# AWS Certified Solutions Architect - Associate (SAA-C02) Cert Prep: 1 Cloud Services Overview

## Chapter 1 – Cloud Computing Overview

### Cloud Computing Defined

Learning about various concepts that flushed out throughout this entire course

Cloud computing – used lots of ways by IT industry, benefits of cloud computing, cloud computing models, History of AWS (reason understanding history you understand implementation), AWS platform, AWS products overview, AWS, security, and compliance (need to make sure security requirements out of the cloud are the same as in the cloud). Regions and Availability (where does stuff really happen)?

Cloud is an internet-based solution – someone else’s server connected to the internet. However, we don’t know a lot of the details about the server e.g., the tech, where the server is and the technical capacity. Many different examples of cloud service providers: Dropbox, Google cloud – storage, email, documents, Microsoft Azure – active directory to SQL, AWS – more people using AWS than the other cloud combined.

Think about AWS as everything you do on local network and devices but in the cloud, DNS services, network services, routing etc. Only difference is in the cloud – question is how can I get to all that stuff in the cloud.

#### Quick Review

Cloud computing is processing on the Internet or a private network where the exact processor location is unknown.

Use of AWS can reduce deployment, hardware and operational costs.

Cloud computing still uses servers, simply hidden from view.

### Benefits of cloud computing

Two ways to look at cloud computing:

What is reduced and what is increased

#### Reduced

Hardware costs – if have three servers on site, got cost of networking, serves and the storage. With AWS you can go to management console and with 3-5 mins have those servers stored. All there and doesn’t cost a lot to deploy – no upfront hardware costs. Pay for it as profits come in

Operational costs – physical hardware requires physical hardware there to physically manage it. Operating in AWS would take 5-10% of the time it would to manage it physically. Doesn’t make the person redundant – it gives them a new angle on the problem.

Deployment times – we don’t have the old way of doing things – 3 separate servers for 3 different things. Got to order them, set them up, wait times.

#### Increased

Resiliency – Increased recoverability – AWS has health monitors and if it deems to be unhealthy it copies the unhealthy server, fixes it fixes it and then removes old one.

Performance – Handle the load of users that are coming, even an increase. There is also something called autoscaling – so if you hit a performance threshold it will increase its resources to make sure it.

Capacity – Lots of references, memory, storage size. Capacity planning and management is there for all the resources. E.g., if you need storage than needs 10TB today and 100TB tomorrow it will allow you to scale that. Change to different instances e.g. instance of 4GB of ram – then later you need 64GB of RAM – you can do that – doesn’t matter where the hardware is

### Cloud Computing Models

Several ways cloud can be used in organisation:

1. Full cloud deployment – all components are in the cloud – database, processing and application logic all deployed in the cloud. Nothing on the premise – so anytime anything needs to be used or managed – they access it using a web browser.
2. Hybrid deployment – some resources on premises and some in the cloud. E.g. processing on premises and some processing in the cloud. Useful for processing that doesn’t need to happen quickly but uses a large amount of resources can be done in the cloud. Whereas instantaneous, low overhead processing done on site. Databases on premises and some in cloud – e.g. archive database in the cloud – bad internet connection. Archived, large. Application logic – some source code is localised and some in the cloud. Web servers in the cloud that talk to application severs on the local network (API).

#### Common cloud computing terms

IAAS – Infrastructure as a service – entire infrastructure in the cloud. Not wires, switches etc the servers and some segments of the networks. Database, storage all in the cloud. Platforms and software run on others infrastructure – but you still need to manage it.

PaaS – Platform as a service – do not manage the infrastructure just the applications that are deployed on this platform (technically speaking this is what web hosting was for many years – all we did was put or code onto the servers and let them run).

SaaS – Software as a service – someone else develops the service, they put it on a server and then you use it as the cloud. E.g. gmail, email in the cloud is SaaS – rather than run it locally on the machine you run it in the cloud and can be used.

### History of cloud computing

AWS first launched in 2004 – it was one thing called SQS – simple queue service.

Relaunch in 2005/2006 – S3 service – simple storage service – buckets and EC2 services

2007 – Introduced – simple DB solution for database access

2008 – elastic IP – static IP address for EC2 instances so you can access them from the internet

2009 – VPC – management console – easy to use visual interface is more attractive than CLI. Virtual Private Cloud.

2010 – Route 53 – DNS provided by amazon, SNS and IAM.

2011 – ElasticCache and Cloud Formation

2012 – SWF – DyanmoDB – noSQL database, 160 new features

2013 – AWS certification

2014 – Redshift – SSD storage rather

2015 – Cloud Trail, WAF – plus loads of features

2016 – EC2 spot advisor – spot instances, cheap compute time for process that occur anytime once in a 24 hour window.

Amazon Chime – teleconferencing in AWS

### The AWS Platform

Core components of AWS – what is everything that it offers built on top of.

Built on tip of compute capabilities – have processors available to you within the cloud. However to do this you need memory, storage – when it comes to compute – you have to think about what a computer does when it computes.

Like a Gameboy – it had a processor, memory, storage (cartridge) that had to be loaded.

So we are basically talking about a computer in the cloud.

Have to have somewhere to put stuff when we are doing stuff – having information near compute capabilities in the cloud.

So this was initial way for AWS – running VMs in the cloud and having a way to store info in the cloud. Whole new way to think of storage – storage as objects rather than streams of data.

AWS provides storage in many ways – objects, block based, AWS instances from other providers. E.g. data from google drive take it process it and put it back.

Database – providing database functionality to its customers. Database as service

Virtual Network in the cloud – VPC – virtual private cloud – network of devices that can all talk to each other. Some may be able to talk to the internet and others can’t – you can figure how all this works using subnets.

Security – it needs to be secure if all these things are in the cloud – each function has its own security

## Chapter 2 – AWS cloud services

### AWS Services Part 1

Key AWS services for AWS certification

They have different features – compute, storage, database

#### Compute

EC2, lightsail, ECS, EKS, Lambda, Batch, Elastic Beanstalk

EC2 – primary focus of the exam, who you build an instance and launch a VM. Manually going through an instance

Elastic Beanstalk – also launch an instance but it does it for you

Lambda is important, Elastic container service

#### Storage

S3, EFS, Glacier and Storage Gatewat

S3 – simple storage service – primary service that was available when first launched. Object based, put things in buckets in system

Elastic File System – EFS – how it works within EC2 connection, EC2 instance that uses EFS

Glacier – a glacier is a large chunk of frozen ice, in AWS you put old data and archival purposes. Put stuff there that isn’t needed very often, network bandwidth not required and doesn’t have to be on superfast storage. So you go into a request and restore something

Storage gateway – access storage in the cloud locally

#### Database

RDS

DynamoDB

ElastiCache

Neptune

Redshift

Can use AWS for free to start with

#### Migration

Snowball – large amount of data to throw at amazon

#### Network and Content Delivery

VPC

Cloud front

Route 53 – DNS

API gateway

Direct Connect – VPN Conneciton

#### Developer tools

#### Management Tools

Cloud watch – health management

Auto Scaling

Advisor

### AWS Services Part 2

#### Media Services

Streaming Media, Trasconding Media, Text recognition in videos

#### Machine Learning

Visual Analysis App – video, audio

#### Analytics

Kinesis

#### Security, Identity and Compliance

Cognito, Inspector, AWS organisations, cloudHSM, Directory service

#### AWS cost management

Cheapest way to do something – they don’t just try and push the most expensive solution that works for you.

#### Mobile Services

Work with tablets, mobile phones

#### AR and VR

#### Application Integration

Simple notification service, simple queue service – handle application processing based on requests coming into a queue and then coming out of that queue

#### Customer Engagement

#### Business Productivity

Business services that are available through AWS

#### Desktop and App Streaming

Run an app as if it is running on virtual machine

#### IoT

The ability to implement IoT solutions and tracked in the cloud

### Security and Compliance

Security wraps around all the services around AWS. If I am putting sensitive data in the cloud, how am I making sure I am compliance with certification.

Shared responsibility model – They take part, you take part. If it is something AWS manages in the cloud, it is their responsibility, the security of EC2 services at their actual locations are all managed by AWS people. Physical security – not telling you exact physical location. Managed services are secure – DynamoDB database is a managed service so they will secure it.

The customer’s responsibility is the responsibility of your own data or your instance.

Security of the cloud is Amazon, security in the cloud is your responsibility.

Infrastructure down and OS up.

### Regions and Availability

AWS does not reveal physical location, but we need the ability to say where we want the data to make sure we get best service and can distribute wherever we might need it.

Region – physical location or a boundary with AWS data centres in them. Within region there may be multiple data centres.

In a region you have an availability zone – multiple zones are within a region. Redundant power and networking.

AWS global infrastructure

Edge Area – server that is near the costumer