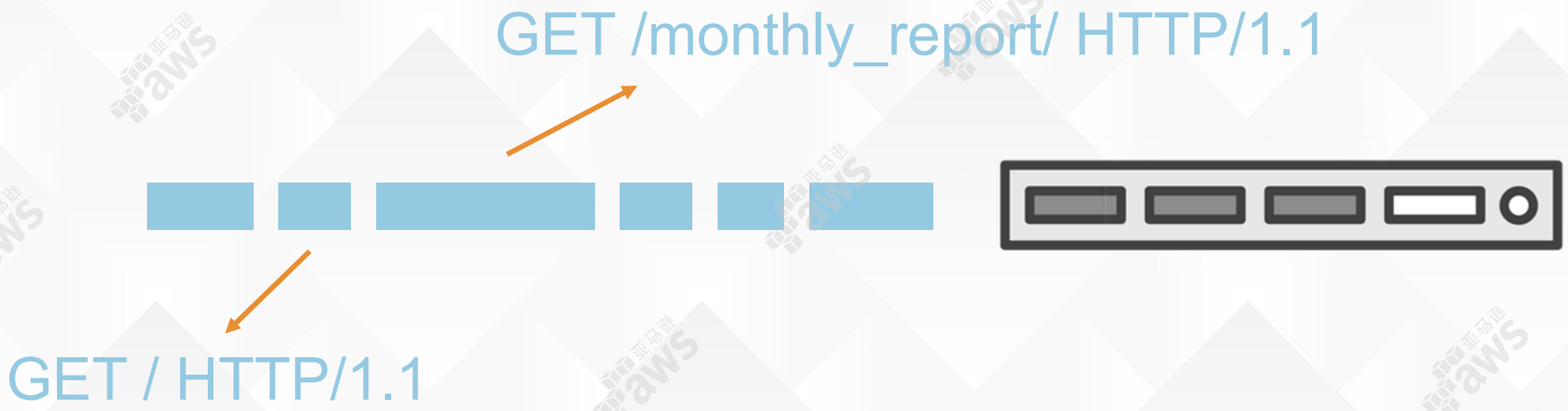
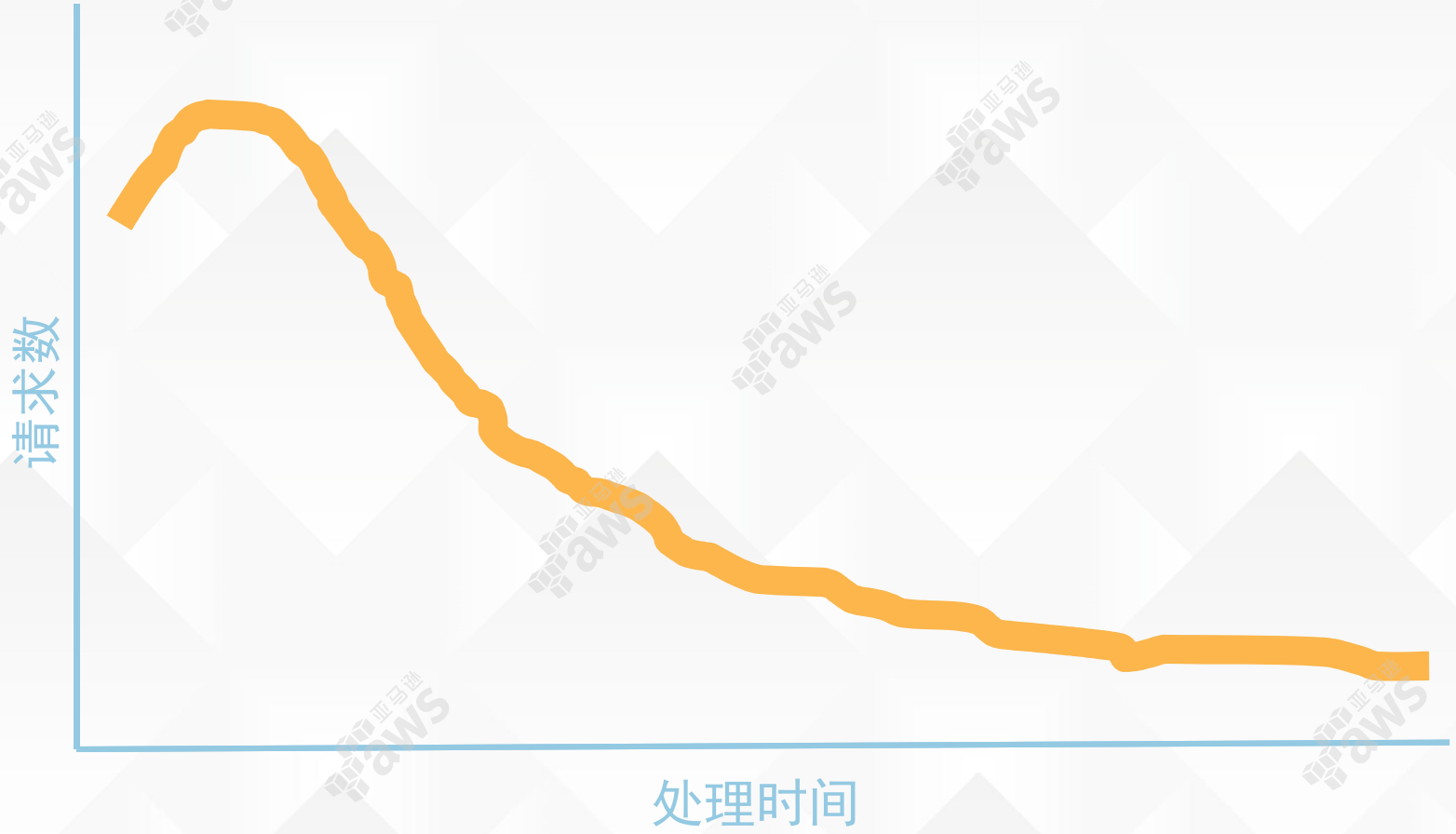
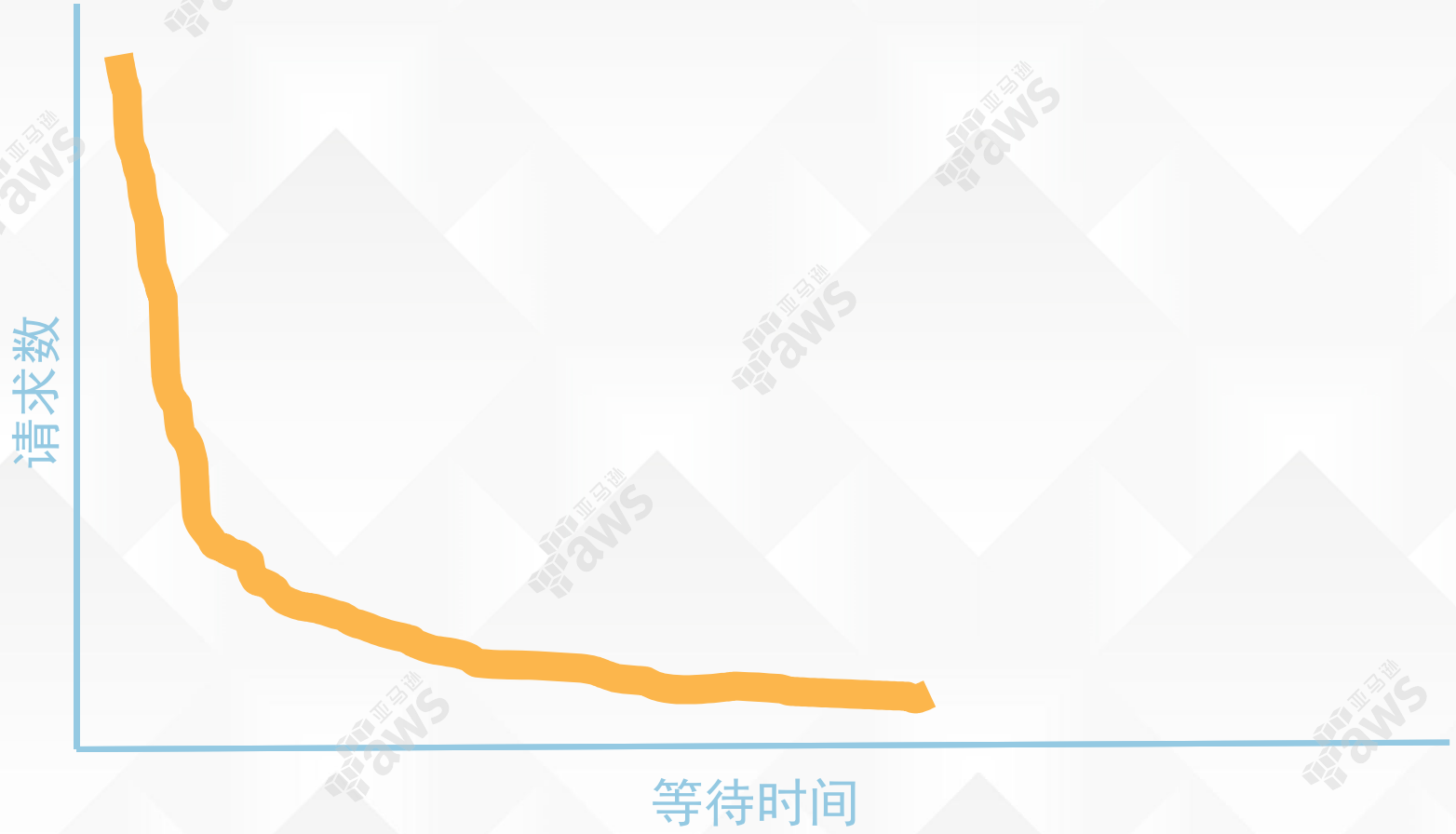


扩展性



扩展性



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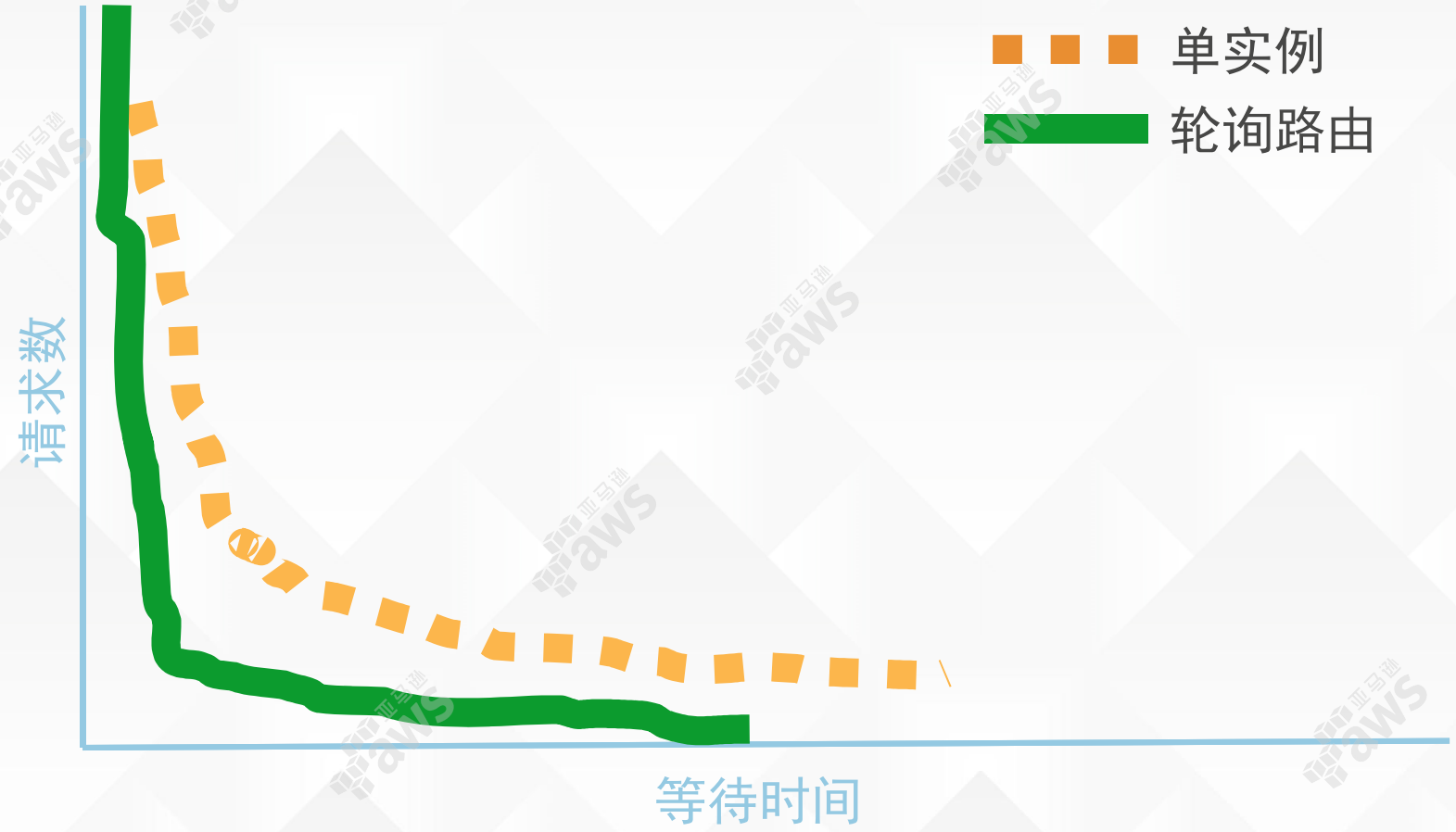
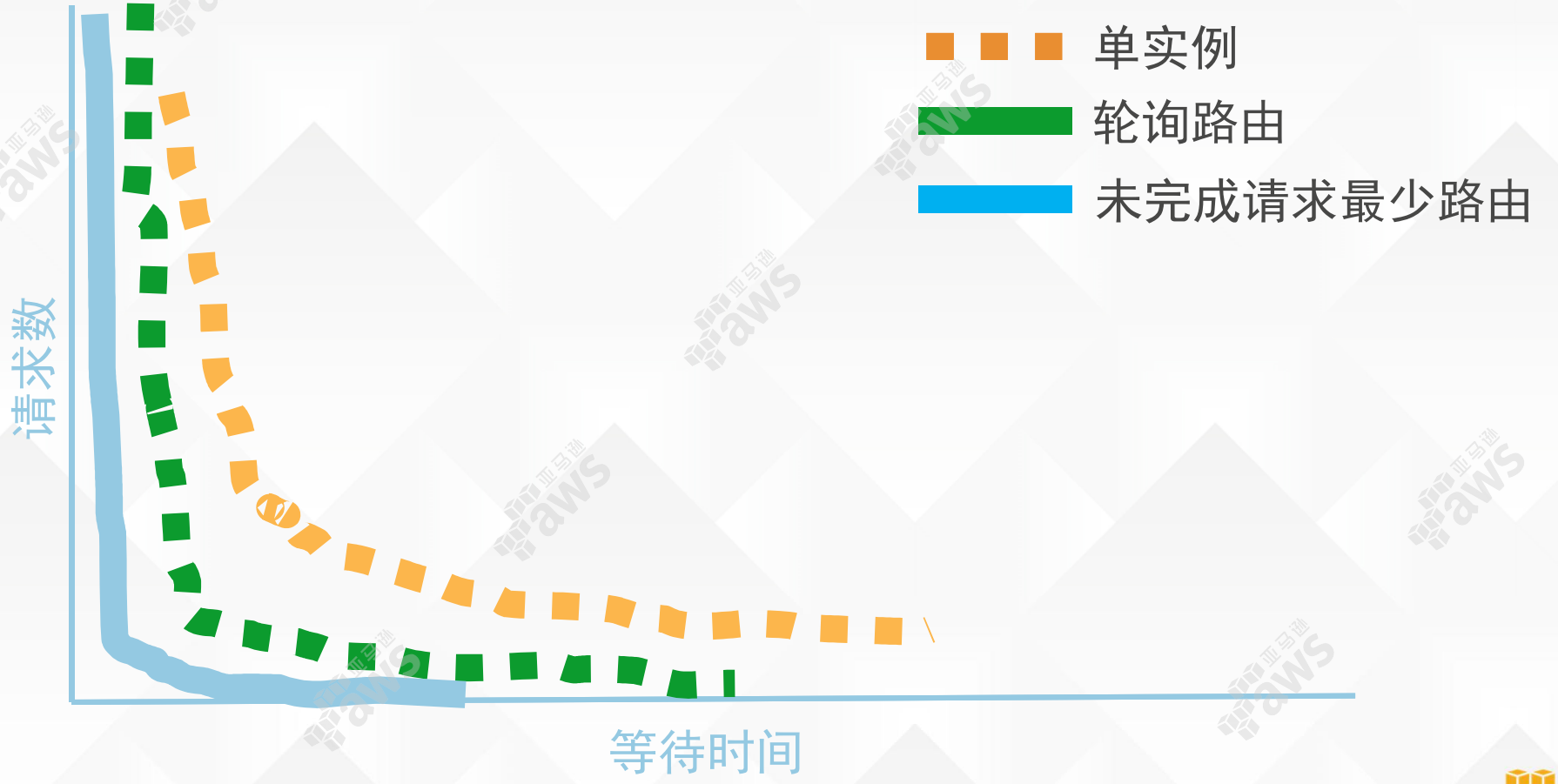


扩展性

扩展性



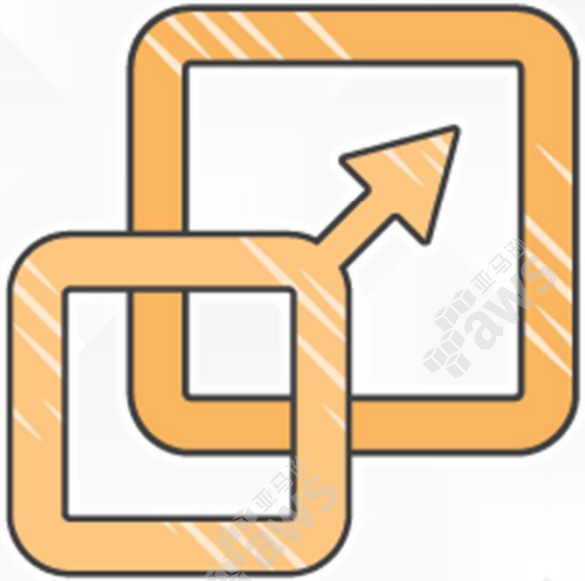
ELB的自动扩展策略分为主动模式，基于添加的后端实例容量，和被动模式，基于收到的负载

CloudWatch和Auto Scaling

Auto Scaling可以使用全部ELB监控指标

允许您基于ELB角度监控的实时应用情况动态扩展

需要根据所有监控指标合理设置Auto Scaling
收缩策略



CloudWatch监控指标

13个CloudWatch监控指标

洞悉ELB以及应用的健康以及运行状态

利用CloudWatch报警迅速通知异常并进行响应

所有监控指标粒度均为1分钟

运行状况良好的主机数 HealthyHostCount

可用区内以ELB视角观察到的健康实例数量

较为常见的导致实例不健康的原因是健康检查超时

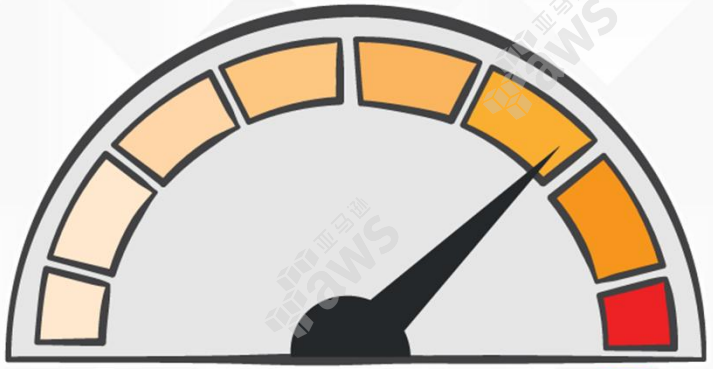
建议根据可用区查询

延迟 Latency

测量请求发送给后端实例至收到响应的时间开销

在故障分析时，分析最小值、平均值以及最大值，从而判断总体请求延迟情况

通过ELB访问日志，详细分析单个请求



波动队列SurgeQueue 和 溢出spillovers

波动队列长度表示无法及时被发送给后端实例的请求数量

最大长度为1,024每个ELB节点, 超出队列长度ELB会返回503错误

通常的原因是ELB无法与后端实例创建连接

表示应用处理能力需要扩展

访问日志 Access logs

- timestamp
- elb name
- client:port
- backend:port
- request_processing_time
- backend_processing_time
- response_processing_time
- elb_status_code
- backend_state_code
- received_bytes
- sent_bytes
- “request”
- “User-Agent”
- Ciphersuite
- SSL/TLS protocol version

2015-05-13T23:39:43.945958Z my-loadbalancer 192.168.131.39:2817 10.0.0.1:80 0.000086 0.001048 0.001337 200 200 0 57 "GET https://www.example.com:443/ HTTP/1.1” "curl/7.38.0" DHE-RSA-AES128-SHA TLSv1.2

全球扩展

结合Route 53进行多个Region的基于延迟或者地理位置的路由

可以有效降低应用延迟

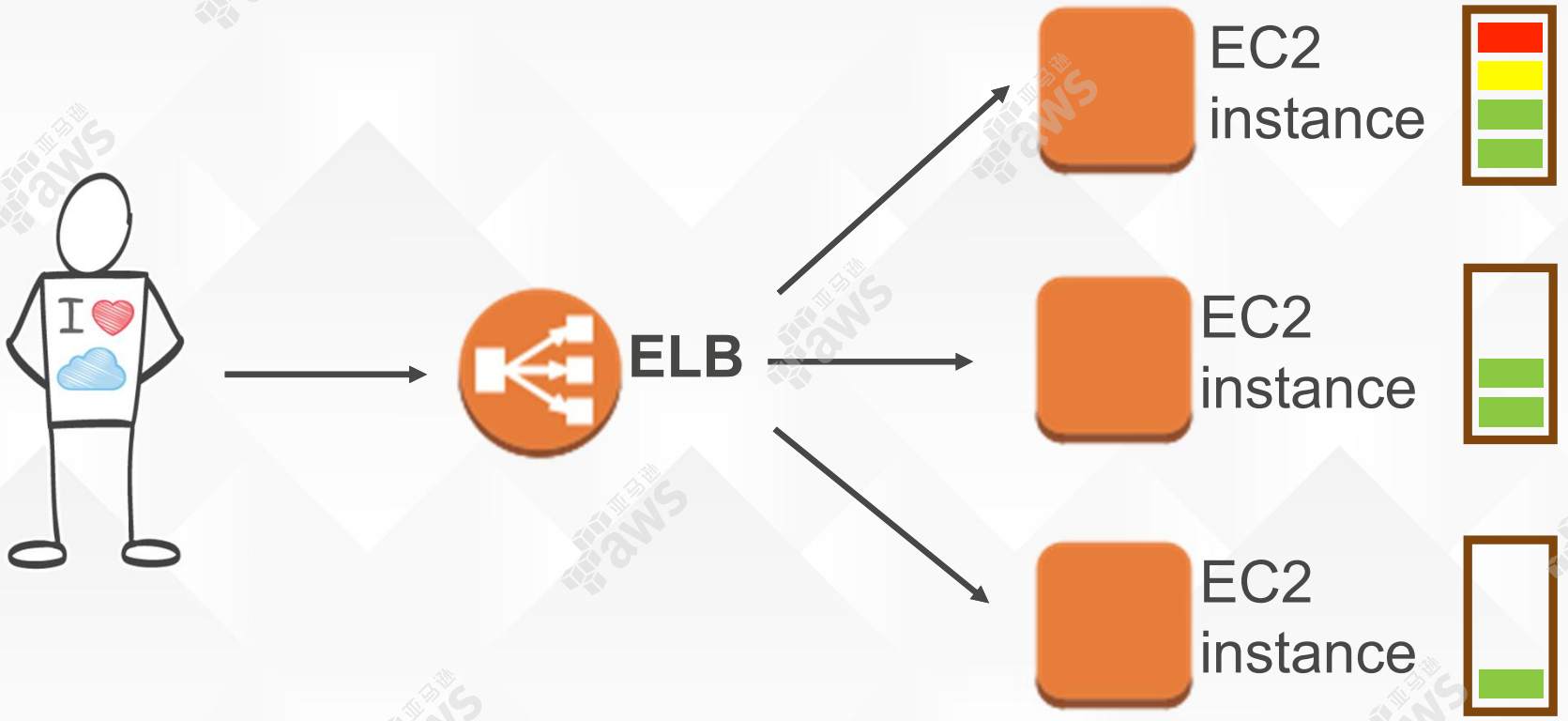
在线广告服务

交易平台

可用性

在进行系统维护时，在线替换后端实例，实现无缝切换

健康检查



健康检查

支持TCP及HTTP健康检查

自定义检查频率及失败阈值

HTTP检查必须返回2XX

如何进行更深层的健康检查

超过空闲超时时长 (Idle Timeout)后，不再被使用的连接会被ELB关闭

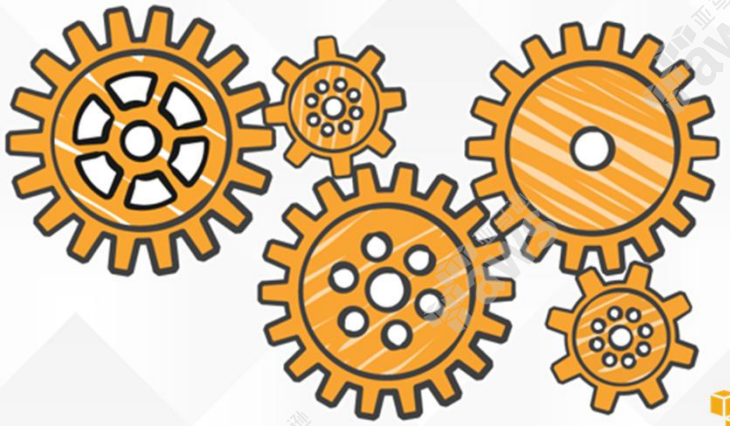
空闲超时 Idle timeouts

空闲连接会被保持的时长

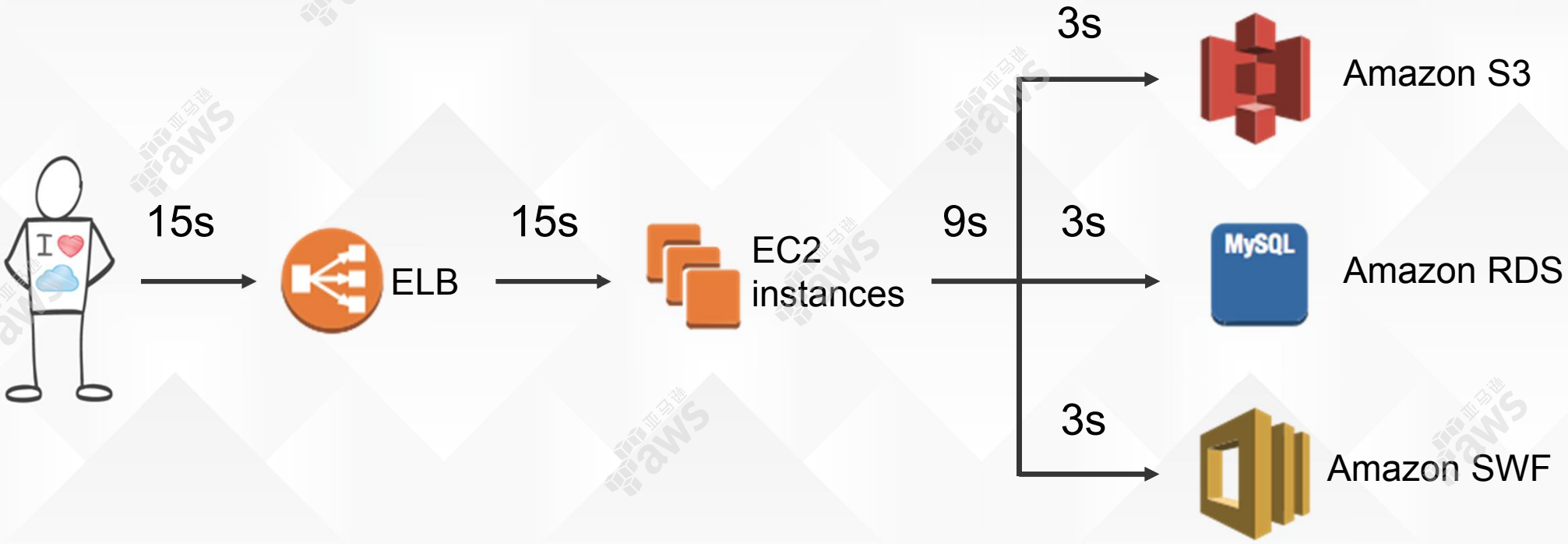
同时作用于客户端至ELB及ELB至后端实例的连接

默认为60秒，允许范围为最低1秒，最高3600秒

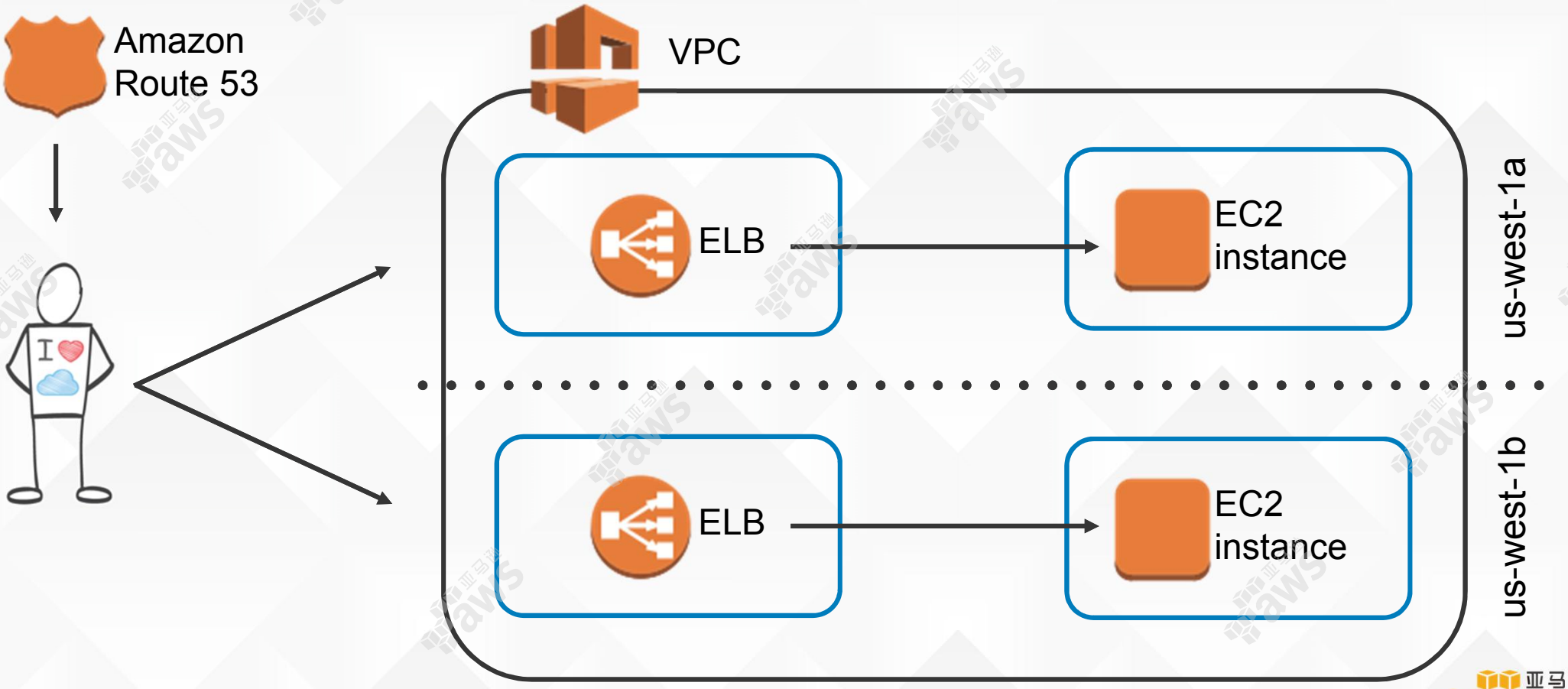
ELB超时时间<=应用超时时间



连接超时 Idle timeouts



多可用区部署


Amazon
Route 53
VPC
ELB
EC2
instance
ELB
EC2
instance
us-west-1a
us-west-1b

Route 53健康检查保障可用性

当某个可用区故障时，所有ELB自动扩展

Route 53发现可用区故障后，自动切走流量

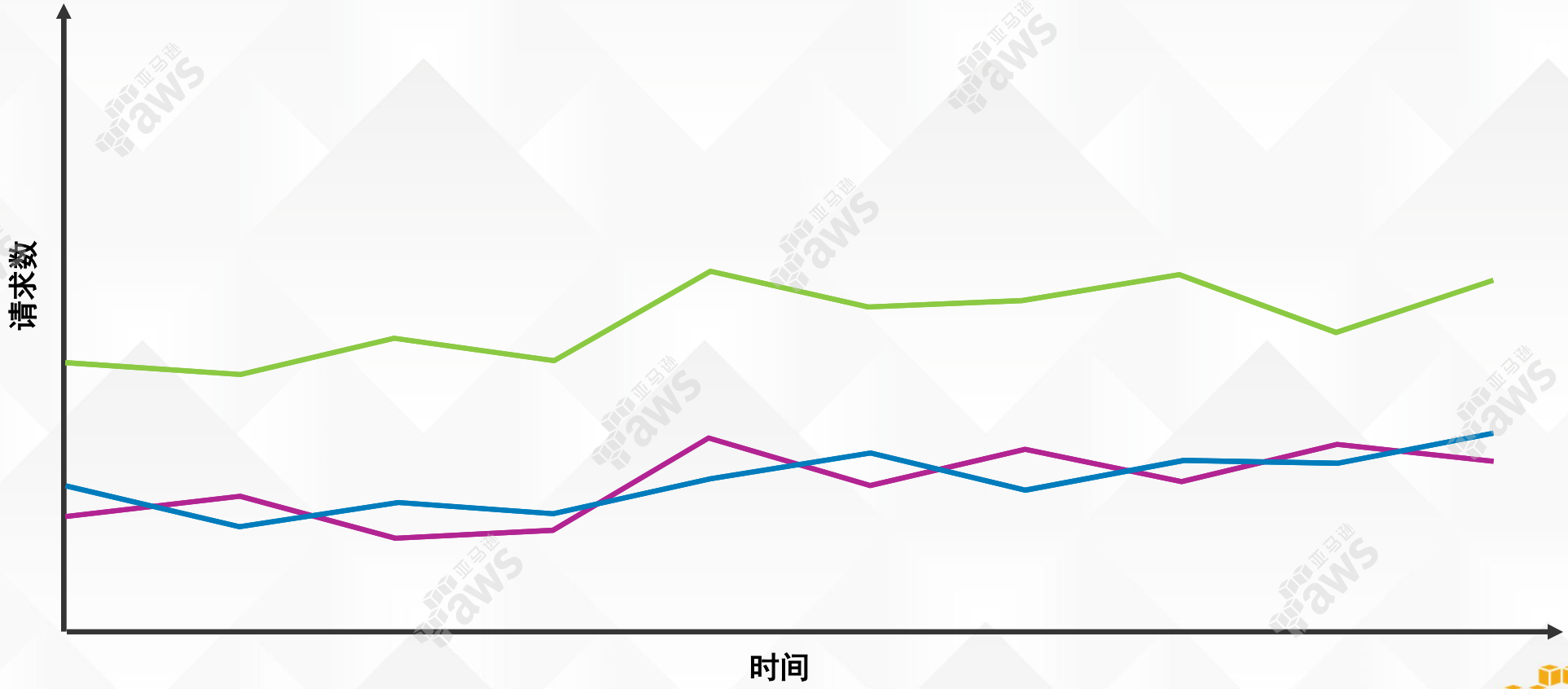
150秒内完成

不需要额外的控制层

为ELB添加至少2个位于不同可用区的子网

如何解决添加多可用区后可能会遇到的问题

负载不均衡



DNS 缓存以及分布

通常情况下DNS TTL会被遵守

有可能出现DNS数量不足，导致ELB节点收到的请求分布不均匀

移动网络通常有更多的DNS服务器

企业网络通常DNS服务器数量较少

DNS优化

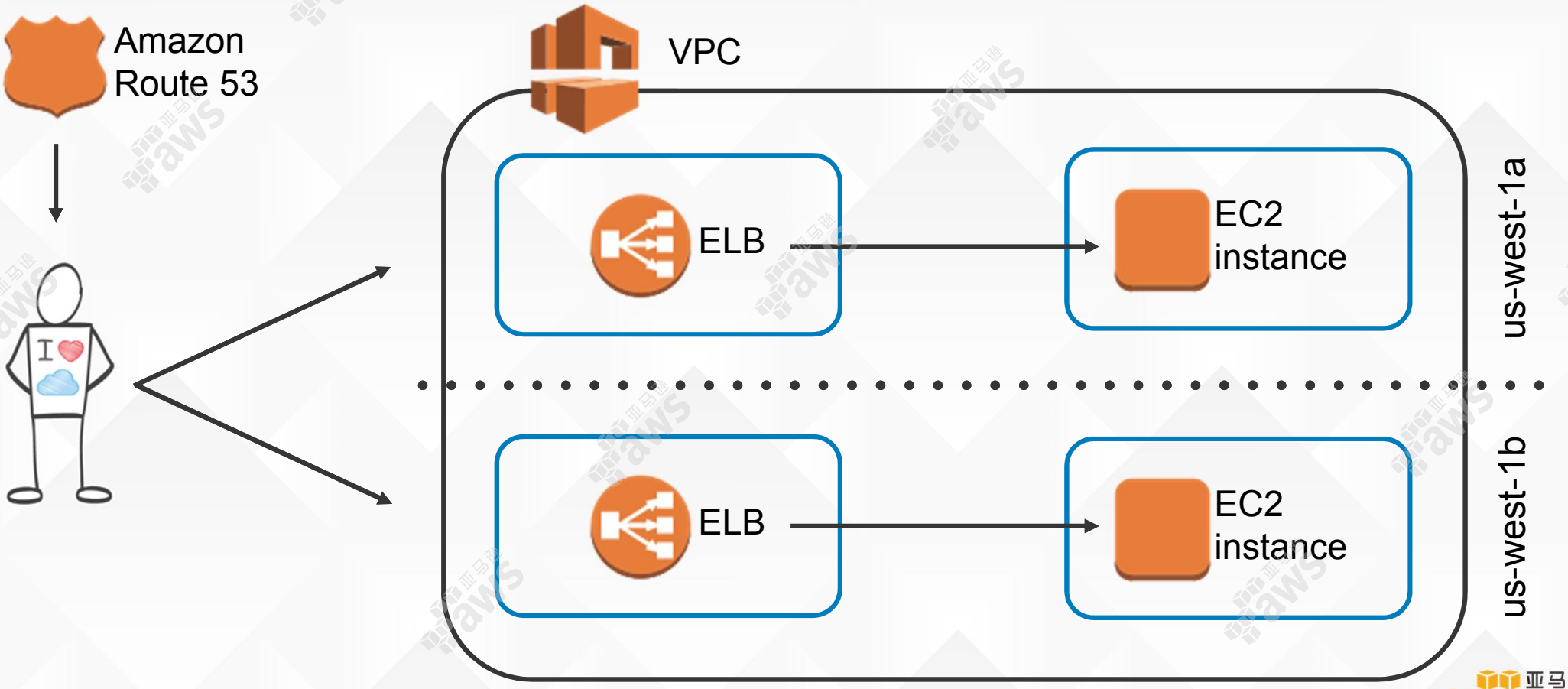
DNS缓存经常会造成客户端在一定时间内使用某一个特定IP地址

在Route 53上使用通配符作为CNAME或者ALIAS

```
// Create a wildcard CNAME or ALIAS in Route 53.
*.example.com ALIAS … elb-12345.us-east-1.elb.amazon.com
*.example.com CNAME elb-12345.us-east-1.elb.amazon.com

// prepend random content for each lookup made by the application.
PROMPT> dig +short 25a8ade5-6557-4a54-a60e-8f51f3b195d1.example.com
192.0.2.1
192.0.2.2
```

多可用区部署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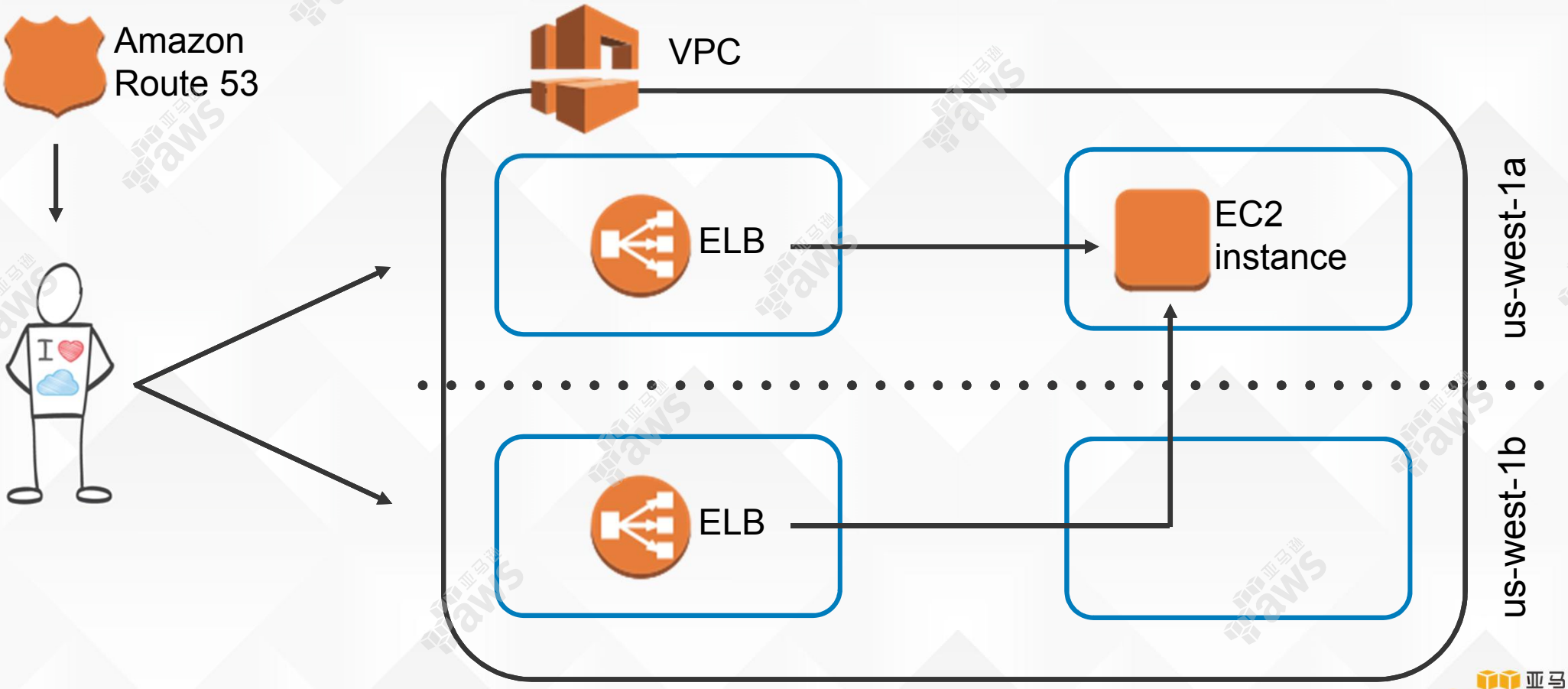
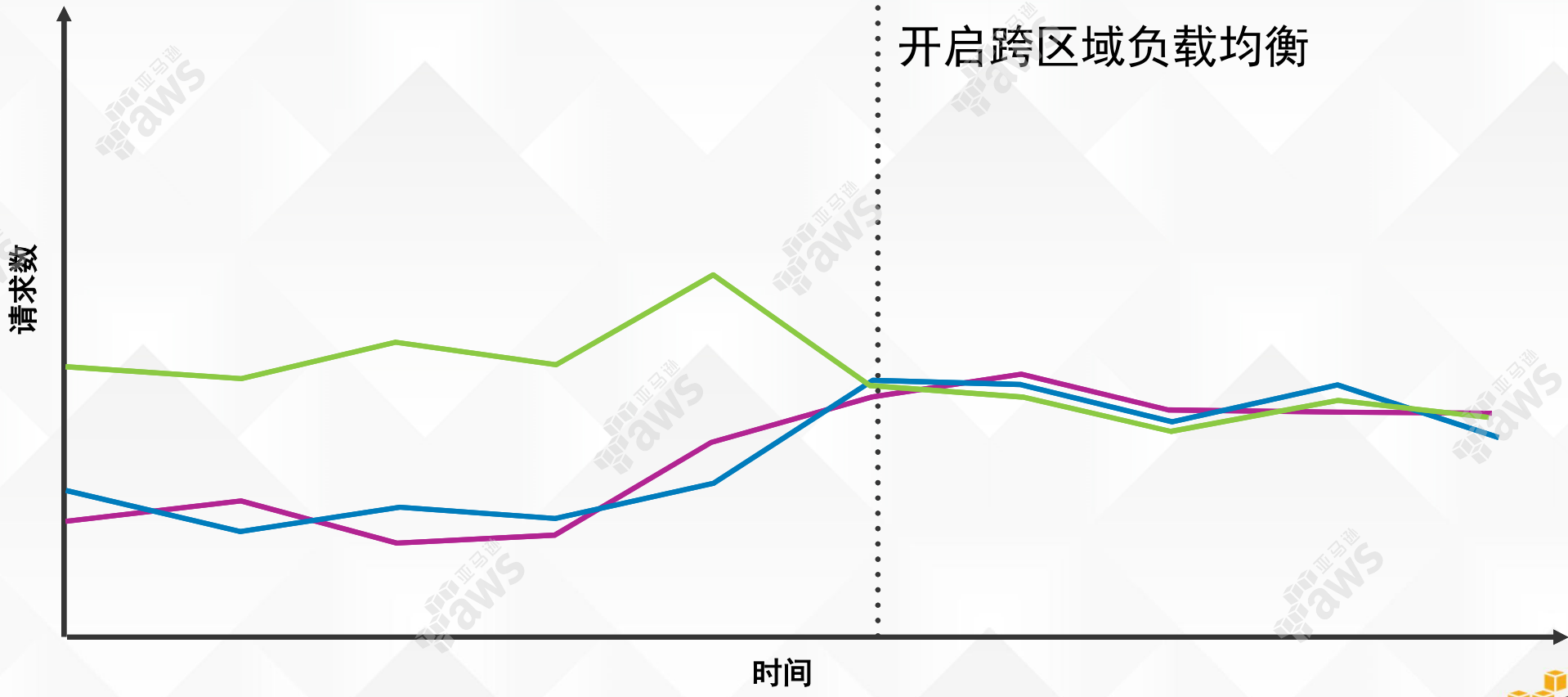


负载变化



跨区域负载均衡 Cross-zone load balancing

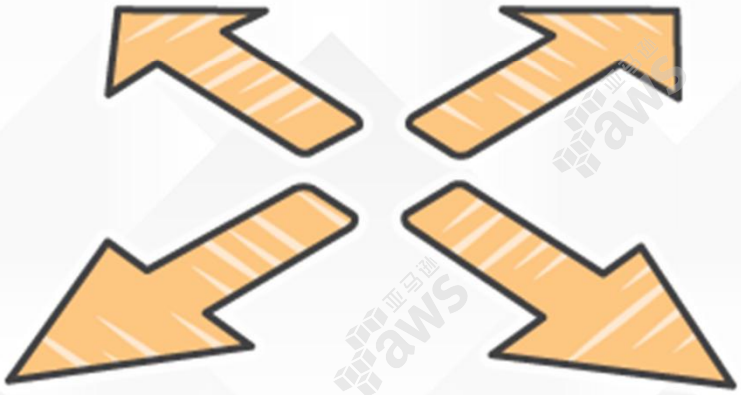
缓解DNS缓存造成的不均衡

消除后端实例负载不均衡

请求均匀地分发至多个可用区

开启前需要确认连接数限制

跨区域分发请求没有额外的带宽费用

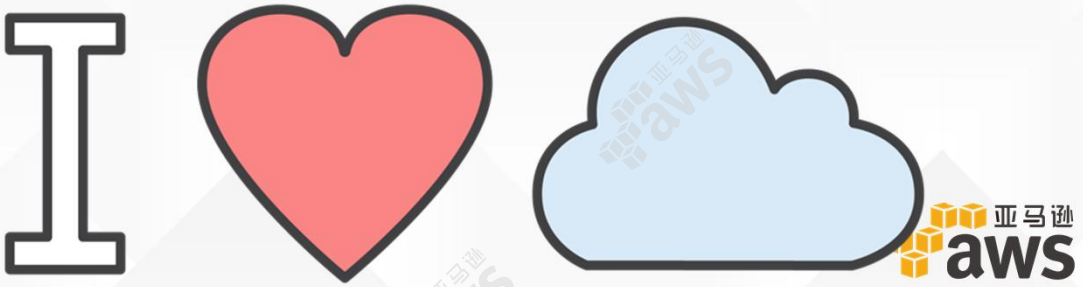


ELB 和 DevOps

可以被AWS CloudFormation, AWS Opsworks,
AWS Elastic Beanstalk, Amazon EC2 Container Service,
Amazon API Gateway, Asgard集成

可以作为蓝/绿部署网关

通过代码自动化管理ELB



Thank You