AWS Concepts: From Beginners to Infinity and Beyond

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Chapter 1

Why Learn AWS?

AWS are the market leaders in cloud. They are at the forefront of cloud revolution. AWS has a partner program:

1.1 AWS Partner Programs

3 different tiers:

1. select.
2. advanced.
3. premier.

types of certificates:

1. Practitioner.
2. Associate.
3. Professional/Speciality Certificates.

Getting an AWS certificates increases your demand because companies need certain number of certified employees to have access to AWS partner programs/premium lounges etc. These are shown in the figure (1.1).

Partner	Practitioner Certs	Associate Certs	Professional/ Specialty Certs
Select	2	2	0
Advanced	4	4	3
Premier	10	10	10

Figure 1.1: AWS Partnership tiers and requirements are shown in the above image. Please look at the benefits at this [link].

1.2 Amount of AWS Features and Services

AWS is too vast. You should have broad overall knowledge, and then you should have your specialization. The number of services increase very fast:

1. 2011: 82.
2. 2015: 735.
3. 2019: 2400.

Hence, please keep learning.
Cloud spending is increasing very fast in the world. Software is eating the world and cloud is eating software.
AWS are leading cloud providers and are growing in public cloud market share at a rate extensively faster than their competitors. AWS makes up 51.8% worldwide cloud market share. It is a safe industry due to it's hyper-growth.

Chapter 2

A broad overview of Amazon Web Services

This is intended to give you some context about AWS. It can give you the ability to build a platform which scales automatically with little to no running cost. That's the beauty of serverless. Startups could go and try out new ideas and if it didn't work, you could just stop and delete it. Without much collateral damage. No 3-5 yr contracts for renting servers.

2.1 History

AWS gave you Virtual Machines and then you could go in and terminate it. You didn't have to live with the collateral damage.

In 2003, Chris Pinkham and Benjamin Black presented a paper on amazon's internal structure. This could become a business proposal which they presented.

- SQS launched in 2004.
- AWS launched in 2006.
- all of Amazon.com moved to AWS in 2010.
- First re:Invent Conference in 2012.
- Certification launched in 2013.
- Committed to 100% renewable energy for global footprint they wanted for 2014.
- AWS breaks out revenue: 6 Billion USD per annum and grew at 90% a year.
- AWS re:Invent released a host of AI Services. Run rate hits 27 Billion USD.
- AWS launched ML and AI certificates in 2019.
- Alexa specialty certificate in 2019.

AWS went for the developers first, instead of corporates, when it released. Dropbox, AirBnB started on AWS.

2.2 A Brief Overview

Services are grouped in A-Z. There are an awful lot of services. However, a lot of them are not very relevant to Certified Solutions Architect associate exam. Let's talk about the relevant ones.

2.2.1 High Level Services

- Compute
- Storage
- Databases
- Migration and Transfer.

2.3 AWS Global Infrastructure

differences between regions and availability zone. Northern Virginia is the oldest region and all new services come out first on there. But also goes down the most (once a year), so don't deploy there. On top of global infrastructure sit the following services:

- Compute. (EC2, Lambda etc.)
- Storage. Putting files into buckets. (S3).
- Databases. Relational Databases (RDS), Non-relational databases (Dynamo DB and RedShift).
- Migration and transfer. way of getting things to and from AWS (Snobble).
- Network and Content Delivery. VPCs, Cloud front (CDM).
- Developer Tools. (Covered in Developer associate exam).
- Robotics, Blockchain and Sattelite. (NR).
- Management and Governance, Media Services, Machine Learning (Some depth of ML is required).
- Analytics.
- Security, Identity and Compliance.
- Mobile.
- AR and VR. (NR)
- Application Integration. (NR)
- AWS Cost Management.
- Customer Engagement.
- Business Applications.
- Desktop and App Streaming.
- IOT and Game Development.

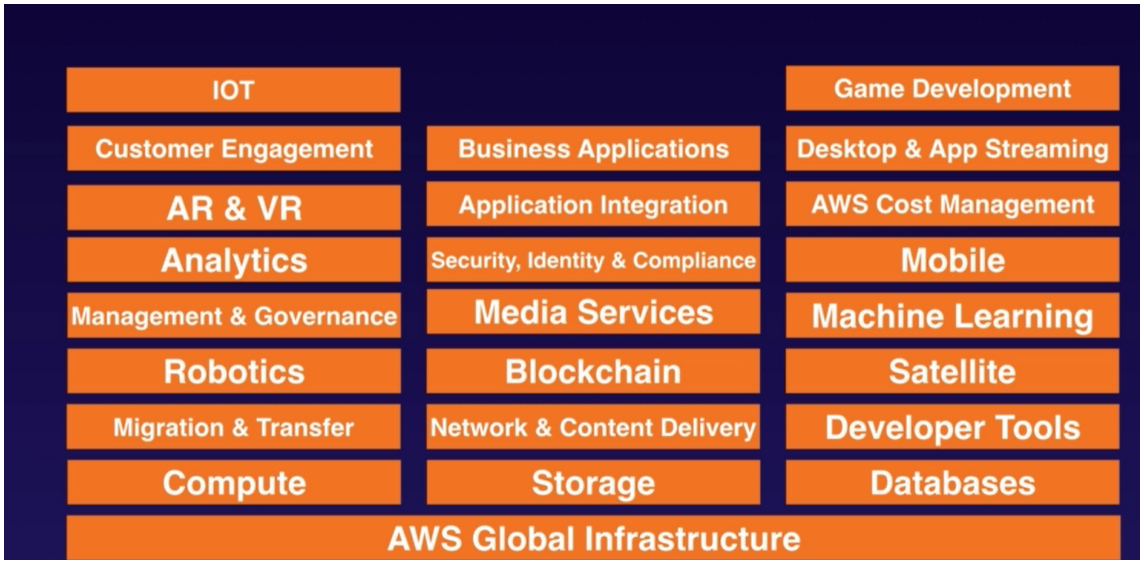


Figure 2.1: Most services available as of 2019

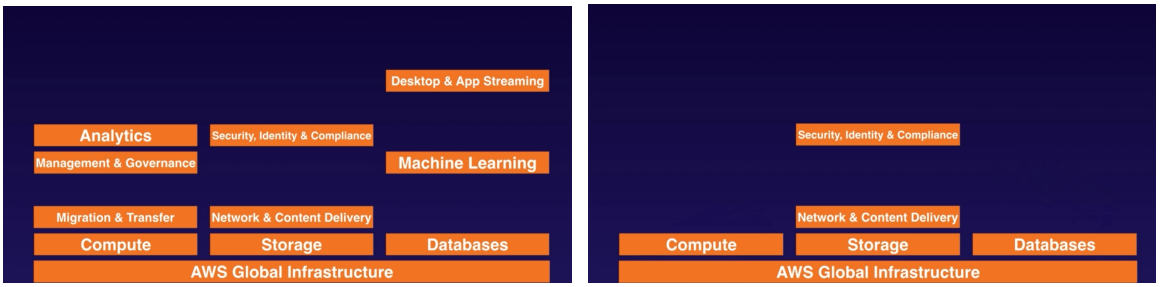
2.3.1 region and availability zone and edge location

19 regions & 57 availability zones in december 2018. 5 more regions and 15 more AZs in 2019.
Availability Zones:

- An availability zone is one/several close data center.
- Everything to do with cloud sits in data centers.

A **Region** is a simple distinct geographic area. Every region has 2, 3 or more availability zones. Always more *edge locations than regions*. **Edge location** are end points for AWS for caching content in local zone. Someone from sydney requests a file from new york, they dl it from newyork. Now it will be cached in sydney edge location. for increased speed in the next dl. Typically consists of CloudFront, Amazon's CDN etc. Singapore, Osaka, Mumbai, region etc. Whole bunch of different edge locations as well.

In future will cover a few relevant services but not all of them. Ones we need to know:



(a) Need to Know services (b) Bread and butter services

Figure 2.2: Services relevant to the exam

2.4 Virtual Private Cloud

A Virtual Private Cloud (VPC) is a virtual network dedicated to a single AWS account. It is logically isolated from other virtual networks in the AWS cloud, providing compute resources with security and robust networking functionality.

2.5 summary concepts

- Regions: Distinct geographical locations holding multiple AZs.
- Availability Zones: One or two data centers holding all computers of AWS.
- Edge locations: Distinct end points used for caching content.
- Virtual Private Cloud: A private cloud within AWS dedicated to a particular account. It provides compute resources securely and robustly. Secure from other private clouds within AWS.

Chapter 3

IAM 101: Identity Access Management

allows to manage users and their level of access in AWS concole.

3.1 Key concepts

- Centralized control of AWS account.
- shared access to your AWS account.
- Granular Permissions.
- Identity Federation.
- Multifactor authentication.
- temporary access.
- allows you to set up password rotation policy.
- integrates with different AWS services.
- supports PCI DSS. (Compliant framework for taking credit card details).

3.2 Key terminology.

- Users
- Groups (Users belonging to group ingerit properties.)
- Policies (Permmissions in JSON files).
- Roles (Role that AWS service plays, eg. allowing a VM to modify data in S3).

3.3 A Billing Alarm - LAB

How to get automatic notifications when bill goes over something. To get bill notifications, goto cloud watch, billing alarms and create SNS topic.

3.4 Summary

- IAM is universal.
- root account is simply created when you first setup your AWS account. It has complete admin access.
- New Users have no permissions when first created.
- New users are assigned access key ID and Secret Access Keys when first created.
- You only get to view them once. So you will need to regenerate them.
- **Always setup multifactor authentication on root account.**
- ability to create and customize password rotation policy.