AWS Certified Architect Associate – Notes

[EC2 3](#_Toc2493357)

[Amazon EC2 Auto Scaling 3](#_Toc2493358)

[Elastic Load Balancing 3](#_Toc2493359)

[ECS, ECR 3](#_Toc2493360)

[Lambda 3](#_Toc2493361)

[Beanstalk 3](#_Toc2493362)

[Lightsail 3](#_Toc2493363)

[S3 4](#_Toc2493364)

[EBS 4](#_Toc2493365)

[EFS 4](#_Toc2493366)

[RDS 4](#_Toc2493367)

[Aurora 4](#_Toc2493368)

[DynamoDB 4](#_Toc2493369)

[Elasticache 4](#_Toc2493370)

[RedShift 4](#_Toc2493371)

[Storage Gateway 4](#_Toc2493372)

[Snowball 4](#_Toc2493373)

[Neptune 4](#_Toc2493374)

[VPC 4](#_Toc2493375)

[Route53 4](#_Toc2493376)

[CloudFront 4](#_Toc2493377)

[IAM 5](#_Toc2493378)

[KMS 5](#_Toc2493379)

[AWS Shield 5](#_Toc2493380)

[WAF 5](#_Toc2493381)

[STS 5](#_Toc2493382)

[Guard Duty 5](#_Toc2493383)

[Cognito 5](#_Toc2493384)

[Inspector 5](#_Toc2493385)

[Macie 5](#_Toc2493386)

[CloudHSM 5](#_Toc2493387)

[SNS 5](#_Toc2493388)

[SQS 5](#_Toc2493389)

[SWF 5](#_Toc2493390)

[Elastic Transcoder 5](#_Toc2493391)

[API Gateway 5](#_Toc2493392)

[DirectConnect 5](#_Toc2493393)

[CloudWatch 6](#_Toc2493394)

[CloudTrail 6](#_Toc2493395)

[CloudFormation 6](#_Toc2493396)

[AWS OpsWorks 6](#_Toc2493397)

[AWS Config 6](#_Toc2493398)

[Systems Manager 6](#_Toc2493399)

[Trusted Advisor 6](#_Toc2493400)

[Personal Health Dashboard 6](#_Toc2493401)

[Well-Architected Tool 6](#_Toc2493402)

[Kinesis 6](#_Toc2493403)

[Cost Explorer 6](#_Toc2493404)

[Cloud9 IDE 6](#_Toc2493405)

[Code Commit 6](#_Toc2493406)

[Code Build 6](#_Toc2493407)

[Code Deploy 6](#_Toc2493408)

[Code Pipeline 6](#_Toc2493409)

[X-Ray 6](#_Toc2493410)

Compute

# EC2

# Amazon EC2 Auto Scaling

* Fully managed service to launch or terminate EC2 instances automatically
* Ensures we have correct number of EC2 Instances required to handle load
* Detects and Replaces Un-healthy instances
* Scales-Up or Scales-Down EC2 fleet according to conditions defined

### EC2 Auto-Scaling Vs AWS Auto-Scaling

Use EC2 Auto-Scaling only to scale ASG (EC2 Auto-Scaling-Group) to maintain health of EC2 fleet

AWS Auto Scaling for resources beyond EC2 like DynamoDB Tables/Indexes, ECS tasks. For AWS Auto Scaling to work, apps must be created using Cloud Formation or Beanstalk

### Benefits of EC2 Auto Scaling

* No Need to manually provision EC2 fleet in advance
* Scale-Up/Scale-Down based on demand (Ex: based on CPU Utilization). This is achieved by using CloudWatch to send alarms to trigger scaling activities and ELB traffic distribution within ASG
* Ability to schedule Auto-scaling if load is predictable

### Fleet Management Vs Dynamic Scaling

Fleet is a set of EC2 instances. Fleet Mgmt refers to functionality of automatically replacing un-healthy instances to maintain desired fleet-capacity. When Auto Scaling detects failed health check, it will replace instance automatically

Dynamic Scaling refers to automatic increase/decrease of capacity based on load and other metrics. Ex: Adding new instance when CPU Utilization > 80%

### Target Tracking

New type of scaling policy for Dynamic Scaling where in a particular load metric for application is specified (Ex: CPU Utilization/Request Count/Response time etc.) and Auto Scaling adjusts EC2 instances in ASG to maintain the target

### Auto Scaling Group (ASG)

Collection of EC2 instances that share similar characteristics and are treated as logical group for fleet management and dynamic scaling.

When ASG is deleted, running instances in the ASG are terminated and ASG is deleted.

### Notifications on Launch/Termination of EC2 instances in ASG

We can configure EC2 Auto Scaling to send SNS notification when EC2 Auto Scaling Group scales.

Ex: EC2\_INSTANCE\_TERMINATE

Notification can be sent as HTTP, HTTPS POST, EMAIL, SQS Queue Message

### Launch Configuration

* Template that EC2 Auto-Scaling Group uses to launch EC2 instances
* Components of Launch Configuration:
  + AMI ID
  + Instance Type
  + Key Pair
  + One or more Security Groups
  + EBS Device Mapping
* Launch Configuration is required to create a ASG.
* Launch Configurations CANNOT be MODIFIED
* To change Launch Configuration of ASG, Create New Launch Configuration and Update the Launch Configuration of the ASG.
* When Launch Configuration is updated, existing instances are NOT affected, new instances are launched based on updated configuration.

### Time Required to Scale-Up or Scale-Down

# Elastic Load Balancing

# ECS, ECR

# Lambda

# Beanstalk

# Lightsail

Storage, Databases, Cache

# S3

# EBS

# EFS

# RDS

# Aurora

# DynamoDB

# Elasticache

# RedShift

# Storage Gateway

# Snowball

# Neptune

Network

# VPC

# Route53

# CloudFront

Security

# IAM

# KMS

# AWS Shield

# WAF

# STS

# Guard Duty

# Cognito

# Inspector

# Macie

# CloudHSM

Integration

# SNS

# SQS

# SWF

# Elastic Transcoder

# API Gateway

# DirectConnect

Management

# CloudWatch

# CloudTrail

# CloudFormation

# AWS OpsWorks

# AWS Config

# Systems Manager

# Trusted Advisor

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