

# Overview of



Feb 2018

# Objectives

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- Get an Overview of Amazon Platform
  - Describe the AWS Global Infrastructure
  - Describe Key AWS Services
  - Understanding Security Features and Shared Responsibility Model
  - To provide first hand experience in using AWS cloud using AWS Console
  - Describe AWS management and Administration features of the AWS platform
  - Identify various Use Cases and choose the appropriate AWS services to realize the use case
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# About AWS

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- 1994 - Amazon is founded by Jeff Bezos
- 1995- Amazon.com launched online bookstore
- 2006 – AWS Launched
- As of Dec 2014 – estimated 1.4 million servers across the globe and growing !
- Every day AWS adds the new server capacity when it was USD 7 billion enterprise ! (Statement made in 2008)
- Supports number of services from Compute, Storage, Networking , CDN , Database , Virtual Private Cloud , App Services , Analytics , Development & Management tools

# AWS Account

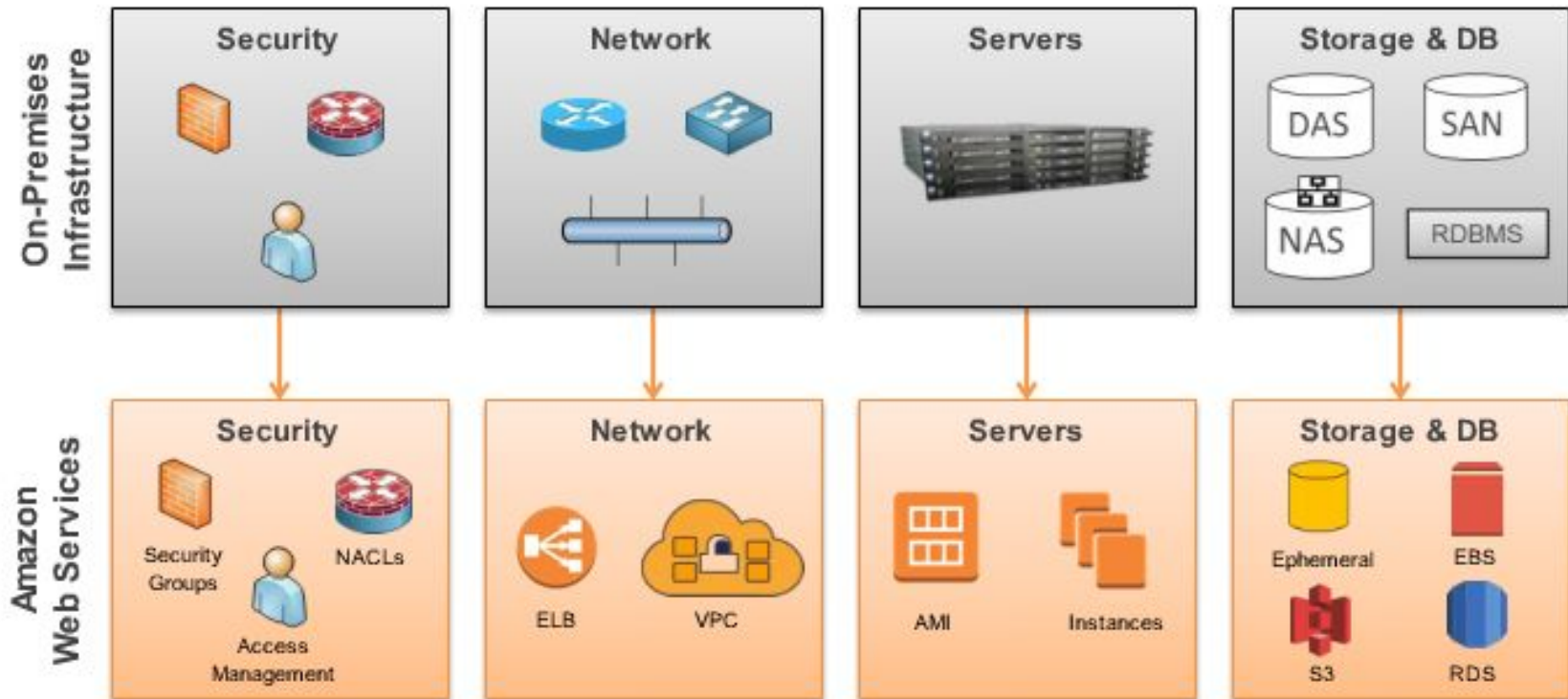
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- Must have an account to access Amazon Web Services
  - Simply an [amazon.com] account that is enabled to use AWS products
  - New Email address not already in the Amazon.com system
  - Existing email-address in the Amazon.com system but different passwords
  - Root Account - super user !
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# **Walkthrough – Creating an AWS Account**

# On Premises and AWS

## On Premises vs. AWS



# Amazon Web Services Portfolio

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**Deployment & Management**

**Analytics**

**Application Services**

**Compute**

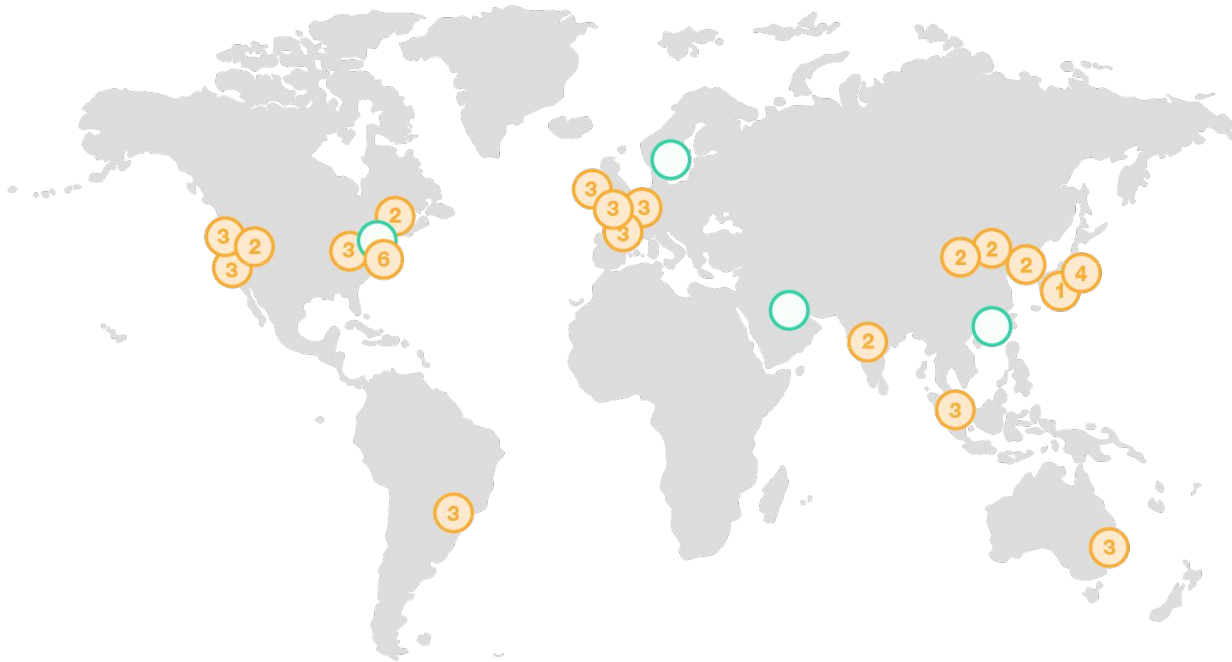
**Storage**

**Database**

**Networking**

**AWS Global Infrastructure**

# AWS Global Infrastructure- Regions and Zones

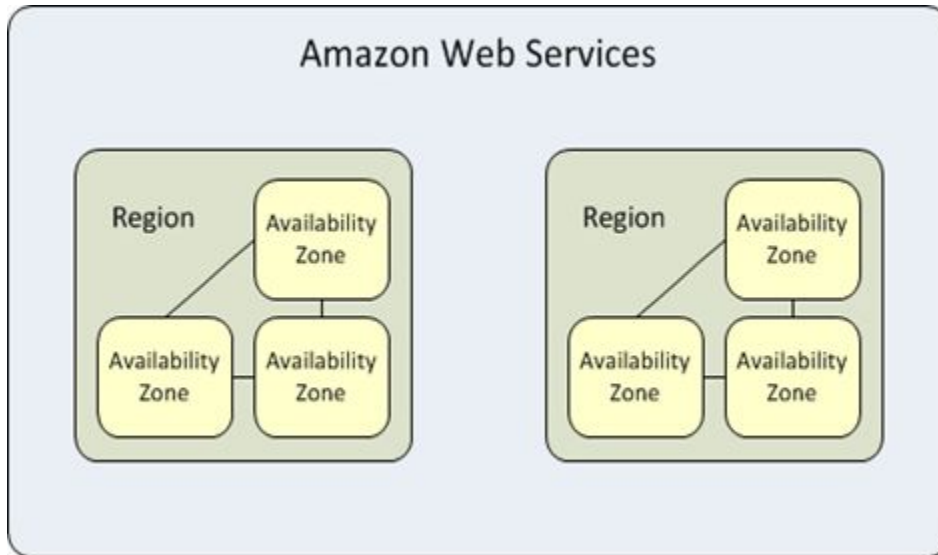


- 53(42) Availability Zones within 18 (16) geographic Regions around the world
- 12 more Availability Zones and 4 more Regions coming online throughout the next year.

source : [aws.amazon.com](https://aws.amazon.com)



# AWS Global Infrastructure



## Regions

- Separate geographical area

## Availability Zones (AZ)

- Different physical facility
- Connected via high speed fiber network
- Provides low latency network ( ms)
- Different natural fault lines

- Flexibility in choosing location
- Enables to meet Compliance and Regulatory requirements
- Not all services may be available in all the regions
- Cost is different in each region

# Edge locations

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## Edge Locations

- Distributes and serves content from various servers across the globe
- Reduces latency
- Increases Availability
- 56 edge locations
- CloudFront and Route 53 are served from Edge Locations

## AWS Resources

- AWS resources can be Global , Tied to a region or tied to Availability Zone
  - Following Services do not support regions
    - Identity and Access Management – IAM
    - `https://iam.amazonaws.com`
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# In Numbers

Sr No.	Category	Some time back	Today
1	Compute	4	6
2	Storage & Content Delivery	6	4
3	Database	5	4
4	Networking (Networking & Content Delivery)	3	4
5	Analytics	5	7
6	Enterprise Applications ( <b>Business Productivity</b> )	3	0
7	Security & Identity (Security, Identity & Compliance)	5	6
8	Application Services	7	4
9	Management Tools	7	9
10	Developer Tools	3	4
11	Internet of Things (IoT)	1	1
12	Mobile Services	5	5
13	Game Development	1	1

# In Numbers

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Sr No.	Category	Some time back	Today
14	<b>Business Productivity</b>	-	2
15	Desktop & App Streaming	-	2
16	Artificial Intelligence	-	4
17	Messaging	-	3
		55	66

and evolving ....

# AWS Services - Some time back





## Compute

-  **EC2**  
Virtual Servers in the Cloud
-  **Lambda**  
Run Code in Response to Events
-  **EC2 Container Service**  
Run and Manage Docker Containers

## Storage & Content Delivery

-  **S3**  
Scalable Storage in the Cloud
-  **Elastic File System** **PREVIEW**  
Fully Managed File System for EC2
-  **Storage Gateway**  
Integrates On-Premises IT Environments with Cloud Storage
-  **Glacier**  
Archive Storage in the Cloud
-  **CloudFront**  
Global Content Delivery Network


## Database

-  **RDS**  
MySQL, Postgres, Oracle, SQL Server, and Amazon Aurora
-  **DynamoDB**  
Predictable and Scalable NoSQL Data Store
-  **ElastiCache**  
In-Memory Cache
-  **Redshift**  
Managed Petabyte-Scale Data Warehouse Service




## Networking

-  **VPC**  
Isolated Cloud Resources
-  **Direct Connect**  
Dedicated Network Connection to AWS





## Administration & Security

-  **Directory Service**  
Managed Directories in the Cloud
-  **Identity & Access Management**  
Access Control and Key Management
-  **Trusted Advisor**  
AWS Cloud Optimization Expert
-  **CloudTrail**  
User Activity and Change Tracking
-  **Config**  
Resource Configurations and Inventory
-  **CloudWatch**  
Resource and Application Monitoring







## Deployment & Management

-  **Elastic Beanstalk**  
AWS Application Container
-  **OpsWorks**  
DevOps Application Management Service
-  **CloudFormation**  
Templated AWS Resource Creation
-  **CodeDeploy**  
Automated Deployments




## Analytics

-  **EMR**  
Managed Hadoop Framework
-  **Kinesis**  
Real-time Processing of Streaming Big Data
-  **Data Pipeline**  
Orchestration for Data-Driven Workflows
-  **Machine Learning**  
Build Smart Applications Quickly and Easily

## Application Services

-  **SQS**  
Message Queue Service
-  **SWF**  
Workflow Service for Coordinating Application Components
-  **AppStream**  
Low Latency Application Streaming
-  **Elastic Transcoder**  
Easy-to-use Scalable Media Transcoding
-  **SES**  
Email Sending Service
-  **CloudSearch**  
Managed Search Service

## Mobile Services

-  **Cognito**  
User Identity and App Data Synchronization
-  **Mobile Analytics**  
Understand App Usage Data at Scale
-  **SNS**  
Push Notification Service

## Enterprise Applications

-  **WorkSpaces**  
Desktops in the Cloud
-  **WorkDocs**  
Secure Enterprise Storage and Sharing Service
-  **WorkMail** **PREVIEW**  
Secure Email and Calendaring Service

# Compute

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## Compute



EC2

Virtual Servers in the Cloud



EC2 Container Service

Run and Manage Docker Containers



Elastic Beanstalk

Run and Manage Web Apps



Lambda

Run Code in Response to Events



## Compute

EC2

EC2 Container Service

Lightsail

Elastic Beanstalk

Lambda

Batch

- Lightsail - Nov 16 - Power of AWS and Simplicity of VPS
- Batch - Dec - 16 - Run Batch Computing in AWS

# Storage

## Storage & Content Delivery



S3

Scalable Storage in the Cloud



CloudFront

Global Content Delivery Network



Elastic File System

Fully Managed File System for EC2



Glacier

Archive Storage in the Cloud



Snowball

Large Scale Data Transport



Storage Gateway

Hybrid Storage Integration



Storage

S3

EFS

Glacier

Storage Gateway

## Simple Storage Service (S3)

- Cloud Storage for the Internet
- Fully redundant Storage Infrastructure
- Accessible from anywhere , any time from the Web

## Glacier

- Extremely low cost storage service
- Useful for data archiving and backup

# Networking



VPC

Isolated Cloud Resources



Direct Connect

Dedicated Network Connection to AWS



Route 53

Scalable DNS and Domain Name Registration



Networking & Content  
Delivery

VPC

CloudFront

Direct Connect

Route 53



# Database

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## Database



RDS

Managed Relational Database Service



DynamoDB

Managed NoSQL Database



ElastiCache

In-Memory Cache



Redshift

Fast, Simple, Cost-Effective Data Warehousing



DMS

Managed Database Migration Service



Database

RDS

DynamoDB

ElastiCache

Redshift

RDS - Managed Relational Database Services

Redshift - Managed Data Warehouse

# Security & Identity

## Security & Identity



**Identity & Access Management**  
Manage User Access and Encryption Keys



**Directory Service**  
Host and Manage Active Directory



**Inspector**  
Analyze Application Security



**WAF**  
Filter Malicious Web Traffic



**Certificate Manager**  
Provision, Manage, and Deploy SSL/TLS Certificates



**Security, Identity & Compliance**

**IAM**

**Inspector**

**Certificate Manager**

**Directory Service**

**WAF & Shield**

**Compliance Reports**

**Inspector** - automated security assessment service

**WAF & Shield** - Block or Allow HTTP/HTTPS requests and protect against DDOS attack

**Compliance Reports** - Download compliance reports

# Application Services

## Application Services



API Gateway

Build, Deploy and Manage APIs



AppStream

Low Latency Application Streaming



CloudSearch

Managed Search Service



Elastic Transcoder

Easy-to-Use Scalable Media Transcoding



SES

Email Sending and Receiving Service



SQS

Message Queue Service



SWF

Workflow Service for Coordinating Application Components



Application Services

Step Functions

SWF

API Gateway

Elastic Transcoder

**Step Functions** - Build distributed applications using visual workflows

## API Gateway

- Create , HOST REST API for exposing Lambda functions or EC2 endpoints + AWS services + third party service

**Elastic Transcoder** - Video transcoding service (iPhone Format etc.)

# Management

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## Management Tools



CloudWatch

Monitor Resources and Applications



CloudFormation

Create and Manage Resources with Templates



CloudTrail

Track User Activity and API Usage



Config

Track Resource Inventory and Changes



OpsWorks

Automate Operations with Chef



Service Catalog

Create and Use Standardized Products



Trusted Advisor

Optimize Performance and Security



## Management Tools

CloudWatch

CloudFormation

CloudTrail

Config

OpsWorks

Service Catalog

Trusted Advisor

Managed Services

Application Discovery Service

**Service Catalog** - Approved Services for users (Images, Servers, Software , Database to multi tier applications

# Mobile Services

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## Mobile Services



### Mobile Hub

Build, Test, and Monitor Mobile Apps



### Cognito

User Identity and App Data Synchronization



### Device Farm

Test Android, iOS, and Web Apps on Real Devices in the Cloud



### Mobile Analytics

Collect, View and Export App Analytics



### SNS

Push Notification Service



## Mobile Services

Mobile Hub

Cognito

Device Farm

Mobile Analytics

Pinpoint

**PinPoint** - improve user engagement by reaching out to user segments through push notification campaigns

# **AWS Characteristics**

# Elastic in Nature

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- Capacity feels infinite
- Elastic in nature – resources can be scaled up as well as scaled down
- Elastic Load Balancer
- S3 - no limit on the number of objects
- EBS - can be expanded as needed

# Pricing Model Characteristics

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- Utility based pricing model
- Pay as you go model
  - no minimum commitments or long term contracts needed
- Pay less when you use more
- Pay even less as AWS grows
  - AWS has dropped prices more than 45+ times
- Multiple Pricing Models - on-demand, reserved , spot
- Tiered Pricing Model
- Custom Pricing – for high volume projects with unique requirements



## ...Pricing Model Characteristics

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- Not all services are charged
- Following services are not charged
  - VPC
  - Elastic Beanstalk
  - Cloud Formation
  - IAM
  - Autoscaling
- Utilize Consolidated Billing to take benefit of tiered pricing structure

## How to access it ?

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- AWS Console
- AWS Command Line Interface
- AWS SDK

## Some more ...characteristics

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- 24x7
- On-demand
- Self Service
- Agile
- Shared Responsibility Model

# Shared Responsibility Model

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## **AWS takes care of**

- Physical Security of data centers
- Security at Hardware level
- Underlying Networking
- Security at hypervisor level
- DDOS attack
- Accreditations
- Security Compliances

## **You need to take care of**

- Application Security
- Security of EC2 instance
- Security Groups related to EC2
- Security of S3
- Security of VPC

# LAB – Navigate AWS Console

- Login to AWS Console
- Overview of AWS Console Dashboard
- Understand Regions
- Accessing various services

**End of Module**