

# Global Large Scale Cloud Design Cloud Native Enterprise Infrastructure

Fast Retailing Co., Ltd.



**FAST RETAILING**

# Keito Fukuda

Lead Technical Architect  
Fast Retailing Co., Ltd.

## Responsibilities:

- Digital Services
- Mobile Services
- O2O
- Backend Platforms
- Infrastructure/Architecture

# Kenichiro Ara

Infrastructure & Communication Lead  
Fast Retailing Co., Ltd.

## Responsibilities:

- Enterprise infrastructure/architecture
- Global WAN
- Office/Store infrastructure
- Corporate infrastructure
- ICT technologies



Theory



COMPTOIR DES  
COTONNIERS

PRINCESSE tam•tam

HELMUT LANG

J BRAND

**JPY1,380,000,000,000**

Revenue

**89,580**

Employees\*

**2,753**

Stores

**20+**

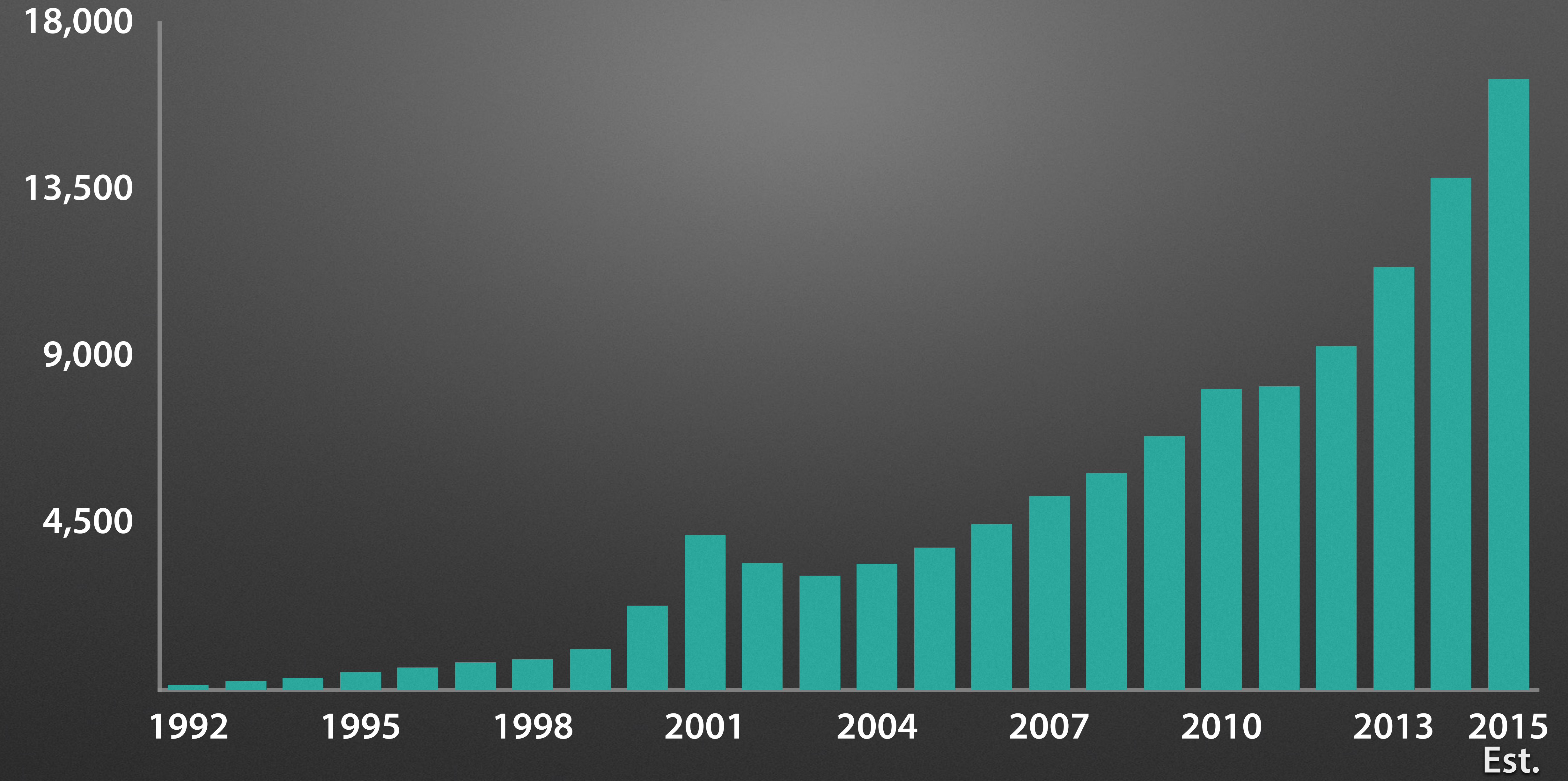
Countries

As of Aug. 2014

\*Including Full-Time Employees, Contract Workers, Part-Timers

# Group Revenue

(JPY 100M)



# Agenda

1. *AWS at FR*
2. *Cloud Design Strategy*
3. *Global Network Design*
4. *Enterprise Cloud Strategy*

# Agenda

**1. AWS at FR**

2. Cloud Design Strategy

3. Global Network Design

4. Enterprise Cloud Strategy



UNIQLO



Recipe



Wakeup



Clock



Calendar



Looks



UTme



Bicqlo



Kids Camera



UNIQLO

お気に入り 2   カート   商品検索   メニュー

ドライ機能が進化し、より汗の乾きが速くなった「ドライEX」機能付きポロシャツ。どんなに汗をかくシーンでも、すぐにサラサラの肌触... [続きを読む](#)

MEN ドライEXポロシャツ (シャドー・半袖)

¥1,990 +消費税

カラー: 69 NAVY   ★★★★★

商品番号: 147903



カラー選択

タップして拡大

EC Site

UNIQLO

メニュー   商品検索

予告!感謝祭 5/29(金)30(土) 31(日)6/1(月) いよいよ今年も!

ユニクロのドライEX・エアリズムウェア

抜群の肌ざわりと優れた吸水速乾性を誇る、DRY-EX素材を使用。

女性の大敵・紫外線を防止する、メッシュタイプのUVカットパーカ。

テニスプレイヤー / バク・ジョコビッチ選手   モデル 松岡 モナ

MEN ドライEXポロシャツ ¥1,990+消費税

WOMEN エアリズムUVカットメッシュパーカ ¥2,290+消費税

ユニクロ オンラインストア

WOMEN   MEN   KIDS   BABY

NEW   NEW   NEW   SCAN

UNIQLO APP

UT MARKET

TADAOMISHIBU

tanabe\_seiichi

81   157

Napoli

STAFF PICK

MARKET   TIMELINE   CREATE   MY PAGE

UTme APP

**20,000,000,000**  
req/month

**100,000**  
req/sec

**45G**  
bps

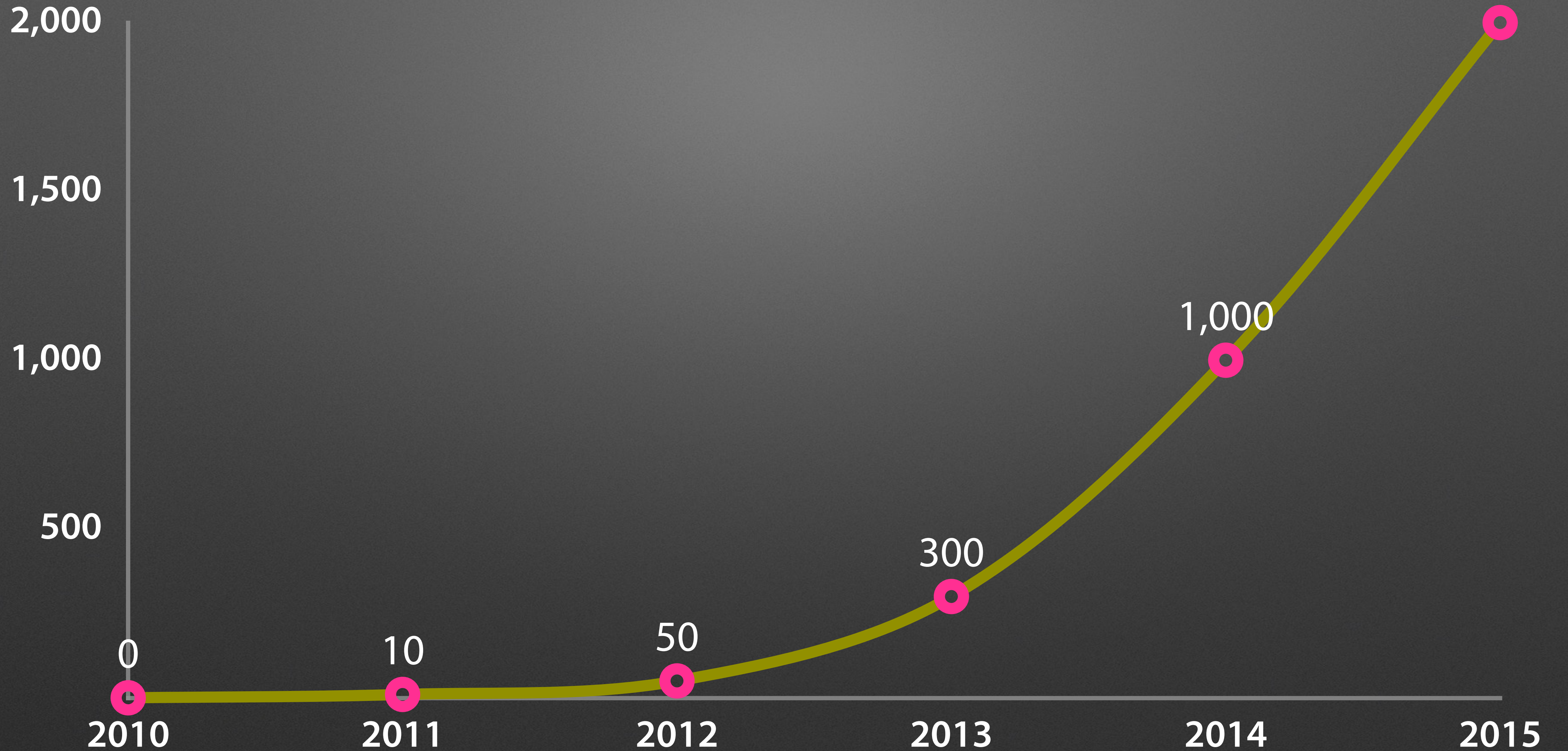
As of May. 2015

**100+**  
systems

**1,300+**  
instances

As of May. 2015

# # of instances on AWS



# Agenda

1. *AWS at FR*

**2. Cloud Design Strategy**

3. *Global Network Design*

4. *Enterprise Cloud Strategy*

# Cloud Design Best Practices

**Independency**

**Maintainability**

**Scalability**

**Availability**

**Visibility**

**Recoverability**

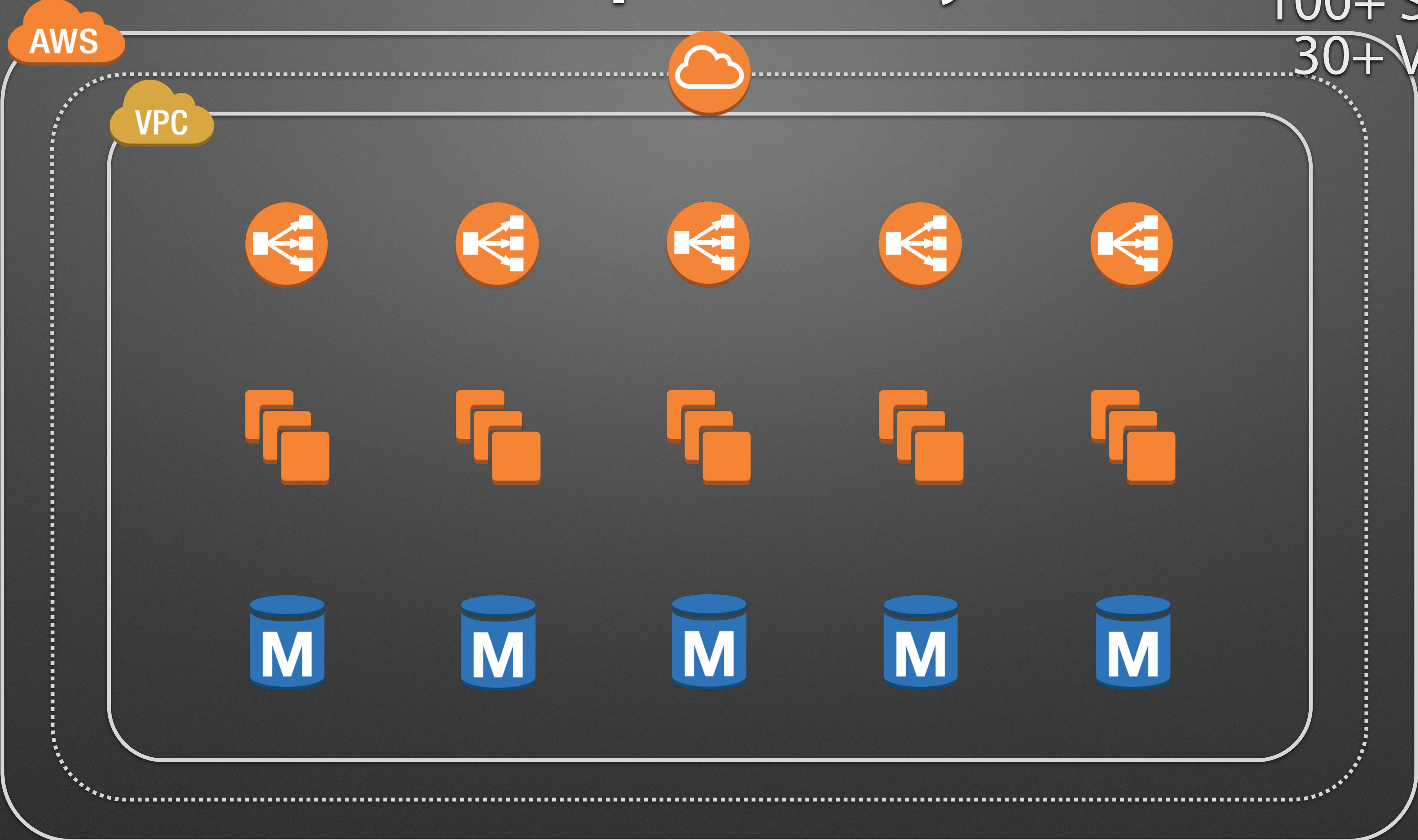
**Replicability**

# Independency

Make System Loosely Decoupled(Micro-Service)

# Independency

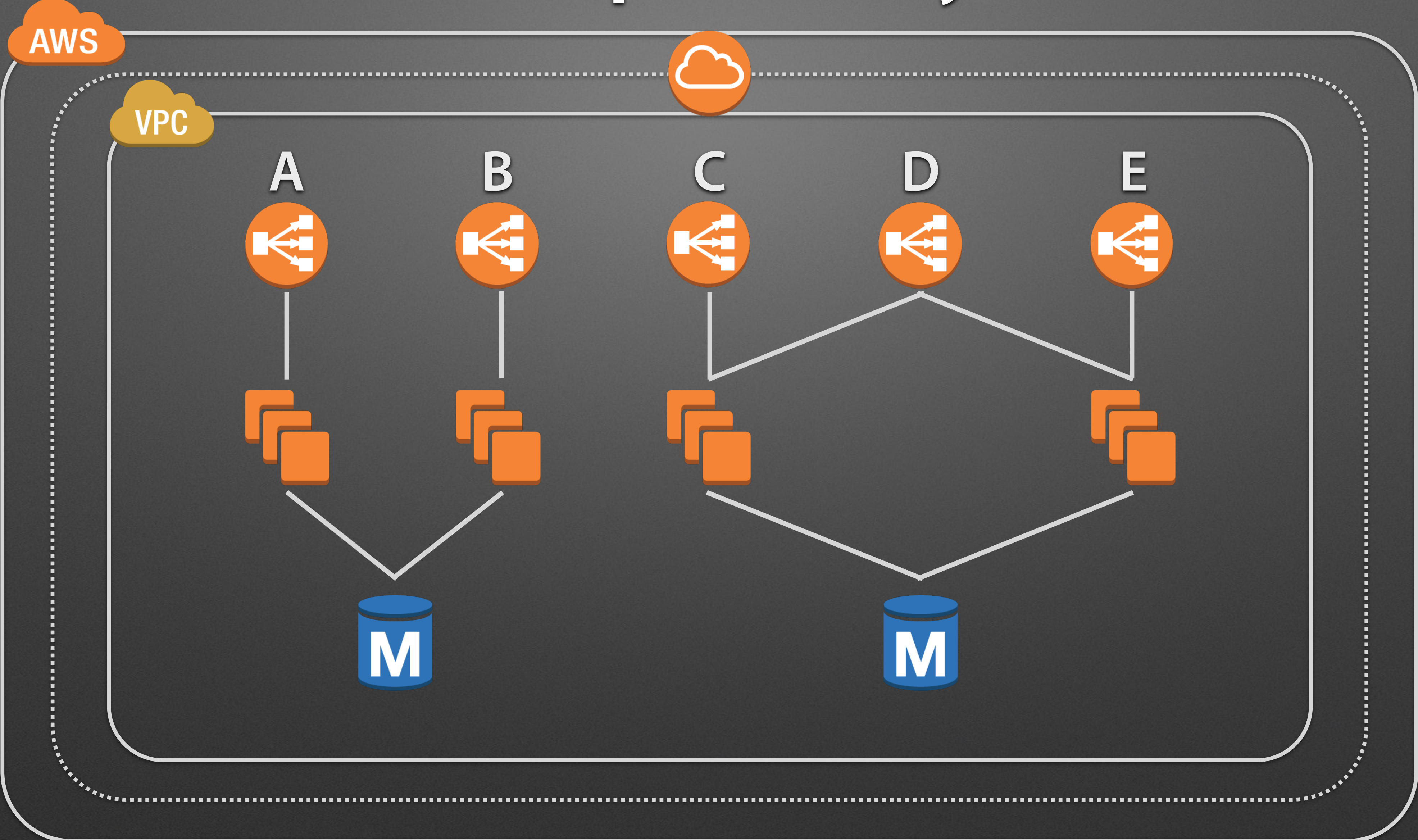
1300+ Instances  
100+ Systems  
30+ Vendors



Many Instances Co-Existing in Cloud

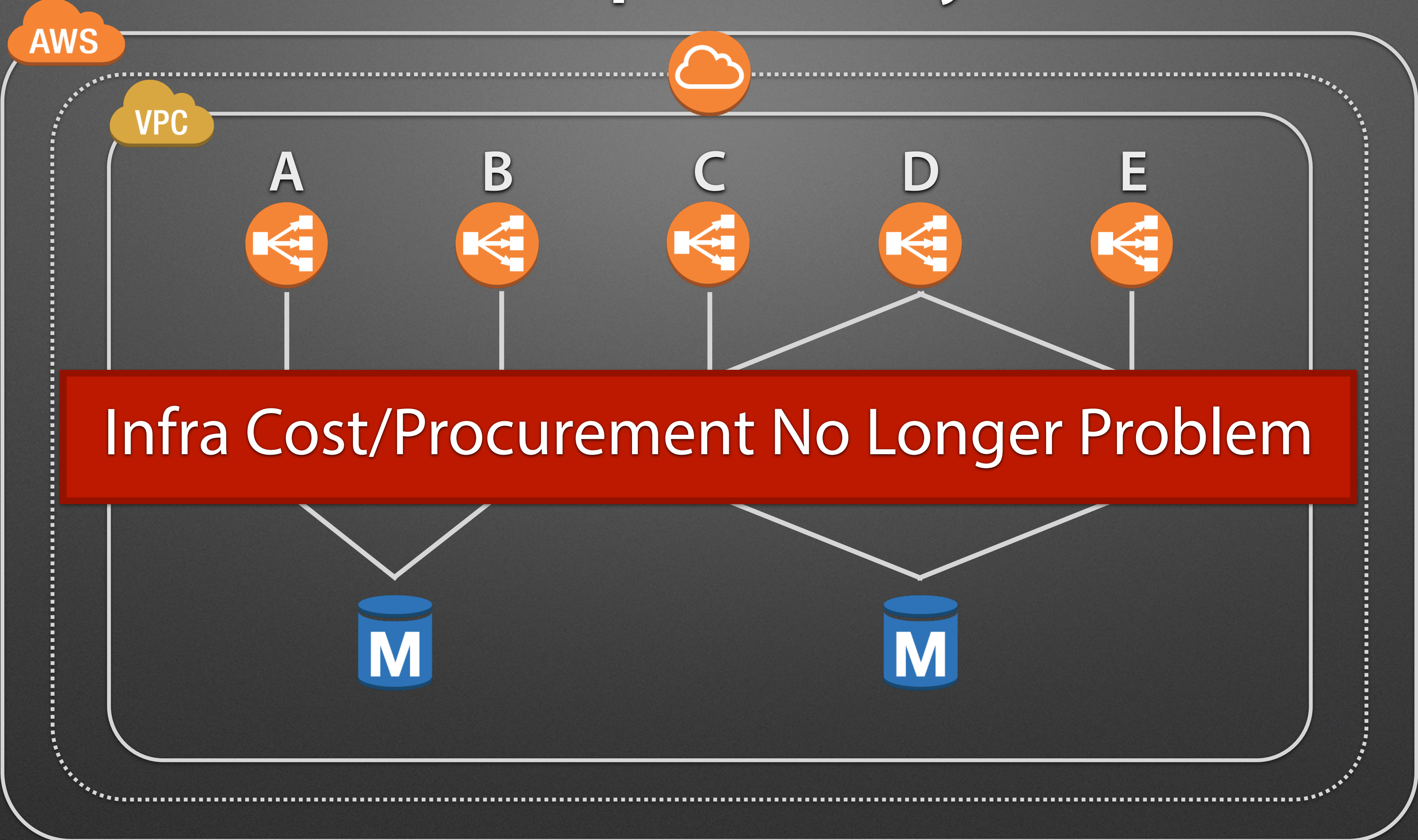


# Independendency



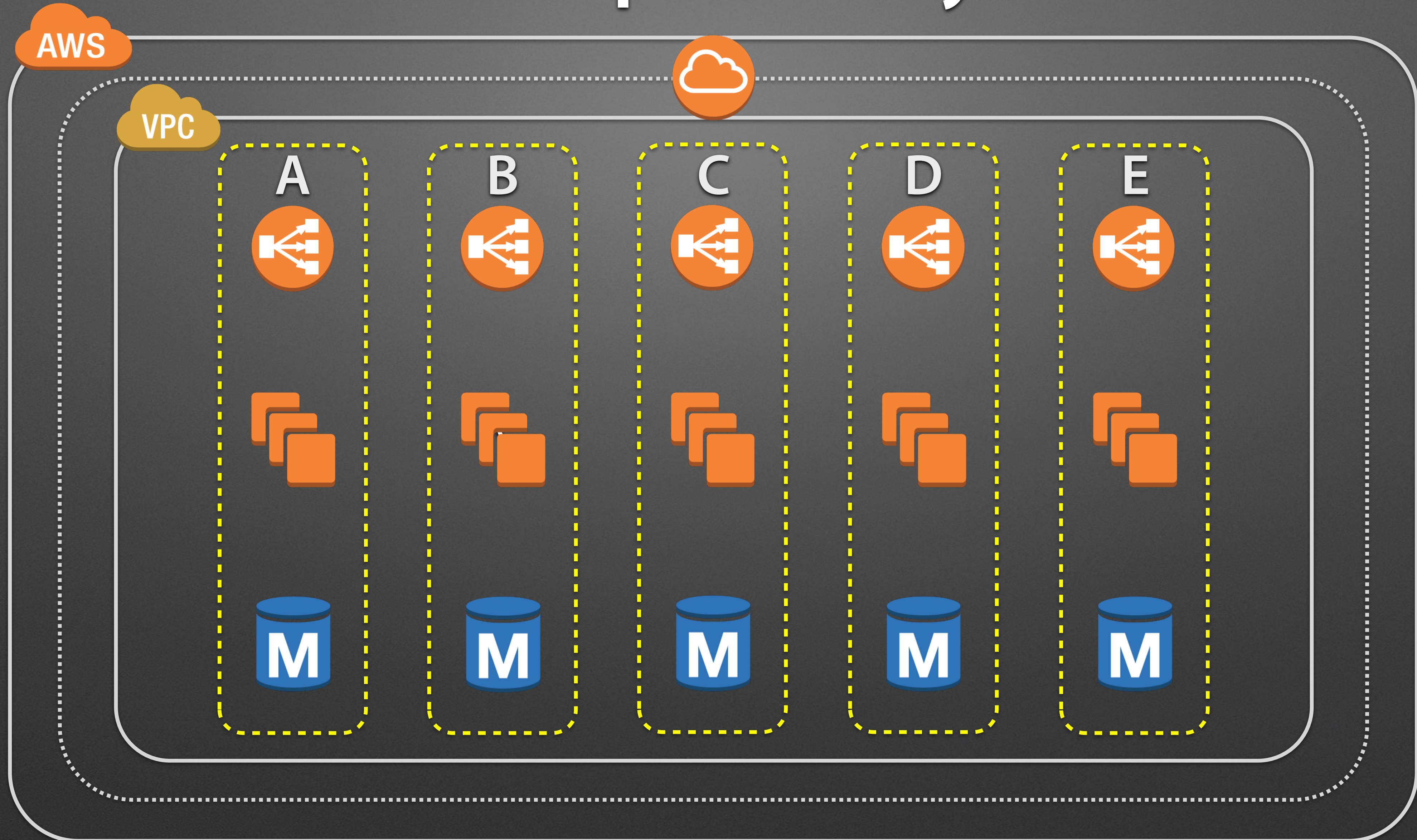
Each System Sharing Recourses and Assets

# Independency



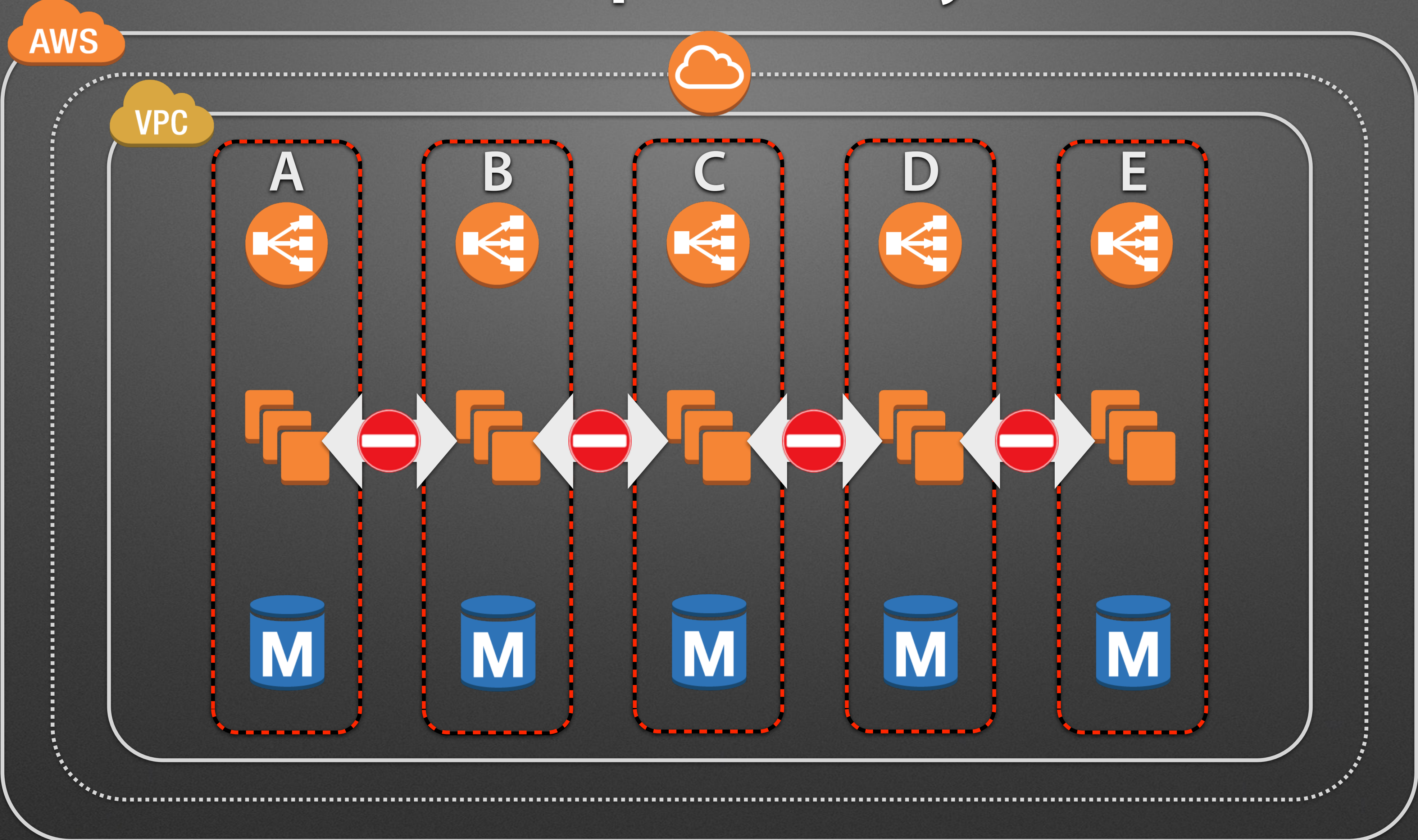
Each System Sharing Recourses and Assets

# Independency



Make Respective System Independent to Minimize Dependency

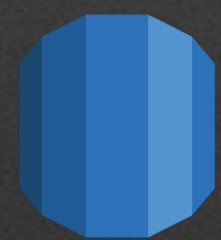
# Independency



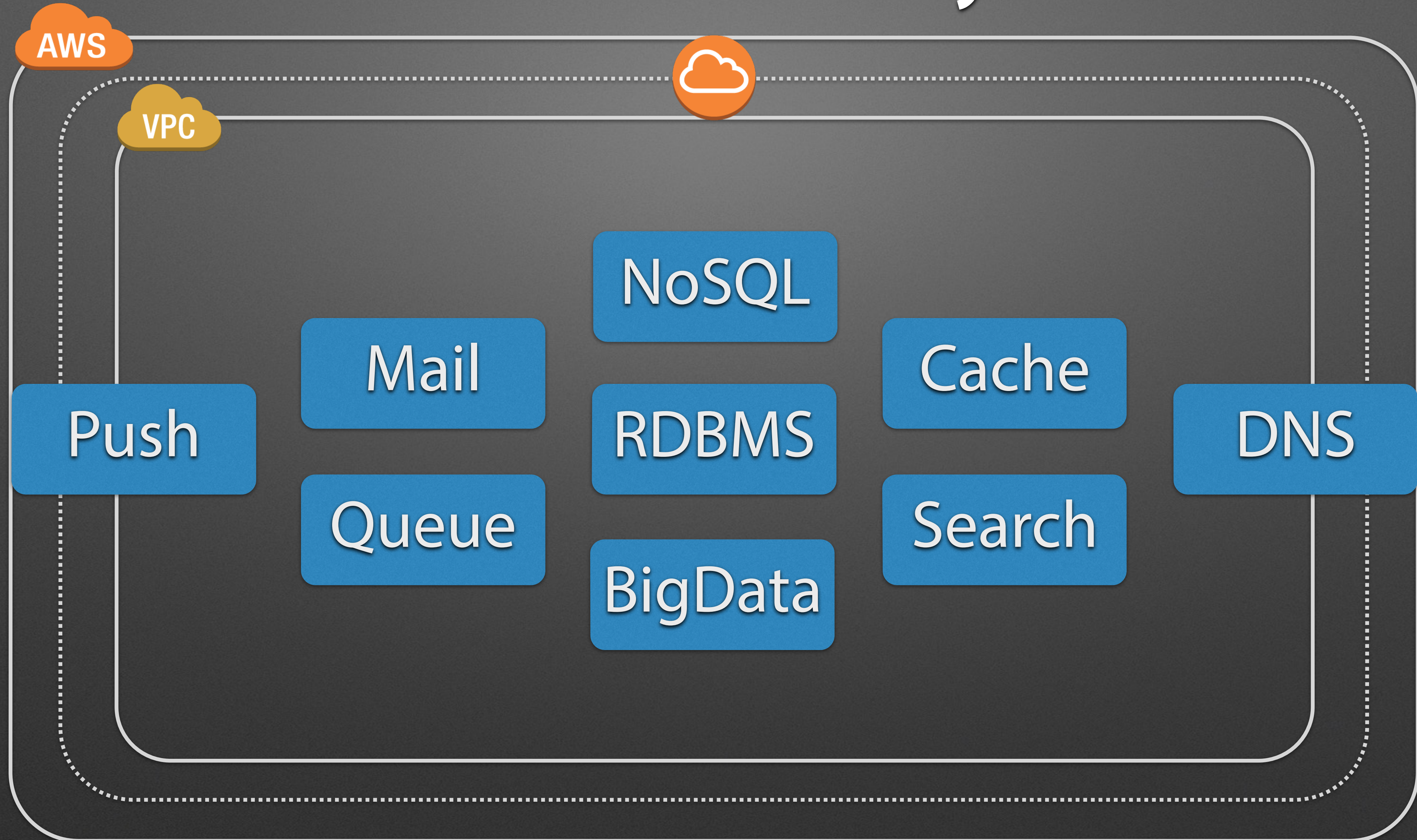
Use Security Group per System to Satisfy Security

# Maintainability

Take Full Advantage of Full-Managed Services(PaaS)

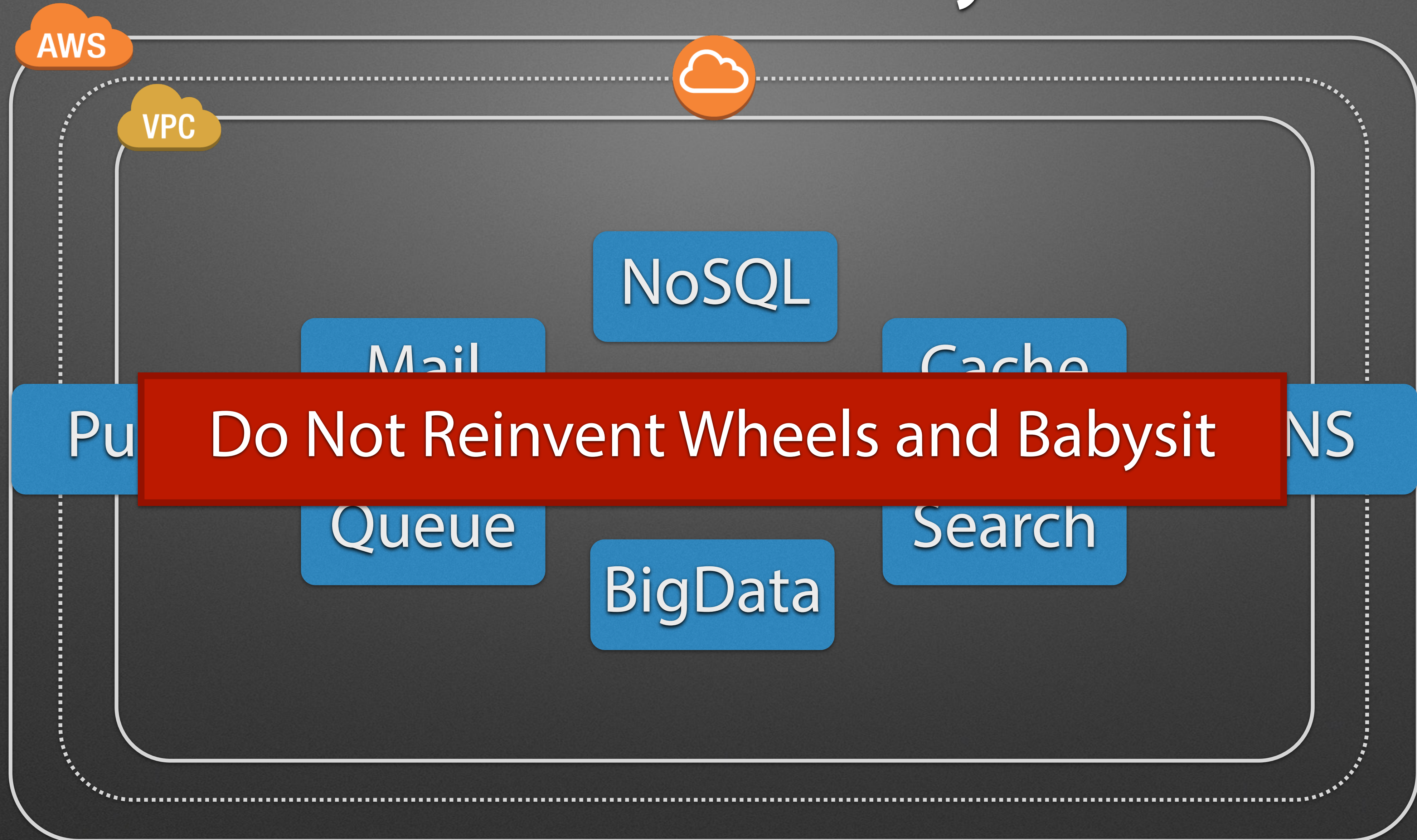


# Maintainability



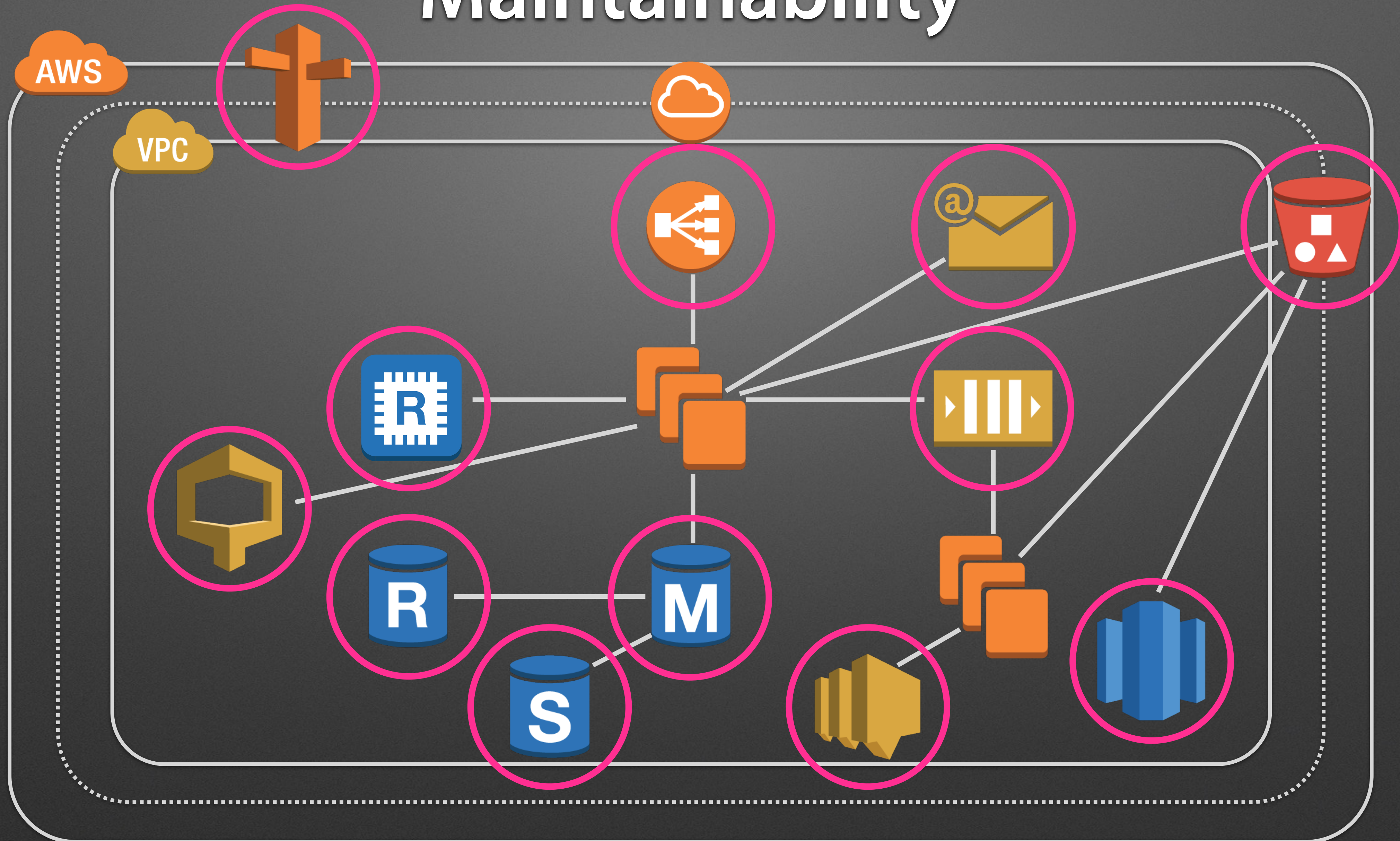
System Getting More Complicated

# Maintainability



System Getting More Complicated

# Maintainability



Minimize Worrying about Infrastructure



# Scalability

ELB + AS Ready Instance with Auto-Scaling



ELB

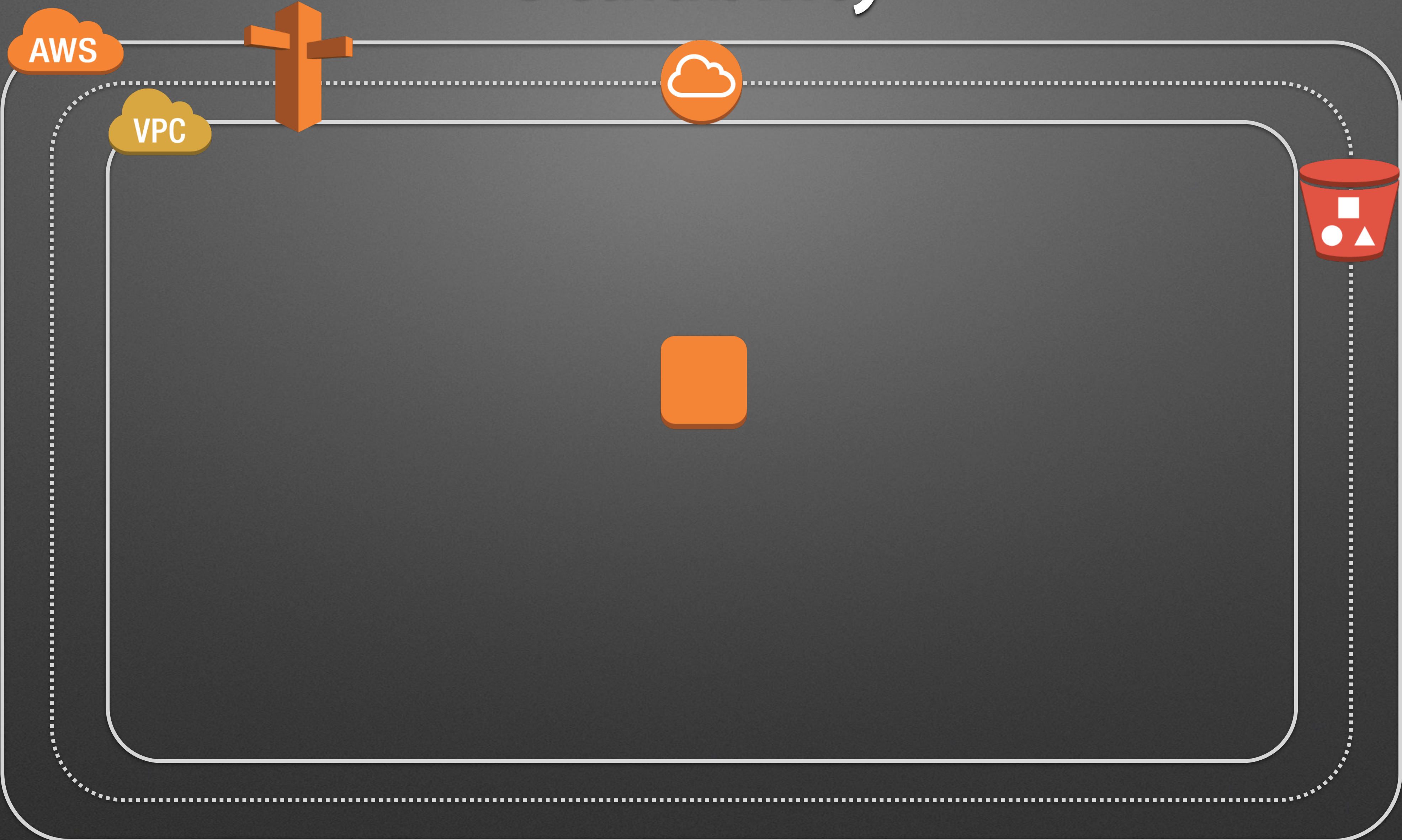


AS Ready EC2



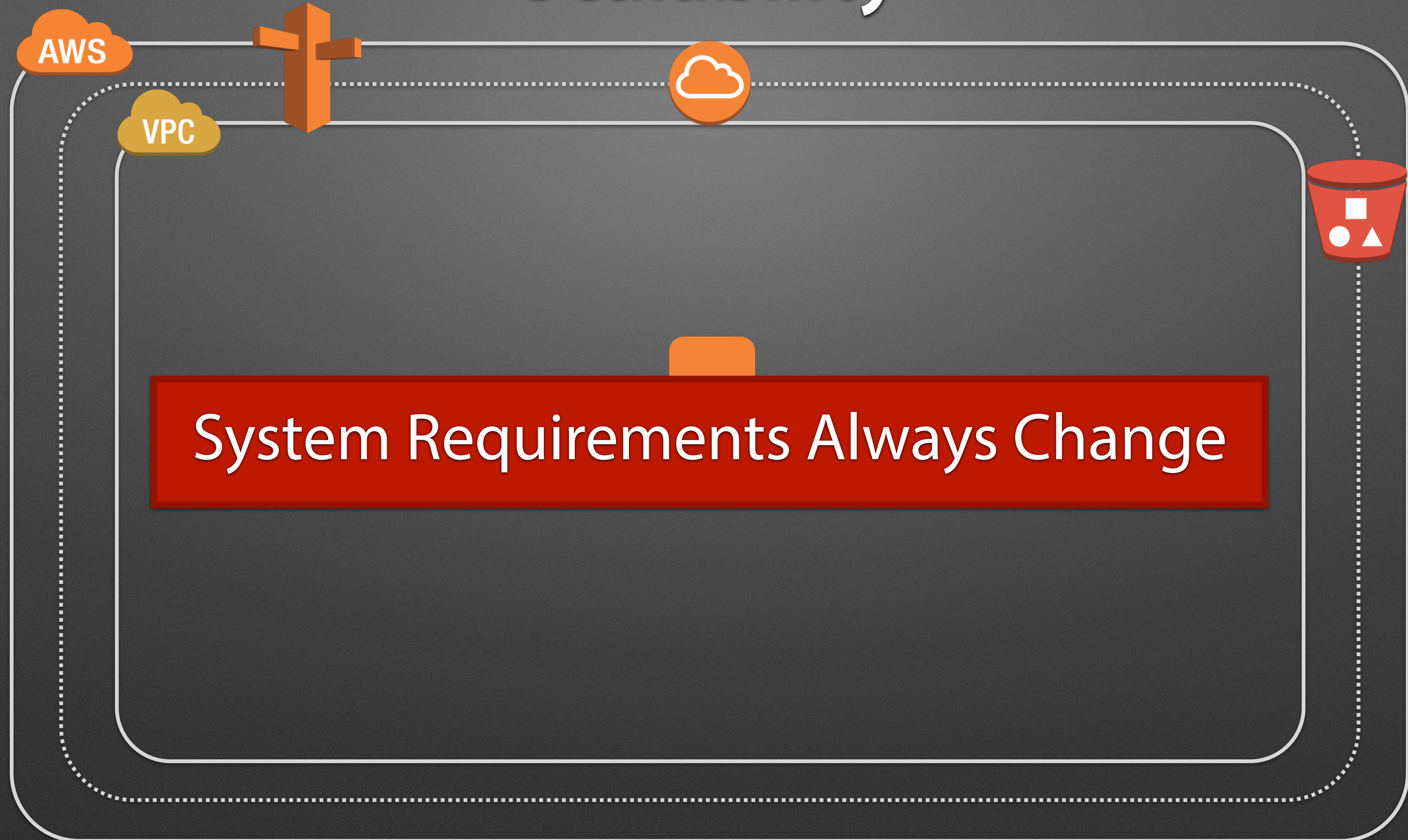
Auto Scale

# Scalability



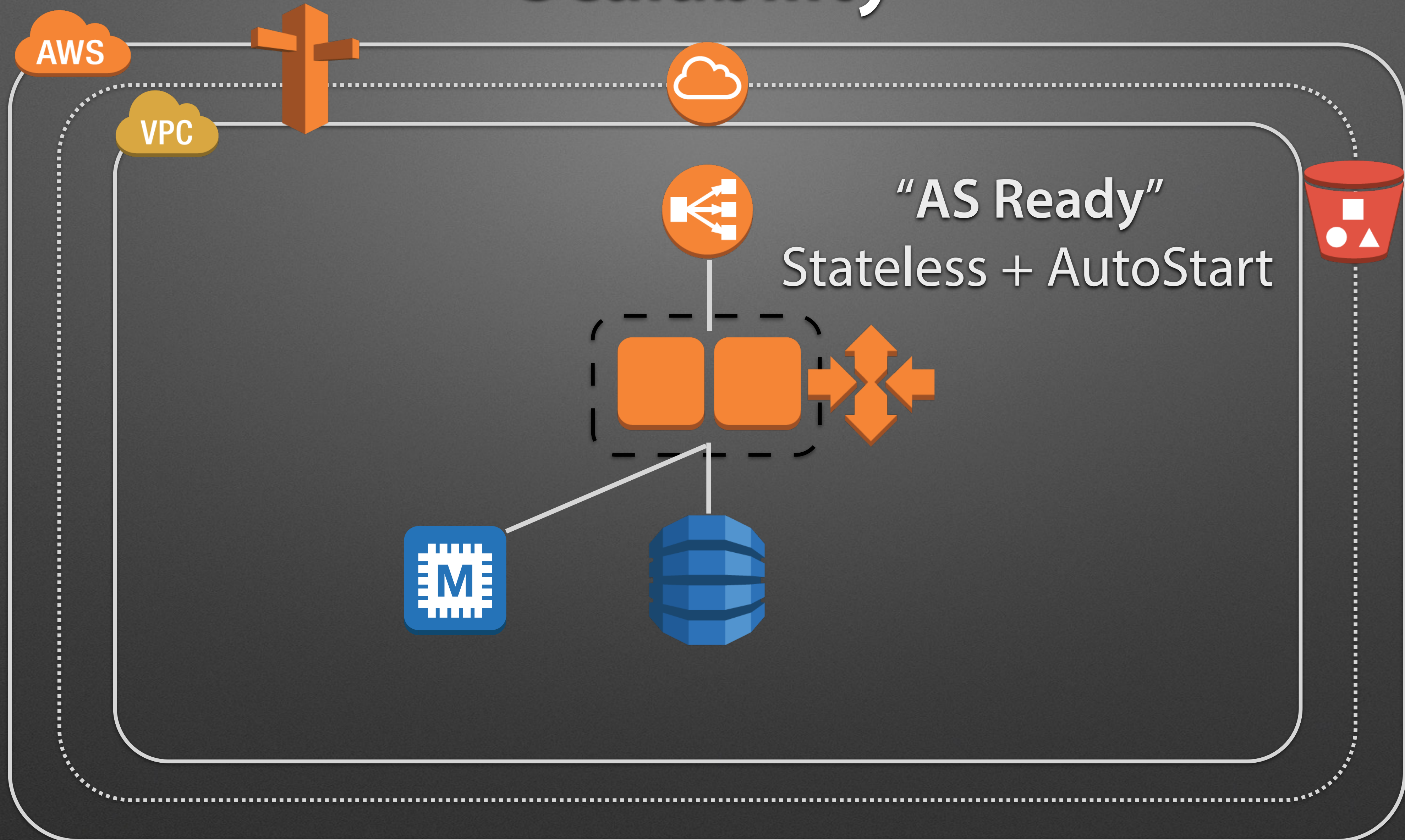
Probably Scalability Not Required at the Beginning

# Scalability



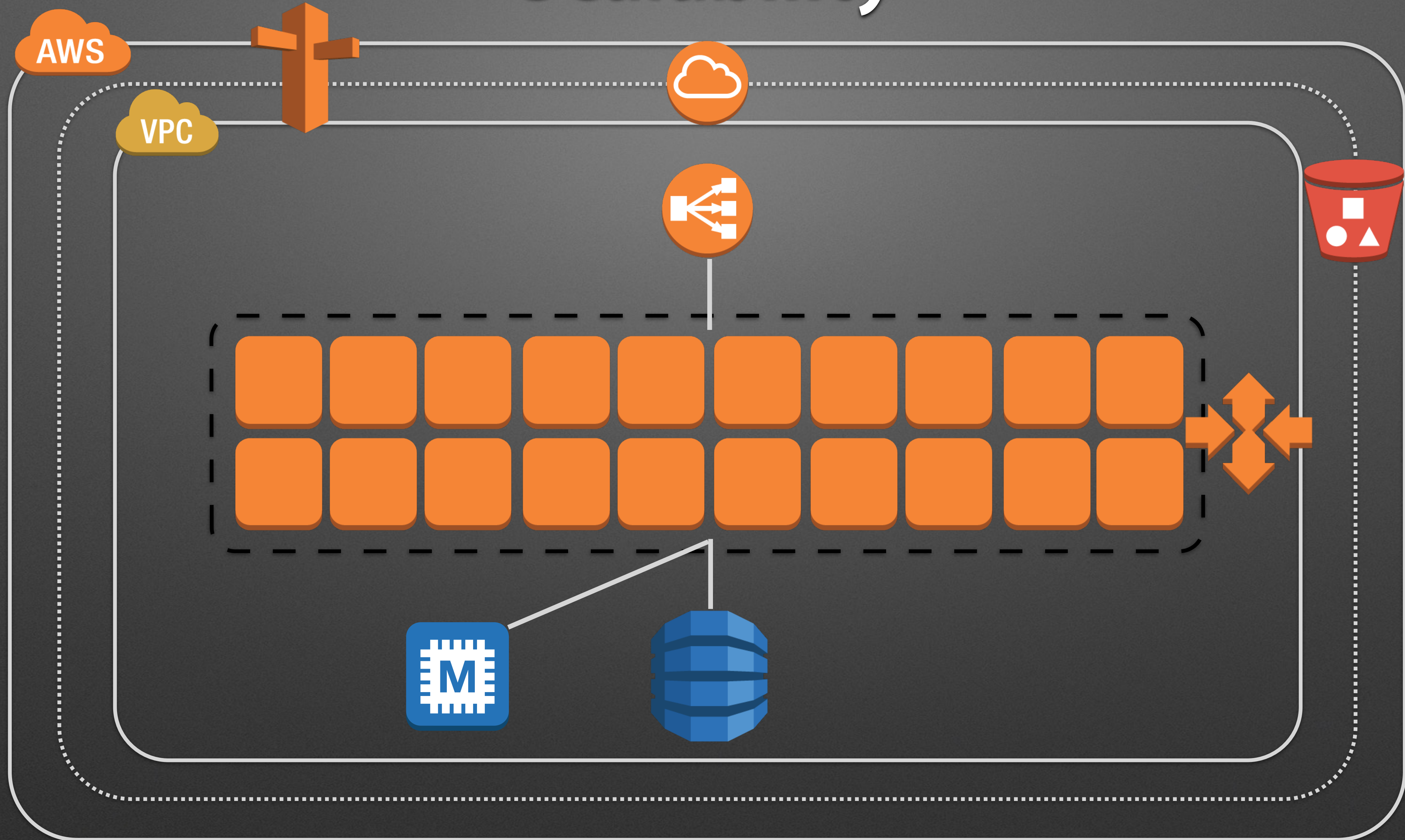
Probably Scalability Not Required at the Beginning

# Scalability



Make System Scalable from the Beginning

# Scalability



Scale System When Necessary

# Availability

Multi-AZ/Region with DNS Failover



Route53



Region

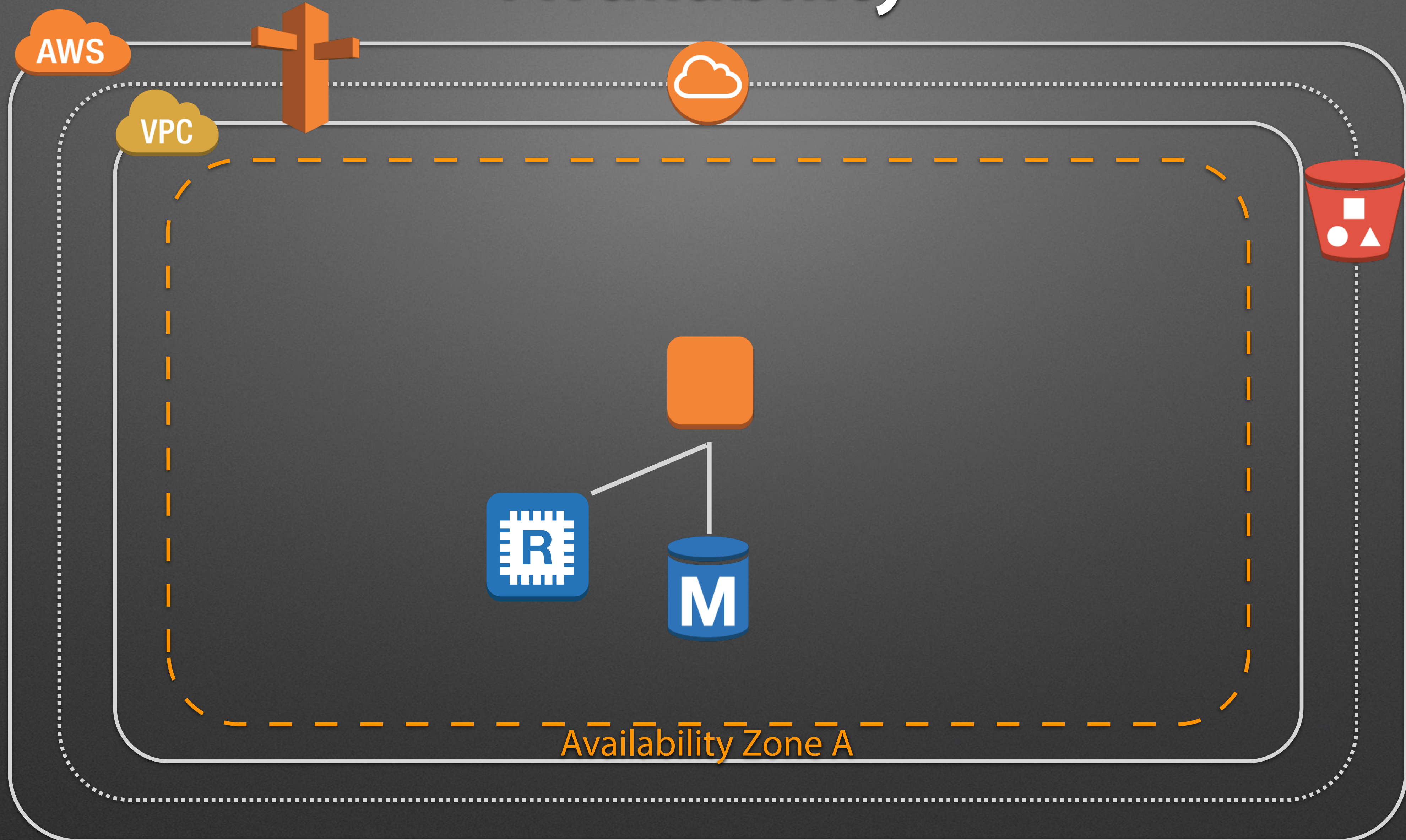


ELB



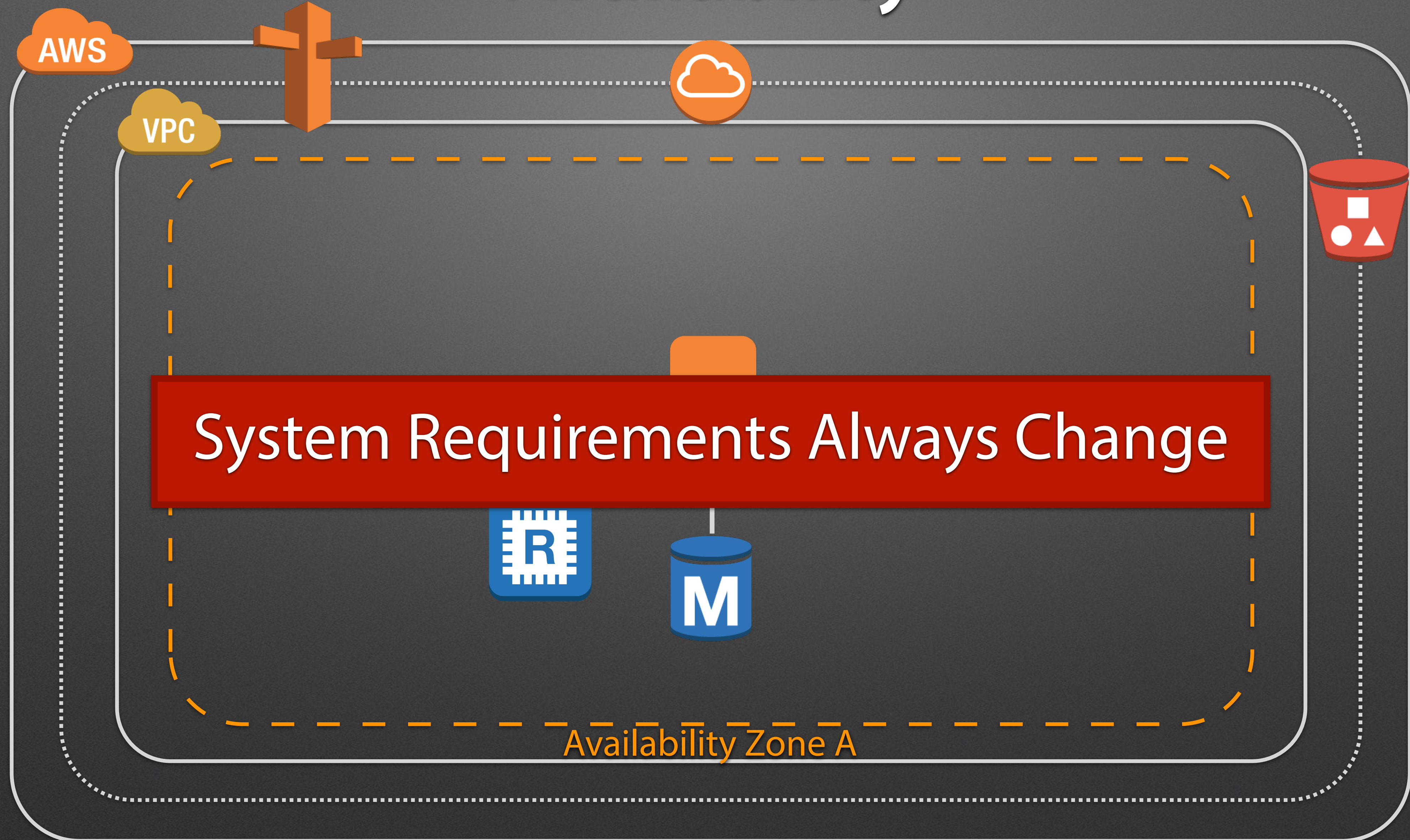
Availability Zone

# Availability



Probably Availability Not Required at the Beginning

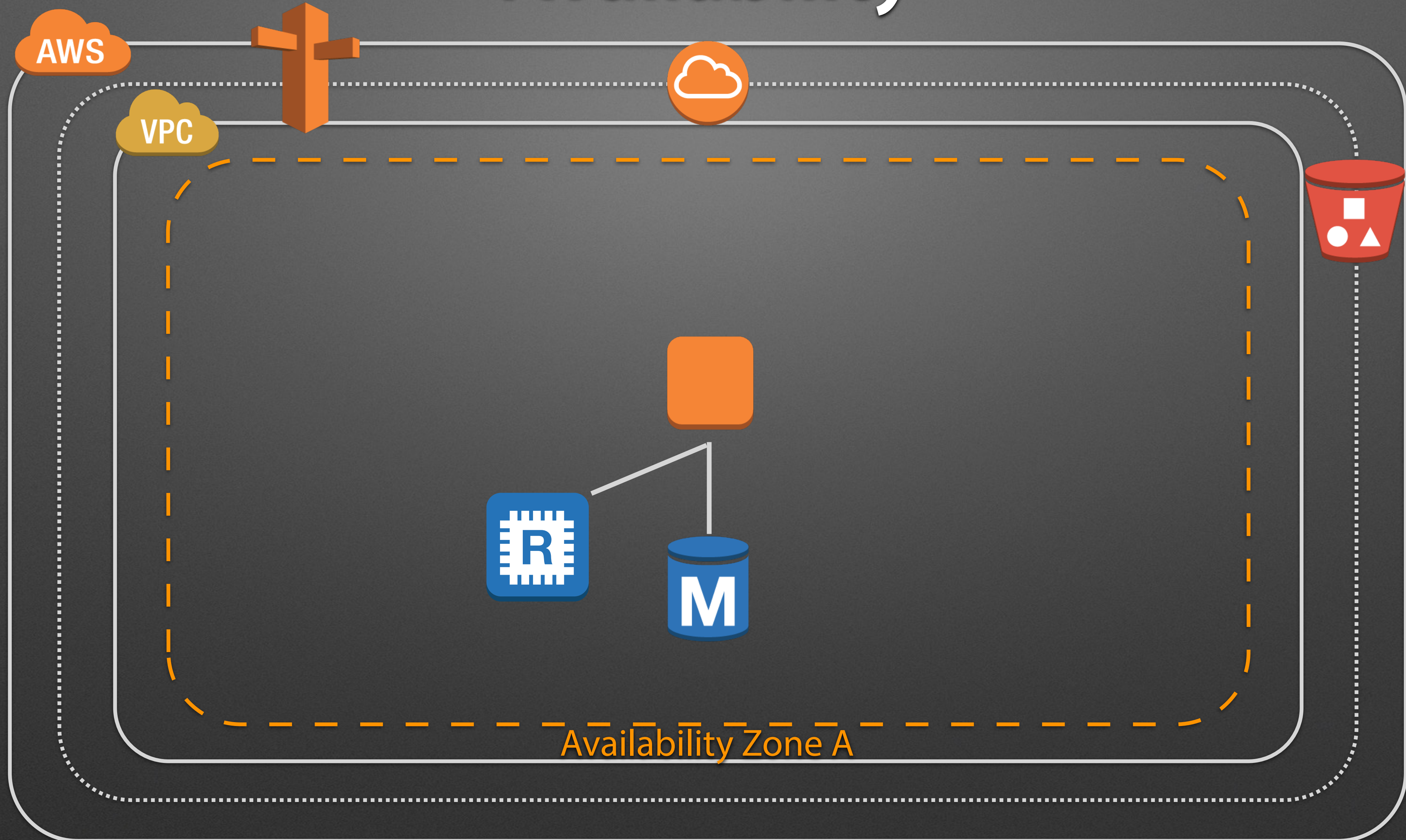
# Availability



Probably Availability Not Required at the Beginning

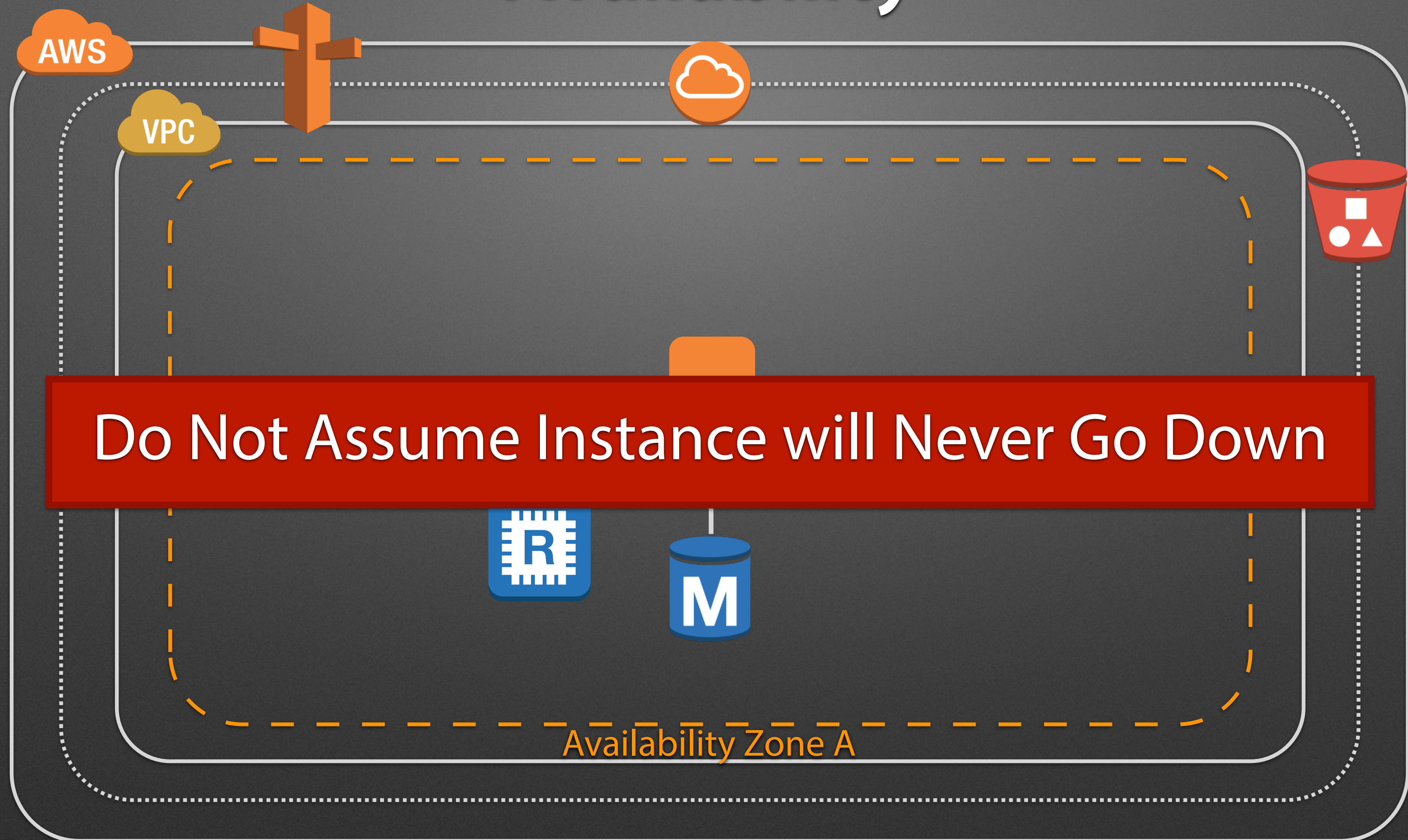


# Availability



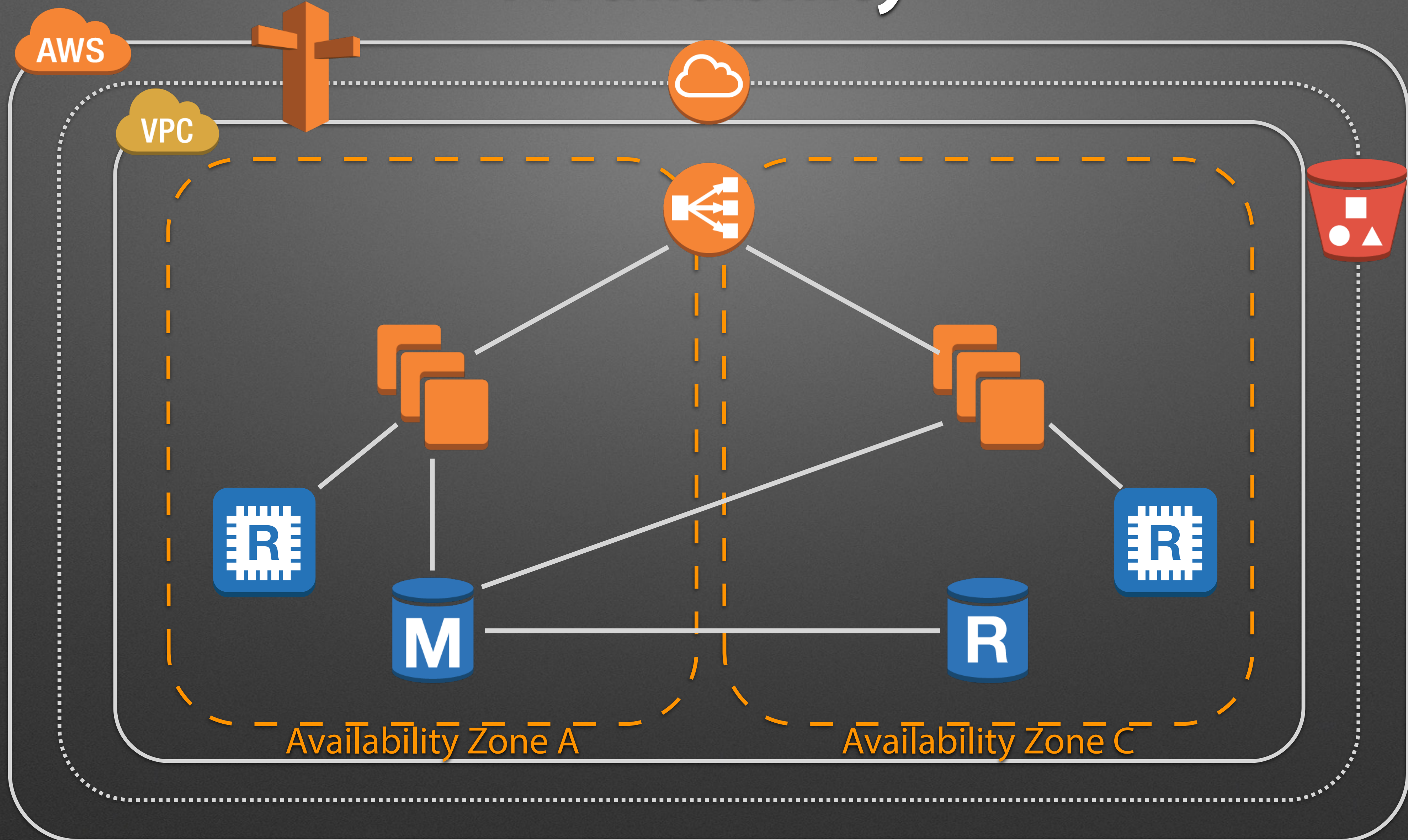
System Designed Assuming Infra Never Goes Down

# Availability



System Designed Assuming Infra Never Goes Down

# Availability



Do Not Retain Availability in Single Instance, Make It Overall

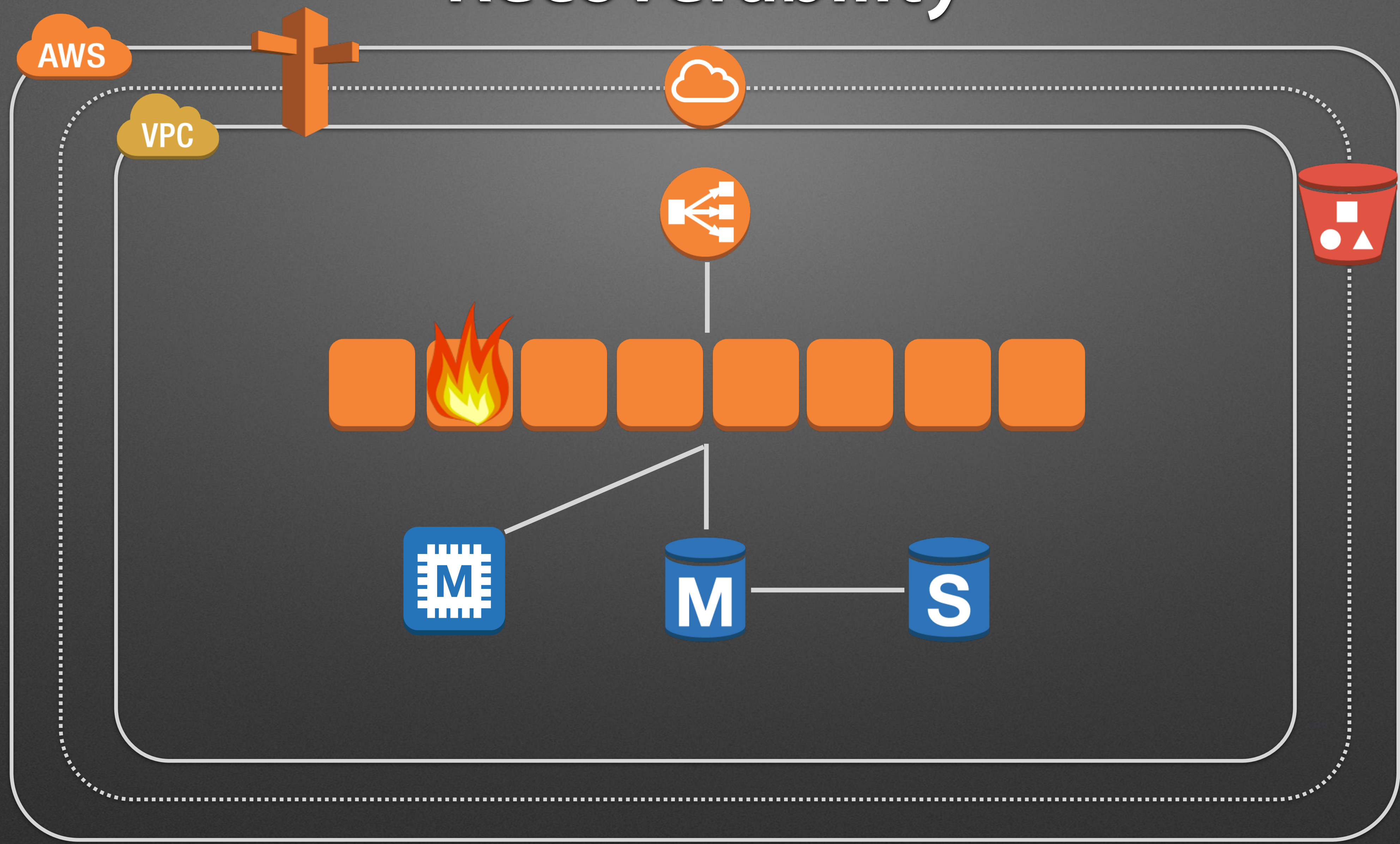
# Recoverability

Easy to Recover from Troubles



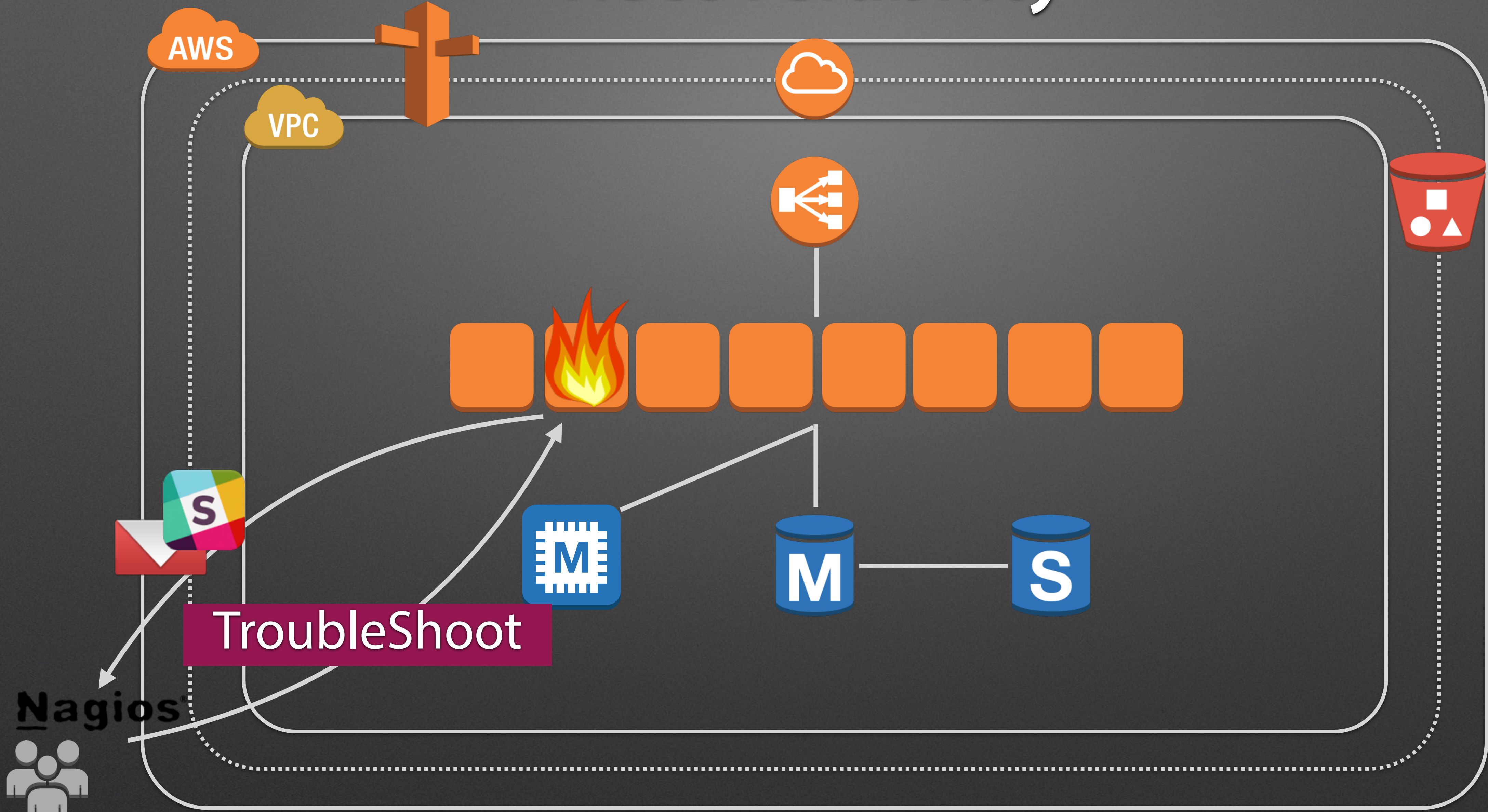
AS Ready EC2

# Recoverability



System Happens to Go Down

# Recoverability



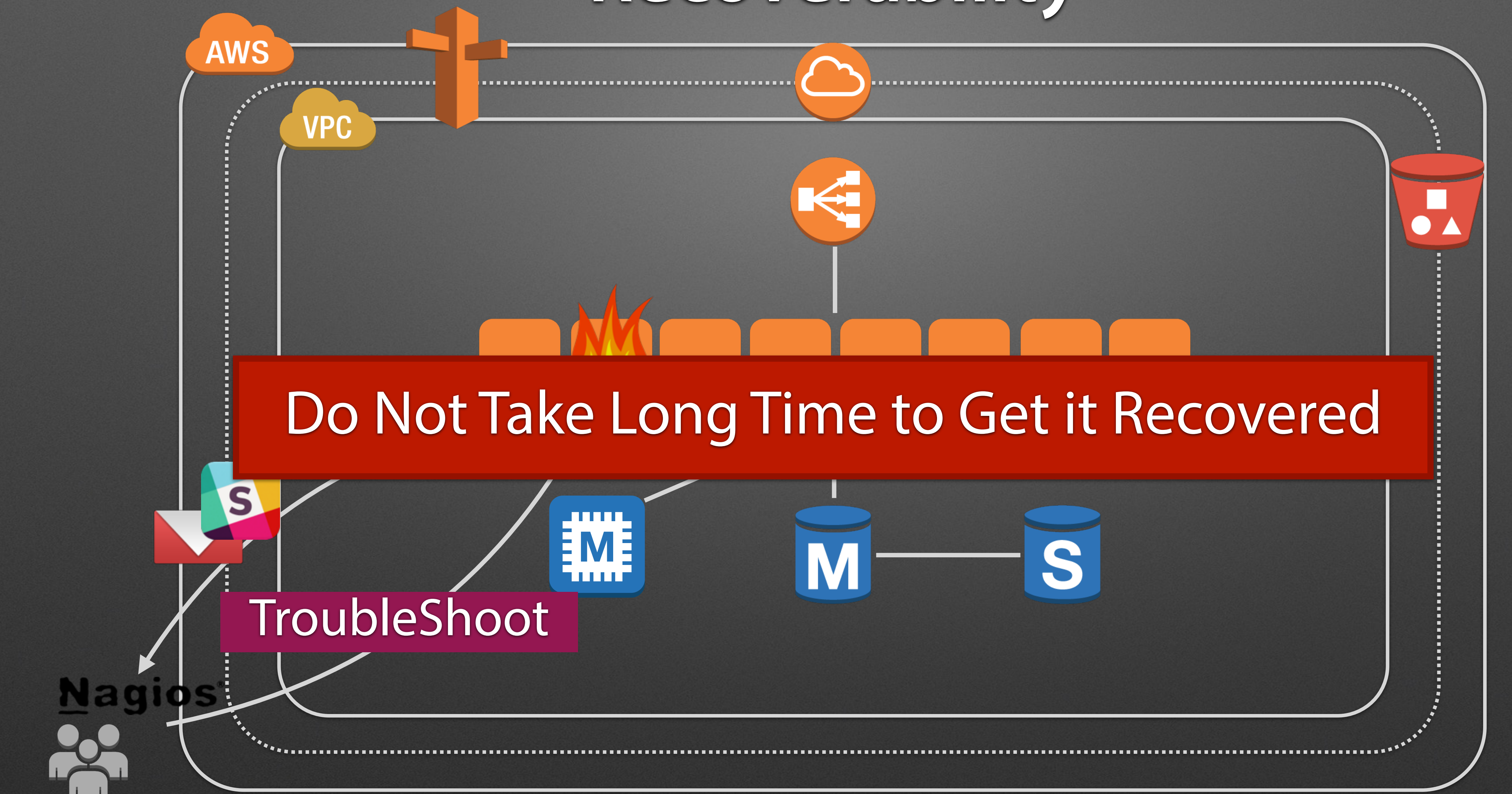
TroubleShoot

Nagios

Monitoring

Developer Begins to Troubleshoot

# Recoverability



Do Not Take Long Time to Get it Recovered

TroubleShoot

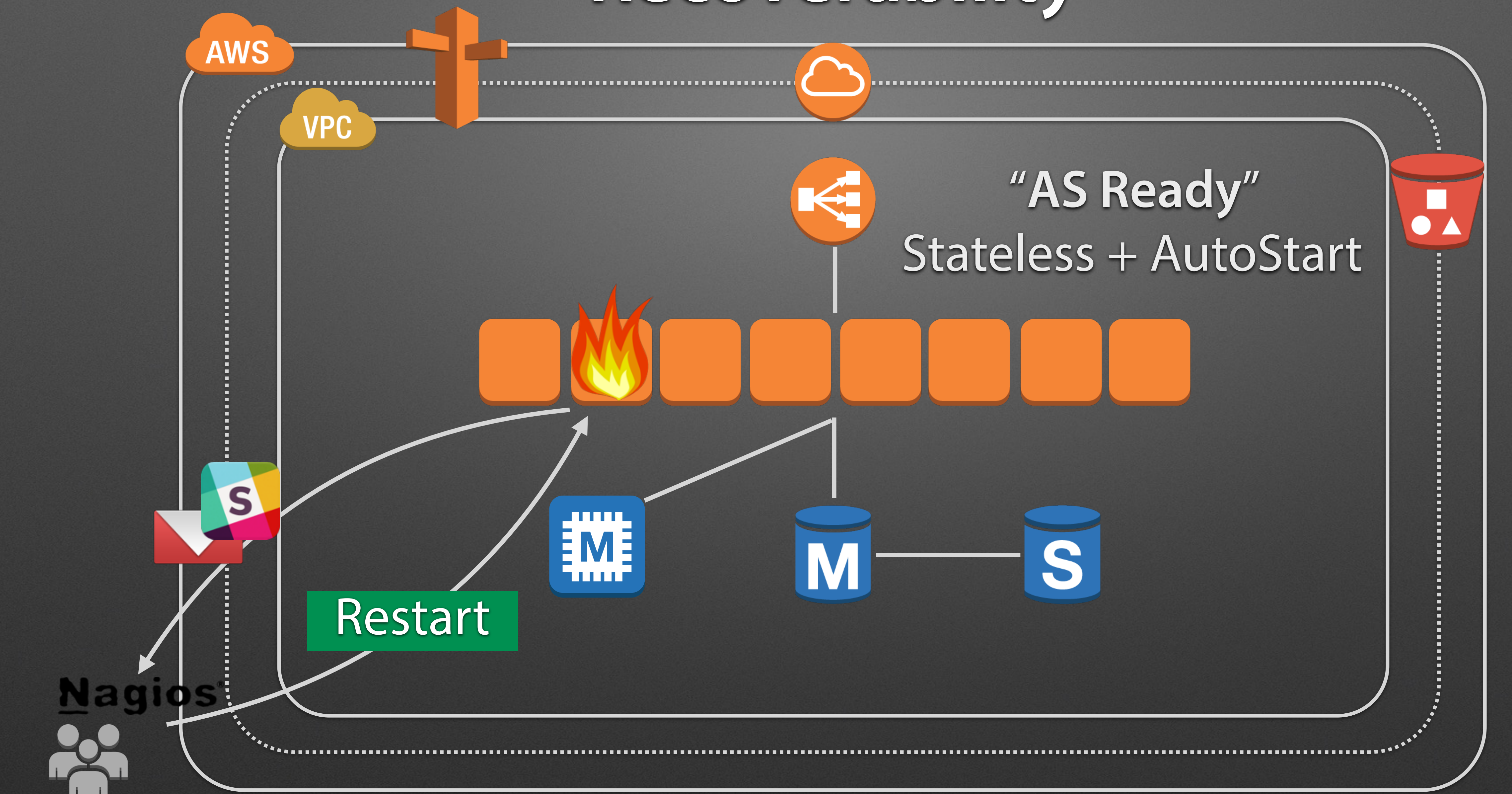
Nagios



Monitoring

Do Not Make Developers TroubleShoot

# Recoverability



**Nagios**

Monitoring

Make System Recovery Easier



# Replicability

Easy to Clone a System



CloudFormation

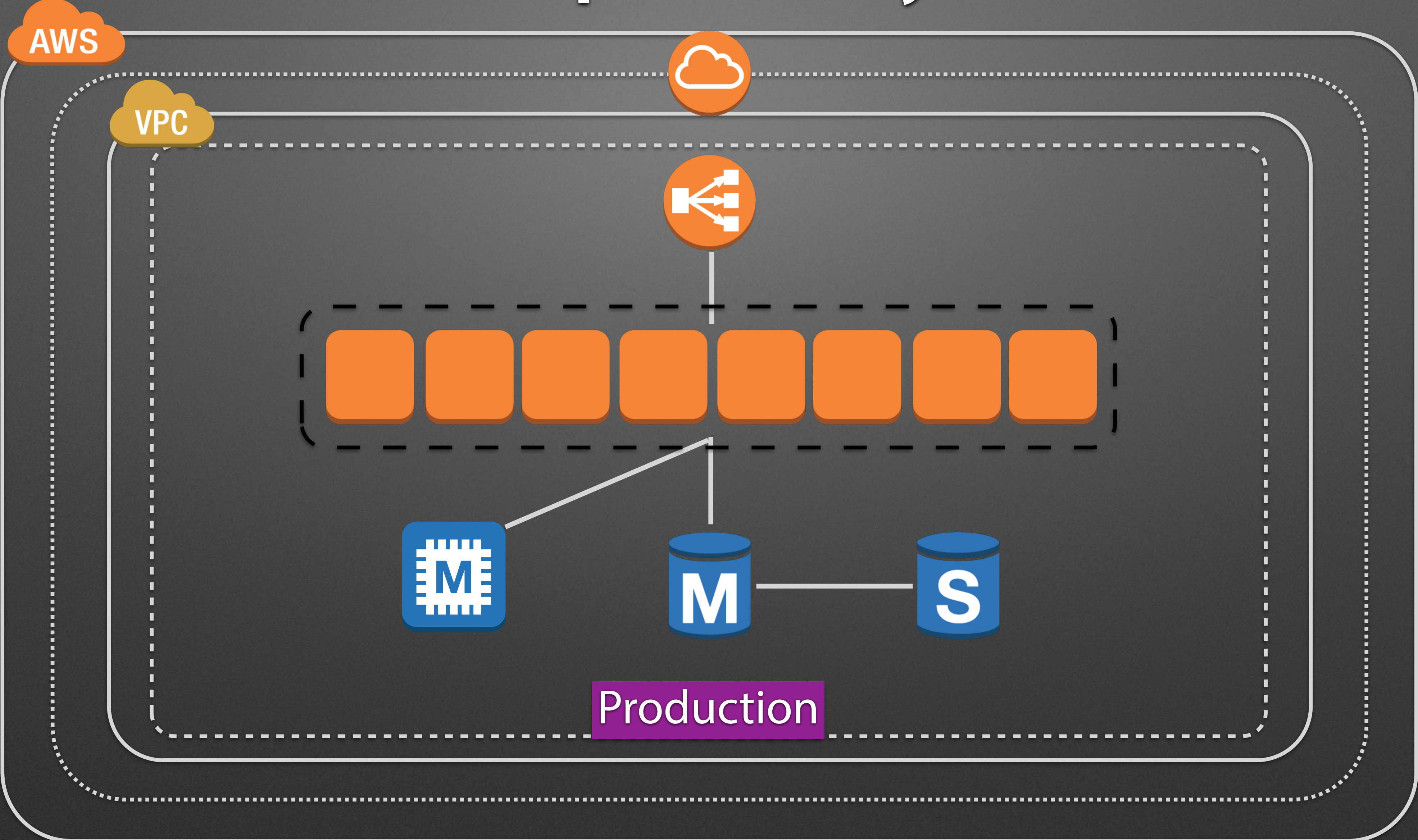


Elastic Beanstalk



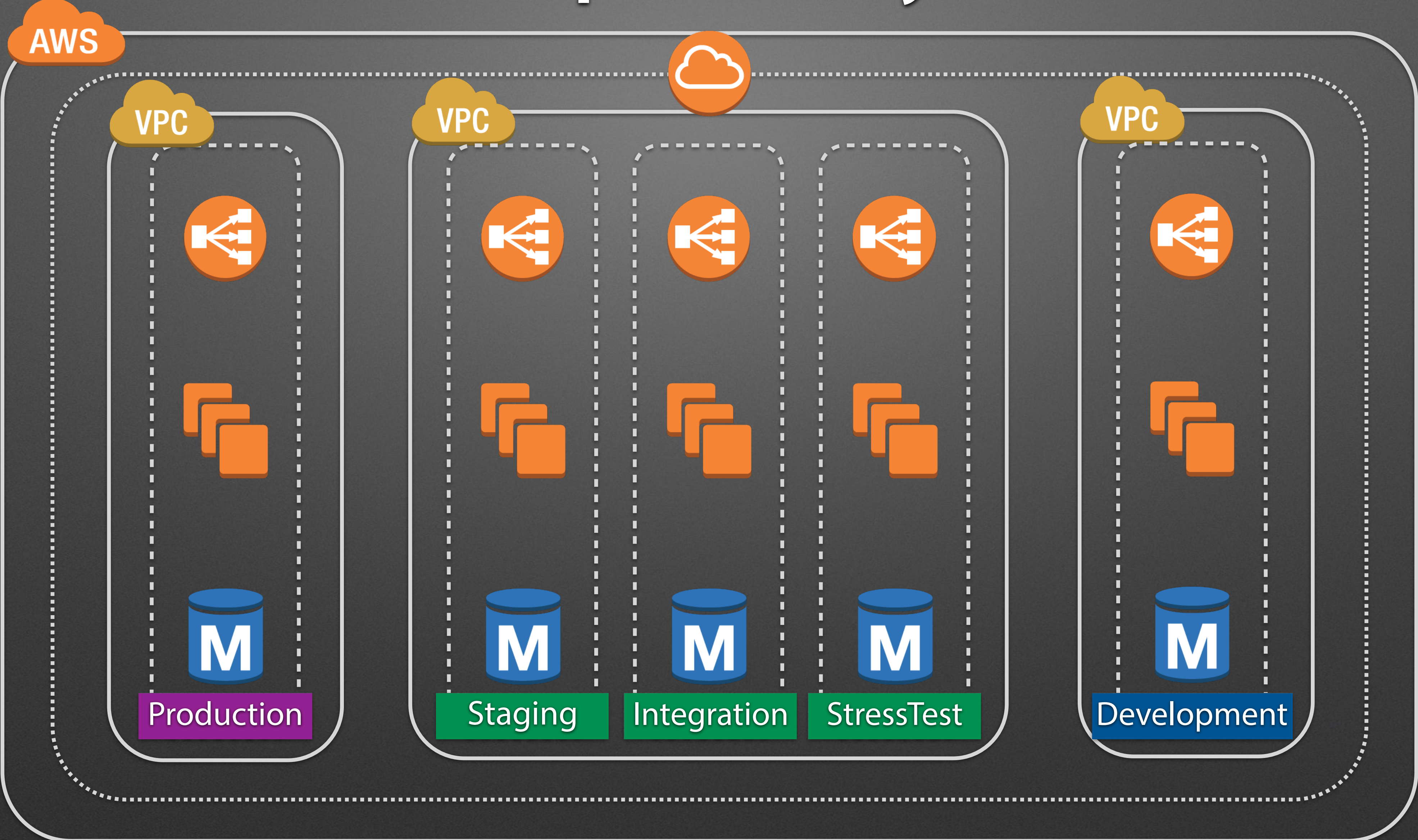
CodeDeploy

# Replicability



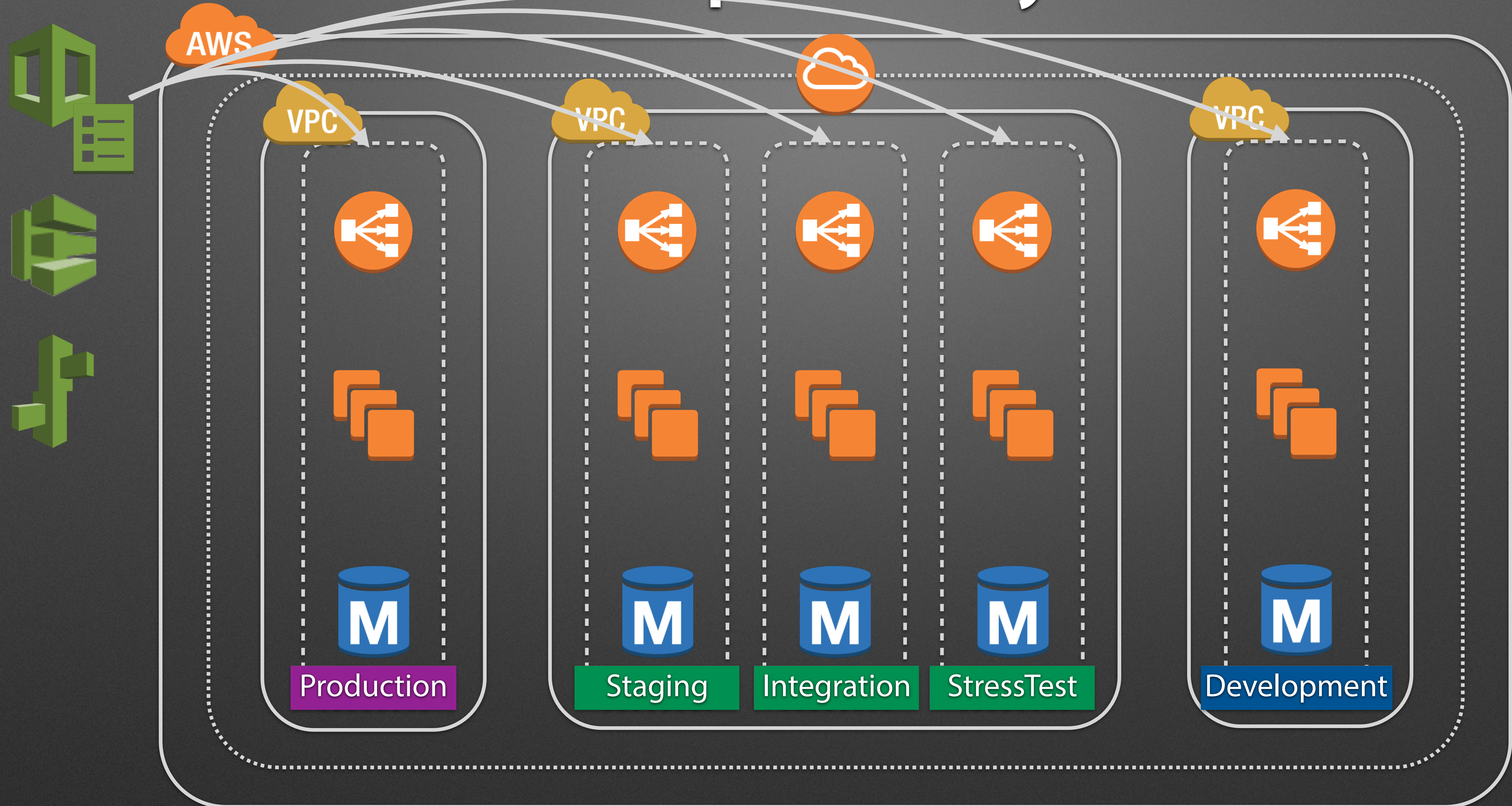
Only Production Environment Necessary at the Beginning

# Replicability



Multi-Environments Required as We Go

# Replicability



Make Cloning System Easy

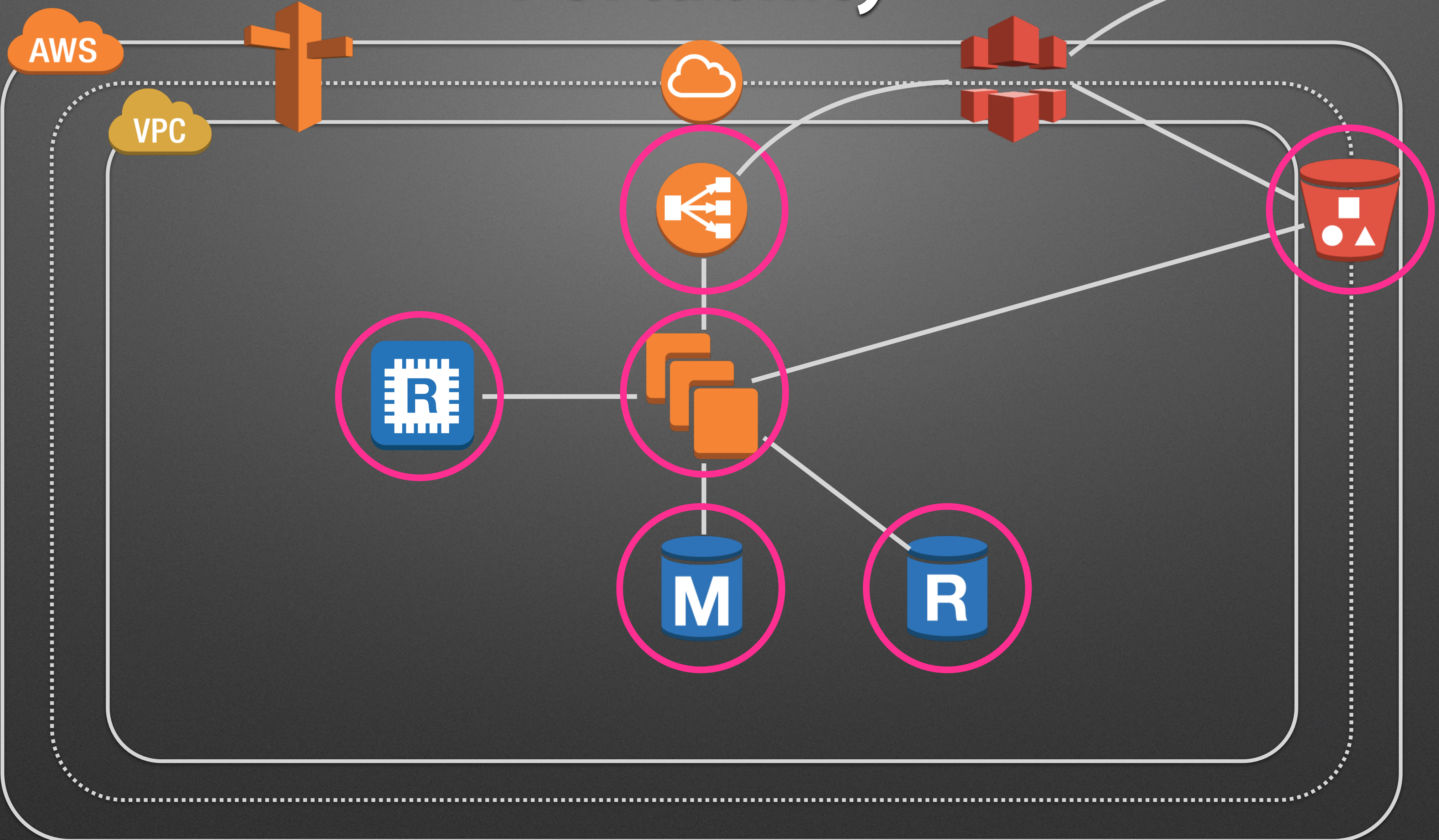
# Portability

From IP-based to “Owned” Name-based



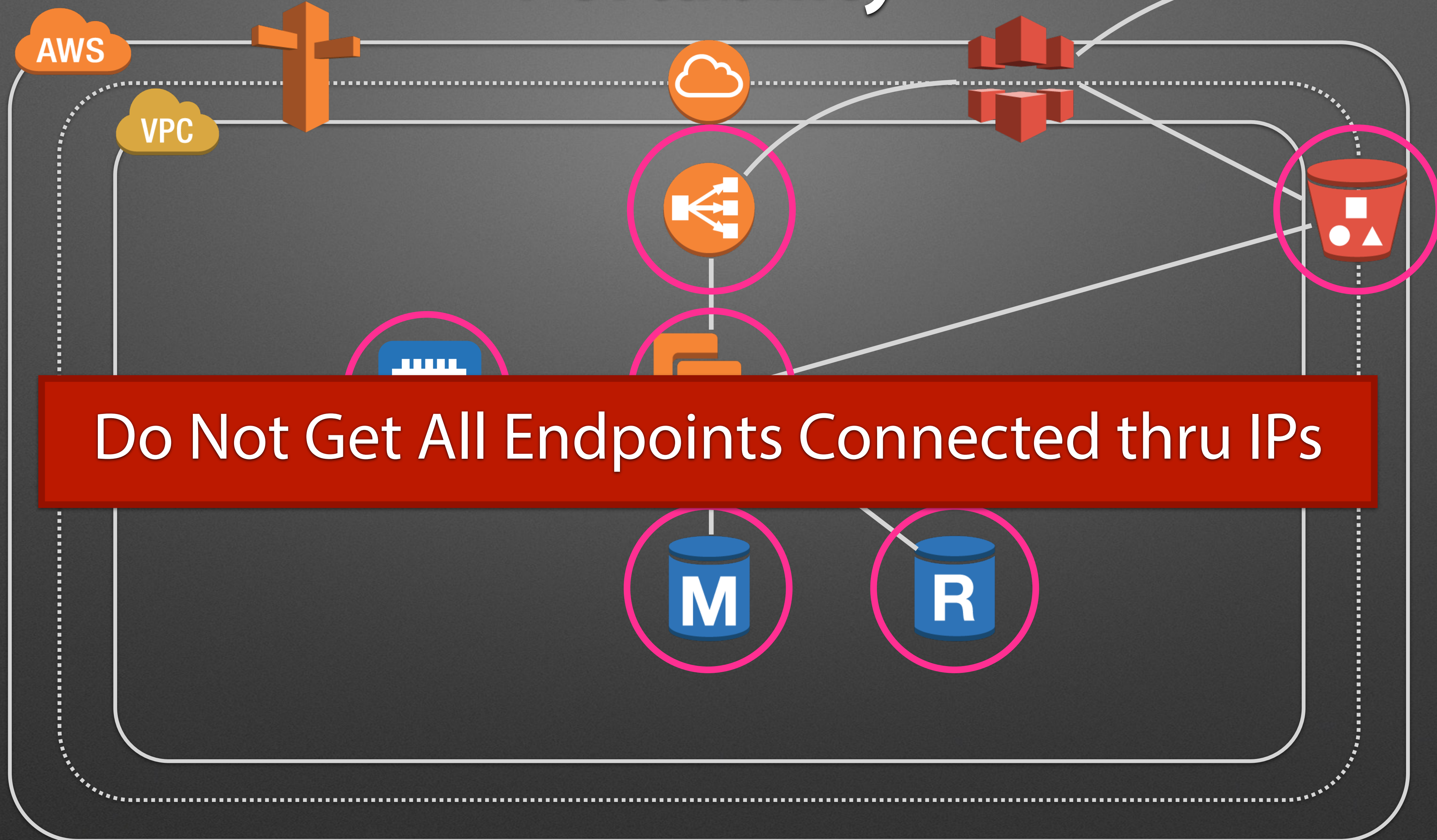
Route53

# Portability



System Needs to Connect with lots of Endpoints

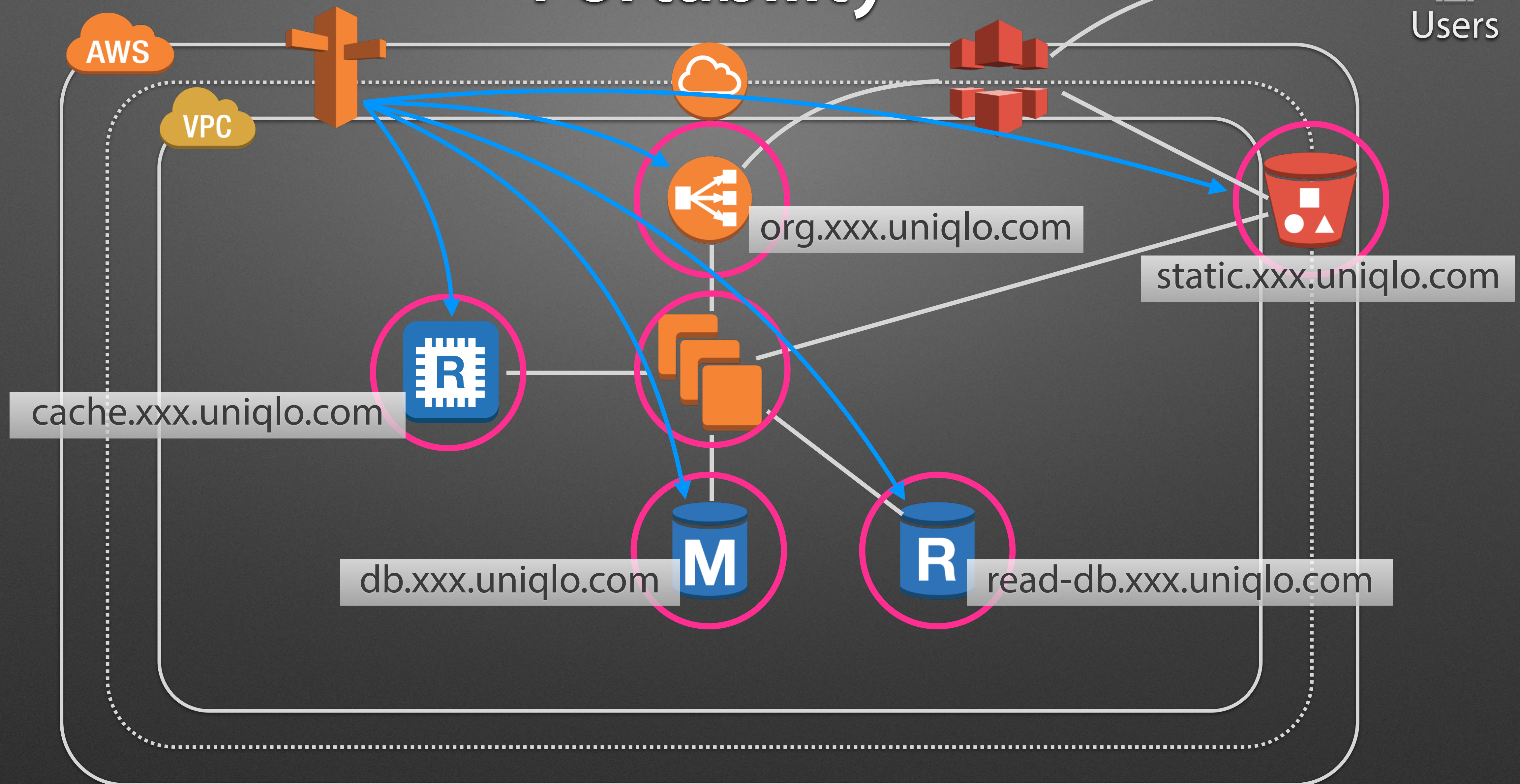
# Portability



Do Not Get All Endpoints Connected thru IPs

System Needs to Connect with lots of Endpoints

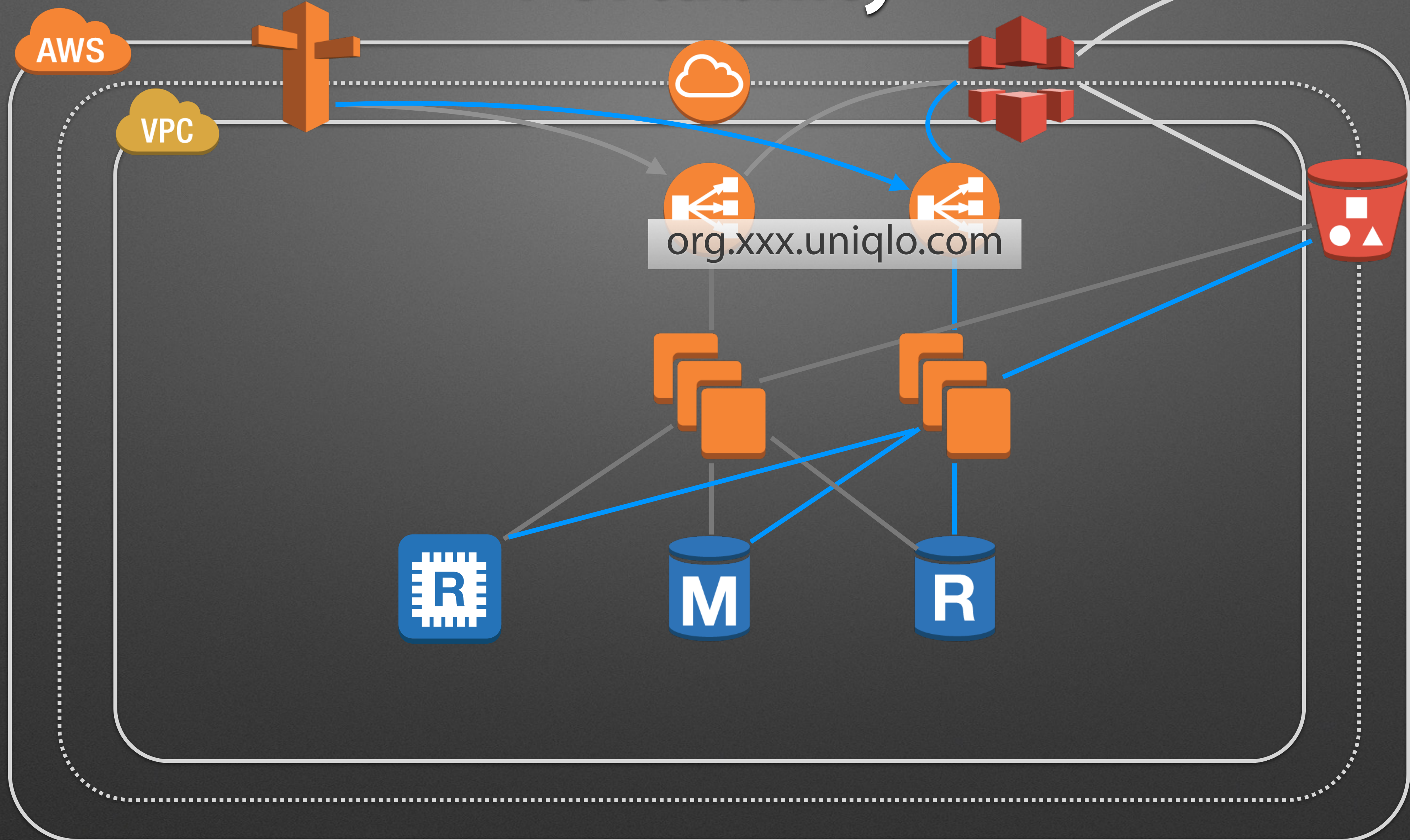
# Portability



Assign "Owned" Hostname to Endpoints for Maximum Flexibility



# Portability



Easy System Update with Blue-Green Deployment

# Visibility

Collect as Much Data as Possible



CloudWatch

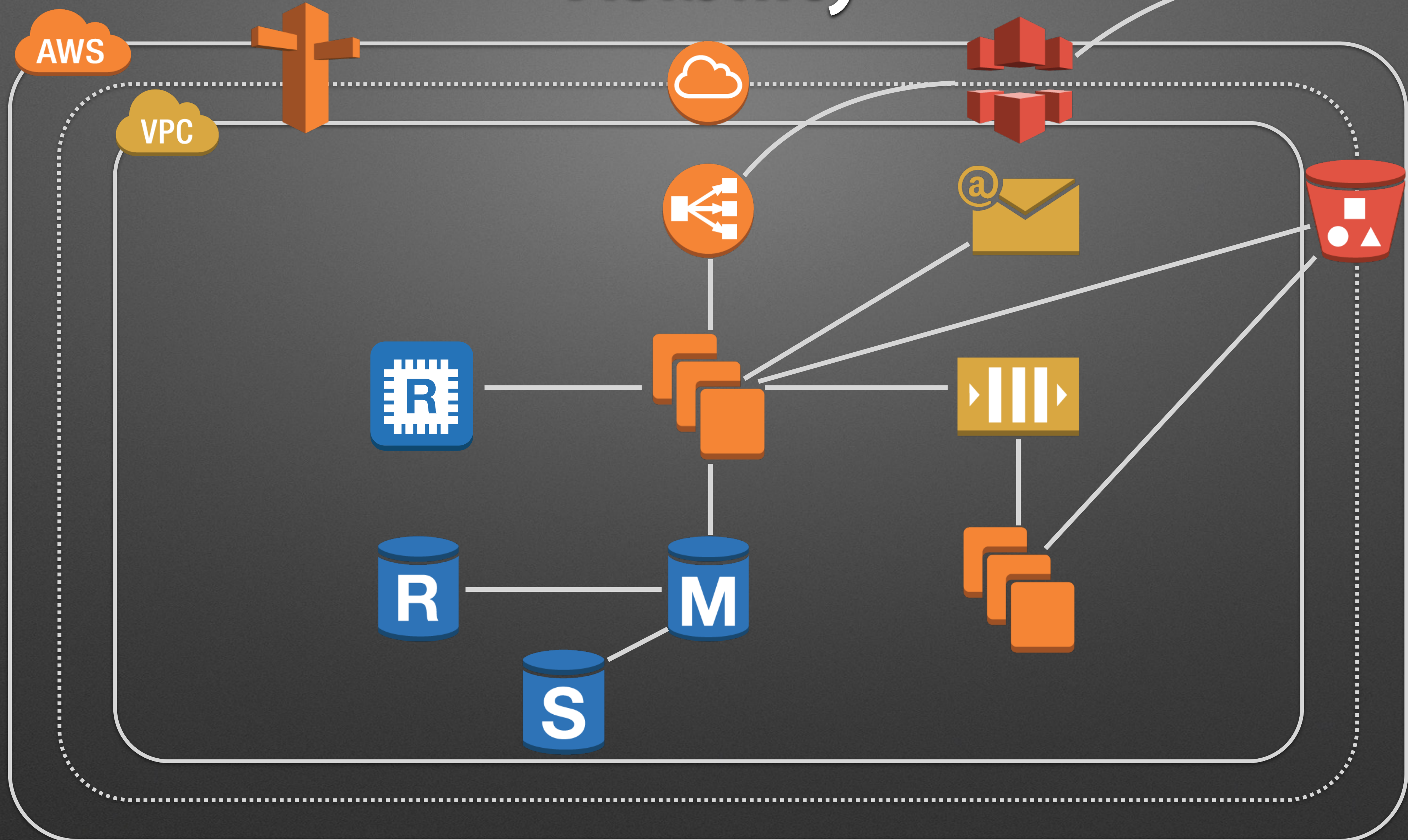


Config



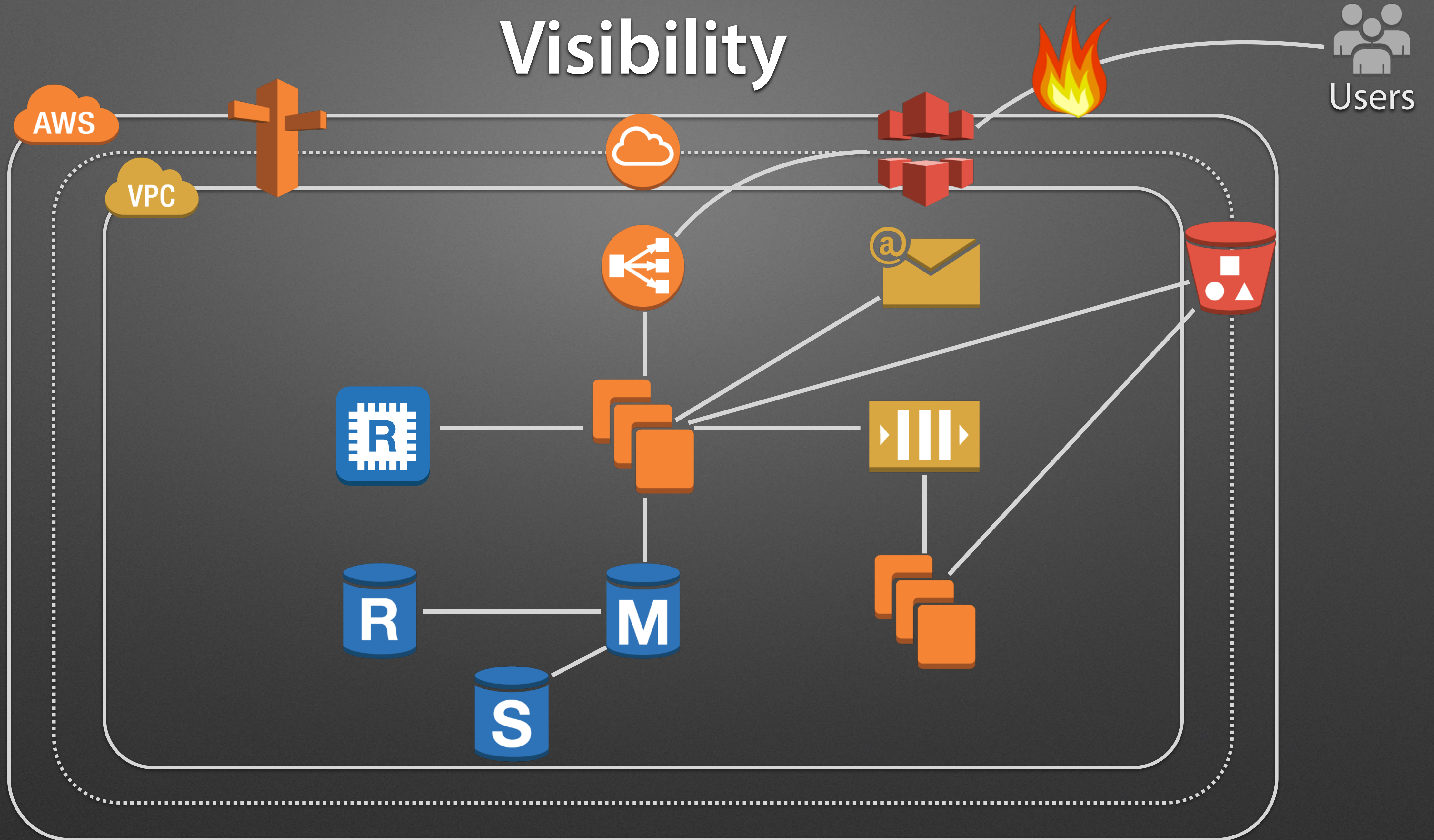
CloudTrail

# Visibility



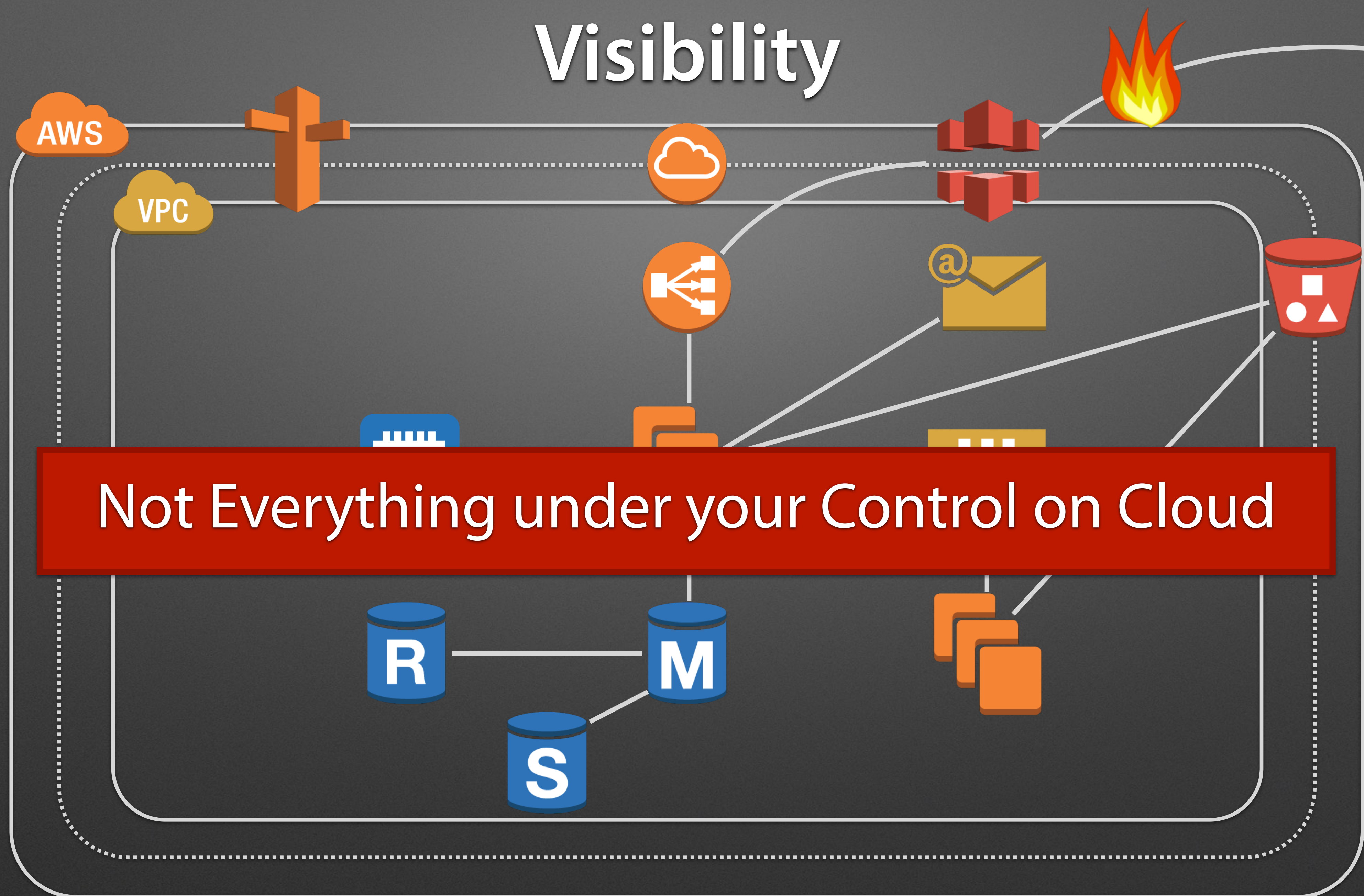
Modern System Consists of Full-Managed Services

# Visibility



Difficult to Figure out Root Cause

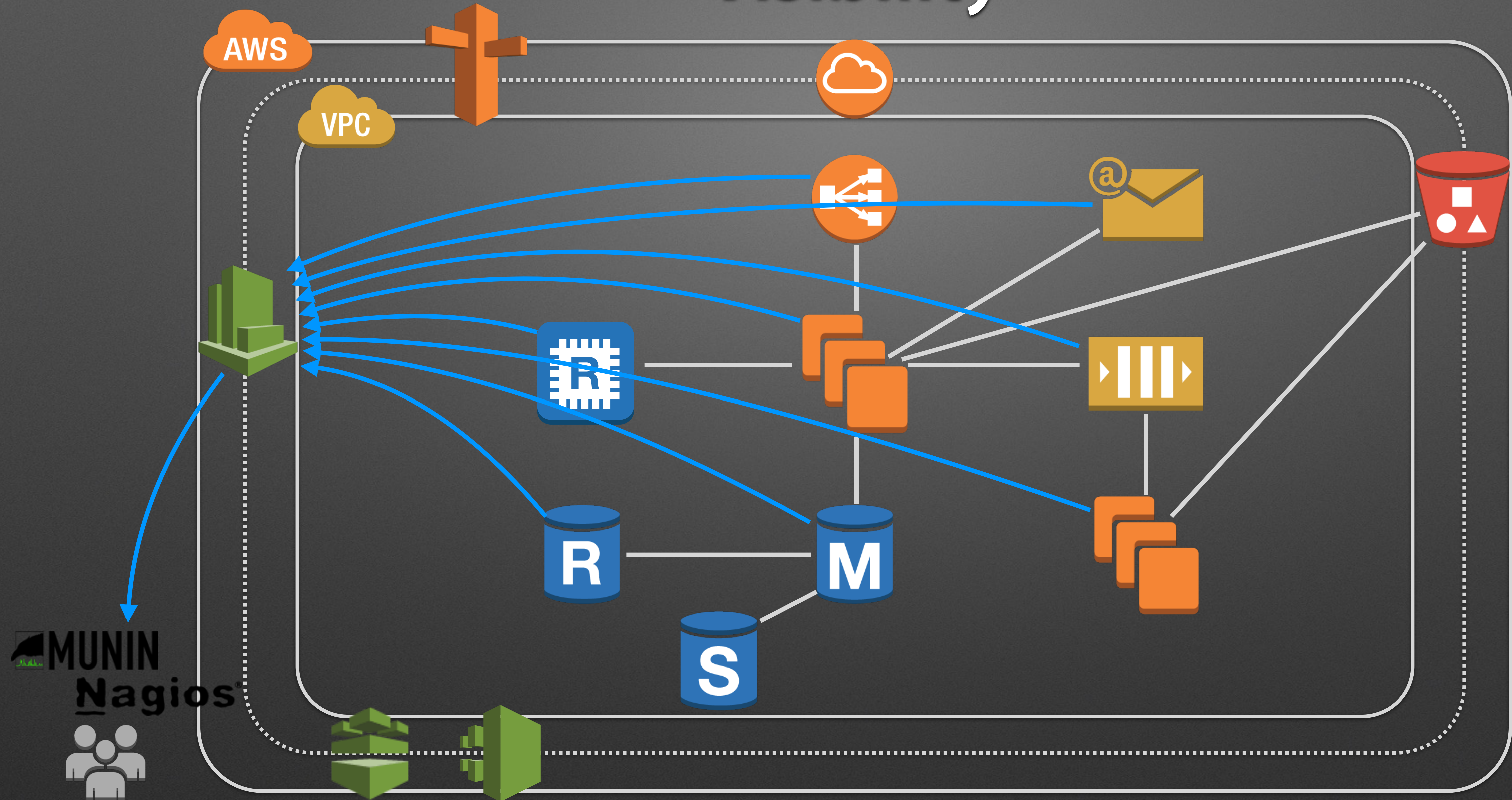
# Visibility



Not Everything under your Control on Cloud

Difficult to Figure out Root Cause

# Visibility



**MUNIN**  
**Nagios**



Monitoring

Collect as Much Data as Possible

Do **NOT** Carry Over  
Enterprise Best Practice to Cloud

# Agenda

1. AWS at FR

2. Cloud Design Strategy

**3. Global Network Design**

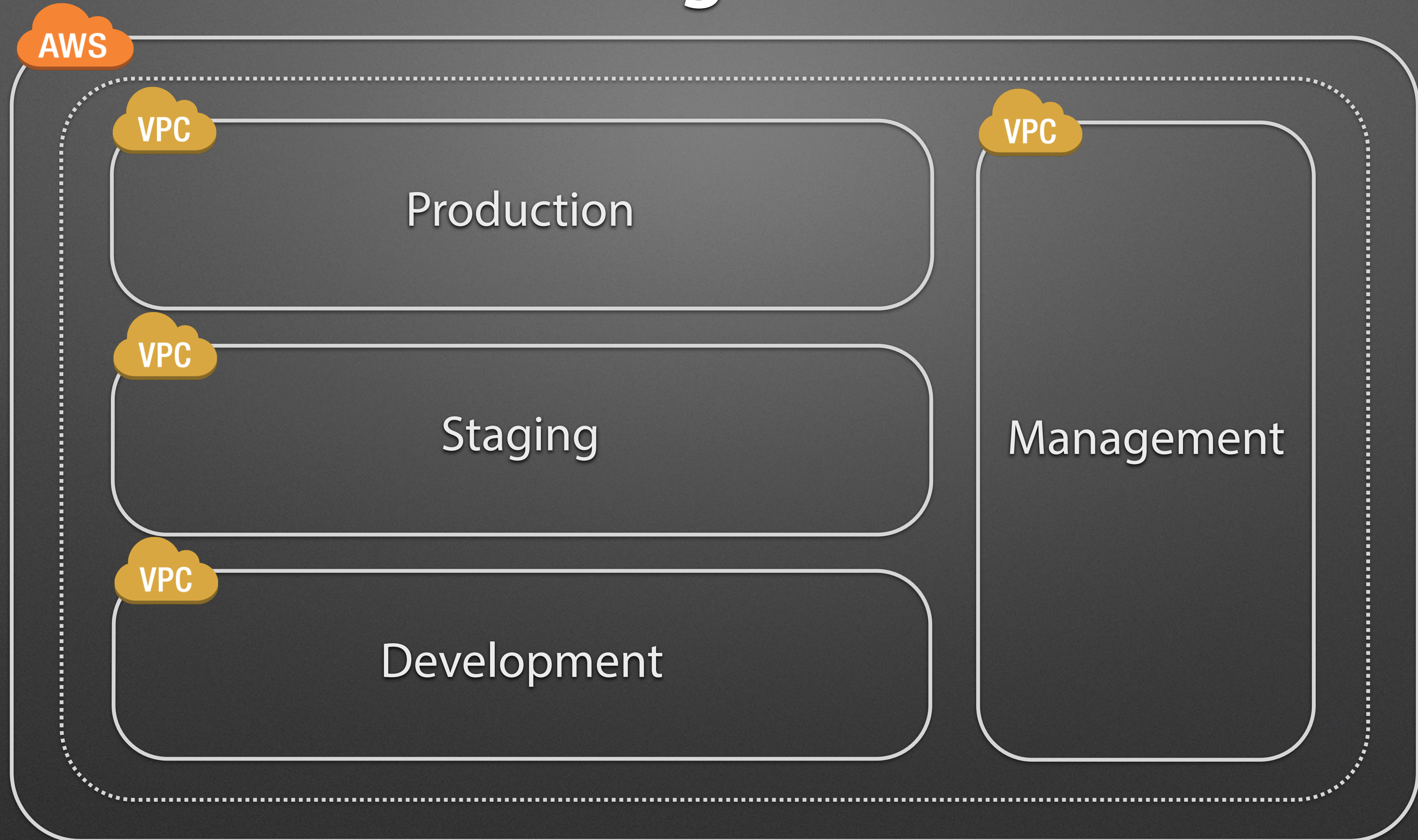
4. Enterprise Cloud Strategy





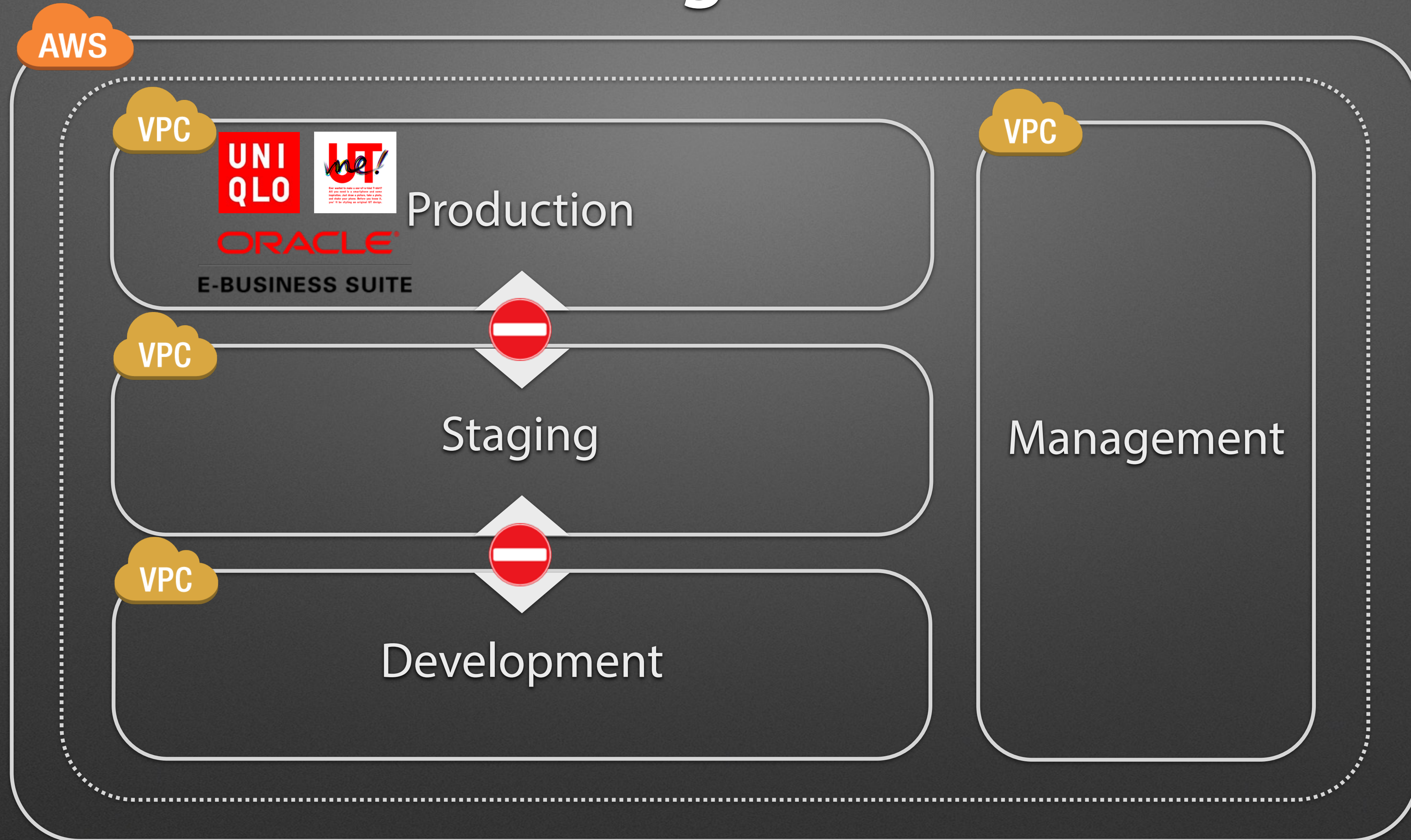
Multi-Regions for Global Service Distribution

# Region



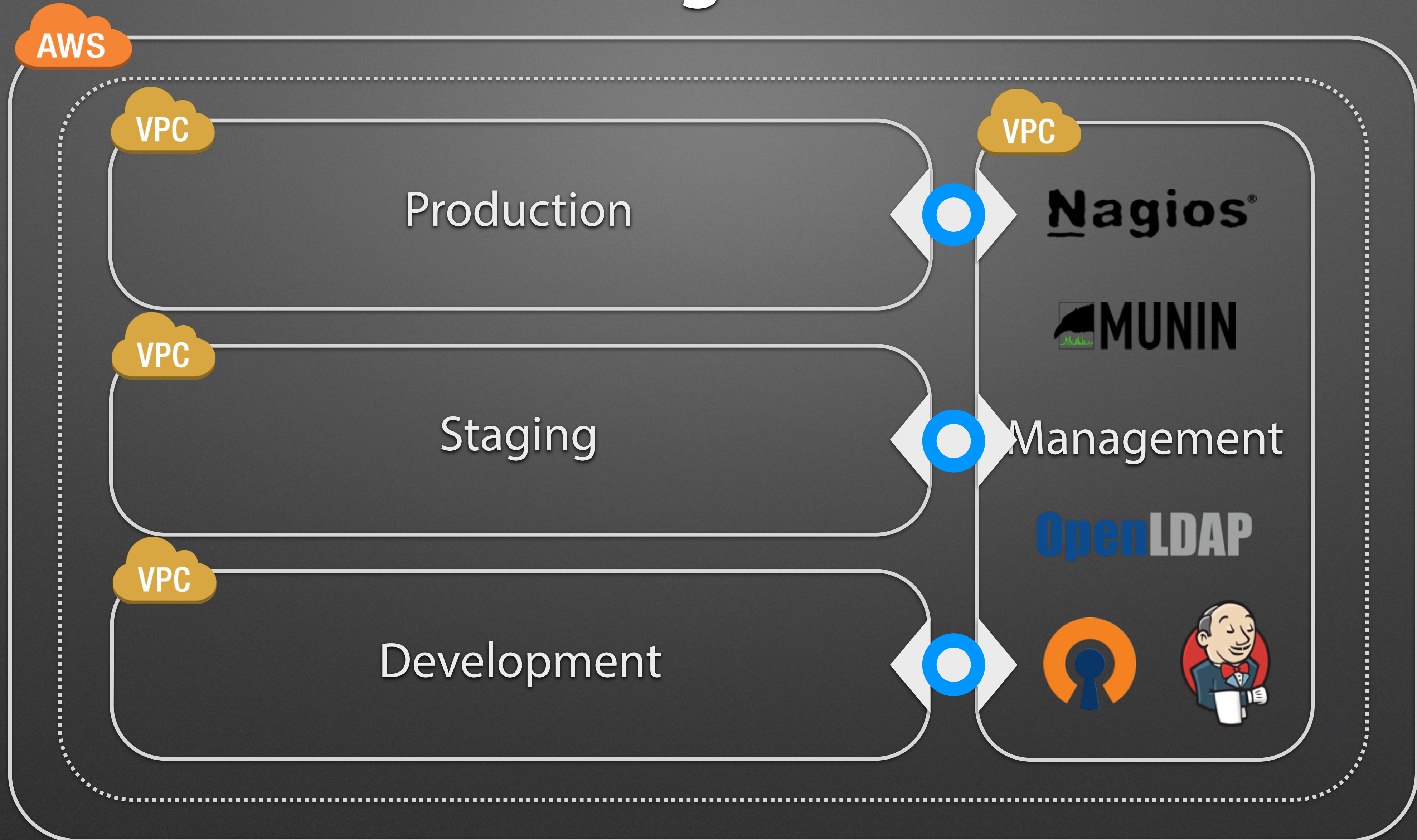
4 VPCs in Each Region

# Region



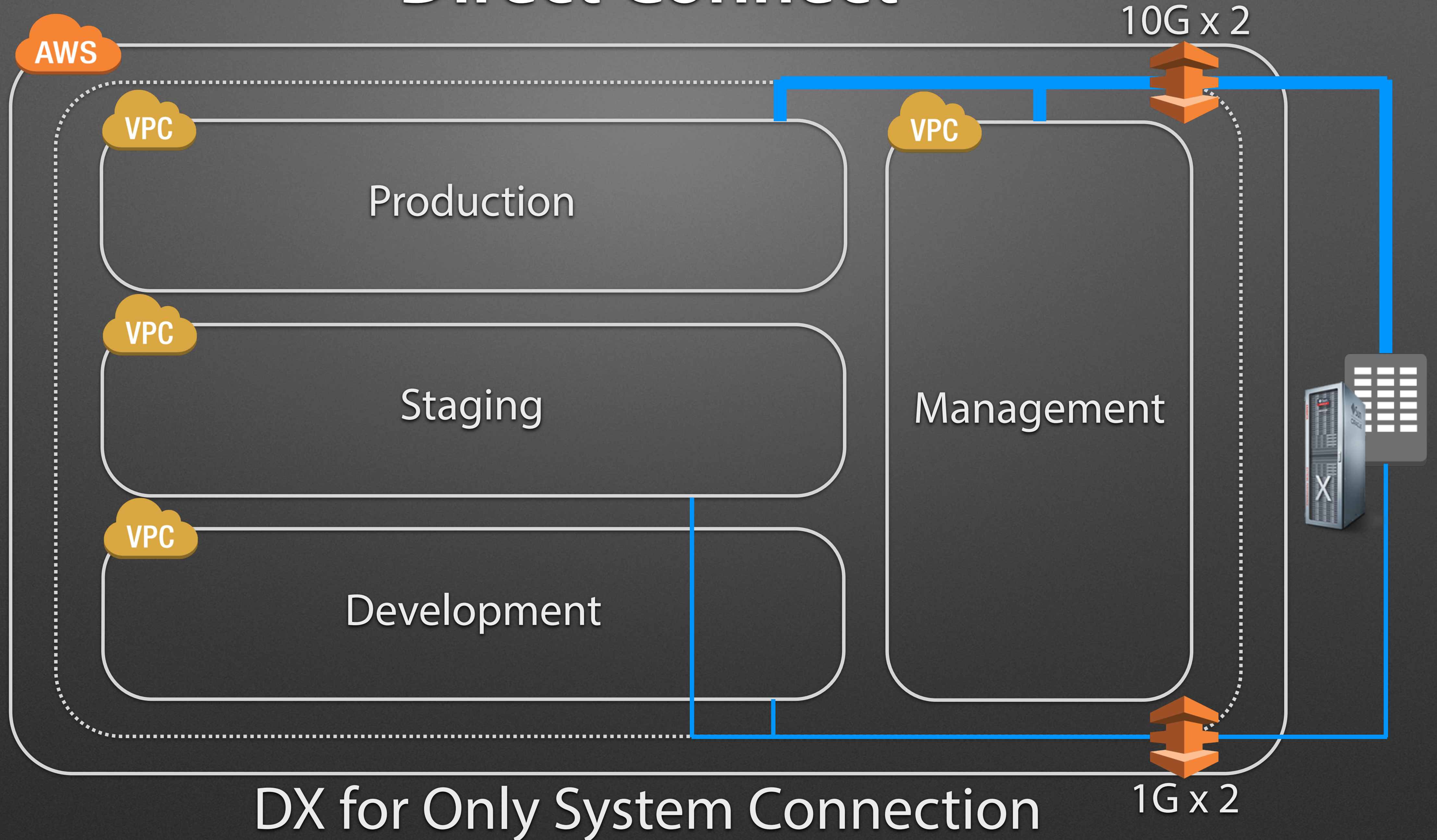
B2C/B System Residing Together, Each VPC Completely Isolated

# Region

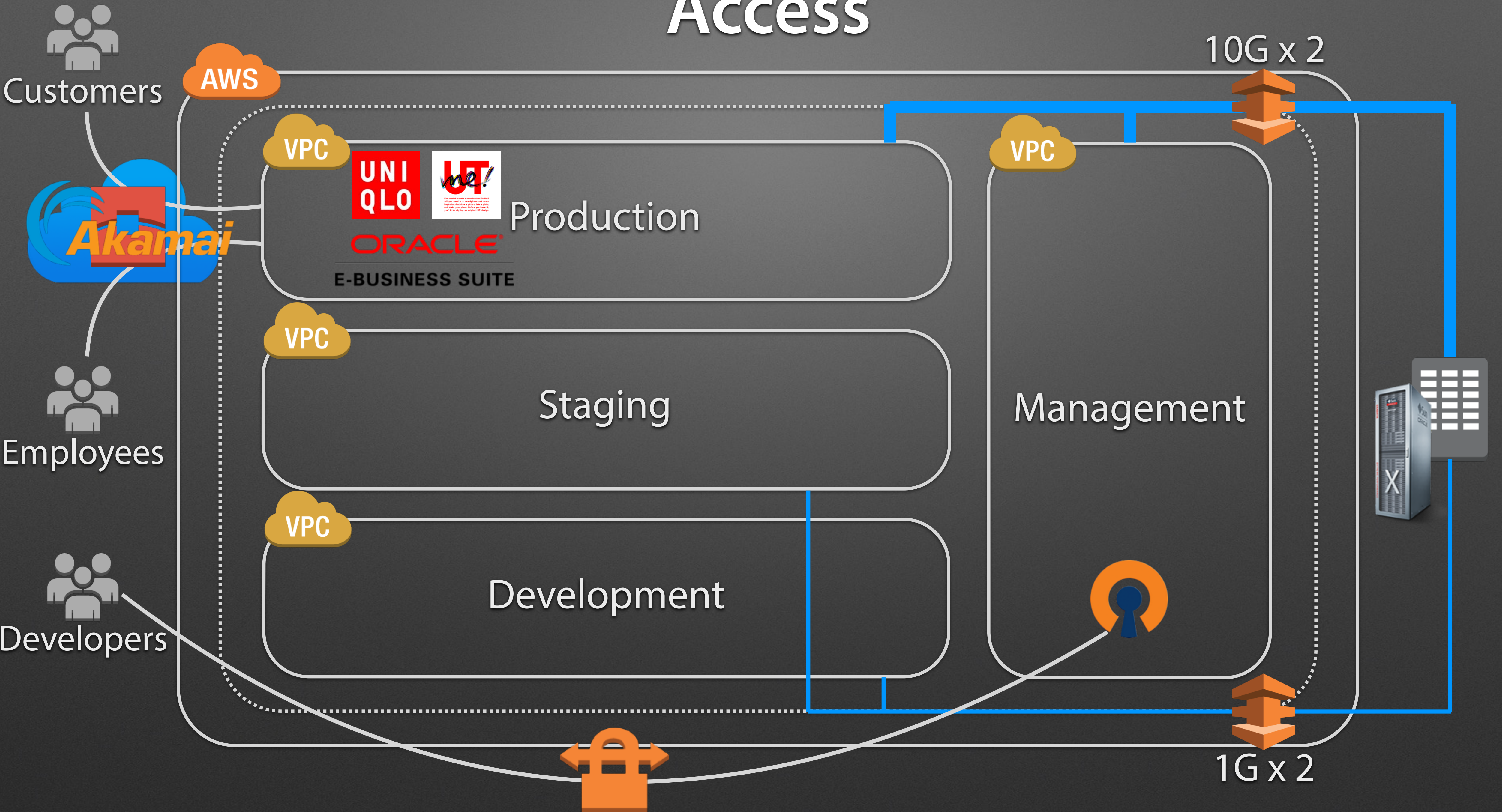


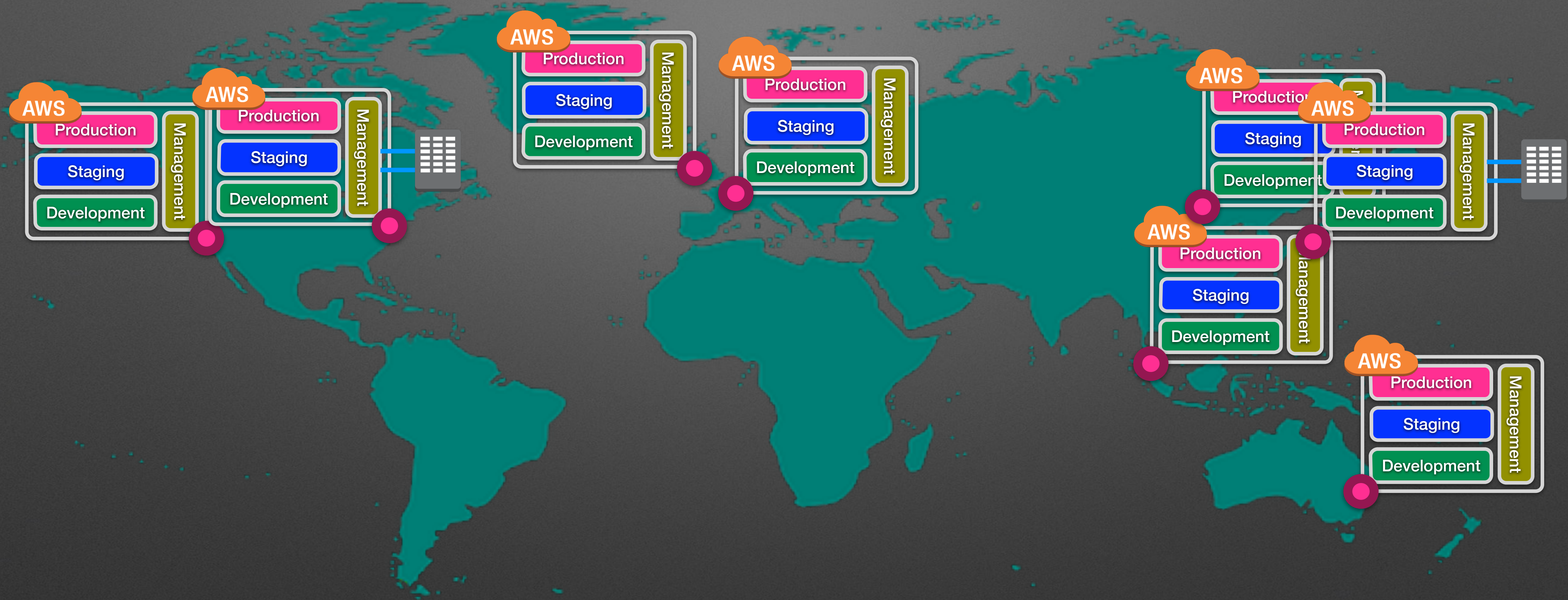
Management VPC Reachable to All VPCs

# Direct Connect

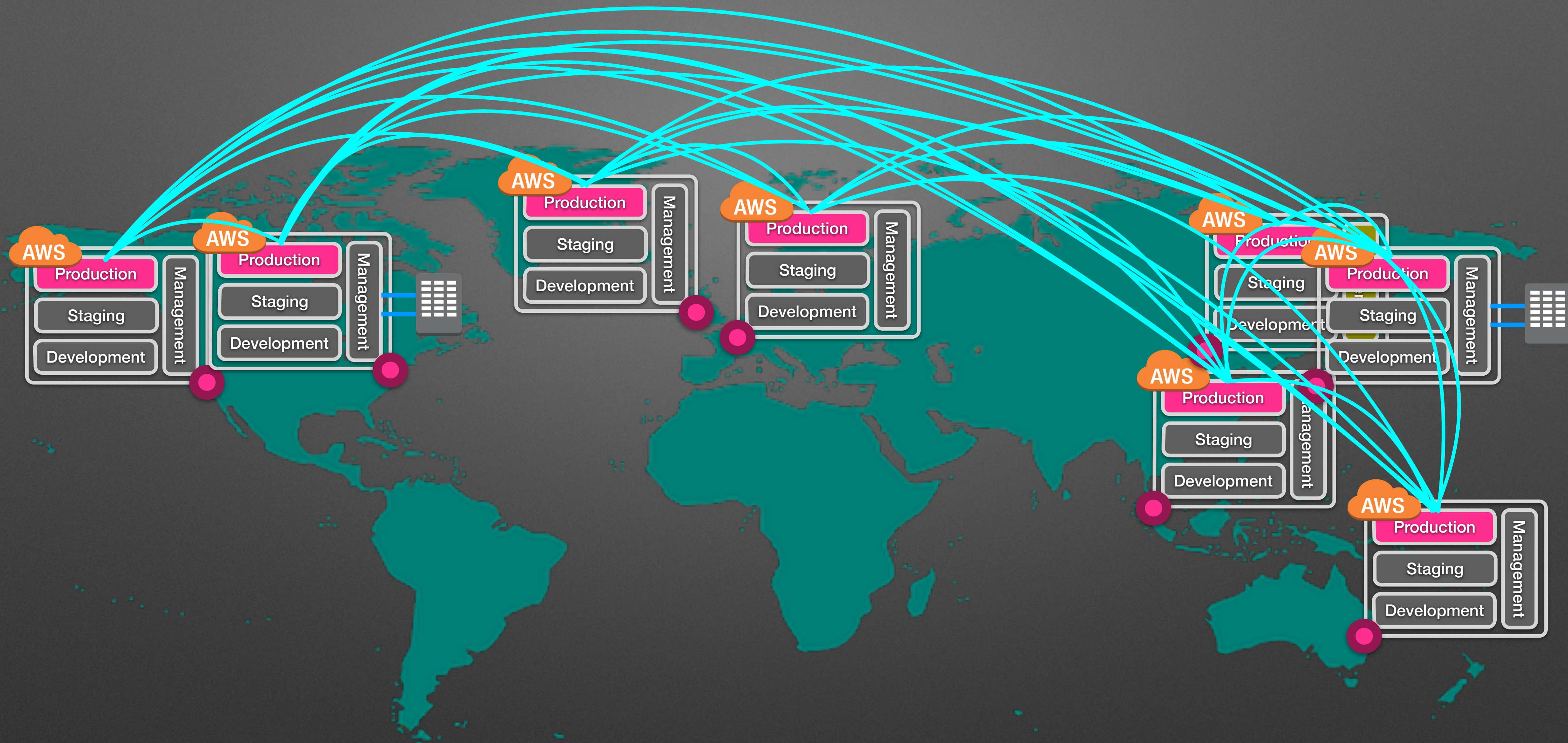


# Access



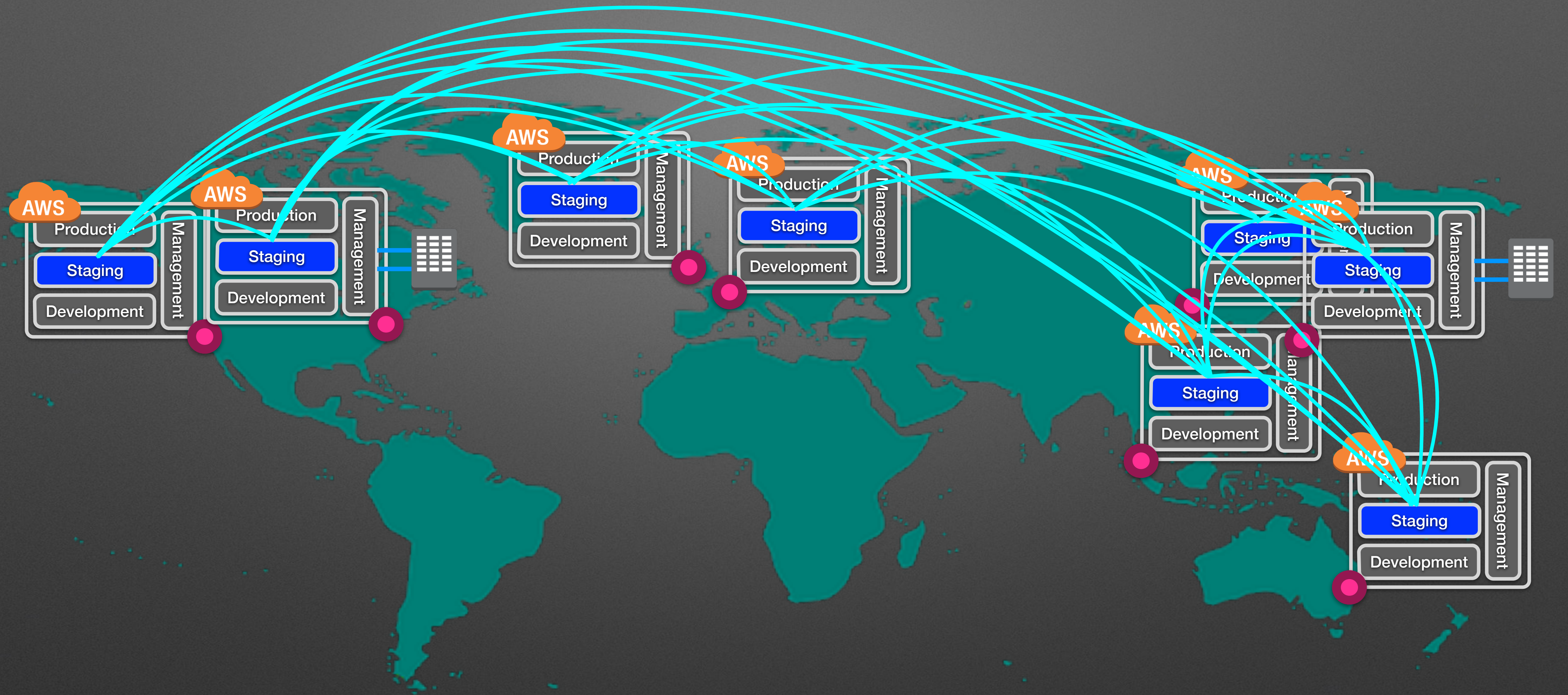


Same VPC Design across Regions

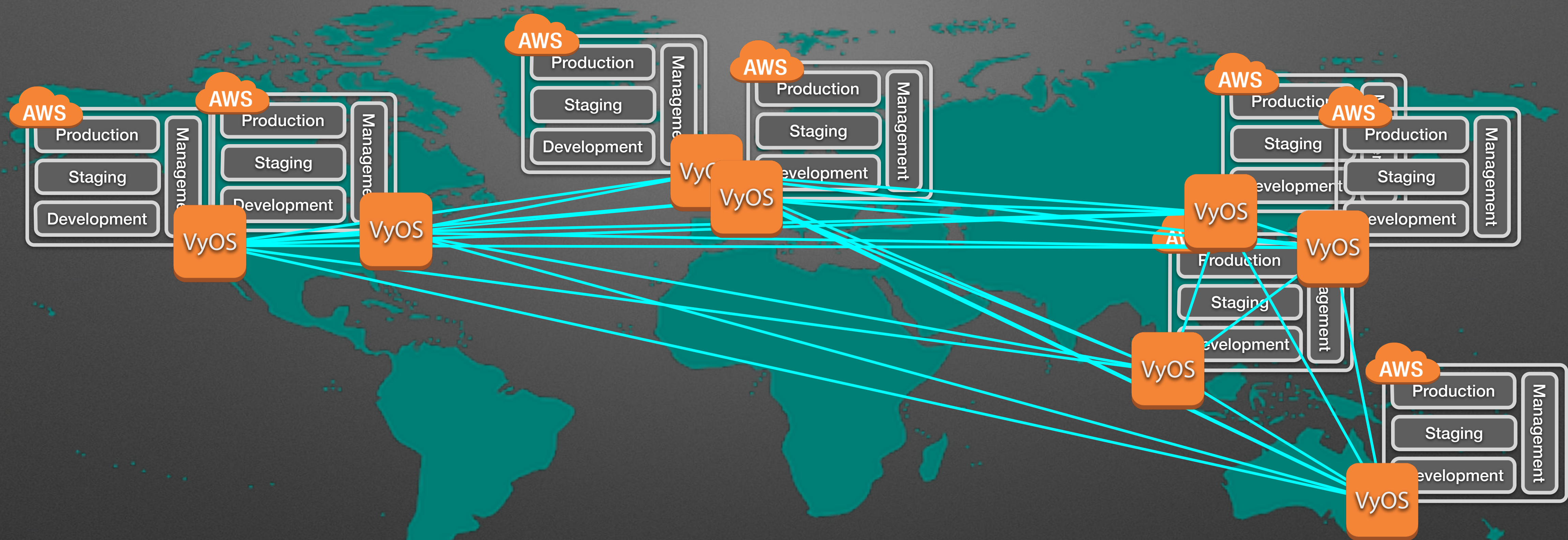


Cross Region VPC Peering

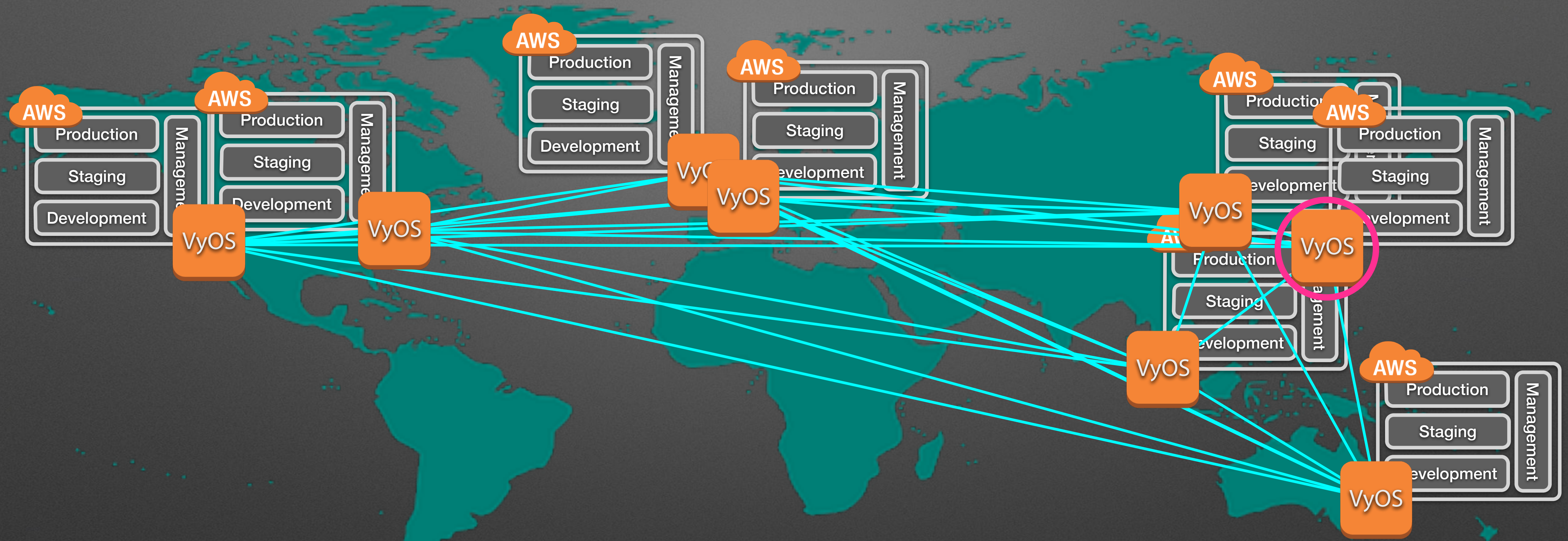




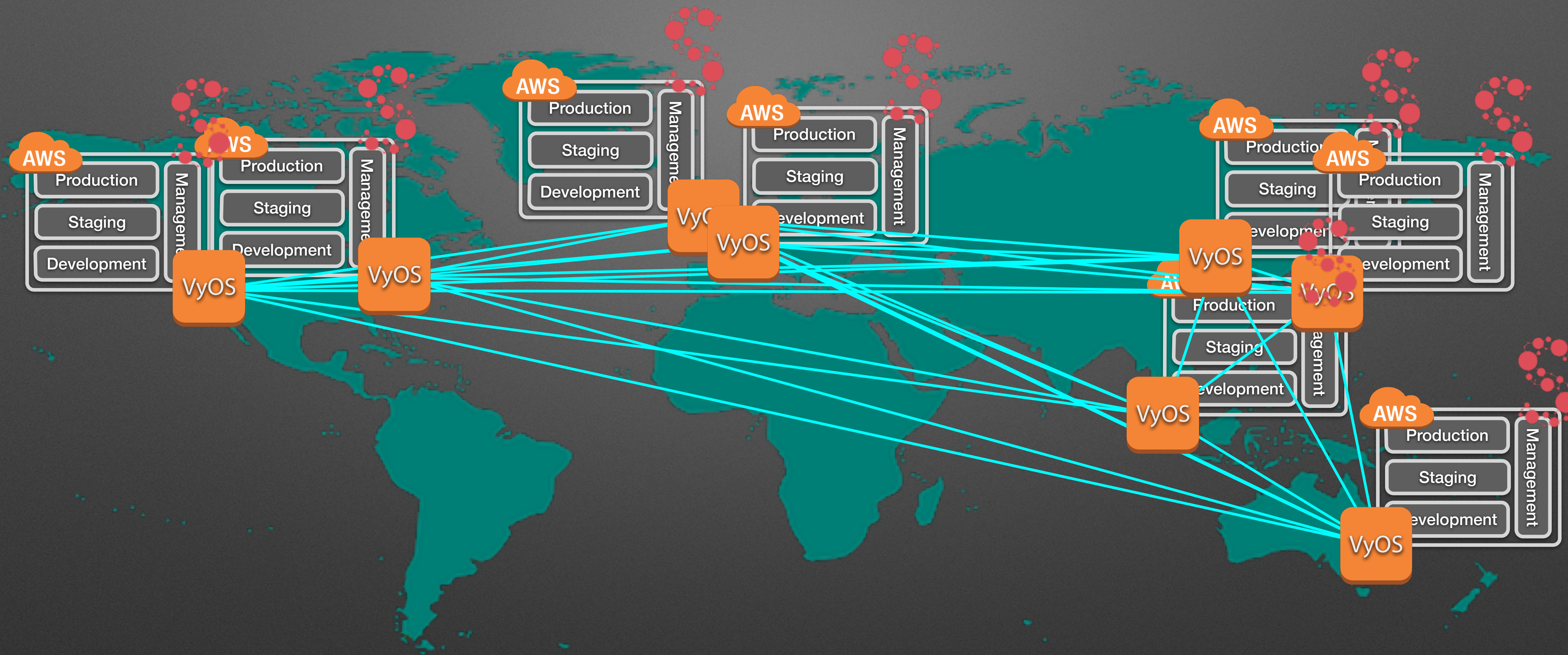
Mesh Topology for High Availability



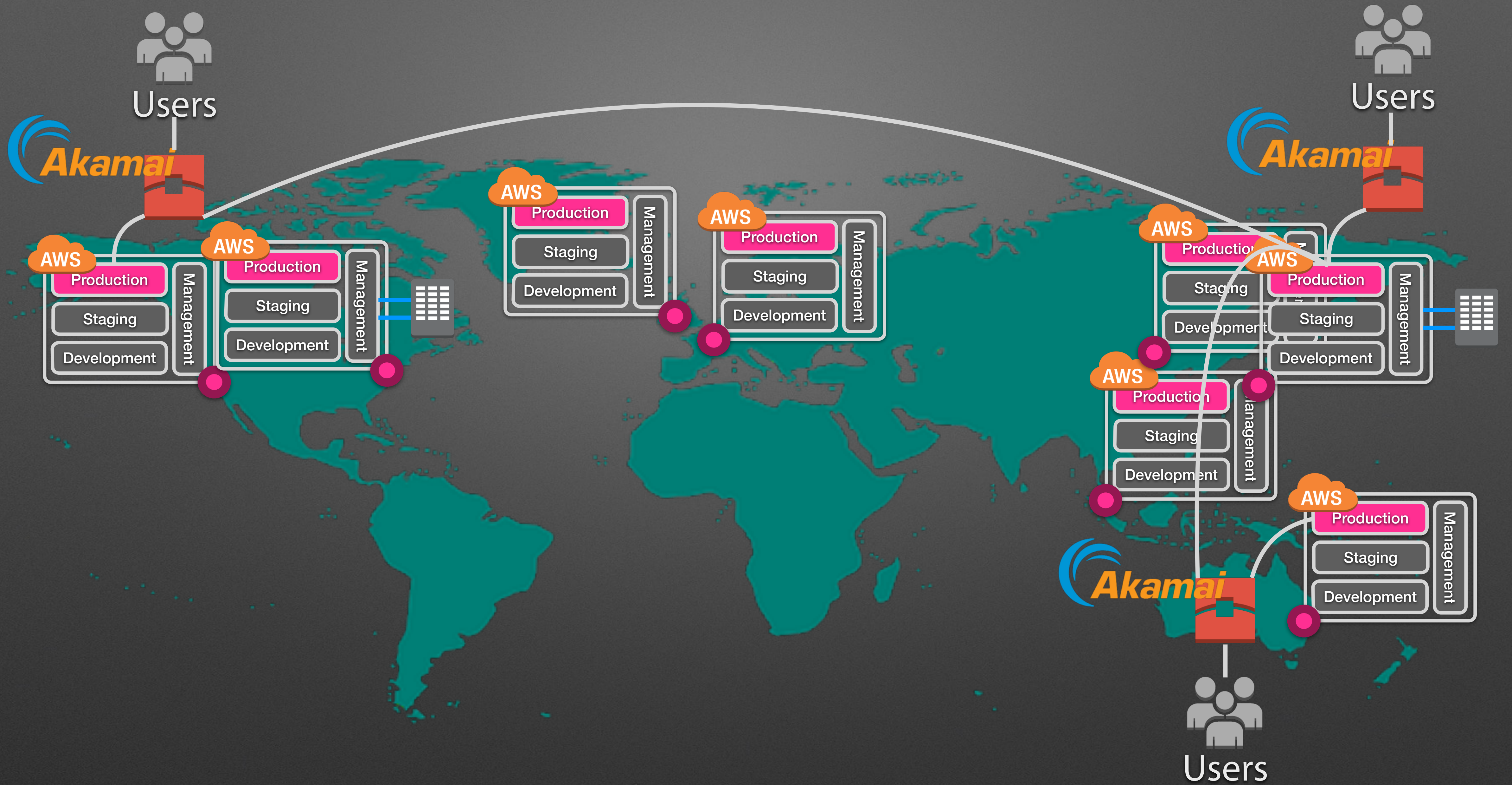
# Cross Region Connection with VyOS



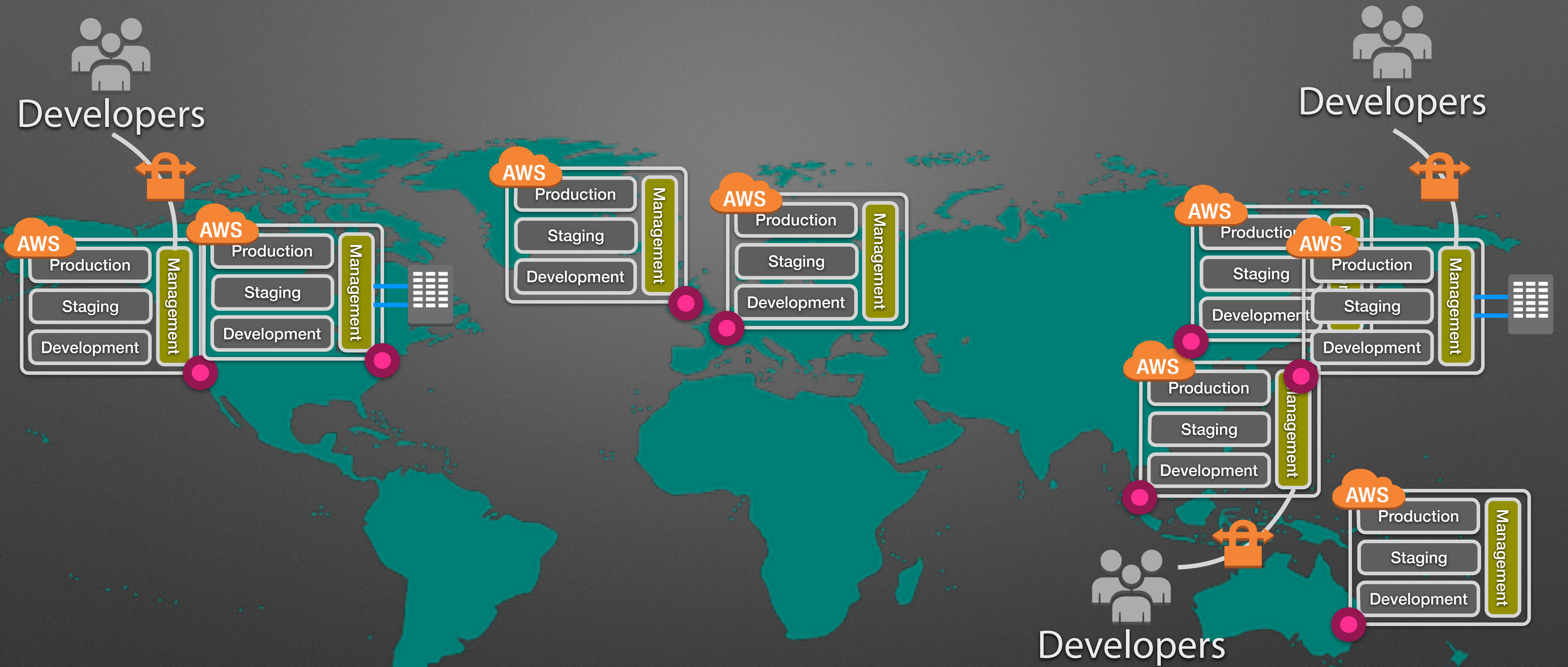
Difficult to Maintain Configuration



# Orchestration for Auto Configuration with Serf

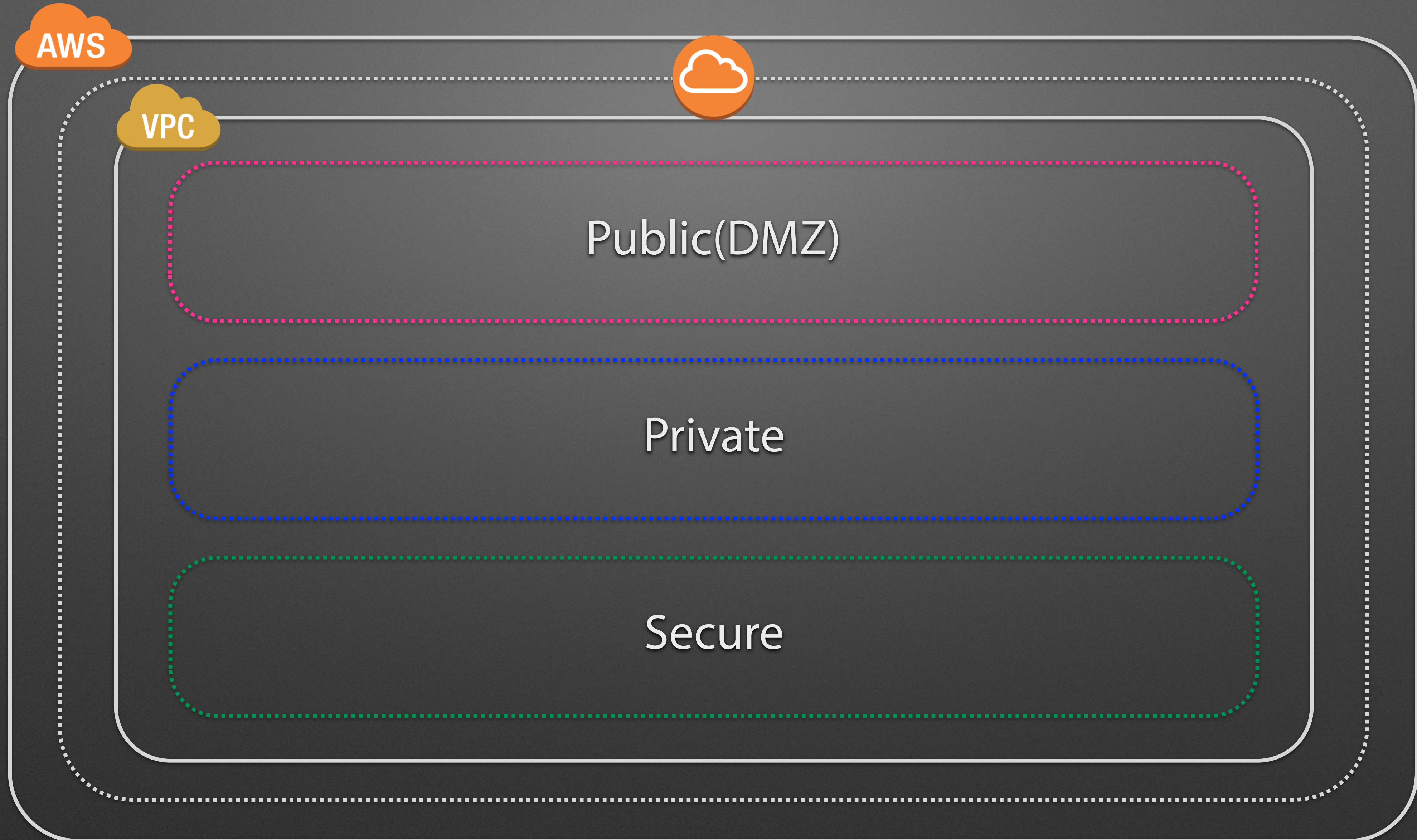


Access from Consumers



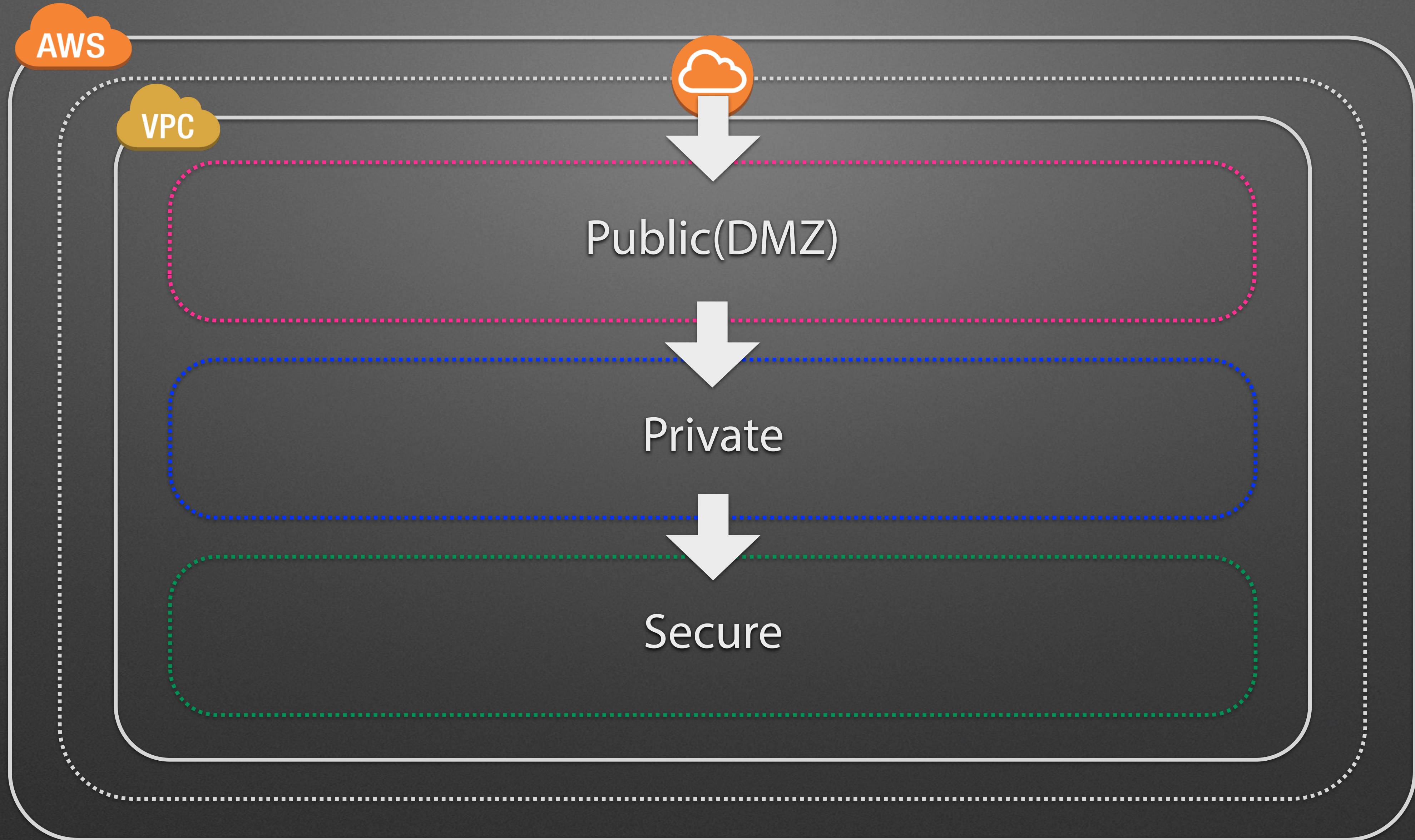
Access from Developers

# VPC



3 Segments in Each VPC

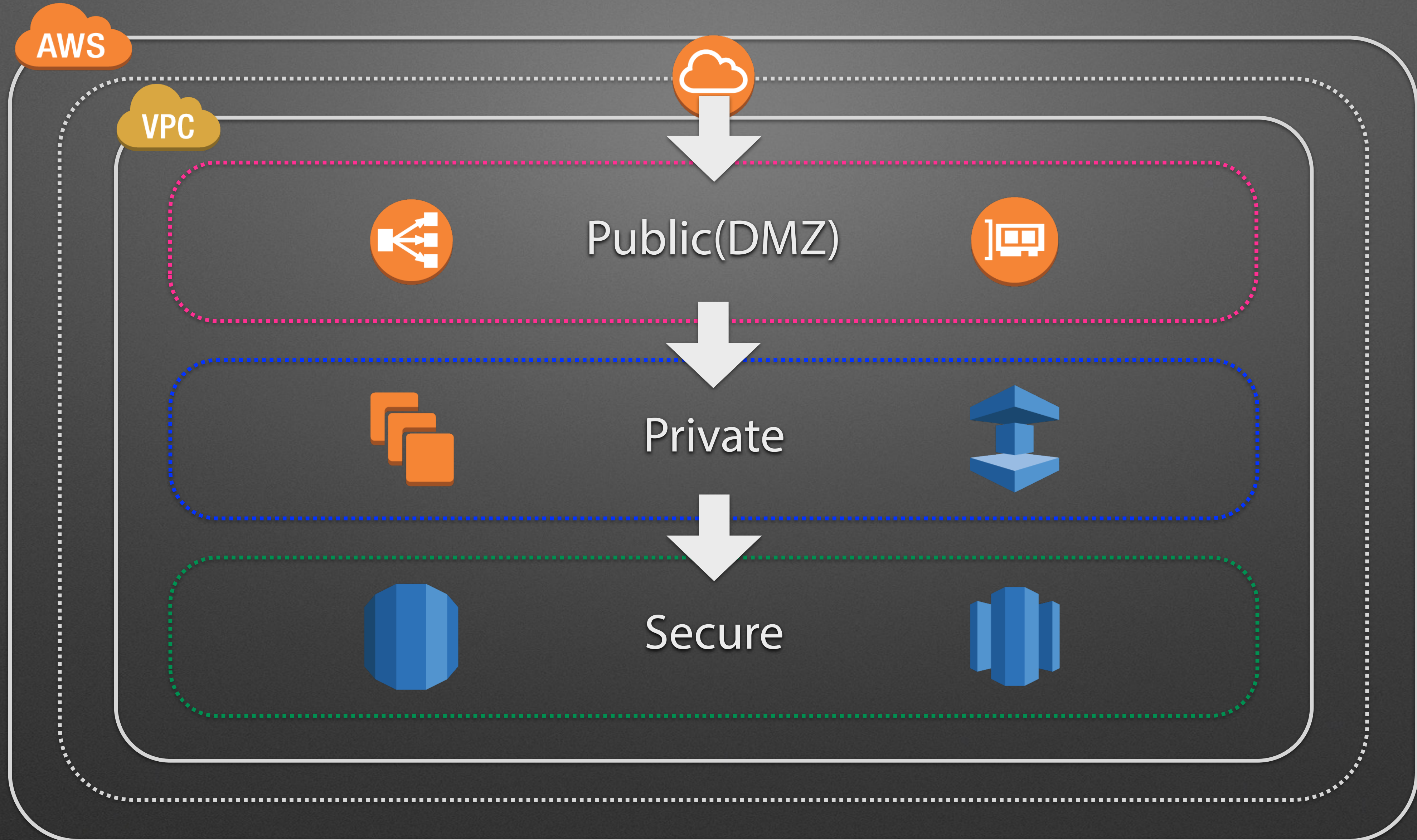
# VPC



Access Control by NACL



# VPC



Hosting in Appropriate Segment

# Agenda

1. *AWS at FR*
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3. *Global Network Design*
4. **Enterprise Cloud Strategy**

# Quick Decision Making for AWS Migration

2014/3:

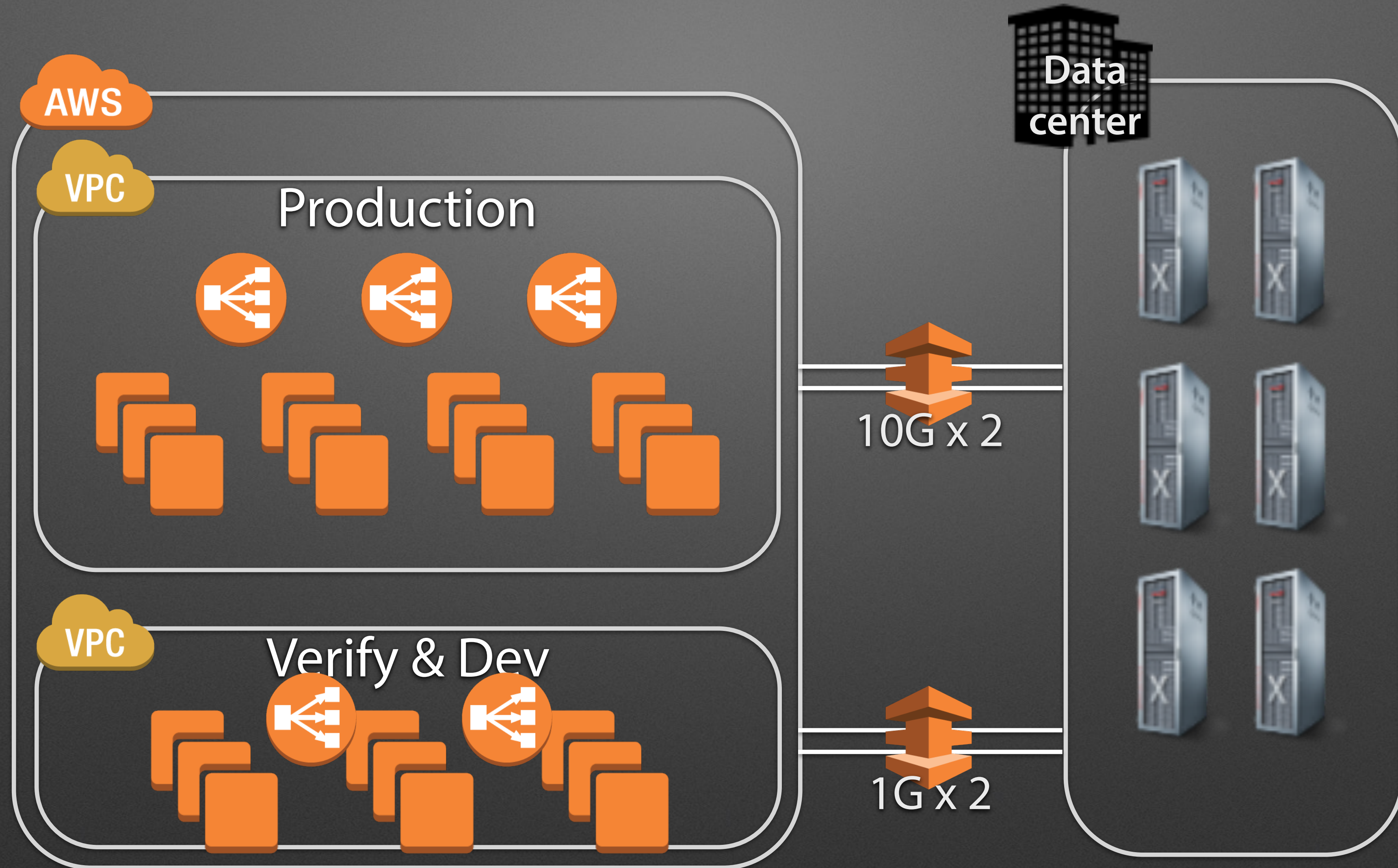


2014/4-10: Verification & Adaptation

2014/11: Director & CIO Approvals

2014/12: CEO Approval

# Current Enterprise AWS Architecture



Paradigm Shift Required -Mindset

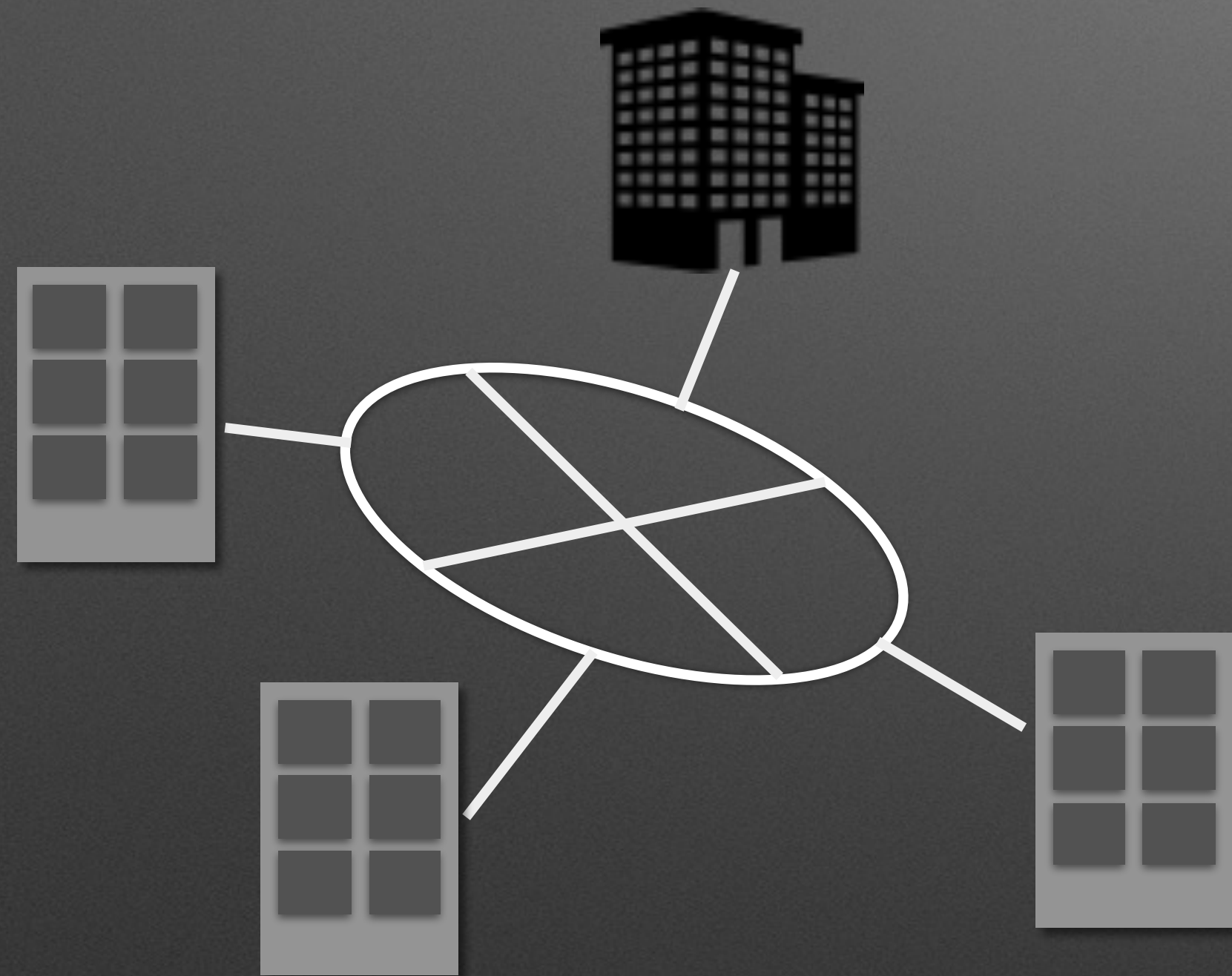
Instance Gets Down

Hardware Crushes

Requirement Changes

# Paradigm Shift Required -Network

WAN-Based

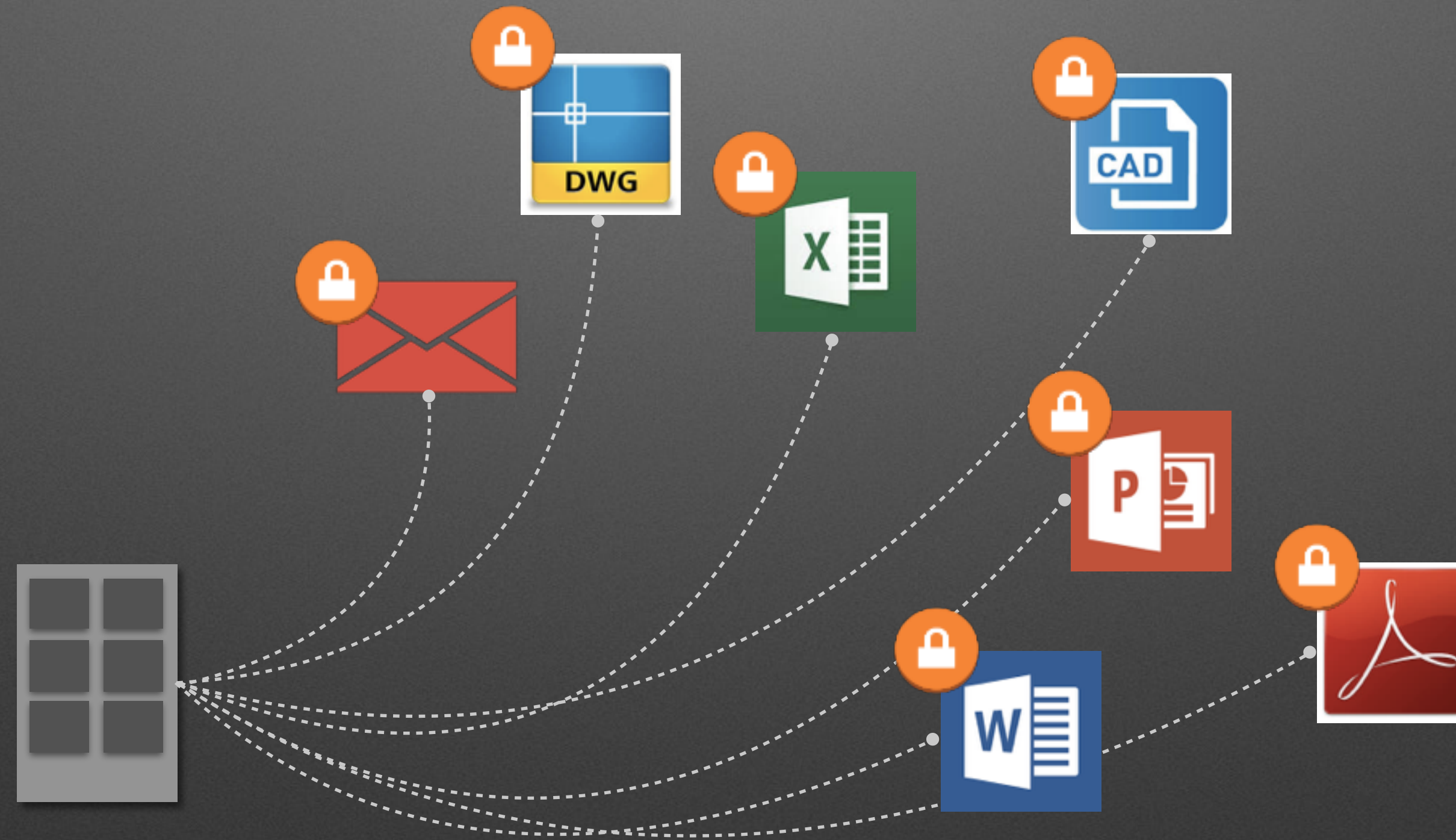


Internet-Based



# Paradigm Shift Required -Security

## Encryption & Rights Management



## Real-Time Monitoring & Treatment

# Fast Retailing IT Team

Direction towards 2020





# Group Revenue

(JPY 100M)

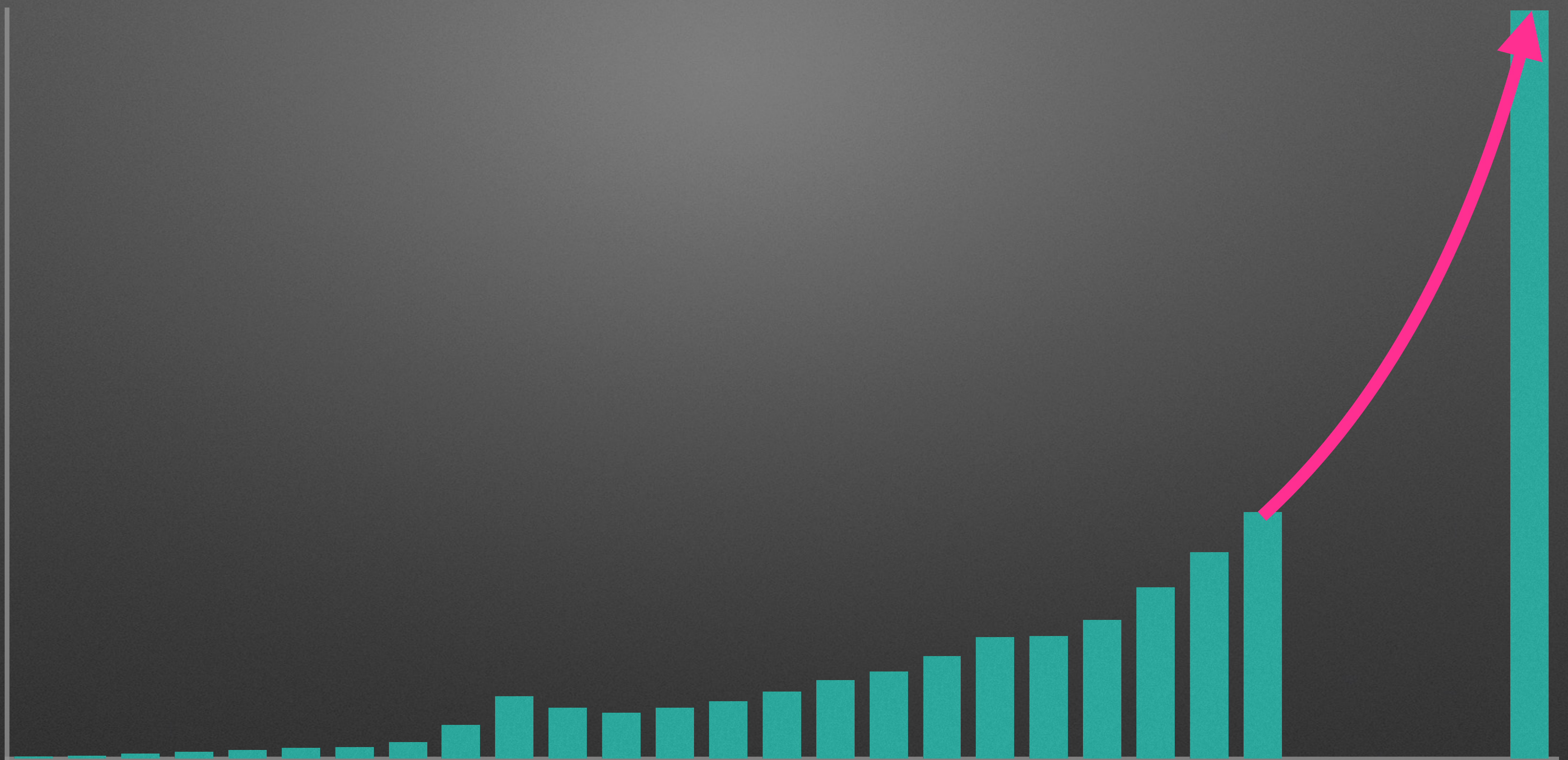
50,000

37,500

25,000

12,500

1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020



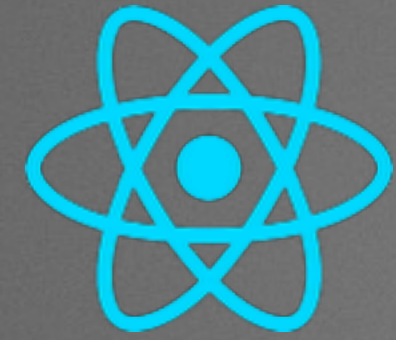
# Disrupt Traditional Enterprise Systems





# In-House Development





NGINX



# Open Source



# Now Hiring!



<http://www.fastretailing.com/employment/career/jp/fr/it/>