Indice

3.1 Define methods of deploying and operating in the AWS cloud

Amazon Web Services offers multiple options for provisioning your IT infrastructure and the deployment of your applications. Whether it is a simple three-tier application or a complex set of workloads, the deployment model varies from customer to customer. But with the right techniques, AWS can help you pick the best strategy and tool set for deploying an infrastructure that can handle your workload. **The main principles to remember are AAA - Automate, Automate, Automate.**

AWS Elastic Beanstalk

Elastic Beanstalk is a high-level deployment tool that helps you get an app from your desktop to the web in a matter of minutes. Elastic Beanstalk handles the details of your hosting environment—capacity provisioning, load balancing, scaling, and application health monitoring—so you don't have to.

A platform configuration defines the infrastructure and software stack to be used for a given environment. When you deploy your app, Elastic Beanstalk provisions a set of AWS resources that can include Amazon EC2 instances, alarms, a load balancer, security groups, and more.

AWS CloudFormation

AWS CloudFormation is a service that helps you model and set up your Amazon Web Services resources so that you can spend less time managing those resources and more time focusing on your applications that run in AWS. You create a template that describes all the AWS resources that you want (like Amazon EC2 instances or Amazon RDS DB instances), and AWS CloudFormation takes care of provisioning and configuring those resources for you.

AWS OpsWorks

AWS OpsWorks is a configuration management service that helps you configure and operate applications in a cloud enterprise by using Chef. There are 2 variants: AWS OpsWorks Stacks and AWS OpsWorks for Chef Automate.

AWS OpsWorks Stacks

AWS OpsWorks Stacks, the original service, provides a simple and flexible way to create and manage stacks and applications. AWS OpsWorks Stacks lets you deploy and monitor applications in your stacks. Unlike AWS OpsWorks for Chef Automate, AWS OpsWorks Stacks does not require or create Chef servers; AWS OpsWorks Stacks performs some of the work of a Chef server for you. AWS OpsWorks Stacks monitors instance health, and provisions new instances for you, when necessary, by using Auto Healing and Auto Scaling.

AWS OpsWorks for Chef Automate

AWS OpsWorks for Chef Automate lets you create AWS-managed Chef servers that include Chef Automate premium features, and use the Chef DK and other Chef tooling to manage them. WS OpsWorks for Chef Automate manages both Chef Automate Server and Chef Server software on a single instance.

AWS CodeCommit

AWS CodeCommit is a fully-managed source control service that makes it easy for companies to host secure and highly scalable private Git repositories. CodeCommit integrates with AWS CodePipeline and AWS CodeDeploy to streamline your development and release process.

AWS CodePipeline

AWS CodePipeline is a continuous integration and continuous deliveryservice for fast and reliable application and infrastructure updates. CodePipeline builds, tests, and deploys your code every time there is a code change, based on the release process models you define.

AWS CodeDeploy

AWS CodeDeploy is a service that automates code deployments and software deployments to any instance, including Amazon EC2 instances and instances running on-premises. AWS CodeDeploy makes it easier for you to rapidly release new features, helps you avoid downtime during application deployment, and handles the complexity of updating your applications.

Amazon Elastic Container Service

Amazon Elastic Container Service (ECS) is a highly scalable, high performance container management service that supports Docker containers and allows you to easily run applications on a managed cluster of Amazon EC2 instances. Amazon ECS eliminates the need for you to install, operate, and scale your own cluster management infrastructure.

Non-AWS Solutions

Infrastructure as Code

- Terraform
- Salt Stack.

Configuration Management

- Chef
- Puppet

Continuous Integration

- Jenkins
- TeamCity

Hosted Version Control Repositories

- GitHub
- GitLab

General Principles:

Good Practice

- Provision infrastructure from code
- Deploy artefacts automatically from version control
- Configuration managed from code and applied automatically
- Scale your infrastructure automatically
- Monitor every aspect of the pipeline and the infrastructure (CloudWatch)
- Logging for every action (CloudWatch Logs and CloudTrail)
- Instance profiles for embedding IAM roles in instances automatically
- Use variables, don't hard code values
- Tagging can be used with automation to provide more insights on what has been provisioned

Updating Your Stack

There are many ways to update your stack.

- You can update your AMIs and then deploy a new environment from them.
- You can use CI tools to deploy the code to existing environments.
- You can use the "Blue/Green" method to have one environment for production (blue) and one for the new version (green). When it is time to upgrade, simply redirect the traffic from blue to green.

3.2 Define the AWS global infrastructure

The AWS Cloud operates 69 Availability Zones within 22 geographic Regions around the world, with announced plans for 9 more Availability Zones and 3 more Regions in Cape Town, Jakarta, and Milan.

5AWS Regions and Availability Zones

The AWS Cloud infrastructure is built around Regions and Availability Zones (AZs). A Region is a physical location in the world with multiple AZs. Availability Zones consist of one or more discrete data centers, each with redundant power and networking, housed in separate facilities that are located on stable flood plains. These AZs offer the abilities to operate production applications and databases which are highly available, fault tolerant, and scalable than would be possible from a single data center. In total, the AWS Cloud operates 69 Availability Zones within 22 geographic Regions around the world.

Region & Number of Availability Zones

US East

N. Virginia (6), Ohio (3)

US West

N. California (3), Oregon (3)

Asia Pacific

Mumbai (2), Seoul (2), Singapore (2), Sydney (3), Tokyo (4), Bahrain

Canada

Central (2)

China

Beijing (2)

Europe

Frankfurt (3), Ireland (3), London (2)

South America

São Paulo (3)

AWS GovCloud (US-West) (2)

The components are:

- Availability Zones (AZs)
- Regions
- Edge Locations
- Regional Edge Caches

High Availability Through Multiple Availability Zones

Unlike virtually every other technology infrastructure provider, each AWS Region has multiple Availability Zones and data centers. As we've learned from running the leading cloud infrastructure technology platform since 2006, customers who care about the availability and performance of their applications want to deploy these applications across multiple Availability Zones in the same region for fault tolerance and low latency. Availability Zones are connected to each other with fast and private fiber-optic network, which enables applications to automatically fail-over between Availability Zones without interruption.

Further Improving Availability by Deploying in Multiple Regions

In addition to replicating applications and data across multiple data centers in the same Region using Availability Zones, you can also choose to further increase redundancy and fault tolerance by replicating data between geographic Regions. You can do so using both private and public network to provide an additional layer of business continuity, or to provide low latency access across the globe.

Meeting Compliance and Data Residency Requirements

You retain complete control and ownership over the region in which your data is physically located, making it easy to meet regional compliance and data residency requirements.

Geographic Expansion

The AWS Cloud has announced plans to expand with 9 more Availability Zones and 3 more Regions in Cape Town, Jakarta, and Milan.

Edge Locations

Edge Locations are AWS sites deployed in major cities and highly populated areas across the globe. They far outnumber the number of availability zones available.

While Edge Locations are not used to deploy your main infrastructures such as EC2 instances, EBS storage, VPCs, or RDS resources like AZs, they are used by AWS services such as AWS CloudFront and AWS Lambda@Edge (currently in Preview) to cache data and reduce latency for end user access by using the Edge Locations as a global Content Delivery Network (CDN).

As a result, Edge Locations are primarily used by end users who are accessing and using your services.

For example, you may have your website hosted on EC2 instances and S3 (your origin) within the Ohio region with a configured CloudFront distribution associated. When a user accesses your website from Europe, they would be re-directed to their closest Edge Location (in Europe) where cached data could be read on your website, significantly reducing latency.

3.3 Identify the core AWS services

Here's a list of the services you should definitely know. But, don't be surprised if you see questions about others as well:

- EC2
- VPC
- S3
- RDS
- Lambda
- Route 53
- SNS
- SQS
- ELB

The level of detail in each question depends on the service. More widely used services may require a bit more knowledge, and others will only require that you know what the service does. For example, EC2 is one of the most important AWS services, so you could be asked questions about different instance types for different scenarios. On the other hand, you may only be asked to choose the best description of a service like CloudFront.

In addition to the traditional services, the exam covers other AWS technology, including the command line interface (CLI) and software development kit (SDK). You may also see questions that overlap with other exam domains. For example, services like AWS Trusted Advisor and AWS Cost Calculator may fall into the technology domain as well as billing and pricing.

EC2

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers.

Instance Types

General Purpose

T2 - T2 instances are Burstable Performance Instances that provide a baseline level of CPU performance with the ability to burst above the baseline.

M4 - M4 instances are the latest generation of General Purpose Instances. This family provides a balance of compute, memory, and network resources, and it is a good choice for many applications.

Compute Optimised

C4 - C4 instances are the latest generation of Compute-optimized instances, featuring the highest performing processors and the lowest price/compute performance in EC2.

Memory Optimised

X1 - X1 Instances are optimized for large-scale, enterprise-class, in-memory applications and high-performance databases, and have the lowest price per GiB of RAM among Amazon EC2 instance types.

R4 - R4 instances are optimized for memory-intensive applications and offer better price per GiB of RAM than R3. The RAM sizes are a step below the X1s.

Accelerated Computing

P2 - P2 instances are intended for general-purpose GPU compute applications.

G3 - G3 instances are optimized for graphics-intensive applications. The GPU specs are a step below the P2s.

F1 - F1 instances offer customizable hardware acceleration with field programmable gate arrays (FPGAs).

Storage Optimised

I3 - High I/O instances. This family includes the High Storage Instances that provide Non-Volatile Memory Express (NVMe) SSD backed instance storage optimized for low latency, very high random I/O performance, high sequential read throughput and provide high IOPS at a low cost.

D2 - Dense-storage instances. D2 instances feature up to 48 TB of HDD-based local storage, deliver high disk throughput, and offer the lowest price per disk throughput performance on Amazon EC2.

Pricing

Amazon EC2 is free to try. There are four ways to pay for Amazon EC2 instances: On-Demand, Reserved Instances, and Spot Instances. You can also pay for Dedicated Hosts which provide you with EC2 instance capacity on physical servers dedicated for your use.

On-Demand

With On-Demand instances, you pay for compute capacity by per hour or per second depending on which instances you run. No longer-term commitments or upfront payments are needed.

Spot Instances

Amazon EC2 Spot instances allow you to bid on spare Amazon EC2 computing capacity for up to 90% off the On-Demand price. Spot instances are recommended for applications that have flexible start and end times, applications that are only feasible at very low compute prices or users with urgent computing needs for large amounts of additional capacity.

Reserved Instances

Reserved Instances provide you with a significant discount (up to 75%) compared to On-Demand instance pricing. For applications that have steady state or predictable usage, require reserved capacity or can commit to using EC2 for a 1 or 3 year period, Reserved Instances can provide significant savings compared to using On-Demand instances.

Per-Second Billing

With per-second billing, you pay for only what you use. It takes cost of unused minutes and seconds in an hour off of the bill, so you can focus on improving your applications instead of maximising usage to the hour.

Security Groups

A *security group* acts as a virtual firewall that controls the traffic for one or more instances. When you launch an instance, you associate one or more security groups with the instance. You add rules to each security group that allow traffic to or from its associated instances. You can modify the rules for a security group at any time; the new rules are automatically applied to all instances that are associated with the security group. When we decide whether to allow traffic to reach an instance, we evaluate all the rules from all the security groups that are associated with the instance.

S3

Amazon S3 is object storage built to store and retrieve any amount of data from anywhere – web sites and mobile apps, corporate applications, and data from IoT sensors or devices. It is designed to deliver 99.999999999% durability, provides comprehensive security and compliance capabilities that meet even the most stringent regulatory requirements and gives customers flexibility in the way they manage data for cost optimization, access control, and compliance. Also, S3 is the only cloud storage solution with query-in-place functionality, allowing you to run powerful analytics directly on your data at rest in S3.

Storage Classes

Amazon S3 offers a range of storage classes designed for different use cases. Lifecycle transitions can be used to move data between classes, given certain events.

Amazon S3 Standard

Designed for general-purpose storage of frequently accessed data. Delivers low latency and high throughput, perfect for a wide variety of use cases. There is no retrieval fee, minimum object size or minimum storage duration.

Amazon S3 Standard - Infrequent Access

Designed for long-lived, but less frequently accessed data. For data that is accessed less frequently, but requires rapid access when needed. Standard - IA offers the high durability, throughput, and low latency of Amazon S3 Standard, with a low per GB storage price and per GB retrieval fee.

Amazon Glacier

Designed for long-term archive. Secure, durable, and extremely low-cost storage service for data archiving. You can reliably store any amount of data at costs that are competitive with or cheaper than on-premises solutions. Amazon Glacier provides three options for access to archives, from a few minutes to several hours.

RDS

Amazon Relational Database Service (Amazon RDS) makes it easy to set up, operate, and scale a relational database in the cloud. It provides cost-efficiency and resizable capacity while automating time-consuming

administration tasks such as hardware provisioning, database setup, patching and backups.

Amazon RDS is available on several database instance types - optimized for memory, performance or I/O. RDS provides you with six familiar database engines to choose from. Amazon RDS supports encryption at rest and in transit, using keys managed through KMS. Backups are automated, user-initiated snapshots are available and database software is updated automatically.

Instance Types

·Standard

·Memory Optimized

·Micro Instances

Database Engines

·Amazon Aurora

·PostgreSQL

·MySQL

· MariaDB

·Oracle

·Microsoft SQL Server

Supporting Services

AWS Database Migration Service

AWS Database Migration Service can help you migrate databases to AWS easily and securely. The source database remains fully operational during the migration, minimizing downtime to applications that rely on the database. The AWS Database Migration Service can migrate your data to and from most widely used commercial and open-source databases. The service supports homogenous migrations such as Oracle to Oracle, as well as heterogeneous migrations between different database platforms, such as Oracle to Amazon Aurora or Microsoft SQL Server to MySQL.

It also allows you to stream data to Amazon Redshift, Amazon DynamoDB, and Amazon S3 from any of the supported sources including Amazon Aurora, PostgreSQL, MySQL, MariaDB, Oracle, SAP ASE, SQL Server and MongoDB, enabling consolidation and easy analysis of data in the petabyte-scale data warehouse. AWS Database Migration Service can also be used for continuous data replication with high-availability.

AWS Schema Conversion Tool

The AWS Schema Conversion Tool makes heterogeneous database migrations predictable by automatically converting the source database schema and a majority of the database code objects, including views, stored procedures, and functions, to a format compatible with the target database. Any objects that cannot be

automatically converted are clearly marked so that they can be manually converted to complete the migration. SCT can also scan your application source code for embedded SQL statements and convert them as part of a database schema conversion project.

Your source database can be on-premises, or in Amazon RDS or EC2 and the target database can be in either Amazon RDS or EC2. The AWS Schema Conversion Tool supports conversions from multiple RBMS providers to an equivalent database in RDS, or from multiple data warehouse providers to Amazon Redshift.

Lambda

AWS Lambda lets you run code without provisioning or managing servers. You pay only for the compute time you consume - there is no charge when your code is not running. With Lambda, you can run code for virtually any type of application or backend service - all with zero administration.

AWS Lambda automatically scales your application by running code in response to each trigger. Your code runs in parallel and processes each trigger individually, scaling precisely with the size of the workload. With AWS Lambda, you are charged for every 100ms your code executes and the number of times your code is triggered. You don't pay anything when your code isn't running.

Route 53

Amazon Route 53 is a highly available and scalable cloud Domain Name System (DNS) web service. You can use Amazon Route 53 to configure DNS health checks to route traffic to healthy endpoints or to independently monitor the health of your application and its endpoints.

Amazon Route 53 Traffic Flow makes it easy for you to manage traffic globally through a variety of routing types, including Latency Based Routing, Geo DNS, Geoproximity, and Weighted Round Robin—all of which can be combined with DNS Failover in order to enable a variety of low-latency, fault-tolerant architectures. Using Amazon Route 53 Traffic Flow’s simple visualor, you can easily manage how your end-users are routed to your application’s endpoints—whether in a single AWS region or distributed around the globe.

Amazon Route 53 also offers Domain Name Registration – you can purchase and manage domain names such as example.com and Amazon Route 53 will automatically configure DNS settings for your domains.

Amazon Route 53 is integrated with Elastic Load Balancing (ELB).

SNS

Amazon Simple Notification Service (SNS) is a Pub/Sub messaging and mobile notifications for microservices, distributed systems, and serverless applications. Amazon SNS Mobile Notifications makes it simple and cost effective to send push notifications to iOS, Android, Fire OS, Windows and Baidu-based devices. It supports HTTP/HTTPS, Email/Email-JSON, SMS or Amazon Simple Queue Service (SQS) queues, or AWS Lambda functions.

Amazon DevPay

Amazon DevPay is a simple-to-use online billing and account management service that makes it easy for

businesses to sell applications that are built in, or run on top of, Amazon Web Services.

Amazon QuickSight

Amazon QuickSight is a fast business analytics service you can use to build visualizations, perform ad hoc analysis, and quickly get business insights from your data. You can access data from multiple sources – upload files or connect to AWS data sources or external databases.

3.4 Identify resources for technology support

The resources available to you for technical support depend on your support plan. They are:

- Developer Support
- Business Support
- Enterprise Support

AWS Support Ticket

If you are on one of these AWS Support plans you can raise a ticket. It's much faster to get support via the console and create a request.

Technical Account Manager

Your designated Technical Account Manager (TAM) is your primary point of contact who provides guidance, architectural review, and ongoing communication to keep you informed and well prepared as you plan, deploy, and proactively optimize your solutions.

- A dedicated voice within AWS to serve as your technical point of contact and advocate
- Proactive guidance and best practices to help optimize your AWS environment
- Orchestration and access to the breadth and depth of technical expertise across the full range of AWS

Trusted Adviser

AWS Trusted Advisor is an online resource that helps you provision your resources following best practices to help reduce cost, increase performance and fault tolerance, and improve security by optimizing your AWS environment. While the four core checks are available to all AWS customers, the full power of AWS Trusted Advisor is available with Business and Enterprise Support plans.

- Guidance on getting the optimal performance and availability based on your requirements
- Opportunities to reduce your monthly spend and retain or increase productivity
- Best practices to help increase security

AWS Whitepapers

AWS Whitepapers features a comprehensive list of technical AWS whitepapers, covering topics such as architecture, security, and economics. These whitepapers have been authored by the AWS Team, independent analysts, or the AWS Community (Customers or Partners).

AWS Service Health Dashboard

This is a general view of the health of all AWS services.

https://status.aws.amazon.com/

AWS Personal Health Dashboard

This is a personal view of the health of the AWS services that are used by you.

	Developer	Business	Enterprise
	Recomendado si está realizando pruebas en AWS.	*Recomendado si tiene cargas de producción en AWS.*	*Recomendado si tiene cargas de trabajo críticas o empresariales en AWS.*
Comprobaciones de prácticas recomendadas de AWS Trusted Advisor	7 comprobaciones principales	Conjunto completo de comprobaciones	Conjunto completo de comprobaciones
Soporte técnico mejorado	Acceso por email a los socios de soporte en la nube durante el horario comercial** Casos ilimitados, 1 contacto principal	Acceso por teléfono, email y chat a los socios de soporte en la nube las 24 horas y los 7 días de la semana Casos ilimitados, contactos ilimitados (compatible con IAM)	Acceso por teléfono, email y chat a los socios de soporte en la nube las 24 horas y los 7 días de la semana Casos ilimitados, contactos ilimitados (compatible con IAM)
Gravedad de los casos/plazos de respuesta*	Asesoramiento general: menos de 24 horas, Horario comercial** Fallo en el sistema: menos de 12 horas, Horario comercial**	Asesoramiento general: < 24 horas Fallo en el sistema: < 12 horas Fallo en el sistema de producción: < 4 horas Sistema de producción inactivo: < 1 hora	Orientación general: < 24 horas Fallo en el sistema: < 12 horas Fallo en el sistema de producción: < 4 horas Sistema de producción inactivo: < 1 hora Sistema crítico para la empresa inactivo: < 15 minutos

	Developer	Business	Enterprise
Asesoramiento sobre arquitecturas	Aspectos generales	Contextualizado a sus casos de uso	Asesoramiento y revisión consultiva en función de sus aplicaciones
Administración de casos de programación		API de AWS Support	API de AWS Support
Soporte para software de terceros		Orientación sobre interoperabilidad y configuración, y resolución de problemas	Orientación sobre interoperabilidad y configuración, y resolución de problemas
Programas proactivos		Acceso a Infrastructure Event Management por una tarifa adicional.	Infrastructure Event Management Revisiones de buena arquitectura Revisiones de operaciones El director técnico de cuenta (TAM) coordina el acceso a los programas y otros expertos de AWS según sea necesario.
Administración técnica de cuentas			Director técnico de cuenta (TAM) asignado para que monitorice proactivamente su entorno y lo ayude con los asuntos relacionados con la optimización.
Formación técnica			Acceso a laboratorios autoguiados online
Asistencia para cuentas			Equipo de soporte Concierge
Precios	A partir de 29 USD al mes*** o bien 3 % del consumo mensual de AWS Consulte los detalles sobre precios y un ejemplo.	A partir de 100 USD al mes*** o bien 10 % del consumo mensual de AWS para los primeros 0 a 10 000 USD 7 % del consumo mensual de AWS desde 10 000 hasta 80 000 USD 5 % del consumo mensual de AWS desde 80 000 hasta 250 000 USD 3 % del consumo mensual de AWS por encima de 250 000 USD Consulte los detalles sobre precios y un ejemplo.	A partir de 15 000 USD o bien, 10 % del consumo mensual de AWS para los primeros 0 a 150 000 USD 7 % del consumo mensual de AWS desde 150 000 hasta 500 000 USD 5 % del consumo mensual de AWS desde 500 000 hasta 1 000 000 USD 3 % del consumo mensual de AWS por encima de 1 000 000 USD Consulte los detalles sobre precios y un ejemplo.