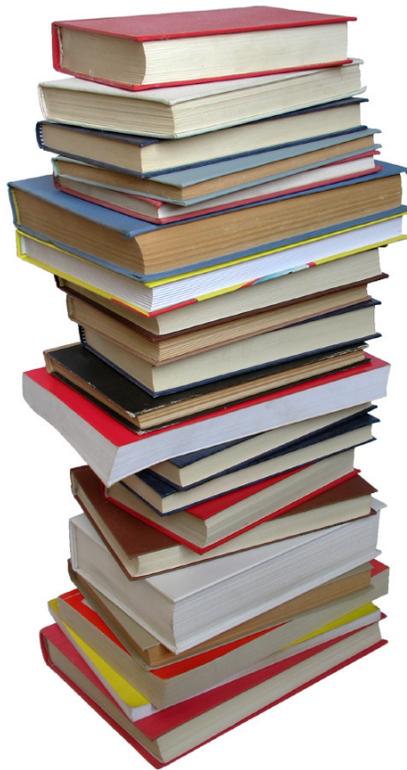


# Enterprise Cloud Computing with AWS

*for internal partner use only*



# How did Amazon Get into Cloud Computing?



# On-Premise Infrastructure is Costly & Complex

Large Capital Expenditures

Underutilized IT Assets

Patching Software

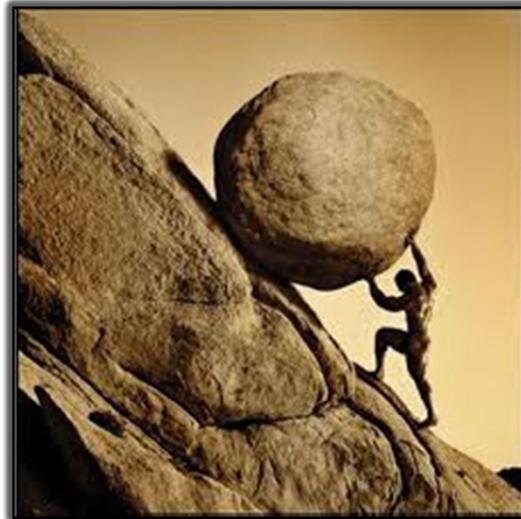
Out of Datacenter Space

Scaling down as needed

Slow IT Deployments

Contract negotiation

Scaling up quickly



Prices too high for IT products

Managing physical growth

“IT spends 80% of its time and resources keeping the lights on”

**Gartner** (\*)

(\*) [Gartner Press Release, 2006](#)

# Cloud Computing Benefits

No Up-Front  
Capital Expense



Low Cost



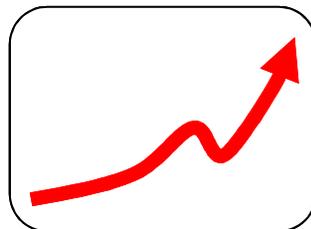
Pay Only for  
What You Use



Self-Service  
Infrastructure



Easily Scale  
Up and Down



Improve Agility &  
Time-to-Market





# No Up-Front Capital Expense

## On-Premise

Physical Space

Cabling

Power

Cooling

Networking

Racks

Servers

Storage

Certification

Labor

## Cloud Computing

**\$0**

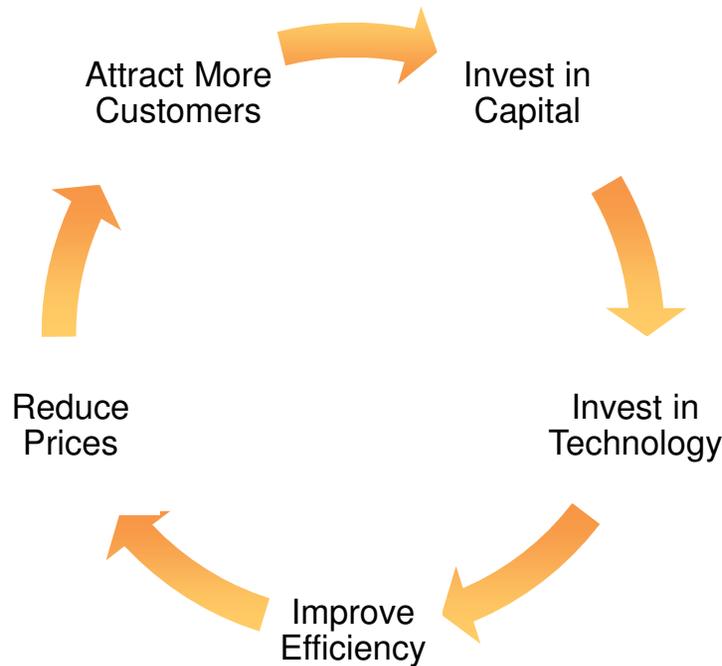
to Get Started



# Low Cost

Scale & Innovation ...

... Drive Costs Down



- Apr 22, 2008: [AWS Lowers Data Transfer Costs](#)
- Oct 09, 2008: [New Tiered Pricing for Amazon S3 Storage](#)
- Jan 28, 2009: [New Lower Pricing Tiers for Amazon CloudFront](#)
- Aug 20, 2009: [New Lower Prices for Amazon EC2 Reserved Instances](#)
- Sep 30, 2009: [New Lower Price for Windows Instances with Auth Services](#)
- Oct 27, 2009: [Announcing Lower Amazon EC2 Instance Pricing](#)
- Dec 08, 2009: [New Lower S3 and EC2 Pricing, Free Inbound Data Transfer](#)
- Feb 01, 2010: [New Lower Pricing for Outbound Data Transfer](#)
- Jun 07, 2010: [Amazon CloudFront Lowers Prices with HTTPS Support](#)
- Sep 01, 2010: [New Lower Prices for High Memory 2x and 4x XL Instances](#)
- Oct 05, 2010: [Lower High Memory DB Instance Prices for Amazon RDS](#)
- Nov 01, 2010: [Amazon S3 Reduces Storage Pricing](#)
- Jan 06, 2011: [New Plans, Lower Pricing in AWS Premium Support](#)
- May 18, 2011: [New Lower Prices for Amazon CloudWatch Monitoring](#)
- June 1, 2011: [Free Inbound Data Transfer and Lower Outbound Tiers](#)

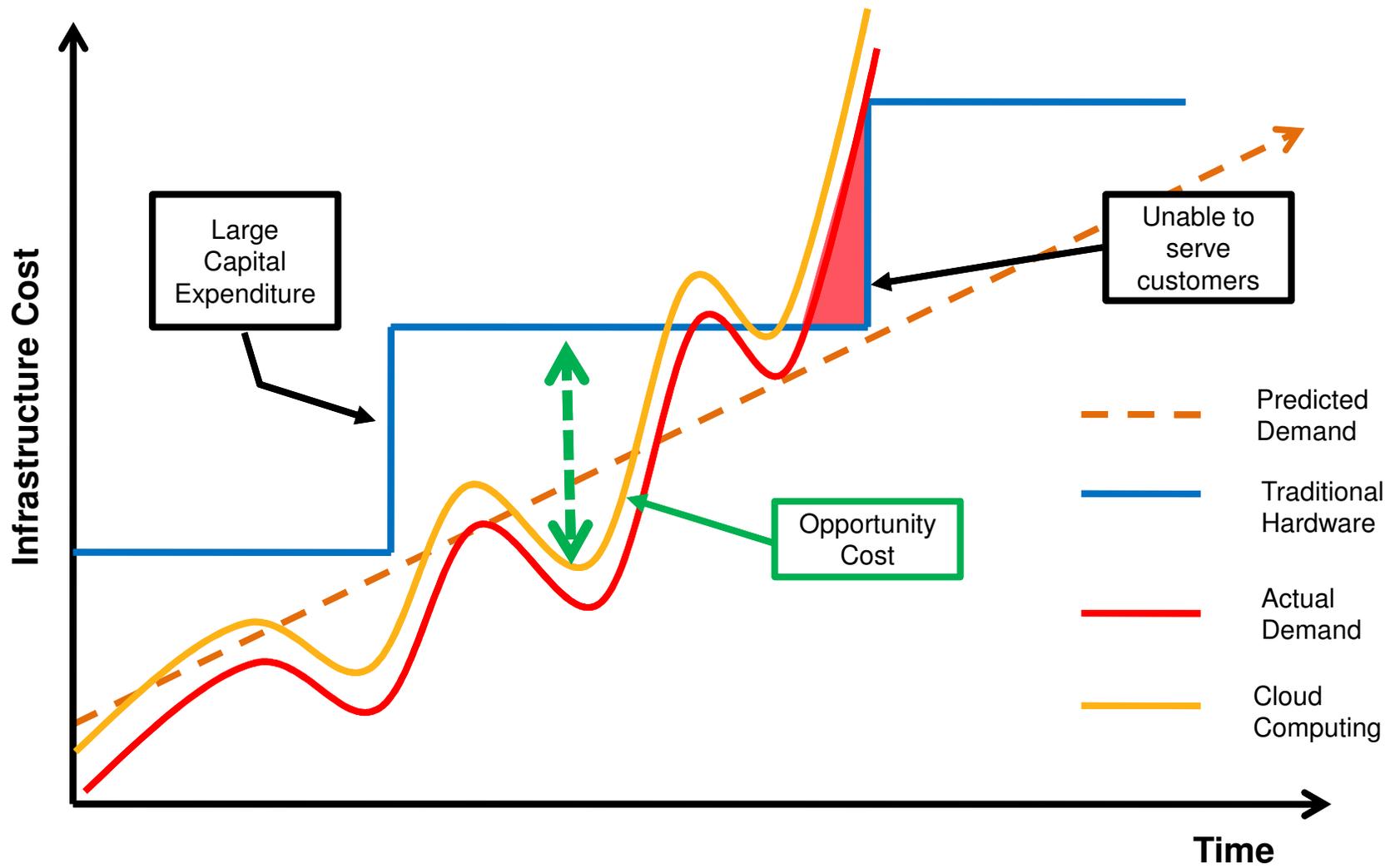
“TCO savings inherent in a cloud provider’s environment relative to that of a tradition enterprise datacenter may be as high as 60%.”

**Morgan Stanley Research<sup>(\*)</sup>**

(\*) [Cloud Computing Takes Off, 2011](#)



# Pay Only for What You Use

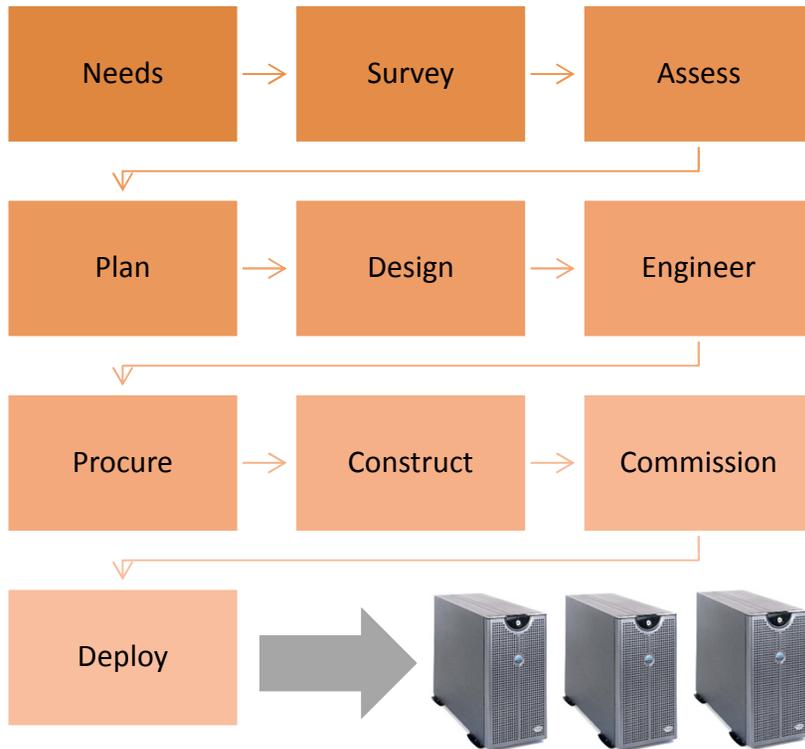




# Self-Service Infrastructure

## On-Premise

Build new environments can be complex and slow



Source: PTS Data Center Solutions

## Cloud Computing

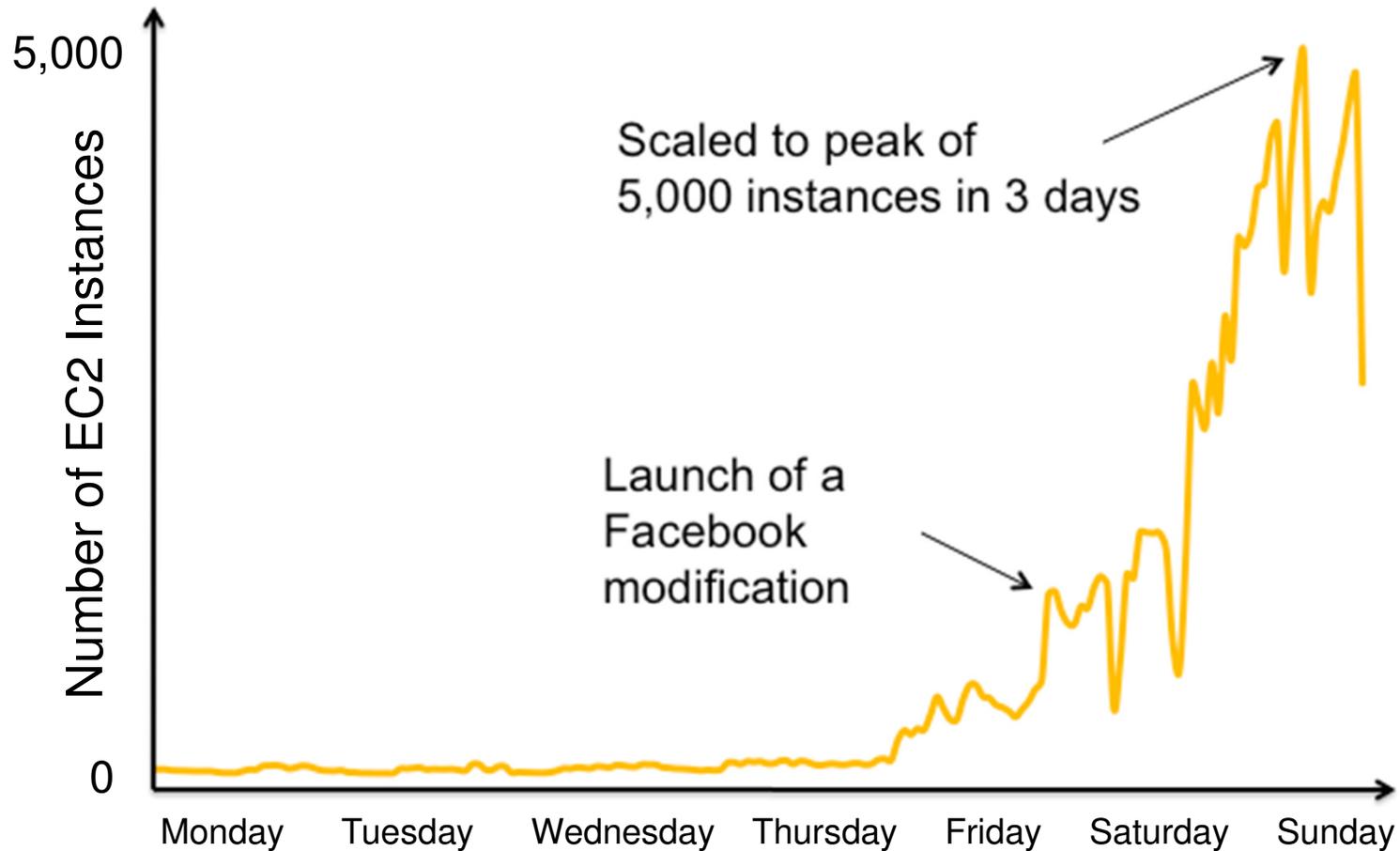
New infrastructure is always a few clicks away

-  New Development Environment
-  New Test Environment
-  New Environment in Japan
-  Add 1,000 Servers
-  Remove 1,000 Servers



# Easily Scale Up and Down

**Internet Video App on Amazon EC2 (\*)**  
From 50 to 5,000 servers in 3 days



(\*) [Amazon.com CEO Jeff Bezos on Animoto, The Animonot Blog, 2008](#)



## Improve Agility & Time to Market

### Respond faster to internal & external demand

“AWS made it possible for our project to happen at the speed of breaking news.”

washingtonpost.com

### Focus resources on innovation & business growth

“We finished our first client project in 6 weeks with no upfront investment, no hardware purchases and no additional staff.”

razorfish™

### Say “yes” more often to the business

“We were able to leverage the infrastructure created by AWS and decrease our time-to-market threefold.”

NASDAQ®

# Cloud Computing is More Than Just Virtualization

	Cloud Computing	On-Premise Virtualization
No Up-Front Capital Expense	✓	✗
Low Cost	✓	✗
Pay Only for What You Use	✓	✗
Self-Service Infrastructure	✓	✓
Easily Scale Up and Down	✓	✗
Improve Agility & Time-to-Market	✓	✗

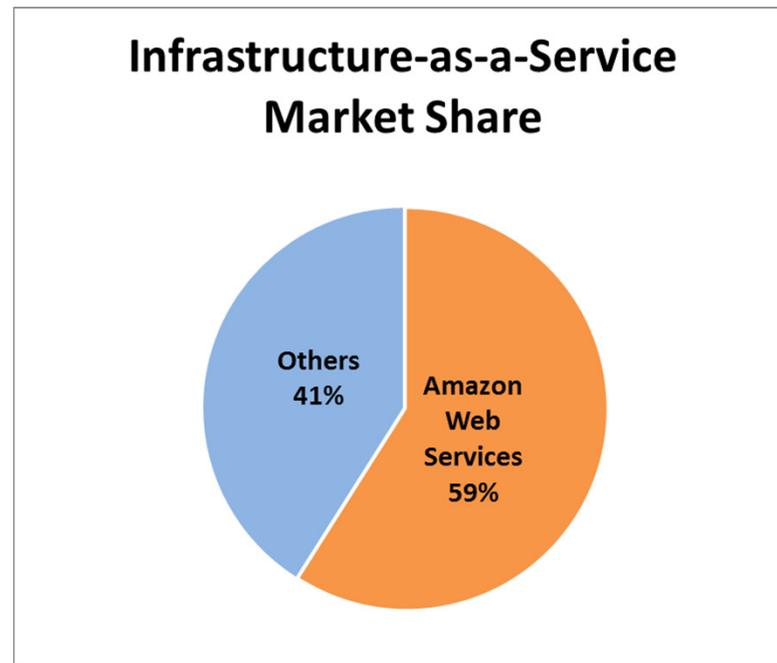
# AWS Adoption

“AWS is the market share leader, and a thought leader.”

**Gartner** (\*)

“In terms of market share, AWS is Coke and there isn't yet a Pepsi.”

**The 451 Group** (\*\*)



**The 451 Group** (\*\*)

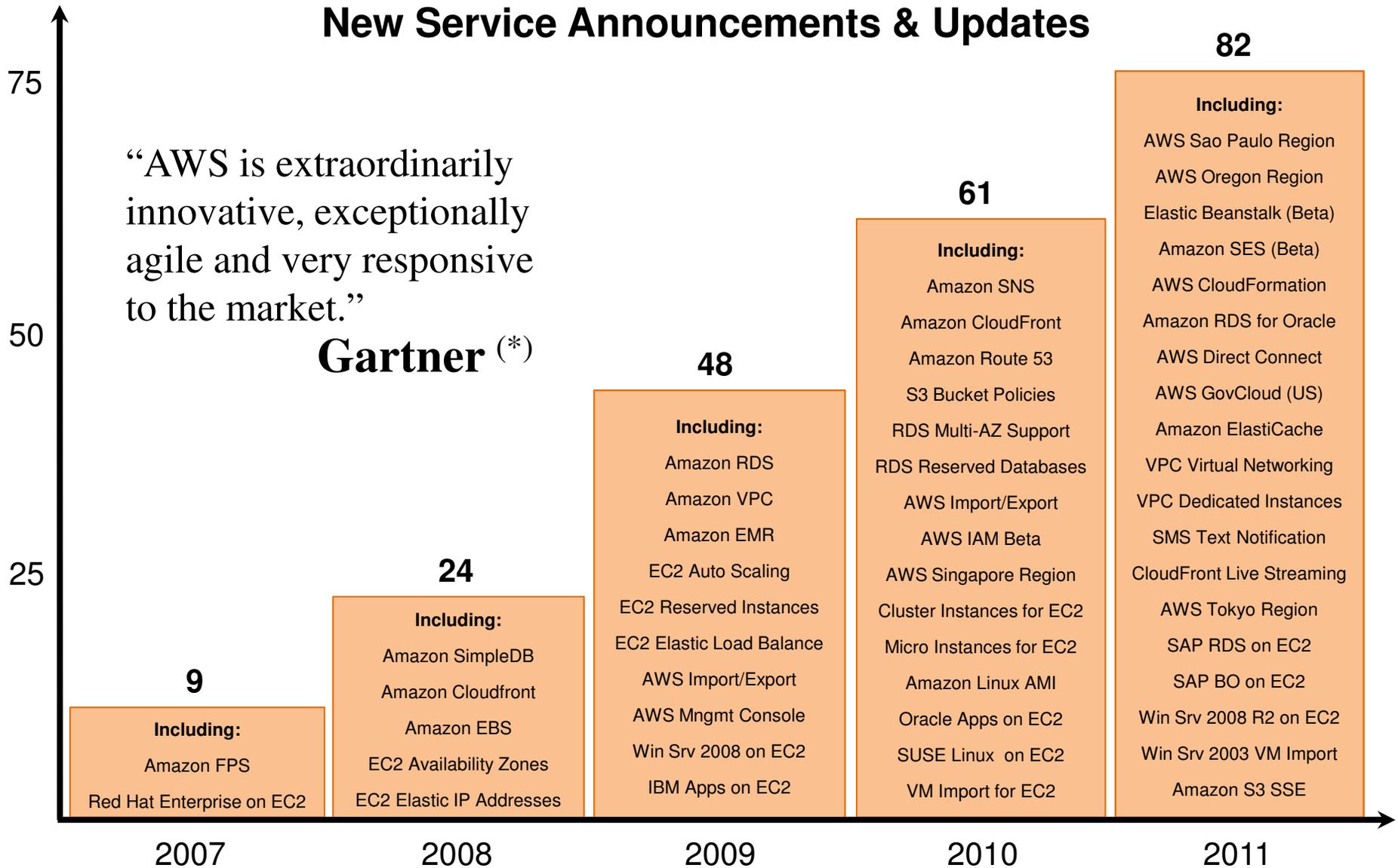
(\*) Gartner Magic Quadrant for Public Cloud Infrastructure as a Service, 2011

(\*\*) [The Wall Street Journal, Meet the Rainmakers, 2011](#)

# Hundreds of Thousands of Customers in 190 Countries



# AWS Pace of Innovation



(\*) Gartner Magic Quadrant for Public Cloud Infrastructure as a Service, 2011

# Large Partner Ecosystem

## System Integrators



## Independent Software Vendors



# AWS is Open and Flexible

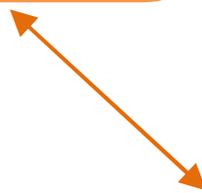
Operating Systems



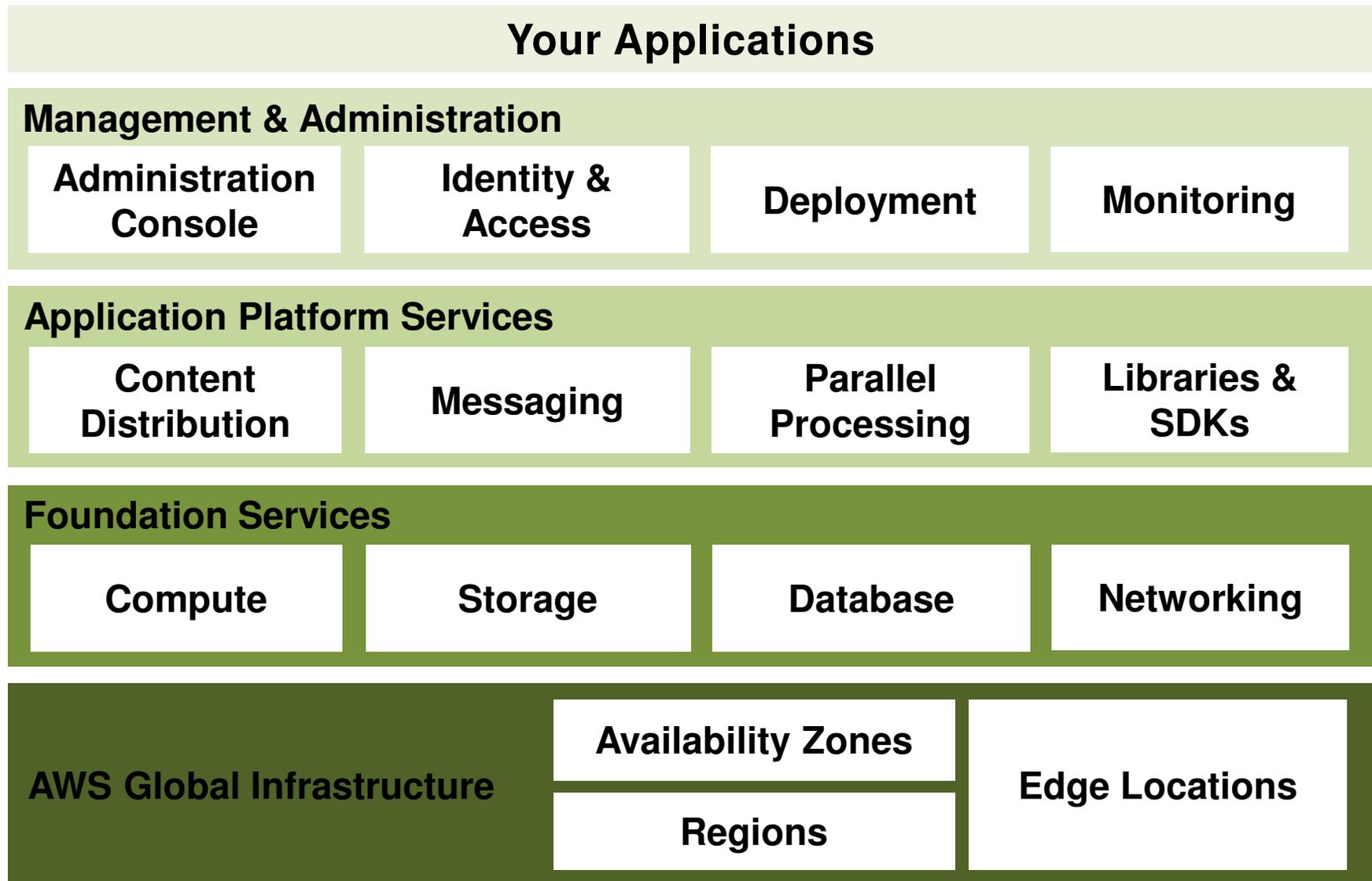
Languages & Libraries



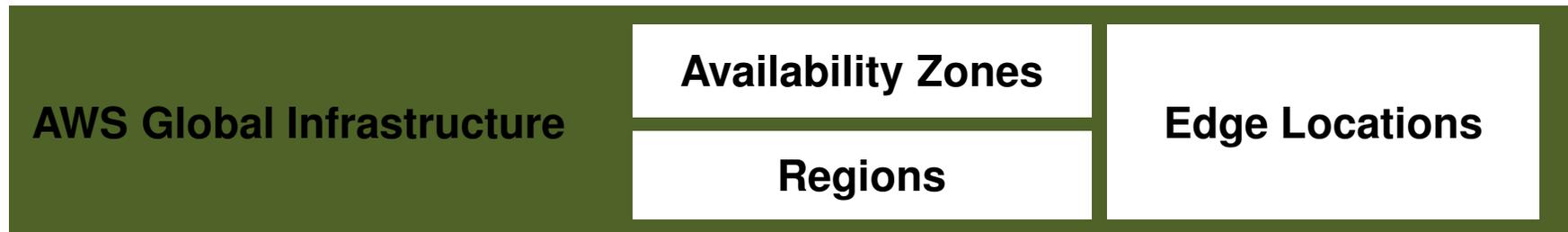
Certified Applications



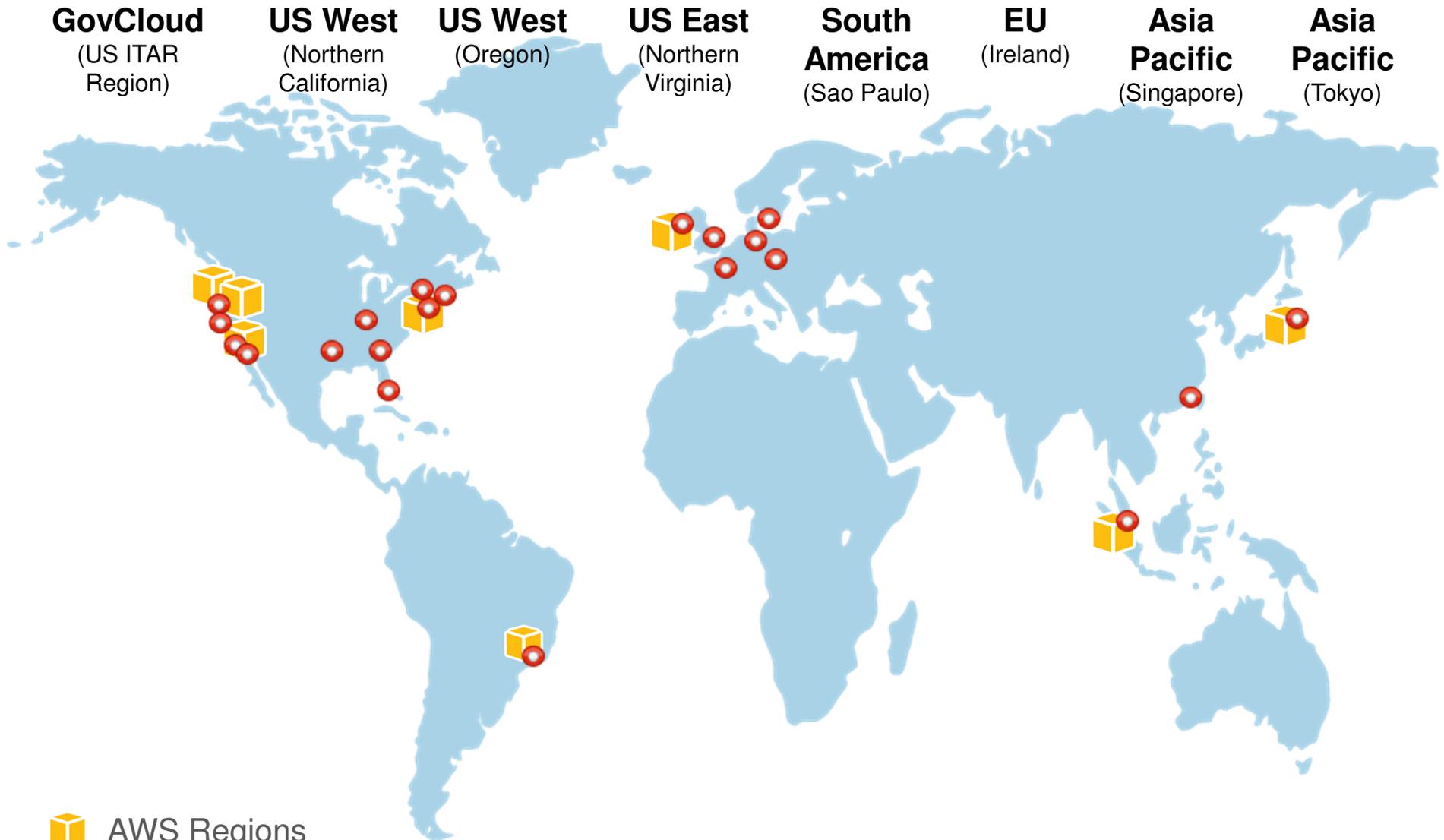
# AWS Platform



# AWS Global Infrastructure



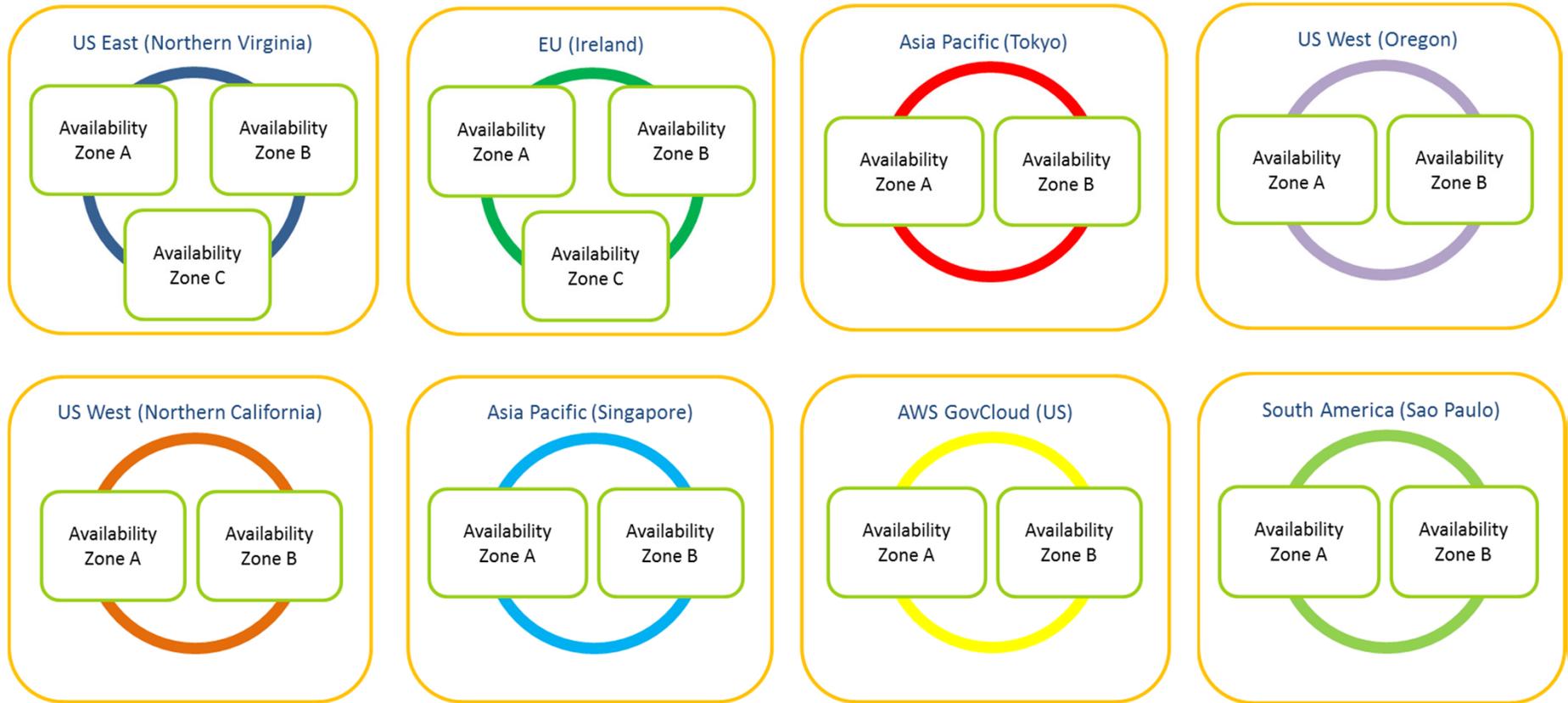
# Global Infrastructure for Global Enterprises



 AWS Regions

 AWS Edge Locations

# AWS Regions and Availability Zones



Customer Decides Where Applications and Data Reside

# Built for Enterprise Security Standards

## Certifications

SOC 1 Type 2  
(formerly SAS-70)

ISO 27001

PCI DSS for EC2,  
S3, EBS, VPC, RDS,  
ELB, IAM

FISMA Moderate  
Compliant Controls

HIPAA & ITAR  
Compliant  
Architecture

## Physical Security

Datacenters in  
nondescript facilities

Physical access  
strictly controlled

Must pass two-factor  
authentication at  
least twice for floor  
access

Physical access  
logged and audited

## HW, SW, Network

Systematic change  
management

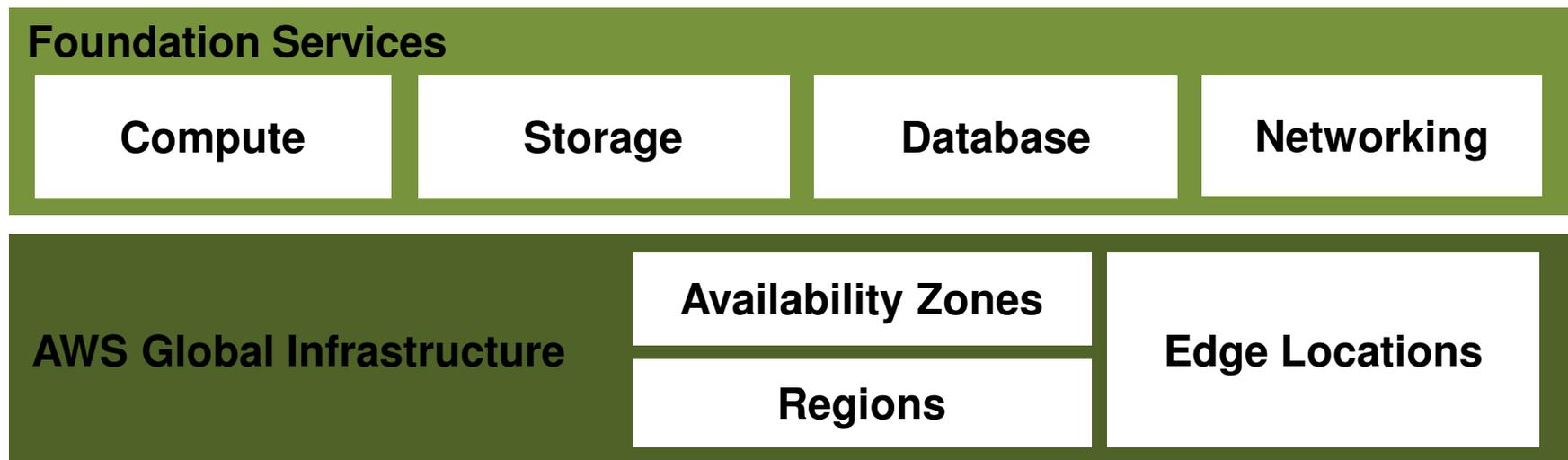
Phased updates  
deployment

Safe storage  
decommission

Automated  
monitoring and self-  
audit

Advanced network  
protection

# AWS Foundation Services



# Compute & Storage Services

## **Amazon EC2**

Virtual Servers in the Cloud  
Your Choice of Linux and Windows  
Easy to Scale Up and Down

## **Amazon EBS**

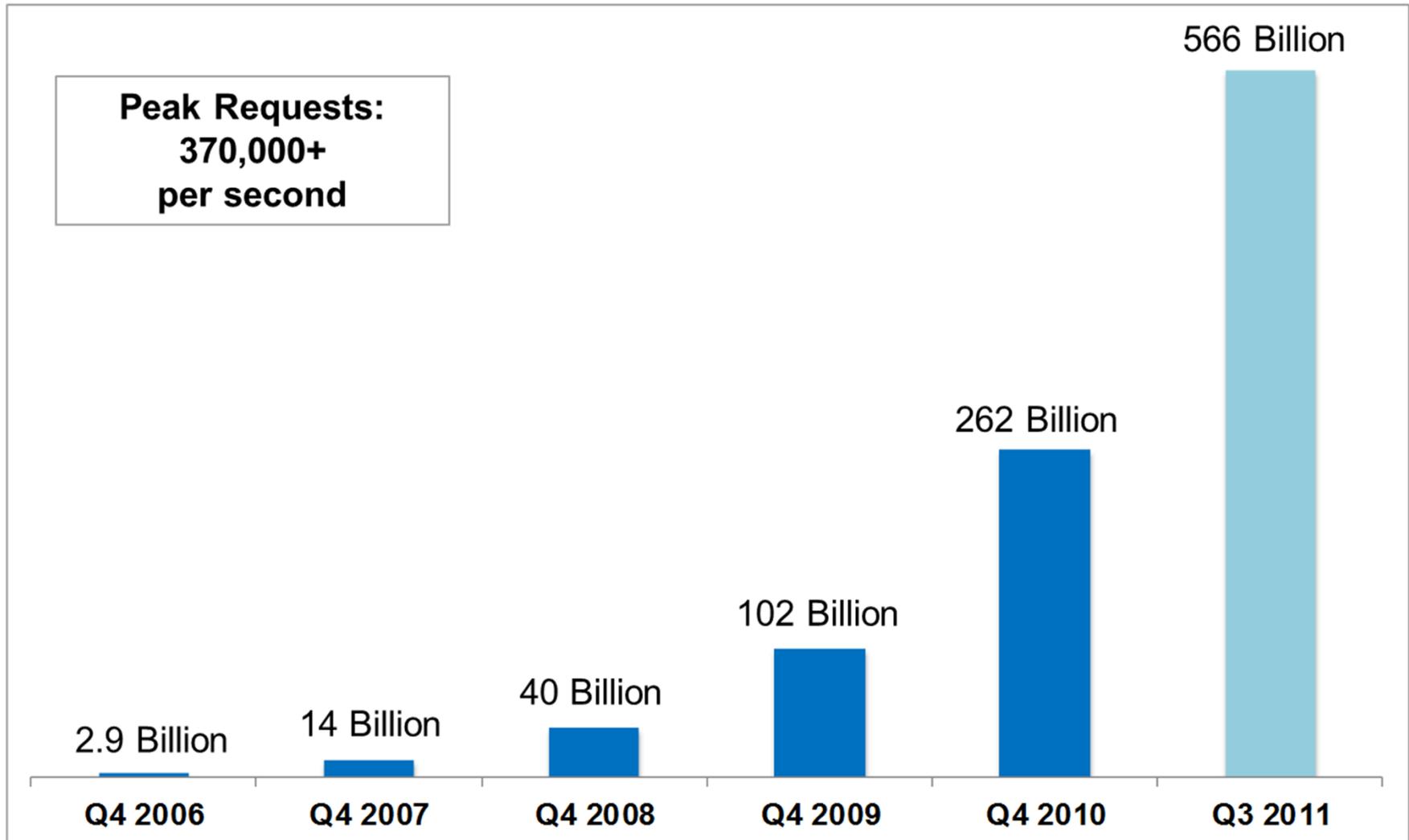
Hard Drive for Virtual Servers on EC2  
Designed for High-Performance  
You can Mount a Drive or Boot from EBS

## **Amazon S3**

High-Volume Storage in the Cloud  
Designed for Durability and Scalability  
Number of Objects You can Store is Unlimited

# Storage: Scale of Amazon S3

Total Number of Objects Stored in Amazon S3



# Database Options

## Self-Managed



### **Database Server on Amazon EC2**

Your choice of  
database running on  
Amazon EC2

Bring Your Own  
License (BYOL)

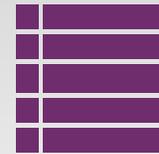
## Managed Databases



### **Amazon Relational Database Service (RDS)**

Oracle or MySQL offered  
as a service

Flexible Licensing: BYOL  
or License Included



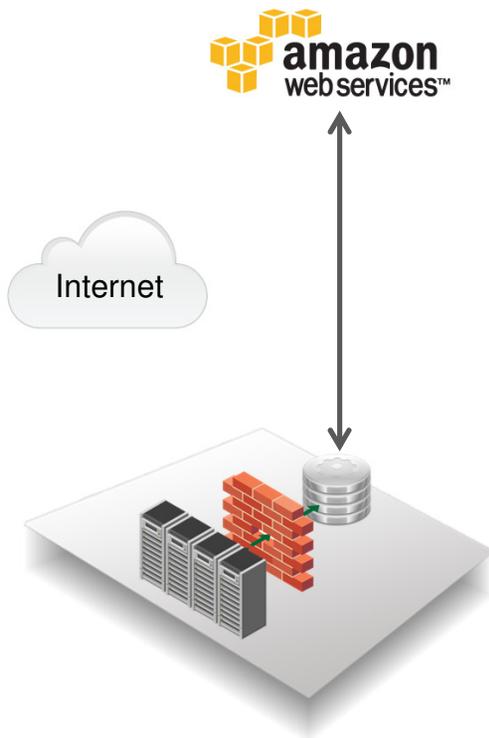
### **Amazon SimpleDB NoSQL Database**

Non-relational model;  
indices and queries

Zero admin overhead

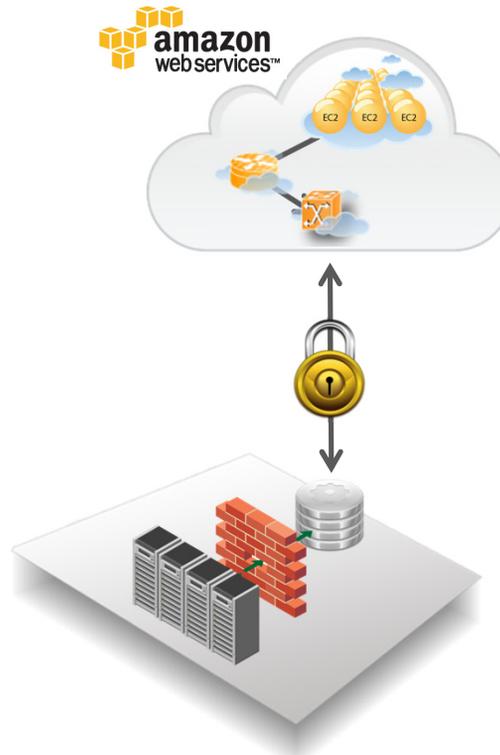
# Networking & Security

## AWS Direct Connect



Dedicated connection  
between your  
datacenter and AWS

## Amazon Virtual Private Cloud (VPC)



Private VPN  
connection to your  
AWS resources

## Dedicated Instances

Single Tenant  
Compute Instance



Amazon EC2  
resources running on  
private hardware

# AWS Application Platform Services

## Application Platform Services

**Content  
Distribution**

**Messaging**

**Parallel  
Processing**

**Libraries &  
SDKs**

## Foundation Services

**Compute**

**Storage**

**Database**

**Networking**

**AWS Global Infrastructure**

**Availability Zones**

**Regions**

**Edge Locations**

# Content Distribution: Amazon CloudFront

Global content delivery network

21 edge locations across the globe

Self-service sign up, easy administration

Built using Amazon.com's highly reliable infrastructure



## Use Cases

- Video and Rich Media
- Online Gaming
- Interactive Agencies
- Software Downloads
- Static Websites

## Key Features

- RTMP Streaming
- HTTPS Delivery
- Private Content for HTTP & Streaming
- Programmatic Invalidation
- Detailed Logs for HTTP & Streaming
- Default Root Object

# Higher-Level Services

## Messaging

### Amazon Simple Queue Service

Reliable and highly scalable message queue for cloud applications

### Amazon Simple Notification Service

Push notifications from the cloud to subscribers or client applications

### Amazon Simple Email Service

Send bulk and transactional emails in a quick and cost-effective manner

## Parallel Processing

### Amazon Elastic MapReduce

Allows customers to easily and cost-effectively process vast amounts of data utilizing a Hadoop framework running Amazon EC2 instances

## Libraries & SDKs

### Developer Centers

Your choice of programming language (Java, PHP, Python, Ruby, .NET) and mobile platform (Android, iOS)

# AWS Management & Administration

## Management & Administration

**Administration  
Console**

**Identity &  
Access**

**Deployment**

**Monitoring**

## Application Platform Services

**Content  
Distribution**

**Messaging**

**Parallel  
Processing**

**Libraries &  
SDKs**

## Foundation Services

**Compute**

**Storage**

**Database**

**Networking**

**AWS Global Infrastructure**

**Availability Zones**

**Regions**

**Edge Locations**

# AWS Management Console

One-stop shop to manage your AWS services

**AWS Management Console** > Amazon EC2 Jeff @ AWS | Help

Navigation: Region: US East (Virginia)

- EC2 Dashboard
- Scheduled Events
- INSTANCES
  - Instances
  - Spot Requests
  - Reserved Instances
- IMAGES
  - AMIs
  - Bundle Tasks
- ELASTIC BLOCK STORE
  - Volumes
  - Snapshots
- NETWORK & SECURITY
  - Security Groups
  - Elastic IPs
  - Placement Groups
  - Load Balancers
  - Key Pairs

### Amazon EC2 Console Dashboard

#### Getting Started

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

[Launch Instance](#)

Note: Your instances will launch in the US East (Virginia) region.

#### Service Health

Service Status

Current Status	Details
<span style="color: green;">✔</span> Amazon EC2 (US East - N. Virginia)	Service is operating normally

[View complete service health details](#)

#### Availability Zone Status

Current Status	Details
<span style="color: green;">✔</span> us-east-1a	Availability zone is operating normally
<span style="color: green;">✔</span> us-east-1b	Availability zone is operating normally
<span style="color: green;">✔</span> us-east-1c	Availability zone is operating normally
<span style="color: green;">✔</span> us-east-1d	Availability zone is operating normally

#### My Resources

You are using the following Amazon EC2 resources in the US East (Virginia) region: [Refresh](#)

- 2 Running Instances
- 2 Elastic IPs
- 5 EBS Volumes
- 10 EBS Snapshots
- 2 Key Pairs
- 8 Security Groups
- 0 Load Balancers
- 0 Placement Groups

#### Scheduled Events

✔ US East (Virginia): No events [Refresh](#)

#### Related Links

- Documentation
- All EC2 Resources
- Forums
- Feedback
- Report an Issue

# Identity & Access Management (IAM)

IAM enables customers to create and manage users in AWS's identity system

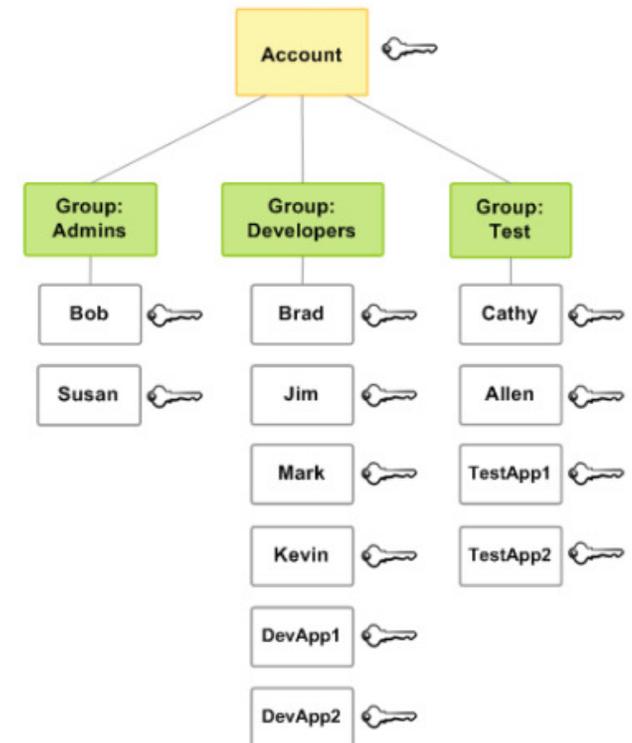
- Identity Federation with local directory is an option for enterprises

Very familiar security model

- Users, groups, permissions

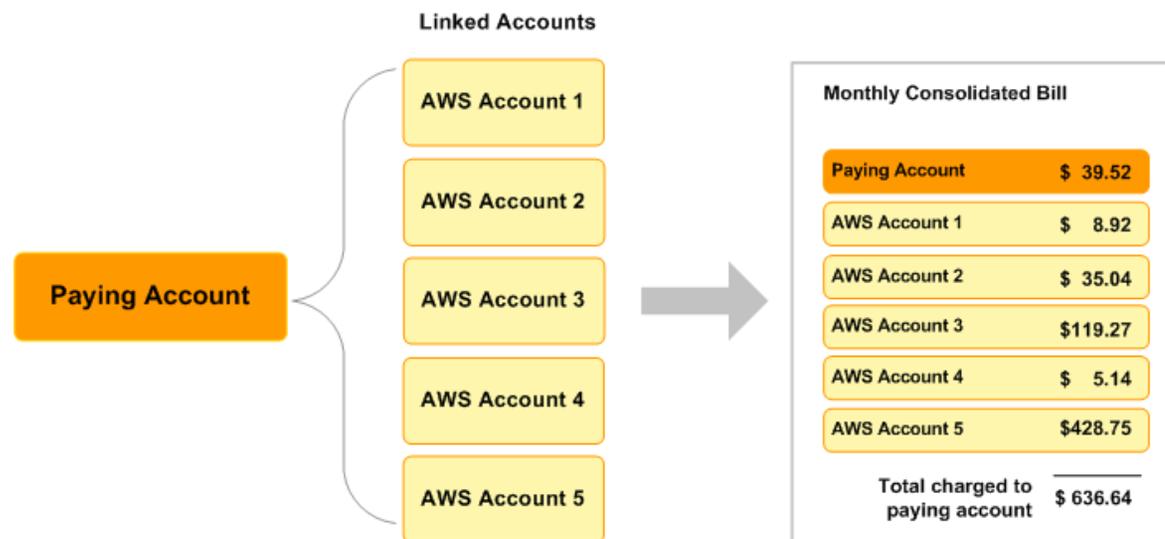
Allows customers to

- Create users
- Assign individual passwords, access keys, multi-factor authentication devices
- Grant fine-grained permissions
- Optionally grant them access to the AWS Console
- Organize users in groups



# Consolidated Billing with IAM

- Allows you to get one bill for multiple accounts
- You can easily track each account's costs and download the cost data in CSV format
- You may be able to reduce costs by combining usage from all the accounts to qualify for volume pricing discounts



# Deployment & Administration Services

## Deployment

**AWS  
CloudFormation**

Use application templates to create a collection of related AWS in order to provision and update them in an orderly and predictable way

## Monitoring

**Amazon  
CloudWatch**

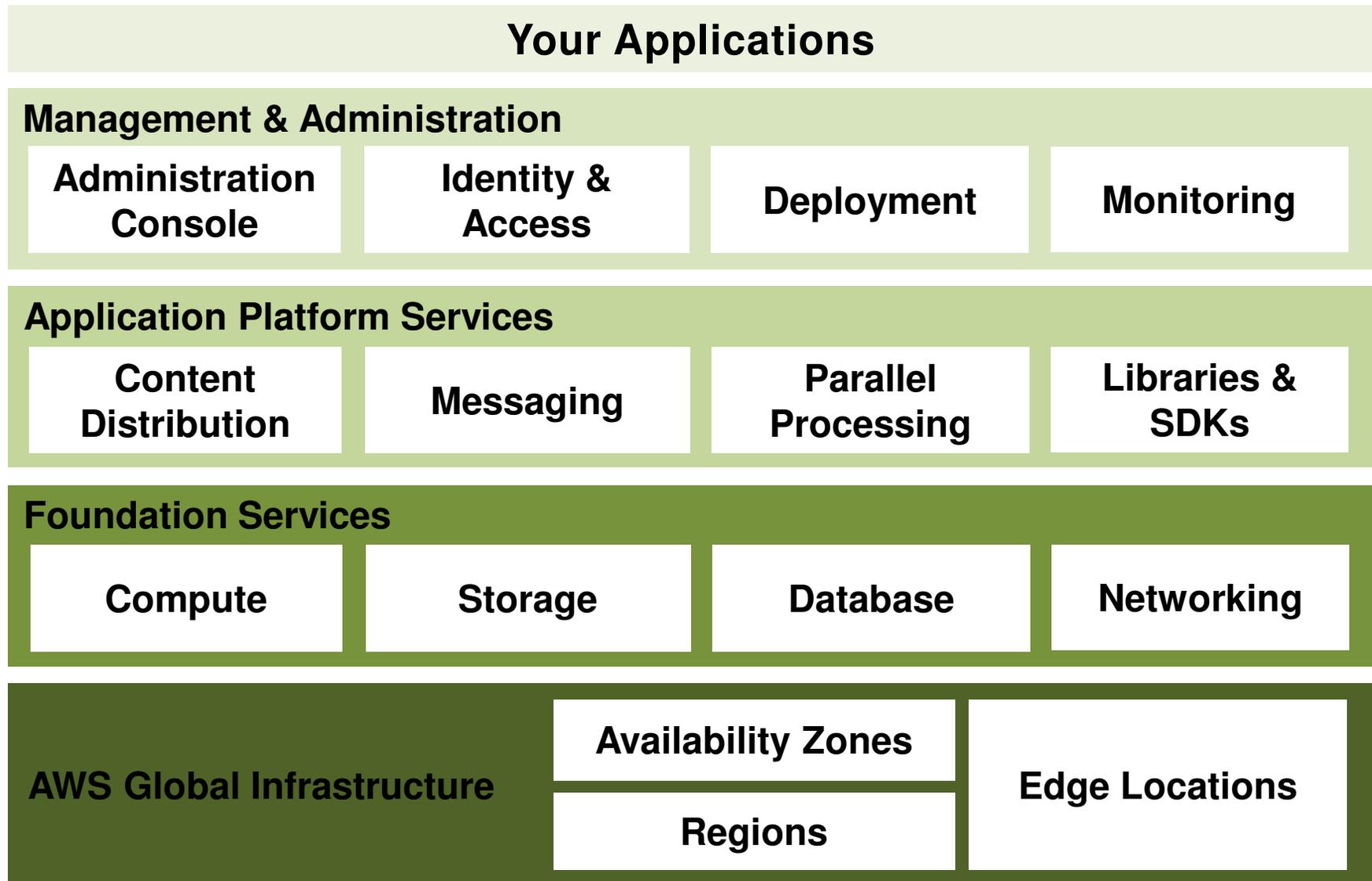
Monitor AWS resources and track metrics to gain insight and react immediately to keep applications running smoothly

## Automation

**AWS Elastic  
Beanstalk**

Provision an Apache Tomcat environment and deploy your Java applications in minutes

# AWS Platform



# What are Customer Running on AWS?



**Enterprise Applications**

Oracle, SAP, Microsoft, IBM  
Line-of-Business Applications



**Web Applications**

Digital Media Distribution  
Gaming  
Media Sharing  
Social Media



**Big Data & High Performance Computing**

Analytics for Consumer Web  
Genome Sequencing  
Large Scale Batch Processing



**Disaster Recovery & Archive**

Backup & Recovery  
Disaster Recovery  
Archive



# Enterprise Applications



Runs its production  
Oracle E-Business  
Suite and Oracle  
RMAN on AWS

**LIONSGATE**

Uses AWS to run  
Microsoft SharePoint  
and SAP Dev & Test  
environments



Connected corporate  
datacenter to the AWS  
cloud to run SAP &  
LOB applications

“The existing relationship between Amazon and Oracle made “not possible” become “push the button”. We have seen cost savings in excess of 70% with no new staff and hundreds of man hours saved each week.”

**Michael Higgins, CTO, Advanced Technologies**



# Web Applications

**NETFLIX**

Runs its online business almost entirely on AWS



Uses AWS to process media files and deliver them to customers



Yelp stores images and analyzes logs with AWS

“We moved to the clouds looking for availability. We have also found a tremendous agility by eliminating complexity, process, and control.”

**Kevin McEntee, VP of Content Engineering, Netflix**



# Big Data & High Performance Computing

## NASA

Runs parallel  
computations and  
image processing on  
AWS

## razorfish™

Uses AWS to  
analyze massive  
click stream datasets  
for client campaigns



HARVARD  
MEDICAL SCHOOL

Runs genome  
sequencing project  
on AWS

“Our first client campaign experienced a 500% increase in their return on ad spend from a similar campaign a year before.”

**Mark Taylor, Program Director, Razorfish**



# Disaster Recovery & Archive

**HITACHI**

Estimated cost savings of \$70,000 on a single storage project

**NASDAQ**<sup>®</sup>

Uses AWS to store real-time stock market data for its financial products

SmugMug 

Uses AWS to store billions of objects adding 10TB of new images each month

“It took less than a week to implement Amazon S3. If we’d stuck with our native photo store, our database would currently be 25 times its current size.”

**Adam Doppelt, Co-Founder, Urbanspoon**

# Examples of How Amazon Uses AWS Today

**Web Hosting:** All traffic for [www.amazon.com](http://www.amazon.com) is now served by Amazon EC2

**Microsoft Sharepoint on AWS:** Corporate Intranet is running on the AWS infrastructure

**Consumer Storage Apps:** Cloud Drive uses Amazon S3 to store customer music, photos, videos and documents

**Cloud Backup:** Kindle automatic backup uses Amazon S3 to store digital purchases for all Kindle devices

**Big Data & Analytics:** Client Experience uses AWS to mimic 100mi active customers across 10+ web properties

**Archive:** Corporate IT archives Oracle application databases to durable Amazon S3 storage

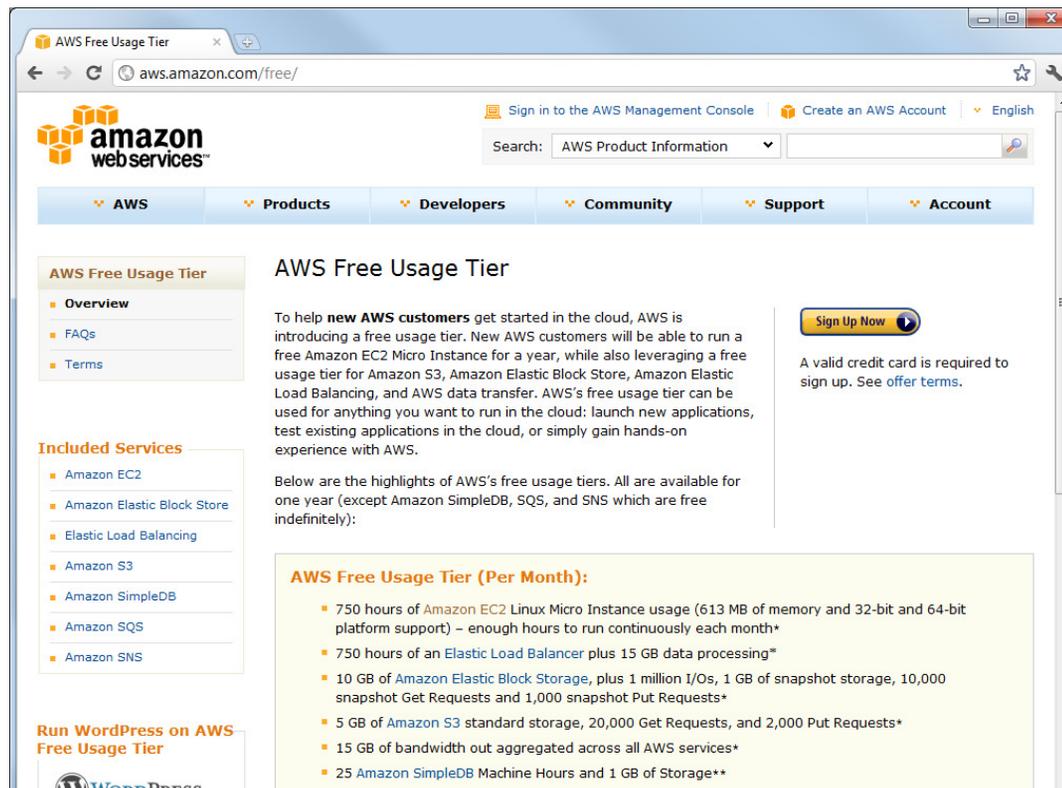
# Next Steps

Learn about Enterprise Cloud Computing with AWS

➤ [aws.amazon.com/enterprise](https://aws.amazon.com/enterprise)

Get started with a free trial

➤ [aws.amazon.com/free](https://aws.amazon.com/free)



The screenshot shows the AWS Free Usage Tier page. The browser address bar displays [aws.amazon.com/free/](https://aws.amazon.com/free/). The page features the Amazon Web Services logo, navigation links for AWS, Products, Developers, Community, Support, and Account, and a search bar. The main content area is titled "AWS Free Usage Tier" and includes an overview, a list of included services (Amazon EC2, Amazon Elastic Block Store, Elastic Load Balancing, Amazon S3, Amazon SimpleDB, Amazon SQS, and Amazon SNS), and a detailed list of the free usage tier benefits per month. A "Sign Up Now" button is prominently displayed, with a note that a valid credit card is required for sign-up. A sidebar on the left offers a link to "Run WordPress on AWS Free Usage Tier".

**AWS Free Usage Tier**

To help new AWS customers get started in the cloud, AWS is introducing a free usage tier. New AWS customers will be able to run a free Amazon EC2 Micro Instance for a year, while also leveraging a free usage tier for Amazon S3, Amazon Elastic Block Store, Amazon Elastic Load Balancing, and AWS data transfer. AWS's free usage tier can be used for anything you want to run in the cloud: launch new applications, test existing applications in the cloud, or simply gain hands-on experience with AWS.

Below are the highlights of AWS's free usage tiers. All are available for one year (except Amazon SimpleDB, SQS, and SNS which are free indefinitely):

**AWS Free Usage Tier (Per Month):**

- 750 hours of Amazon EC2 Linux Micro Instance usage (613 MB of memory and 32-bit and 64-bit platform support) – enough hours to run continuously each month\*
- 750 hours of an Elastic Load Balancer plus 15 GB data processing\*
- 10 GB of Amazon Elastic Block Storage, plus 1 million I/Os, 1 GB of snapshot storage, 10,000 snapshot Get Requests and 1,000 snapshot Put Requests\*
- 5 GB of Amazon S3 standard storage, 20,000 Get Requests, and 2,000 Put Requests\*
- 15 GB of bandwidth out aggregated across all AWS services\*
- 25 Amazon SimpleDB Machine Hours and 1 GB of Storage\*\*

**Run WordPress on AWS Free Usage Tier**

**Thank You!**



# AWS Platform

## Your Applications

### Management & Administration

#### Identity & Access

AWS IAM  
Identity Federation  
Consolidated Billing

#### Web Interface

Management Console

#### Monitoring

Amazon CloudWatch

#### Deployment & Automation

AWS Elastic Beanstalk  
AWS CloudFormation

### Application Platform Services

#### Content Distribution

Amazon CloudFront

#### Messaging

Amazon SNS  
Amazon SQS  
Amazon SES

#### Parallel Processing

Elastic MapReduce

#### Libraries & SDKs

Java, PHP, Python,  
Ruby, .NET

### Foundation Services

#### Compute

Amazon EC2  
Auto Scale

#### Storage

Amazon S3  
Amazon EBS

#### Database

Amazon RDS  
Amazon SimpleDB  
Amazon ElastiCache

#### Networking

Amazon VPC  
Elastic Load Balancing  
Amazon Route 53  
AWS Direct Connect

**AWS Global Infrastructure**

**Availability Zones**

**Regions**

**Edge Locations**

# AWS Infrastructure Investments

Every day, AWS adds enough new server capacity to support all of Amazon's global infrastructure in the company's fifth full year of operation, when it was a \$2.76B annual revenue enterprise

# Compute: Amazon Elastic Compute Cloud (EC2)

- **Amazon EC2: Virtual Servers in the Cloud**
  - Provision and boot new servers in minutes
  - Your choice of Linux or Windows
  - Quickly scale capacity up or down
  - Deploy across Regions and Availability Zones for reliability
- Getting started is free: [aws.amazon.com/free](https://aws.amazon.com/free)
- Flexible ways to buy Amazon EC2 instances
  - On-Demand: Pay as you go compute
  - Reserved: Small upfront fee for 34%-50% hourly discount
  - Spot: Bid on unused capacity

# Storage: Amazon Elastic Block Store (EBS)

- **Amazon EBS: Hard Drive for Amazon EC2 Instances**
  - Persistent storage independent of any particular instance
  - Easy to create, attach, backup, restore and delete volumes
- Designed for high-performance
  - Equal to or faster than a local drive
- Volumes behave like unformatted block devices visible from Linux or Windows instances
  - You can create a file system on top of Amazon EBS
  - You can boot Amazon EC2 instances from Amazon EBS

# Storage: Amazon Simple Storage Service (S3)

- **Amazon S3: Storage in the Cloud**
  - Write, read, delete objects containing from 1 byte to 5 TB
  - The number of objects you can store is virtually unlimited
- Authentication mechanisms are provided to help protect data from unauthorized access
- Options for secure data upload/download and encryption of data at rest are provided for additional data protection
- Fast, economical, highly available and durable