**Compute and Serverless**

**AWS Batch -** AWS Batch enables developers, scientists, and engineers to easily and efficiently run hundreds of thousands of batch computing jobs on AWS. AWS Batch dynamically provisions the optimal quantity and type of compute resources (e.g., CPU or memory optimized instances) based on the volume and specific resource requirements of the batch jobs submitted. With AWS Batch, there is no need to install and manage batch computing software or server clusters that you use to run your jobs, allowing you to focus on analyzing results and solving problems. AWS Batch plans, schedules, and executes your batch computing workloads across the full range of AWS compute services and features, such as AWS Fargate, Amazon EC2 and Spot Instances.

There is no additional charge for AWS Batch. You only pay for the AWS resources (e.g., EC2 instances or Fargate jobs) you create to store and run your batch jobs.

**AWS Elastic Beanstalk**

With Elastic Beanstalk, developers upload their application. Then, Elastic Beanstalk automatically handles the deployment details of **capacity provisioning, load balancing, auto-scaling, and application health monitoring.** By using Elastic Beanstalk, developers can focus on developing their application and are freed from deployment-oriented tasks, such as provisioning servers, setting up load balancing, or managing scaling.

Elastic Beanstalk automatically scales your application up and down based on your application's specific need using adjustable Auto Scaling settings. At the same time, you retain full control over the AWS resources powering your application and can access the underlying resources at any time.

**AWS Lambda** - AWS Lambda is a serverless compute service that lets to run code without provisioning or managing servers. AWS Lambda is a serverless, event-driven compute service that lets you run code for virtually any type of application or backend service without provisioning or managing servers. You can trigger Lambda from over 200 AWS services and software as a service (SaaS) application, and only pay for what you use.

**Amazon LightSail -** is an easy-to-use **virtual private server (VPS)** provider that offers you everything needed **to build an application or website for a cost-effective**, monthly plan. LightSail provides developers with compute, storage, networking capacity and capabilities to deploy and **manage websites and web applications in the cloud.**

LightSail provides low-cost, pre-configured cloud resources for simple workloads just starting on AWS.

**Amazon Workspaces -** Secure, reliable, and scalable access to persistent desktops from any location. Amazon Workspaces is a fully managed desktop virtualization service for Windows and Linux that enables you to access resources from any supported device.

**AWS Fargate** – Run Containers without managing Servers or clusters. AWS Fargate is a serverless, pay-as-you-go compute engine that lets you focus on building applications without managing servers. AWS Fargate is compatible with both Amazon Elastic Container Service (ECS) and Amazon Elastic Kubernetes Service (EKS).

**AWS Compute Services**

Compute is a generic term used to reference all the resources required for a program to successfully run. These resources include the processing power, memory, and other necessary resources needed for the computational success of the program. The three main categories of AWS compute:

**Amazon Elastic Compute Cloud (Amazon EC2) -** Instances are virtual computers in the cloud. Whatever you would do on a physical computer, you can do with an instance. You determine your compute options: CPU, memory, storage. You choose the OS and maintain all security and patching of the instance. You can scale the resources up or down as you need it. instances are VMs that emulate physical hardware components. AWS manages the underlying physical hardware and infrastructure on which the instance runs but does EC2 not have access to your instance. AWS cannot access the OS, passwords or keys, or any data stored in your account. With Amazon EC2, you pay for the capacity you use, and billing starts when the instance starts and is in a *running*state. You are not billed if an instance is in a *stopped*state.

**Benefits:**

1. With Amazon EC2, you can quickly build and start a new server: You don't need to rack the server, run cable, and update hardware drivers as you would do with a traditional server.
2. You can scale capacity as needed, both up and down. This means that if you need more memory, processing, or storage, you can add it.
3. Instances offer at least 99.99% (four nines) of availability.
4. Amazon EC2 offers instances that are optimized for specific types of workloads, including **memory optimized, compute optimized, storage optimized, accelerated computing, and general purpose.**
5. Various instance types are available with different pricing options, so you can choose the best option to fit your business requirements. These options include **On-Demand Instances, Reserved Instances, and Spot Instances.**
6. Amazon EC2 gives you complete control over the instance, down to the root level. You can manage the instance as you would manage a physical server.
7. You can use instances for long-running applications, especially those with state information and long-running computation cycles.

**Containers** - **AWS Fargate** is a technology that you can use with Amazon ECS to run containers without having to manage servers or clusters of Amazon EC2 instances. With Fargate, you no longer have to provision, configure, or scale clusters of virtual machines to run containers.

**Benefits:**

1. The application is packaged so that you control the application and all associated resources, such as policies, security, and deployment.
2. Containers are portable and can be moved to different OS or hardware platforms, and through different environments such as **development, testing/staging, pre-production, and production**.
3. There are no time-out limits when running. This is useful for applications that run longer than 15 minutes or that need to initiate instantly when called.
4. Containers run without the startup latency of Lambda or Amazon EC2.
5. Containers have no size limit. They can be as large or as small as you need them to be.
6. **Containers are useful when taking a large traditional application and breaking it down into small parts, or microservices, to make the application more scalable and resilient.**

**Serverless** – **Lambda -** With Lambda, you don't have to provision or manage any server instances. You build your code, and Lambda automatically allocates compute resources to run it. Lambda handles everything required to run your code based on the incoming request or event and will scale automatically as needed. You can set up your code to be automatically invoked from other AWS services or call it directly from any web or mobile app.

**Benefits:**

1. **Fast Development** - Using a serverless solution, you and your developers can focus on building and refining your applications without spending time managing and maintaining servers.
2. **Pay for Value** - You only pay for the time that your application runs. This model helps keep costs down so that you aren't paying for time when your application is idle. The AWS Lambda free tier includes **one million free requests per month** and **400,000 GB-seconds of compute time per month**
3. **Short Lived-applications -** Lambda is a suitable choice for any short-lived application that can finish running in **under 15 minutes**. If an application needs to run longer than 15 minutes, it's no longer cost effective to use Lambda.
4. **Event-driven Applications -** You might need event-initiated, or event-driven, stateless applications that need quick response times.

An event-driven architecture uses events to initiate actions and communication between decoupled services. An event is a change in state, a user request, or an update, such as an item being placed in a shopping cart in an ecommerce website. When an event occurs, the information is published for other services to consume it.

1. **Automatic Scaling** - When you use Lambda, the service is responsible for all the resources required to run your application. If your application suddenly needs more resources, Lambda adjusts your resource consumption up or down to maintain consistent application performance during peak utilization and off-hour timeframes.
2. **Redundancy & resilience -** The AWS Global Infrastructure is built around AWS Regions and Availability Zones. Regions provide multiple physically separated and isolated Availability Zones, which are connected with low-latency, high-throughput, and highly redundant networking. Lambda runs your function **in multiple Availability Zones** to ensure that it is available to process events in case of a service interruption in a single zone. Lambda also provides additional resilience features such as **versioning, reserved resources, retries**, and the previously mentioned automatic scaling capability.

**Analytics**

**Amazon Athena**

Amazon Athena is an interactive query service that makes it easy to analyze data in Amazon S3 using standard SQL. Athena is serverless, so there is no infrastructure to manage, and you pay only for the queries that you run.

Athena is easy to use. Simply point to your data in Amazon S3, define the schema, and start querying using standard SQL. Most results are delivered within seconds. With Athena, there’s no need for complex ETL jobs to prepare your data for analysis. This makes it easy for anyone with SQL skills to quickly analyze large-scale datasets.

**Amazon Kinesis**

Amazon Kinesis makes it easy to collect, process, and analyze real-time, streaming data so you can get timely insights and react quickly to new information. Amazon Kinesis offers key capabilities to cost-effectively process streaming data at any scale, along with the flexibility to choose the tools that best suit the requirements of your application. With Amazon Kinesis, you can ingest real-time data such as **video, audio, application logs, website clickstreams, and IoT telemetry data** for machine learning, analytics, and other applications.

Amazon Kinesis enables you to process and analyze data as it arrives and respond instantly instead of having to wait until all your data is collected before the processing can begin.

**Amazon Kinesis Data Streams** is a scalable and durable real-time data streaming service that can continuously capture gigabytes of data per second from hundreds of thousands of sources.

**Amazon Kinesis Data Firehose** is the easiest way to capture, transform, and load data streams into AWS

data stores for near real-time analytics with existing business intelligence tools.

**Amazon Kinesis Data Analytics** is the easiest way to process data streams in real time with SQL or

Apache Flunk without having to learn new programming languages or processing frameworks.

**Amazon Kinesis Video Streams** makes it easy to securely stream media from connected devices to AWS

for storage, analytics, machine learning (ML), playback, and other processing. Kinesis Video Streams automatically provisions and elastically scales all the infrastructure needed to ingest streaming media from millions of devices. It durably stores, encrypts, and indexes media in your streams, and allows you to access your media through easy-to-use APIs. Kinesis Video Streams enables you to quickly build computer vision and ML applications through integration with Amazon Rekognition Video, Amazon

SageMaker, and libraries for ML frameworks such as Apache MxNet, TensorFlow, and OpenCV.

**Amazon QuickSight** - Amazon QuickSight allows everyone in your organization to understand your data by asking questions in natural language, exploring through interactive dashboards, or automatically looking for patterns and outliers powered by machine learning.

**AWS Glue** - AWS Glue is a serverless data integration service that makes it easy to discover, prepare, and combine data for analytics, machine learning, and application development. AWS Glue provides all the capabilities needed for data integration so that you can start analyzing your data and putting it to use in minutes instead of months’. Glue provides both visual and code-based interfaces to make data integration easier. Users can easily find and access data using the AWS Glue Data Catalog. Data engineers and ETL (extract, transform, and load) developers can visually create, run, and monitor ETL workflows with a few clicks in AWS Glue Studio.

**AWS Data Pipeline** - AWS Data Pipeline is a web service that helps you reliably process and move data between different AWS compute and storage services, as well as on-premises data sources, at specified intervals. With AWS Data Pipeline, you can regularly access your data where it’s stored, transform and process it at scale, and efficiently transfer the results to AWS services such as Amazon S3, Amazon RDS, Amazon DynamoDB, and Amazon EMR.

AWS Data Pipeline helps you easily create complex data processing workloads that are fault tolerant, repeatable, and highly available. You don’t have to worry about ensuring resource availability, managing inter-task dependencies, retrying transient failures or timeouts in individual tasks, or creating a failure notification system. AWS Data Pipeline also allows you to move and process data that was previously locked up in on-premises data silos.

**Amazon EMR** -Amazon EMR is a cloud big data platform for running large-scale distributed data processing jobs, interactive SQL queries, and machine learning (ML) applications using open-source analytics frameworks such as Apache Spark, Apache Hive, and Presto.

**Networking and Content Delivery**

**Amazon API Gateway** is a fully managed service that makes it easy for developers to create, publish, maintain, monitor, and secure APIs at any scale. APIs act as the "front door" for applications to access data, business logic, or functionality from your backend services. Using API Gateway, you can create RESTful APIs and WebSocket APIs that enable real-time two-way communication applications. API Gateway supports containerized and serverless workloads, as well as web applications.

**Amazon CloudFront**

Amazon CloudFront is a global content delivery network (CDN) service that securely delivers data, videos, applications, and APIs to your viewers with low latency and high transfer speeds.

**AWS Direct Connect** – Dedicated Network connection to AWS. With AWS Direct Connect Sitelink, you can send data between AWS Direct Connect locations to create private network connections between the offices and data centers in your global network.

**Amazon Route 53** - Amazon Route 53 is a highly available and scalable Domain Name System (DNS) web service. Route 53 connects user requests to internet applications running on AWS or on-premises.

**Amazon VPC** – Define and launch AWS resources in a logically isolated virtual network. Amazon Virtual Private Cloud (Amazon VPC) gives you full control over your virtual networking environment, including resource placement, connectivity, and security. Get started by setting up your VPC in the AWS service console. Next, add resources to it such as Amazon Elastic Compute Cloud (EC2) and Amazon Relational Database Service (RDS) instances. Finally, define how your VPCs communicate with each other across accounts, Availability Zones, or AWS Regions.

**AWS Security, Identity, and Compliance**

**AWS Artifact** is a central resource for compliance-related information that matters to you. It provides on-demand access to **AWS’ security and compliance reports and select online agreements**. Reports available in AWS Artifact include our Service Organization Control (SOC) reports, Payment Card Industry (PCI) reports, and certifications from accreditation bodies across geographies and compliance verticals that validate the implementation and operating effectiveness of AWS security controls. Agreements available in AWS Artifact include the Business Associate Addendum (BAA) and the Nondisclosure Agreement (NDA).

**AWS Certificate Manager** - Easily provision, manage, and deploy public and private SSL/TLS certificates for use with AWS services and internal connected resources. **SSL/TLS certificates** are used to secure network communications and establish the identity of websites over the Internet as well as resources on private networks. AWS Certificate Manager removes the time-consuming manual process of purchasing, uploading, and renewing SSL/TLS certificates.

**AWS CloudHSM** - AWS CloudHSM is a cloud-based hardware security module (HSM) that enables you to easily generate and use your own encryption keys on the AWS Cloud. With CloudHSM, you can manage **your own encryption keys using** FIPS 140-2 Level 3 validated HSMs. CloudHSM offers you the flexibility to integrate with your applications using industry-standard APIs, such as PKCS#11, Java **Cryptography** Extensions (JCE), and Microsoft CryptoNG (CNG) libraries. CloudHSM is standards-compliant and enables you to export all of your keys to most other commercially available HSMs, subject to your configurations. It is a fully managed service that automates time-consuming administrative tasks for you, such as hardware provisioning, software patching, high-availability, and backups. CloudHSM also enables you to scale quickly by adding and removing HSM capacity on-demand, with no up-front costs.

**Amazon Cognito**

Amazon Cognito provides **authentication, authorization, and user management** **for web and mobile apps**. Users can sign in directly with a username and password, or through a third party such as Facebook, Amazon, Google or Apple. The two main components of Amazon Cognito are **user pools and identity pools**.

**Amazon Detective** makes it easy to analyze, investigate, and quickly identify the root cause of potential security issues or suspicious activities. Amazon Detective automatically collects log data from your AWS resources and uses machine learning, statistical analysis, and graph theory to build a linked set of data that enables you to easily conduct faster and more efficient security investigations.

**Amazon GuardDuty** - Protect your AWS accounts with intelligent threat detection. Amazon GuardDuty is a threat detection service that continuously monitors your AWS accounts and workloads for malicious activity and delivers detailed security findings for visibility and remediation.

**AWS Identity and Access Management (IAM)** - Securely manage identities and access to AWS services and resources. With AWS Identity and Access Management (IAM), you can specify who or what can access services and resources in AWS, centrally manage fine-grained permissions, and analyze access to refine permissions across AWS.

**Amazon Inspector** - Amazon Inspector is an automated vulnerability management service that continually scans AWS workloads for software vulnerabilities and unintended network exposure.

**AWS License Manager** - AWS License Manager makes it easier to manage your software licenses from vendors such as Microsoft, SAP, Oracle, and IBM across AWS and on-premises environments. AWS License Manager lets administrators create customized licensing rules that mirror the terms of their licensing agreements. Administrators can use these rules to help prevent licensing violations, such as using more licenses than an agreement stipulates. Rules in AWS License Manager help prevent a licensing breach by stopping the instance from launching or by notifying administrators about a potential infringement. Administrators gain control and visibility of all their licenses with the AWS License Manager dashboard and reduce the risk of non-compliance, misreporting, and additional costs due to licensing overages. In addition, IT administrators or license administrators can now easily manage Visual Studio licenses for their end users via “User-based Subscriptions “in AWS License Manager.

**Amazon Macie**

Amazon Macie is a **fully managed data security and data privacy service** that uses **machine learning and pattern matching to discover and protect your sensitive data in AWS**. Amazon Macie uses machine learning and pattern matching to cost efficiently discover sensitive data at scale. Macie automatically detects a large and growing list of sensitive data types, including personally identifiable information (PII) such as **names, addresses, and credit card numbers**. It also gives you constant visibility of the data security and data privacy of your data stored in Amazon S3. Macie is easy to set up with one click in the AWS Management Console or a single API call. Macie provides multi-account support using AWS Organizations, so you can enable Macie across all your accounts with a few clicks.

**AWS Shield**

AWS Shield is a managed Distributed Denial of Service (DDoS) protection service that safeguards applications running on AWS. AWS Shield provides always-on detection and automatic inline mitigations that minimize application downtime and latency, so there is no need to engage AWS Support to benefit from DDoS protection. There are two tiers of AWS Shield - Standard and Advanced.

**AWS Shield Standard-** All AWS customers benefit from the automatic protections of AWS Shield Standard, at no additional charge. AWS Shield Standard defends against most common, frequently occurring network and transport layer DDoS attacks that target your web site or applications. When you use AWS Shield Standard with Amazon CloudFront and Amazon Route 53, you receive comprehensive availability protection against all known infrastructure (Layer 3 and 4) attacks.

**AWS Shield Advanced -** In addition to the network and transport layer protections that come with Standard, AWS Shield Advanced provides additional detection and mitigation against large and sophisticated DDoS attacks, near real-time visibility into attacks, and integration with AWS WAF, a web application firewall. AWS Shield Advanced also gives you 24x7 access to the AWS Shield Response Team (SRT) and protection against DDoS related spikes in your Amazon Elastic Compute Cloud (EC2), Elastic Load Balancing (ELB), Amazon CloudFront, AWS Global Accelerator and Amazon Route 53 charges.

**AWS WAF - Web Application Firewall**

AWS WAF is a web application firewall that helps protect your web applications or APIs against common web exploits and bots that may affect availability, compromise security, or consume excessive resources. AWS WAF gives you control over how traffic reaches your applications by enabling you to create security rules that control bot traffic and block common attack patterns, such as SQL injection or cross-site scripting. You can also customize rules that filter out specific traffic patterns. You can get started quickly using Managed Rules for AWS WAF, a pre-configured set of rules managed by AWS or AWS Marketplace Sellers to address issues like the OWASP Top 10 security risks and automated bots that consume excess resources, skew metrics, or can cause downtime. These rules are regularly updated as new issues emerge. AWS WAF includes a full-featured API that you can use to automate the creation, deployment, and maintenance of security rules.

You can deploy AWS WAF on Amazon CloudFront as part of your CDN solution, the Application Load Balancer that fronts your web servers or origin servers running on EC2, Amazon API Gateway for your REST APIs, or AWS AppSync for your GraphQL APIs. With AWS WAF, you pay only for what you use, and the pricing is based on how many rules you deploy and how many web requests your application receives.

**AWS Developer Tools**

**AWS CodeStar** - AWS CodeStar enables you to quickly develop, build, and deploy applications on AWS. AWS CodeStar provides a unified user interface, enabling you to easily manage your software development activities in one place. With AWS CodeStar, you can set up your entire continuous delivery toolchain in minutes, allowing you to start releasing code faster. AWS CodeStar makes it easy for your whole team to work together securely, allowing you to easily manage access and add owners, contributors, and viewers to your projects. Each AWS CodeStar project comes with a project management dashboard, including an integrated issue tracking capability powered by Atlassian JIRA Software. With the AWS CodeStar project dashboard, you can easily track progress across your entire software development process, from your backlog of work items to teams’ recent code deployments.

**AWS CodeCommit** is a secure, highly scalable, managed source control service that hosts private Git repositories. It makes it easy for teams to securely collaborate on code with contributions encrypted in transit and at rest. CodeCommit eliminates the need for you to manage your own source control system or worry about scaling its infrastructure. You can use CodeCommit to store anything from code to binaries. It supports the standard functionality of Git, so it works seamlessly with your existing Git-based tools.

**AWS CodeBuild** is a fully managed continuous integration service that compiles source code, runs tests, and produces software packages that are ready to deploy. With CodeBuild, you don’t need to provision, manage, and scale your own build servers. CodeBuild scales continuously and processes multiple builds concurrently, so your builds are not left waiting in a queue. You can get started quickly by using prepackaged build environments, or you can create custom build environments that use your own build tools. With CodeBuild, you are charged by the minute for the compute resources you use.

**AWS CodeDeploy** is a fully managed deployment service that automates software deployments to a variety of compute services such as Amazon EC2, AWS Fargate, AWS Lambda, and on-premises servers. AWS CodeDeploy makes it easier to rapidly release new features, helps you avoid downtime during application deployment, and handles the complexity of updating your applications. You can use AWS CodeDeploy to automate software deployments, eliminating the need for error-prone manual operations. The service scales to match your deployment needs.

**AWS CodePipeline** is a fully managed continuous delivery service that helps you automate your release pipelines for fast and reliable application and infrastructure updates. CodePipeline automates the build, test, and deploy phases of your release process every time there is a code change, based on the release model you define. This enables you to rapidly and reliably deliver features and updates. You can easily integrate AWS CodePipeline with third-party services such as GitHub or with your own custom plugin. With AWS CodePipeline, you only pay for what you use. There are no upfront fees or long-term commitments.

**AWS X-Ray** helps developers analyze and debug production, distributed applications, such as those built using a microservices architecture. With X-Ray, you can understand how your application and its underlying services are performing to identify and troubleshoot the root cause of performance issues and errors. X-Ray provides an end-to-end view of requests as they travel through your application and shows a map of your application’s underlying components. You can use X-Ray to analyze both applications in development and in production, from simple three-tier applications to complex microservices applications consisting of thousands of services.

**AWS Cloud9** is a cloud-based integrated development environment (IDE) that lets you write, run, and debug your code with just a browser. It includes a code editor, debugger, and terminal. Cloud9 comes prepackaged with essential tools for popular programming languages, including JavaScript, Python, PHP, and more, so you don’t need to install files or configure your development machine to start new projects. Since your Cloud9 IDE is cloud-based, you can work on your projects from your office, home, or anywhere using an internet-connected machine. Cloud9 also provides a seamless experience for developing serverless applications enabling you to easily define resources, debug, and switch between local and remote execution of serverless applications. With Cloud9, you can quickly share your development environment with your team, enabling you to pair program and track each other's inputs in real time.

**AWS Management & Governance**

**AWS Auto Scaling**

AWS Auto Scaling monitors your applications and automatically adjusts capacity to maintain steady, predictable performance at the lowest possible cost. Using AWS Auto Scaling, it’s easy to setup application scaling for multiple resources across multiple services in minutes. The service provides a simple, powerful user interface that lets you build scaling plans for resources including Amazon EC2 instances and Spot Fleets, Amazon ECS tasks, Amazon DynamoDB tables and indexes, and Amazon Aurora Replicas. AWS Auto Scaling makes scaling simple with recommendations that allow you to optimize performance, costs, or balance between them.

**AWS Budgets** - AWS Budgets allows you to set custom budgets to track your cost and usage from the simplest to the most complex use cases. With AWS Budgets, you can choose to be alerted by email or SNS notification when actual or forecasted cost and usage exceed your budget threshold, or when your actual RI and Savings Plans' utilization or coverage drops below your desired threshold. With AWS Budget Actions, you can also configure specific actions to respond to cost and usage status in your accounts, so that if your cost or usage exceeds or is forecasted to exceed your threshold, actions can be executed automatically or with your approval to reduce unintentional over-spending.

**AWS Cost and Usage Reports -**You can use Cost and Usage Reports to publish your AWS billing reports to an Amazon Simple Storage Service (Amazon S3) bucket that you own. You can receive reports that break down your costs by the hour, day, or month, by product or product resource, or by tags that you define yourself. AWS updates the report in your bucket once a day in comma-separated value (CSV) format. You can view the reports using spreadsheet software such as Microsoft Excel or Apache OpenOffice Calc, or access them from an application using the Amazon S3 API.

AWS Cost and Usage Reports tracks your AWS usage and provides estimated charges associated with your account. Each report contains line items for each unique combination of AWS products, usage type, and operation that you use in your AWS account. You can customize the AWS Cost and Usage Reports to aggregate the information either by the hour, day, or month. AWS Cost and Usage Reports can do the following:

* Deliver report files to your Amazon S3 bucket
* Update the report up to three times a day
* Create, retrieve, and delete your reports using the AWS CUR API Reference

**Amazon EventBridge** - Amazon EventBridge is a serverless event bus that makes it easier to build event-driven applications at scale using events generated from your applications, integrated Software-as-a-Service (SaaS) applications, and AWS services. EventBridge delivers a stream of real-time data from event sources such as Zendesk or Shopify to targets like AWS Lambda and other SaaS applications. You can set up routing rules to determine where to send your data to build application architectures that react in real-time to your data sources with event publisher and consumer completely decoupled.

**AWS Managed Services** - AWS Managed Services (AMS) helps you adopt AWS at scale and operate more efficiently and securely. We leverage standard AWS services and offer guidance and execution of operational best practices with specialized automations, skills, and experience that are contextual to your environment and applications. AMS provides proactive, preventative, and detective capabilities that raise the operational bar and help reduce risk without constraining agility, allowing you to focus on innovation. AMS extends your team with operational capabilities including monitoring, incident detection and management, security, patch, backup, and cost optimization.

**AWS Secrets Manager**

AWS Secrets Manager helps you protect secrets needed to access your applications, services, and IT resources. The service enables you to easily rotate, manage, and retrieve database credentials, API keys, and other secrets throughout their lifecycle. Users and applications retrieve secrets with a call to Secrets Manager APIs, eliminating the need to hardcode sensitive information in plain text. Secrets Manager offers secret rotation with built-in integration for Amazon Relational Database Service (Amazon RDS), Amazon Redshift, and Amazon DocumentDB. Also, the service is extensible to other types of secrets, including API keys and OAuth tokens. In addition, Secrets Manager enables you to control access to secrets using fine-grained permissions and audit secret rotation centrally for resources in the AWS Cloud, third-party services, and on-premises.

**AWS Systems Manager Parameter Store** that supports the removal of a label associated with a parameter, to enable customers to reorganize Parameter Store parameters with new labels.

**Amazon CloudWatch** is a monitoring and observability service built for DevOps engineers, developers, site reliability engineers (SREs), IT managers, and product owners. CloudWatch provides you with data and actionable insights to monitor your applications, respond to system-wide performance changes, and optimize resource utilization. CloudWatch collects monitoring and operational data in the form of logs, metrics, and events. You get a unified view of operational health and gain complete visibility of your AWS resources, applications, and services running on AWS and on-premises. You can use CloudWatch to detect anomalous behavior in your environments, set alarms, visualize logs and metrics side by side, take automated actions, troubleshoot issues, and discover insights to keep your applications running smoothly.

**CloudFormation** helps you model and set up your AWS resources so that you can spend less time managing resources and more time focusing on your applications. Using CloudFormation, you create a template that describes all the AWS resources that you want (like Amazon EC2 instances or Amazon RDS DB instances). Once you create the template, CloudFormation takes care of provisioning and configuring those resources for you. You don't need to individually create and configure AWS resources and figure out what's dependent on what; CloudFormation handles that. CloudFormation can help you simplify infrastructure management, quickly replicate your infrastructure, and easily control and track changes to your infrastructure.

**AWS CloudTrail** - Track user activity and API usage.AWS CloudTrail monitors and records account activity across your AWS infrastructure, giving you control over storage, analysis, and remediation actions.

**AWS Config -** Record and evaluate configurations of your AWS resources.AWS Config is a service that enables you to assess, audit, and evaluate the configurations of your AWS resources. Config continuously monitors and records your AWS resource configurations and allows you to automate the evaluation of recorded configurations against desired configurations. With Config, you can review changes in configurations and relationships between AWS resources, dive into detailed resource configuration histories, and determine your overall compliance against the configurations specified in your internal guidelines. This enables you to simplify compliance auditing, security analysis, change management, and operational troubleshooting.

**AWS OpsWorks** for Chef Automate provides a fully managed Chef Automate server and suite of automation tools that give you workflow automation for continuous deployment, automated testing for compliance and security, and a user interface that gives you visibility into your nodes and their status. The Chef Automate platform gives you full stack automation by handling operational tasks such as software and operating system configurations, continuous compliance, package installations, database setups, and more. The Chef server centrally stores your configuration tasks and provides them to each node in your compute environment at any scale, from a few nodes to thousands of nodes. OpsWorks for Chef Automate is completely compatible with tooling and cookbooks from the Chef community and automatically registers new nodes with your Chef server.

**AWS Systems Manager** - Gain operational insights into AWS and on-premises resources.

* Improve visibility and control in the cloud, on premises, and at the edge.
* Shorten the time to detect and resolve operational issues.
* Maintain instance compliance against your patch, configuration, and custom policies.
* Automate configuration and ongoing management of applications and resources.

**AWS Trusted Advisor** - Reduce costs, improve performance, improve security. AWS Trusted Advisor provides recommendations that help you follow AWS best practices. Trusted Advisor evaluates your account by using checks. These checks identify ways to optimize your AWS infrastructure, improve security and performance, reduce costs, and monitor service quotas. You can then follow the check recommendations to optimize your services and resources.

**AWS Well-Architected Tool -** Review your architecture and adopt best practices. The AWS Well-Architected Tool is designed to help you review the state of your applications and workloads, and it provides a central place for architectural best practices and guidance. The AWS Well-Architected Tool is based on the AWS Well-Architected Framework, which was developed to help cloud architects build secure, high-performing, resilient, and efficient application infrastructures. The Framework has been used in tens of thousands of workload reviews by AWS solutions architects, and it provides a consistent approach for evaluating your cloud architecture and implementing designs that will scale with your application needs over time.

**AWS Organizations** - Centrally manage and govern your environment as you scale your AWS resources. Using AWS Organizations, you can programmatically create new AWS accounts and allocate resources, group accounts to organize your workflows, apply policies to accounts or groups for governance, and simplify billing by using a single payment method for all of your accounts. In addition, AWS Organizations is integrated with other AWS services so you can define central configurations, security mechanisms, audit requirements, and resource sharing across accounts in your organization. AWS Organizations is available to all AWS customers at no additional charge.

**AWS Well-Architected Framework**

Built around six pillars—

1. **Operational excellence** – Running & Monitoring System, improve processes &  
    procedure.

**Organization, Prepare, Operate & Evolve**.

1. **Security** - confidentiality and integrity of data, managing user permissions, and  
    establishing controls to detect security events.

**IAM, Detection, Infrastructure protection, Data Protection, Incident response**

1. **Reliability** – It’s the ability of a Workload to perform its intended function correctly & consistently when it’s expected to. Distributed system design, recovery planning, and adapting to changing requirements.

**Foundation, Workload architecture, Change management, Failure management**

1. **Performance efficiency** - selecting resource types and sizes optimized for workload  
    requirements, monitoring performance, and maintaining efficiency as  
    business needs evolve.

**Selection, Review, Monitoring & Trade offs**

1. **Cost optimization** - understanding spending over time and controlling fund allocation,  
    selecting resources of the right type and quantity, and scaling to  
    meet business needs without overspending.

Practice Cloud Financial Management

Expenditure & Usage awareness

Cost-effective resources

Manage demand & supply resources

Optimize over time

1. **Sustainability -** shared responsibility model for sustainability, understanding impact, and   
    maximizing utilization to minimize required resources and reduce  
    downstream impacts.

**AWS Well – Architected tool**

An Architecture review tool is that provides customers and partners with a consistent approach to reviewing their architectures against current Best practices and gives advice on how to architect workloads for the cloud.

AWS well- architected tool helps to Review, Measure & improve Workloads.

AWS well- architected tool brings the Best practices of the Well-architected framework into the AWS Management Console.

[**AWS Local Zones**](https://aws.amazon.com/about-aws/global-infrastructure/localzones/) place compute, storage, database, and other select AWS services closer to end-users. With AWS Local Zones, you can easily run highly demanding applications that require single-digit millisecond latencies to your end-users such as media & entertainment content creation, real-time gaming, reservoir simulations, electronic design automation, and machine learning.

[**AWS Wavelength**](https://aws.amazon.com/wavelength/) enables developers to build applications that deliver single-digit millisecond latencies to mobile devices and end-users.

[**AWS Outposts**](https://aws.amazon.com/outposts/) bring native AWS services, infrastructure, and operating models to virtually any data center, co-location space, or on-premises facility. You can use the same AWS APIs, tools, and infrastructure across on-premises and the AWS cloud to deliver a truly consistent hybrid experience. AWS Outposts is designed for connected environments and can be used to support workloads that need to remain on-premises due to low latency or local data processing needs.

AWS offers three types of Savings Plans – Compute Savings Plans, EC2 Instance Savings Plans, and Amazon SageMaker Savings Plans. – AWS COST Explorer

1. Compute Savings Plans apply to usage across Amazon EC2, AWS Lambda, and AWS Fargate.
2. The EC2 Instance Savings Plans apply to EC2 usage, and
3. Amazon SageMaker Savings Plans apply to Amazon SageMaker usage

**Benefits:** Flexible plans, Significant savings, Easy to use

**Amazon S3 pricing**

**S3 Standard** - General purpose storage for any type of data, typically used for frequently accessed data

**S3 Intelligent - Tiering**\* - Automatic cost savings for data with unknown or changing access patterns, Optional asynchronous Archive Access tiers

**S3 Standard - Infrequent Access**\*\* - For long lived but infrequently accessed data that needs millisecond access

**S3 One Zone - Infrequent Access\*\*** - For re-createable infrequently accessed data that needs millisecond access

**S3 Glacier Instant Retrieval**\*\*\* - For long-lived archive data accessed once a quarter with instant retrieval in milliseconds

**S3 Glacier Flexible Retrieval (Formerly S3 Glacier) \*\*\*** - For long-term backups and archives with retrieval option from 1 minute to 12 hours

**S3 Glacier Deep Archive**\*\*\* - For long-term data archiving that is accessed once or twice in a year and can be restored within 12 hours

**AWS Pricing Calculator**

Estimates the cost for your architecture solution.

Configure a cost estimate that fits your unique business or personal needs with AWS products and services.

**Migration Evaluator**

Migration Evaluator (Formerly TSO Logic) is a complimentary service to create data-driven business cases for AWS Cloud planning and migration.

**AWS Cost Explorer -->** Filter & group your data --> Set time interval & granularity --> Forecast future costs & usage.

Visualize, understand, and manage your AWS costs and usage over time

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There are three fundamental drivers of cost with AWS: **compute, storage, and outbound data transfer**

* **On-Demand Instances** let you pay for compute or database capacity by the hour or second (minimum of 60 seconds) depending on which instances you run with no long-term commitments or upfront payments.
* **Savings Plans** are a flexible pricing model that offer low prices on Amazon EC2, AWS Lambda and AWS Fargate usage, in exchange for a commitment to a consistent amount of usage (measured in $/hour) for a one- or three-year term.
* **Spot Instances** are an Amazon EC2 pricing mechanism that let you request spare computing capacity with no upfront commitment and at discounted hourly rate (up to 90% off the on-demand price).
* **Reservations** provide you with the ability to receive a greater discount, up to 75 percent, by paying for capacity ahead of time

**AWS Storage**

**AWS Backup -** Centrally manage and automate backups across AWS services.AWS Backup to centralize and automate data protection across AWS services and hybrid workloads. AWS Backup offers a cost-effective, fully managed, policy-based service that further simplifies data protection at scale. AWS Backup also helps you support your regulatory compliance or business policies for data protection. Together with AWS Organizations, you can use AWS Backup to centrally deploy data protection policies to configure, manage, and govern your backup activity across your company’s AWS accounts and resources.

**AWS Storage Gateway** - Provide on-premises applications with access to virtually unlimited cloud storage

**Snow Family**

The AWS Snow Family helps customers that need to run operations in austere, non-data center

environments, and in locations where there's lack of consistent network connectivity.

The Snow Family, comprised of **AWS Snowcone, AWS Snowball, and AWS Snowmobile**, offers a number of physical devices and capacity points, most with built-in computing capabilities. These services help physically transport up to exabytes of data into and out of AWS.

Snow Family devices are owned and managed by AWS and integrate with AWS security, monitoring, storage management, and computing capabilities.

1. **AWS Snowcone**

AWS Snowcone is the smallest member of the AWS Snow Family of edge computing and data transfer

devices. Snowcone is portable, rugged, and secure. You can use Snowcone to collect, process, and move data to AWS, either offline by shipping the device, or online with **AWS DataSync**.

With AWS Snowcone, you pay only for the use of the device and for data transfer out of AWS. Data

transferred offline into AWS with Snowcone does not incur any transfer fees.Standard pricing applies once data is stored in the AWS Cloud.

1. **AWS Snowball**

AWS Snowball is a data migration and edge computing device that comes in two device options:

**Compute Optimized and Storage Optimized**.

**Snowball Edge Storage Optimized** devices provide 40 vCPUs of compute capacity coupled with 80

terabytes of usable block or Amazon S3-compatible object storage. It is well-suited for local storage and large-scale data transfer.

**Snowball Edge Compute Optimized** devices provide 52 vCPUs, 42 terabytes of usable block or object storage, and an optional GPU for use cases such as advanced machine learning and full motion video analysis in disconnected environments.

Customers can use these two options for data collection, machine learning and processing, and storage in environments with intermittent connectivity (such as manufacturing, industrial, and transportation) or in extremely remote locations (such as military or maritime operations) before shipping it back to AWS. These devices may also be rack mounted and clustered together to build larger, temporary installations.

AWS Snowball has three pricing elements to consider: **usage, device type, and term of use. Data transferred into AWS does not incur any data transfer fees, and standard pricing applies for data stored in the AWS Cloud.**

1. **AWS Snowmobile**

AWS Snowmobile moves up to 100 PB of data in a 45-foot-long ruggedized shipping container and

is ideal for multi-petabyte or Exabyte-scale digital media migrations and data center shutdowns. A

Snowmobile arrives at the customer site and appears as a network-attached data store for more secure, high-speed data transfer. After data is transferred to Snowmobile, it is driven back to an AWS Region where the data is loaded into Amazon S3.

Snowmobile pricing is based on the **amount of data stored on the truck per month**.

**AWS Snowball –** Petabyte-scale Data transport

**AWS Snowball Edge –** Petabyte-scale Data transport with on-board compute

**AWS Snowmobile -** Exabyte-scale Data transport

**AMAZON DATABASES**

**Amazon RDS**

Amazon RDS is a web service that makes it easy to set up, operate, and scale a relational database in the cloud. It provides cost-efficient and resizable capacity while managing time-consuming database administration tasks, so you can focus on your applications and business. Achieve high availability with Amazon RDS Multi-AZ deployments. Has seven popular engines

1. [Amazon Aurora with MySQL compatibility](https://aws.amazon.com/rds/aurora/?pg=ln&sec=hiw),
2. [Amazon Aurora with PostgreSQL compatibility](https://aws.amazon.com/rds/aurora/?pg=ln&sec=hiw),
3. [MySQL](https://aws.amazon.com/rds/mysql/?pg=ln&sec=hiw),
4. [MariaDB](https://aws.amazon.com/rds/mariadb/?pg=ln&sec=hiw),
5. [PostgreSQL](https://aws.amazon.com/rds/postgresql/?pg=ln&sec=hiw),
6. [Oracle](https://aws.amazon.com/rds/oracle/?pg=ln&sec=hiw), and
7. [SQL Server](https://aws.amazon.com/rds/sqlserver/?pg=ln&sec=hiw)

**Amazon DynamoDB**

Amazon DynamoDB is a fast and flexible **NoSQL database service** for all applications that need consistent, single-digit millisecond latency at any scale. It is a fully managed cloud database and supports both **document and key-value** store models. Its flexible data model, reliable performance, and automatic scaling of throughput capacity makes it a great fit for mobile, web, games, ad tech, IoT, and many other applications.

**Data transfer**

There is no additional charge for data transferred between Amazon DynamoDB and other AWS services

within the same Region. Data transferred across regions (e.g., between Amazon DynamoDB in the US East (Northern Virginia) Region and Amazon EC2 in the EU (Ireland) Region) will be charged on both sides of the transfer.

**Global tables**

Global tables builds on DynamoDB’s global footprint to provide you with a fully managed, multi-region,

and multi-active database that provides fast local read and write performance for massively scaled, global applications. Global tables replicate your Amazon DynamoDB tables automatically across your choice of AWS Regions.

DynamoDB charges for global tables usage based on the resources used on each replica table. **Write**

**requests for global tables** are measured in replicated WCUs instead of standard WCUs. The number of replicated WCUs consumed for replication depends on the version of global tables you are using.

**Read requests and data storage** are billed consistently with standard tables (tables that are not global

tables). If you add a table replica to create or extend a global table in new Regions, DynamoDB charges

for a table restore in the added regions per gigabyte of data restored. Cross-Region replication and

adding replicas to tables that contain data also incur charges for data transfer out.

**Amazon Aurora -** Amazon Aurora is a modern relational database service that offers performance and high availability at scale, fully open-source MySQL- and PostgreSQL-compatible editions, and a range of developer tools for building serverless and machine learning-driven applications.

**Amazon ElastiCache**

Amazon ElastiCache is a fully managed, in-memory caching service supporting flexible, real-time use cases. You can use ElastiCache for caching, which accelerates application and database performance, or as a primary data store for use cases that don't require durability like session stores, gaming leaderboards, streaming, and analytics. ElastiCache is compatible with Redis and Memcached

**Amazon Redshift -** Fastest, easiest, and most widely used cloud data warehouse. Amazon Redshift uses SQL to analyze structured and semi-structured data across data warehouses, operational databases, and data lakes, using AWS-designed hardware and machine learning to deliver the best price performance at any scale.

**Amazon Neptune -** Amazon Neptune is a fast, reliable, and fully managed graph database service that makes it easy to build and run applications that work with highly connected datasets for use cases such as identity graphs, knowledge graphs, and fraud detection.

**Amazon Quantum Ledger Database (QLDB) -** Fully managed Ledger Database

**Amazon Document DB -** Amazon Document DB (with MongoDB compatibility) is a fully managed document database service that supports MongoDB workloads.

**AWS Database Migration Service** - AWS Database Migration Service (AWS DMS) helps you migrate databases to AWS easily and securely at a low cost. Migrate Databases with minimal downtime.

**Amazon Timestream** - Fully managed Time Series DB

**AWS Support Plans**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Developer** | **Business** | **Enterprise -On Ramp** | **Enterprise** |
| **Use case** | Suitable for Experiment or Test in AWS | Suitable for Production Workloads in AWS | Suitable for Production/Business critical Workloads in AWS | Suitable for Business/ Mission critical Workloads in AWS |
| **Customer Service and Communities** | 24x7 access to customer service, documentation, whitepapers, and AWS re: Post | 24x7 access to customer service, documentation, whitepapers, and AWS re: Post. | 24x7 access to customer service, documentation, whitepapers, and AWS re: Post | 24x7 access to customer service, documentation, whitepapers, and AWS re:Post |
| [**AWS Personal Health Dashboard**](https://aws.amazon.com/premiumsupport/technology/personal-health-dashboard/) | A personalized view of the health of AWS services, and alerts when your resources are impacted | A personalized view of the health of AWS services, and alerts when your resources are impacted | A personalized view of the health of AWS services, and alerts when your resources are impacted | A personalized view of the health of AWS services, and alerts when your resources are impacted |
| **AWS Trusted Advisor Best Practice Checks** | Basic Security checks | Full set of checks | Full set of checks | Full set of checks |
| **Enhanced Technical Support** | Business hours\*\* web access to Cloud Support Associates. | 24x7 phone, web, and chat access to Cloud Support Engineers | 24x7 phone, web, and chat access to Cloud Support Engineers | 24x7 phone, web, and chat access to Cloud Support Engineers |
| **Case Severity / Response Times** | General guidance: < 24 hours\*\*  System impaired: < 12 hours\*\* | General guidance: < 24 hours  System impaired: < 12 hours  Production system impaired: < 4 hours  Production system down: < 1 hour | General guidance: < 24 hours  System impaired: < 12 hours  Production system impaired: < 4 hours  Production system down: < 1 hour  Business-critical system down: < 30 minutes | General guidance: < 24 hours  System impaired: < 12 hours  Production system impaired: < 4 hours  Production system down: < 1 hour  Business/Mission-critical system down: < 15 minutes |
| **Architectural Guidance** | General | Contextual to your use-cases | Consultative review and guidance based on your applications | Consultative review and guidance based on your applications |
| **Programmatic Case Management** |  | AWS Support API | AWS Support API | AWS Support API |
| **Third-Party Software Support** |  | Interoperability and configuration guidance and troubleshooting | Interoperability and configuration guidance and troubleshooting | Interoperability and configuration guidance and troubleshooting |
| **AWS Managed Services** |  | Access to [AWS Managed Services (AMS)](https://aws.amazon.com/managed-services/) for an additional fee. AMS augments your existing teams with cloud advanced operations skills and capacity. Includes baseline operations, a designated Cloud Service Delivery Manager (CSDM), Cloud Architect (CA), and access to the AMS security team. | Access to [AWS Managed Services (AMS)](https://aws.amazon.com/managed-services/) for an additional fee. AMS augments your existing teams with cloud advanced operations skills and capacity. Includes baseline operations, a designated Cloud Service Delivery Manager (CSDM), Cloud Architect (CA), and access to the AMS security team. | Access to [AWS Managed Services (AMS)](https://aws.amazon.com/managed-services/) for an additional fee. AMS augments your existing teams with cloud advanced operations skills and capacity. Includes baseline operations, a designated Cloud Service Delivery Manager (CSDM), Cloud Architect (CA), and access to the AMS security team. |
| **Technical Account Management** |  |  | A pool of Technical Account Managers to provide proactive guidance, and coordinate access to programs and AWS experts | Designated Technical Account Manager (TAM) to proactively monitor your environment and assist with optimization and coordinate access to programs and AWS experts |
| **Training** |  |  |  | Access to online self-paced labs |
| **Account Assistance** |  |  | Concierge Support Team | Concierge Support Team |

**AWS CloudShell** (CLI) is a browser-based shell that makes it easy to securely manage, explore, and interact with your AWS resources. CloudShell is pre-authenticated with your console credentials. Common development and operations tools are pre-installed, so no local installation or configuration is required.

**Amazon Elastic Container Registry** – Store & Retrieve Docker images

**Amazon Fsx for Lustre -** High-performance file system for processing Amazon S3 or on-premises data.

**Amazon Fsx for Windows File Server -** Fully managed native Microsoft Windows file system. Amazon FSx for Windows File Server provides fully managed shared storage built on Windows Server, and delivers a wide range of data access, data management, and administrative capabilities.

**AWS Cloud Development Kit (AWS CDK)** is a software development framework for defining cloud infrastructure in code and provisioning it through AWS CloudFormation. The AWS CDK supports familiar programming languages, such as TypeScript, JavaScript, Python, Java, C#/.Net, and Go (in developer preview).

**Amazon Kendra**

Amazon Kendra is a highly accurate and easy to use **enterprise search service** that’s powered by machine

learning. Amazon Kendra enables developers to add search capabilities to their applications so their end

users can discover information stored within the vast amount of content spread across their company.

When you type a question, the service uses machine learning algorithms to understand the context and

return the most relevant results, whether that be a precise answer or an entire document.

**AWS IoT Events**

AWS IoT Events helps companies continuously monitor their equipment and fleets of devices for failure

or changes in operation and trigger alerts to respond when events occur. AWS IoT Events recognizes events across multiple sensors to identify operational issues, such as equipment slowdowns, and generates alerts such as notifying support teams of an issue. AWS IoT Events offers a managed complex

event detection service on the AWS Cloud, accessible through the AWS IoT Events console, a browser-based GUI where you can define and manage your event detectors, or direct ingest application program

interfaces (APIs), code that allows two applications to communicate with each other. Understanding equipment or a process based on telemetry from a single sensor is often not possible, a complex event

detection service will combine multiple sources of telemetry to gain full insight into equipment and processes. You define conditional logic and states inside AWS IoT Events to evaluate incoming telemetry

data to detect events in equipment or a process. When AWS IoT Events detects an event, it can trigger

pre-defined actions in another AWS service, such as sending alerts through Amazon Simple Notification

Service (Amazon SNS).

**AWS PrivateLink** - Securely access services hosted on AWS. AWS PrivateLink provides private connectivity between VPCs, AWS services, and on-premises networks, without exposing traffic to the public internet. AWS PrivateLink makes it easy to connect services across different accounts and VPCs to significantly simplify your network architecture.

**Amazon Connect** - Provide superior customer service at a lower cost with an easy-to-use omnichannel cloud contact center. With Amazon Connect, you can set up a contact center in minutes that can scale to support millions of customers.

**Amazon Simple Notification Service** - Amazon Simple Notification Service (Amazon SNS) is a fully managed messaging service for both application-to-application (A2A) and application-to-person (A2P) communication.

The A2A pub/sub functionality provides topics for high-throughput, push-based, many-to-many messaging between distributed systems, microservices, and event-driven serverless applications. Using Amazon SNS topics, your publisher systems can fanout messages to a large number of subscriber systems, including Amazon SQS queues, AWS Lambda functions, HTTPS endpoints, and Amazon Kinesis Data Firehose, for parallel processing. The A2P functionality enables you to send messages to users at scale via SMS, mobile push, and email.

**Amazon Simple Queue Service** - Amazon Simple Queue Service (SQS) is a fully managed message queuing service that enables you to decouple and scale microservices, distributed systems, and serverless applications. SQS eliminates the complexity and overhead associated with managing and operating message-oriented middleware and empowers developers to focus on differentiating work. Using SQS, you can send, store, and receive messages between software components at any volume, without losing messages or requiring other services to be available. Get started with SQS in minutes using the AWS Management Console, Command Line Interface or SDK of your choice, and three simple commands.

SQS offers two types of message queues. Standard queues offer maximum throughput, best-effort ordering, and at-least-once delivery. SQS FIFO queues are designed to guarantee that messages are processed exactly once, in the exact order that they are sent.

**AWS Health Dashboard** - View important events and changes affecting your AWS environment. The AWS Health Dashboard is the single place to learn about the availability and operations of AWS services. You can view the overall status of AWS services, and you can sign in to view personalized communications about your particular AWS account or organization. Your account view provides deeper visibility into resource issues, upcoming changes, and important notifications.

**Security Groups** - An AWS security group acts as a virtual firewall for your EC2 instances to control incoming and outgoing traffic. Both inbound and outbound rules control the flow of traffic to and traffic from your instance.

**AWS Service Catalog** -AWS Service Catalog allows organizations to create and manage catalogs of IT services that are approved for use on AWS. These IT services can include everything from virtual machine images, servers, software, and databases to complete multi-tier application architectures. AWS Service Catalog allows you to centrally manage deployed IT services and your applications, resources, and metadata. This helps you achieve consistent governance and meet your compliance requirements, while enabling users to quickly deploy only the approved IT services they need. With AWS Service Catalog AppRegistry, organizations can understand the application context of their AWS resources. You can define and manage your applications and their metadata, to keep track of cost, performance, security, compliance and operational status at the application level.

**AWS Marketplace** - The AWS Marketplace enables qualified partners to market and sell their software to AWS Customers. AWS Marketplace is an online software store that helps customers find, buy, and immediately start using the software and services that run on AWS.

AWS Marketplace is designed for Independent Software Vendors (ISVs), Value-Added Resellers (VARs), and Systems Integrators (SIs) who have software products they want to offer to customers in the cloud. Partners use AWS Marketplace to be up and running in days and offer their software products to customers around the world.

**AWS Management Console** -Everything you need to access and manage the AWS Cloud — in one web interface.

**AWS VPN** -Extend your on-premises networks to the cloud and securely access them from anywhere. Virtual Private Network solutions establish secure connections between your on-premises networks, remote offices, client devices, and the AWS global network. AWS VPN is comprised of two services: AWS Site-to-Site VPN and AWS Client VPN. Each service provides a highly available, managed, and elastic cloud VPN solution to protect your network traffic.

AWS Site-to-Site VPN creates encrypted tunnels between your network and your Amazon Virtual Private Clouds or AWS Transit Gateways. For managing remote access, AWS Client VPN connects your users to AWS or on-premises resources using a VPN software client.