# Cloud Concepts

### Advantages of moving from on-premises to cloud:

Flexibility, Cost Savings, Scalability, Security, Disaster Recovery, Collaboration, Remote Access, Elimination of expenses for running and maintaining data centers, The ability to use the pay-as-you-go model, No longer having to guess what capacity will be required.

### Advantages of the AWS Cloud:

Global Reach, Reliability, Security, Cost Efficiency, Agility, Innovation, High economies of scale, Launch globally in minutes, AWS enables capacity to be adjusted on demand, AWS eliminates many of the costs of building and maintaining on-premises data centers.

### Agility:

Speed, Flexibility, Rapid Deployment, Quick Iterations, The speed at which AWS resources are implemented, The ability to experiment quickly

### Elasticity:

Auto Scaling, Resource Adjustment, Cost Efficiency, Demand Adaptation, The ability to rightsize resources as demand shifts, How easily resources can be procured when they are needed

### Scalability:

Growth Support, Horizontal Scaling, Vertical Scaling, Load Management

### Horizontal Scaling:

Adding more instances, distributing load, increased redundancy, improved fault tolerance, linear scalability, elasticity, load balancers, Adding more EC2 instances of the same size to handle an increase in traffic

### Vertical Scaling:

Increasing instance size, upgrading hardware, more CPU/RAM, single

instance, limited by machine capacity, quick upgrades, non-linear scalability

### Economies of Scale:

Cost Savings, Resource Efficiency, Bulk Pricing, Reduced Overhead, benefit of the economies of scale is lower variable costs over fixed costs

### High Availability:

Redundancy, Fault Tolerance, Uptime, Disaster Recovery, ability to withstand failures with minimal downtime

### Global Reach:

Worldwide Data Centers, Low Latency, Regional Availability

### Pay-As-You-Go:

Cost Control, No Upfront Costs, Usage-Based Billing, Financial Flexibility

### Cost Effectiveness:

Budget Efficiency, Lower TCO, Operational Savings, Economical Resource Usage

### Consolidated Billing:

Unified Billing, Cost Tracking, Centralized Management, Simplified Accounting, if consolidated billing is set for several AWS accounts and one of the accounts has purchased a number of reserved instances for 3 years, all accounts can receive the hourly cost benefit of the Reserved Instances, benefit of consolidated billing are Volume discounts, One bill for multiple accounts

### Multiple AWS Accounts:

Segregation, Resource Management, Cost Allocation, Security Boundaries

### Infrastructure as a Service (IaaS):

Virtual Machines, Storage, Networking, Data Centers, On-Demand Resources

### Platform as a Service (PaaS):

Development Tools, Middleware, Database Management, Application Hosting

### Software as a Service (SaaS):

Web Applications, Subscription-Based, User Accessibility, Automatic Updates

### Public Cloud:

Shared Resources, Multi-Tenancy, Scalability, Cost Savings

### Private Cloud:

Dedicated Resources, Enhanced Security, Customization, Compliance

### Hybrid Cloud:

Integration, Flexibility, Resource Optimization, Cloud Bursting

# AWS Architecture

### Decouple Components:

decoupling, separation, modular, independent, integration

### Rightsizing:

optimization, resource management, cost-efficiency, scaling, tuning, MOST cost-effective architecture

### Loosely Couple/Loose Coupling:

independence, flexibility, decoupling, modularity, integration, divide the application into microservices

### Server Design and Concurrency:

architecture, parallelism, threads, performance, scalability

### Design for Failure:

resilience, fault-tolerance, redundancy, high availability, recovery

## AWS Well-Architected Framework (AWS WAF)

* best practices, guidance, architecture, design, review, Learn to improve from operational failures
* Pillars of AWS WAF are Security, Reliability, Performance Efficiency, Cost Optimization, Operational Excellence

### Security:

protection, encryption, access control, compliance, risk, physical location

### Reliability:

availability, recovery, fault tolerance, resilience, continuity, Automatically provisioning new resources to meet demand, Ability to recover quickly from failures

### Performance Efficiency:

optimization, scalability, efficiency, resources, throughput

### Cost Optimization:

budgeting, saving, efficiency, resource management, spending

### Operational Excellence:

operations, monitoring, improvement, management, automation

## AWS Cloud Adoption Framework (AWS CAF)

* strategy, cloud journey, migration, transformation, maturity, Responsibilities vary depending on the services used
* Pillars of AWS CAF are Platform Perspective, People Perspective, Operation Perspective, Business Perspective, Security Perspective, Governance Perspective

### Platform Perspective:

infrastructure, tools, platforms, services, technology, Data architecture

### People Perspective:

skills, culture, training, roles, change management, Cloud fluency

### Operation Perspective:

processes, monitoring, automation, management, operations

### Business Perspective:

value, goals, alignment, investment, benefits

### Security Perspective:

protection, compliance, risk management, policies, controls

### Governance Perspective:

policies, compliance, management, oversight, accountability, foundational capabilities

# AWS Shared Responsibility Model

## Customer’s Responsibilities

* Access to DynamoDB tables
* Configure the AWS provided security group firewall
* Classify company assets in the AWS Cloud
* Managing the code within the Lambda function
* Configure firewalls and networks
* Perform client-side data encryption
* Configure IAM credentials
* Application data security
* Apply the latest security updates and patches for Amazon EC2 instances
* Encrypt data and maintain data integrity
* Maintain identity and access management controls
* Design encryption-at-rest strategies
* Cost of application software licenses
* Manage database access permissions
* Apply encryption options for the database
* Identify which users can access the EC2 instances and manage their permissions in the operating system
* Identify and manage the users who are allowed to create or delete EC2 instances
* Security inside of code
* Writing and updating of code
* Encryption of data in transit
* Encryption of data at rest
* User access management

## AWS’s Responsibilities

* Patch the physical infrastructure that hosts the EC2 instances
* Operating system installations
* Maintenance of physical and environmental controls
* Apply updates to the Nitro Hypervisor
* Upgrade the firmware of the network infrastructure
* Maintain the physical security of edge locations

## Both AWS and Company’s Responsibilities

* Patch management
* Awareness and training
* Configuration management
* Cloud awareness and training

## Company’s Responsibilities

* Cost of application software licenses
* Manage database access permissions

# AWS Team

### AWS Support & Team:

AWS, support, team, technical assistance, customer support

### Product Team:

product, team, development, innovation, features, updates

### AWS Trust & Safety Team:

AWS, trust, safety, security, compliance, user protection

### APN Consulting Partner:

APN, consulting, partner, cloud solutions, expertise, services

### AWS Partner Network (APN):

AWS, Partner Network, APN, collaboration, ecosystem, services

### Concierge Support Team:

concierge, support, team, billing, account management, customer care

### Abuse Team:

abuse, team, security, incident response, policy enforcement

### AWS Managed Services (AMS):

AWS, Managed Services, AMS, infrastructure, operations, automation

# AWS Services

## Analytics:

### Amazon Athena:

SQL query, serverless, interactive analysis, run queries on the data for analysis

### AWS Data Exchange:

data sharing, data marketplace, third-party data

### Amazon EMR:

Hadoop, Spark, big data processing

### AWS Glue:

Simple, scalable, serverless data integration, ETL, data catalog, discover, transform, and visualize the data

### Amazon Kinesis:

real-time data, streaming, analytics

### Amazon Managed Streaming for Apache Kafka (Amazon MSK):

Apache Kafka, managed service, stream processing

### Amazon OpenSearch Service:

Elasticsearch, log analytics, Search, visualize, and analyze up to petabytes of text and unstructured data,

### Amazon QuickSight:

BI, data visualization, dashboards, fast business analytics service, discover, transform, and visualize the data

### Amazon Redshift:

data warehouse, analytics, SQL, fast, simple

## Application Integration:

### Amazon EventBridge:

event bus, serverless, event-driven architecture

### Amazon Simple Notification Service (Amazon SNS):

messaging, pub/sub, notifications, send both text and email messages

### Amazon Simple Queue Service (Amazon SQS):

message queue, decoupling, scalability, able to send messages to each other

### AWS Step Functions:

workflow automation, orchestration, state machines, Coordination for distributed applications

## Business Applications:

### Amazon Connect:

contact center, customer service, omnichannel

### Amazon Simple Email Service (Amazon SES):

email sending, transactional, marketing

## Cloud Financial Management:

### AWS Billing Conductor:

billing management, cost allocation, invoicing

### AWS Budgets:

cost tracking, budget alerts, forecasting, receive a notification when a specific AWS cost threshold is reached, set custom alerts when their costs or usage exceed established thresholds

### AWS Cost and Usage Report:

cost management, usage tracking, detailed billing

### AWS Cost Explorer:

cost analysis, usage trends, savings , visualize, understand, and manage spending and usage over time

### AWS Pricing Calculator:

create a cost estimate for a project before the infrastructure is provisioned, create cost estimates for its AWS use cases

### AWS Marketplace:

software procurement, third-party apps, subscriptions

## Compute:

### AWS Batch:

batch processing, job scheduling, compute management

### Amazon EC2:

virtual servers, compute, scalable, security best practice is have the EC2 instance assume a role to obtain the privileges to upload the file.

### On-Demand EC2 Instances:

pay-as-you-go, flexible, no commitments, run an application for 2 months each year without downtime

### Spot EC2 Instances:

unused capacity, cost savings, bidding, stateless, is fault tolerant, and runs for up to 3 hours, test AWS environment that can be interrupted and does not need to run continuously, do not need to run at specific times

### Reserved EC2 Instances:

long-term commitment, cost savings, capacity reservation, run its Amazon EC2 instances for 1 year without any disruption, upfront commitment

### Upfront Reserved Instance:

full upfront payment, cost savings, reserved capacity, best discount for Reserved instances

### Partial Upfront Reserved Instance:

partial payment, cost savings, reserved capacity

### Standard Reserved Instance:

long-term, cost savings, fixed capacity

### Convertible Reserved Instance:

exchangeable, flexibility, cost savings

### Dedicated Instance:

single-tenant, isolation, compliance

### Dedicated Host:

physical server, license management, compliance

### Savings Plan EC2 Instances:

flexible pricing, cost savings, compute usage, upfront commitment

### AMI:

machine images, pre-configured, reusable, disaster recovery solutions

### EC2 Image Builder:

AMI creation, automation, EC2

### AWS Elastic Beanstalk:

platform-as-a-service, application deployment, managed environment, deploy an application quickly on AWS without manually creating the required resources

### Amazon Lightsail:

simple VPS, fixed pricing, small applications, launch and manage virtual private servers

### AWS Local Zones:

edge computing, low latency, metro areas

### AWS Outposts:

on-premises, hybrid cloud, hybrid architecture, AWS infrastructure

### AWS Wavelength:

5G, edge computing, low latency

## Containers:

### Amazon Elastic Container Registry (Amazon ECR):

container images, storage, management

### Amazon Elastic Container Service (Amazon ECS):

container orchestration, Docker, microservices

### Amazon Elastic Kubernetes Service (Amazon EKS):

Kubernetes, managed service, container orchestration

## Customer Engagement:

### AWS Activate for Startups:

startup program, credits, mentorship

### AWS IQ:

expert engagement, on-demand help, project assistance

### AWS Managed Services (AMS):

operational management, infrastructure, security

### AWS Support:

technical support, troubleshooting, guidance

### Basic:

self-service, community forums, Provides 24/7 access to AWS documentation, whitepapers, and support forums

### Developer:

development support, email access, best practices, technical support via email during business hours and access to the AWS Support API

### Business:

24/7 support, chat access, guidance, 24/7 access to Cloud Support Engineers via phone, chat, and email, along with access to the full set of Trusted Advisor checks and AWS Support API

### Enterprise:

dedicated support, TAM, architectural guidance, 24/7 access to Cloud Support Engineers, and access to infrastructure event management and other enterprise-level services

### AWS Enterprise On-Ramp Support:

AWS, Enterprise On-Ramp, support, guidance, migration, onboarding

### AWS Professional Services:

AWS, Professional Services, consulting, expertise, cloud solutions, help from a global team of experts

## Database:

### Amazon Aurora:

relational database, MySQL-compatible, PostgreSQL-compatible

### Amazon DynamoDB:

NoSQL database, key-value, document store

### Amazon DocumentDB (with MongoDB compatibility):

DocumentDB, MongoDB compatibility, NoSQL, JSON

### Amazon MemoryDB for Redis:

in-memory database, Redis-compatible, low latency

### Amazon Neptune:

graph database, high performance, connected data

### Amazon RDS:

managed relational database, automated backups, scaling, PostgreSQL compatible

### RDS Multi AZ:

high availability, failover, redundancy

### Read Replicas in RDS:

replication, read scalability, disaster recovery

## Developer Tools:

### AWS AppConfig:

configuration management, feature toggles, application settings

### AWS CLI:

command line interface, automation, scripting

### AWS Cloud9:

cloud IDE, coding, collaboration

### AWS CloudShell:

browser-based shell, CLI access, instant environment, command line access to AWS tools and resources directly from a web browser

### AWS Cloud Development Kit (AWS CDK):

Infrastructure as code, DevOps, cloud resources, software development framework

### AWS Software Development Kit (AWS SDK):

API, programming, AWS services, integrate AWS service features directly into an application

### AWS CodeArtifact:

artifact repository, dependency management, secure storage

### AWS CodeBuild:

continuous integration, build service, testing

### AWS CodeCommit:

source control, Git repository, collaboration

### AWS CodeDeploy:

automated deployments, release management, rollback

### AWS CodePipeline:

CI/CD, automation, deployment pipeline

### AWS CodeStar:

DevOps, project management, development environment

### AWS X-Ray:

distributed tracing, debugging, performance analysis

## End User Computing:

### Amazon AppStream 2.0:

application streaming, SaaS, remote access, managed applications

### Amazon WorkSpaces:

virtual desktops, VDI, remote work, managed Windows virtual desktops

### Amazon WorkSpaces Web:

secure browser, remote access, web applications

## Frontend Web and Mobile:

### AWS Amplify:

mobile development, web development, full-stack

### AWS AppSync:

GraphQL, API, real-time data

### AWS Device Farm:

app testing, device testing, automation

## Internet of Things (IoT):

### AWS IoT Core:

IoT connectivity, device management, messaging

### AWS IoT Greengrass:

edge computing, IoT, local processing

## Machine Learning:

### Amazon Comprehend:

natural language processing, text analysis, sentiment analysis

### Amazon Kendra:

enterprise search, AI-powered, document indexing

### Amazon Lex:

conversational AI, chatbot, voice interface

### Amazon Polly:

text-to-speech, voice synthesis, natural voices

### Amazon Rekognition:

image analysis, facial recognition, video analysis

### Amazon SageMaker:

machine learning, model training, deployment

### Amazon Textract:

text extraction, document analysis, OCR

### Amazon Transcribe:

speech-to-text, transcription, audio analysis

### Amazon Translate:

language translation, multilingual, neural machine translation

## Management and Governance:

### AWS Auto Scaling:

dynamic scaling, resource management, automation

### AWS CloudFormation:

infrastructure as code, templates, provisioning, ability to manage infrastructure as code, maintain a development environment infrastructure and a production environment infrastructure in a repeatable fashion, automate infrastructure deployment by using infrastructure as code (IaC)

### AWS CloudTrail:

audit logs, compliance, activity tracking, determine who took an action, audit API calls

### Amazon CloudWatch:

monitoring, logging, metrics, receive a notification when a specific AWS cost threshold is reached

### AWS Compute Optimizer:

resource optimization, cost savings, performance tuning

### AWS Config:

configuration management, compliance, resource inventory

### AWS Control Tower:

governance, multi-account management, setup

### AWS Health Dashboard:

service health, incidents, notifications

### AWS Launch Wizard:

guided deployments, best practices, automated setup

### AWS License Manager:

license tracking, compliance, cost management

### AWS Management Console:

web interface, AWS services, management, web based user interface

### AWS Organizations:

account management, consolidated billing, policy control, used at no additional cost

### AWS Resource Groups and Tag Editor:

resource grouping, tagging, management

### AWS Service Catalog:

service catalog, portfolio management, provisioning, manage deployed IT services and govern its infrastructure as code (IaC) templates

### AWS Systems Manager:

operations management, automation, compliance

### AWS Systems Manager Parameter Store:

Configuration management, secrets management

### AWS Trusted Advisor:

best practices, recommendations, cost optimization, monitor for misconfigured security groups, benefits of AWS Trusted Advisor are Detecting underutilized resources to save costs, Improving security by proactively monitoring the AWS environment

### AWS Well-Architected Tool:

architectural review, best practices, guidance

## Migration and Transfer:

### AWS Application Discovery Service:

application inventory, dependency mapping, migration planning

### AWS Application Migration Service:

lift-and-shift, application migration, replication

### AWS Database Migration Service (AWS DMS):

database migration, replication, data transfer

### AWS Migration Hub:

migration tracking, progress monitoring, migration tools

### AWS Schema Conversion Tool (AWS SCT):

schema conversion, database migration, transformation

### AWS Transfer Family:

managed file transfer, SFTP, FTPS, FTP

### AWS Snow Family:

data transfer, edge computing, rugged devices

### Snowcone:

portable, data transfer, edge computing

### Snowball:

data transfer, storage, edge computing

### Snowball Edge:

compute, storage, rugged device, Use of the Snowball Edge appliance for a 10-day period is free

### Snowmobile:

exabyte-scale, data transfer, physical appliance

### Local Zone:

Proximity, low latency, compute resources

## Networking and Content Delivery:

### Amazon API Gateway:

**API** management, RESTful APIs, WebSocket APIs

### Amazon CloudFront:

CDN, content delivery, caching, deploy an application close to end users, to deliver images and videos globally with minimal latency Deliver the content through Amazon CloudFront

### AWS Direct Connect:

dedicated network, low latency, secure, create a private connection between an on-premises workload and an AWS Cloud workload

### AWS Global Accelerator:

traffic management, global applications, performance, deliver highly available applications with fast failover for multi-Region and Multi-AZ architectures, improves network performance by sending traffic through the AWS worldwide network infrastructure

### Amazon VPC:

virtual network, isolation, security, purpose of having an internet gateway within a VPC is to allow communication between the VPC and the internet

### VPC Flow Logs:

Network monitoring, traffic logs, VPC

### VPC peering:

Network connectivity, VPC, private

### AWS Transit Gateway

hybrid cloud architecture connecting on-premises networks to the AWS Cloud using AWS Direct Connect

### AWS VPN:

secure connectivity, encryption, private network

**AWS Managed VPN**: Managed, VPN, AWS, secure, connectivity

### AWS Site-to-Site VPN:

Site-to-Site, VPN, AWS, hybrid, networks

### Amazon Route 53:

DNS, routing, domain registration

### Simple Routing Policy:

DNS, routing, simple

### Failover Routing Policy:

DNS, routing, high availability

### Latency Routing Policy:

DNS, routing, low latency

### Weighted Routing Policy:

DNS, routing, traffic distribution

## Security:

### AWS Certificate Manager (ACM):

SSL/TLS certificates, encryption, automated renewal

### AWS CloudHSM:

hardware security module, encryption, key management

### Amazon Detective:

security investigation, threat detection, analysis

### AWS Directory:

Service managed directory, Active Directory, LDAP

### AWS Firewall Manager:

centralized management, firewall policies, security

### Amazon GuardDuty:

threat detection, continuous monitoring, security, monitor for misconfigured security groups

### Amazon Inspector:

security assessment, vulnerability scanning, compliance

### AWS Key Management Service (AWS KMS):

key management, encryption, security

### Amazon Macie:

data security, privacy, sensitive data discovery, discover and protect sensitive data

### AWS Network Firewall:

network protection, firewall rules, traffic control

### AWS Secrets Manager:

secret management, encryption, secure storage, establish a schedule for rotating database user credentials, manage its AWS Cloud resources through a web interface

### AWS Security Hub:

security management, compliance, threat detection, cloud security posture management (CSPM) service

### AWS WAF:

web application firewall, protection, traffic filtering, rule-based system, block SQL injection attacks

### AWS Shield:

DDoS protection, security, availability

### AWS Shield Advanced:

DDoS protection, enhanced security

### AWS Shield Standard:

DDoS protection, basic security

## Identity:

### Amazon Cognito:

user authentication, identity management, secure access

### AWS Resource Access Manager (AWS RAM):

resource sharing, cross-account access, management

### AWS Security Token Service (AWS STS):

Temporary credentials, security, IAM , use temporary, limited-privilege credentials for authentication with other AWS APIs

### AWS IAM Identity Center (AWS Single Sign-On):

single sign-on, identity management, user access, always provided at no charge

### AWS IAM Access Analyzer:

Permissions management, security, IAM, Amazon S3 bucket or an IAM role has been shared with an external entity

### AWS IAM Credential Report:

Security, IAM, user credentials, audit its password and access key rotation details

### AWS Identity and Access Management (IAM):

access control, user management, security policies, IAM security best practices is turn on multi-factor authentication (MFA) for added security during the login process

### IAM Users:

individual identities, access permissions, credentials

### IAM Group:

group identities, access control, policy management

### IAM Roles:

temporary credentials, permissions, service access, grant users in one AWS account access to resources in another AWS account

### IAM Policies:

access control, permissions, security rules

## Compliance:

### AWS Artifact:

compliance, audit reports, documentation, HIPAA compliance and governance-related documents, find compliance-related information and reports, to obtain AWS compliance Download the reports from AWS Artifact

### AWS Audit Manager:

compliance, audit preparation, control mapping

## Serverless:

### AWS Fargate:

serverless containers, orchestration, scalability, Docker environment on Amazon EC2 instances

### AWS Lambda:

serverless compute, event-driven, auto-scaling

## AWS Global Infrastructure

### Availability Zone:

Data center, fault tolerance, high availability

### AWS Region:

Geographic location, global infrastructure, physical location

### Edge Location:

Content delivery, CDN, latency reduction

## Storage:

### AWS Backup:

data protection, backup management, recovery

### Amazon Elastic Block Store (Amazon EBS):

block storage, volumes, persistence

#### Amazon Elastic Block Store (Amazon EBS) snapshots

disaster recovery solutions

### Amazon Elastic File System (Amazon EFS):

scalable file storage, NFS, shared access

### AWS Elastic Disaster Recovery:

disaster recovery, replication, failover

### AWS Storage Gateway:

hybrid cloud, hybrid cloud storage service, storage integration, data transfer, configure and deploy an, to extend file storage capabilities configure and deploy an AWS Storage Gateway file gateway and connect each user’s workstation to the file gateway, AWS services for the backups without changing its existing backup workflows

### AWS Storage Gateway file gateway:

Connect each user’s workstation to the file gateway

### Amazon S3 Glacier:

archival storage, low-cost, long-term

### Amazon FSx:

managed file storage, Windows, Lustre

### Amazon FSx File Gateway:

File storage, hybrid storage, FSx integration

### Amazon S3:

object storage, scalable, durable

### Standard S3:

S3 storage, frequently accessed, high durability

### Infrequent Access:

S3 storage, less frequent, cost-effective

### Standard IA:

S3 storage, less frequent, high durability

### OneZone IA:

single AZ, less frequent, cost-effective

### Glacier:

archival, long-term, low-cost

### Glacier Deep Archive:

archival, very long-term, lowest-cost

### Amazon S3 Glacier Vault Lock:

policy enforcement, compliance, lockable, data unit, storage, scalable

### Object Durability:

data preservation, reliability, long-term

### Object Availability:

data access, uptime, redundancy

### Object Lifecycle:

data management, policies, transitions

### S3 Lifecycle Management:

automated transitions, data policies, storage class

### S3 Object Lifecycle Management:

lifecycle policies, transitions, automation access control, permissions, links

### Object versioning:

version control, data retention, recovery, protect the data from accidental deletion or overwriting

### S3 Replication:

data replication, cross-region, redundancy

### Access Analyzer for S3:

Access control, S3, IAM, security, review all Amazon S3 buckets with ACLs and S3 bucket policies

### Amazon S3 Bucket:

Object storage, data storage, scalable

### Amazon S3 Versioning:

Object versions, data recovery, S3

### Amazon S3 File Gateway:

Hybrid storage, on-premises, S3 integration

### Amazon S3 Transfer Acceleration:

Fast data transfer, S3, global

# Documentations

### AWS Knowledge Center:

answers to the most frequently asked security-related questions

# Others

### Access Key:

access to AWS resources through the AWS CLI or the AWS API

### Least privilege access:

grant access only to the resources needed to perform a task

### Security Groups:

block network traffic to an instance

### Network ACLs:

block network traffic to an instance, set up a firewall to control traffic going into and coming out of an Amazon VPC subnet

### Global Services

* Amazon EC2 (Elastic Compute Cloud)
* Amazon S3 (Simple Storage Service)
* Amazon RDS (Relational Database Service)
* Amazon CloudFront
* Amazon Route 53
* AWS Lambda
* AWS IAM (Identity and Access Management)
* AWS Direct Connect
* Amazon CloudWatch
* AWS Organizations
* AWS Marketplace

### Supports rightsizing

* AWS Cost Explorer
* AWS Trusted Advisor
* Amazon EC2 Auto Scaling
* AWS Compute Optimizer
* Amazon RDS Performance Insights
* AWS Lambda
* AWS Cost Management Tools

### Supports Hybrid Cloud

* AWS Direct Connect
* AWS VPN (Virtual Private Network)
* AWS Storage Gateway
* AWS Snow Family
* AWS Outposts
* Amazon VPC (Virtual Private Cloud)
* AWS Cloud WAN
* AWS Transit Gateway
* AWS Systems Manager
* AWS Application Discovery Service
* AWS Database Migration Service (DMS)
* AWS DataSync

### AWS Services create loosely coupled applications/ decouple components

* Amazon SQS (Simple Queue Service)
* Amazon SNS (Simple Notification Service)
* Amazon EventBridge
* AWS Step Functions
* AWS Lambda
* Amazon API Gateway
* AWS App Mesh
* Amazon Kinesis
* AWS Fargate
* AWS App Runner

### AWS Services supports reservation

* Amazon EC2 Reserved Instances (RIs)
* Amazon EC2 Savings Plans
* Amazon RDS Reserved Instances
* Amazon DynamoDB Reserved Capacity
* Amazon Redshift Reserved Instances
* Amazon SageMaker Savings Plans
* Amazon EFS Reserved Throughput
* Amazon CloudFront Reserved Capacity

### AWS services support VPC Endpoint Gateway for a private connection from a VPC:

* Amazon S3
* Amazon DynamoDB

### AWS alerts when the reservation utilization falls below the defined threshold:

* AWS Cost Explorer
* AWS Budgets
* AWS Cost and Usage Reports (CUR)
* Amazon CloudWatch
* AWS Trusted Advisor

### Hosting Websites

|  |  |
| --- | --- |
| Static Websites | Dynamic Websites |
| * Amazon S3 (Simple Storage Service) * Amazon CloudFront * AWS Amplify * AWS Lightsail * AWS Lambda * Amazon API Gateway | * Amazon EC2 (Elastic Compute Cloud) * Amazon RDS (Relational Database Service) * AWS Elastic Beanstalk * Amazon DynamoDB * Amazon Aurora * Amazon EKS (Elastic Kubernetes Service) * Amazon ECS (Elastic Container Service) |

### OLTP and OLAP

|  |  |
| --- | --- |
| **OLTP** | **OLAP** |
| * Amazon RDS (Relational Database Service) * Amazon Aurora * Amazon DynamoDB * Amazon ElastiCache * Amazon Redshift * Amazon DocumentDB (with MongoDB compatibility) * Amazon Neptune | * Amazon Redshift * Amazon EMR (Elastic MapReduce) * Amazon Athena * Amazon Aurora * Amazon Neptune * Amazon Managed Apache Cassandra Service * AWS Glue |

### AWS WAF

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Operational Excellence** | **Security** | **Reliability** | **Performance Efficiency** | **Cost Optimization** |
| * **AWS Support** * **AWS Managed Services (AMS)** * **AWS Systems Manager** * **AWS Service Catalog** * **AWS CloudFormation** * **AWS CodeCommit** * **AWS CodeBuild** * **AWS CodePipeline** * **AWS CodeDeploy** * **AWS CodeStar** * **AWS X-Ray** * **AWS CloudTrail** * **AWS Cloud9** * **AWS CloudShell** * **AWS CLI** * **AWS Management Console** * **AWS Trusted Advisor** * **AWS Organizations** * **AWS Control Tower** * **AWS Well-Architected Tool** * **Amazon CloudWatch** * **AWS Compute Optimizer** * **AWS Health Dashboard** * **AWS Launch Wizard** * **AWS Resource Groups and Tag Editor** * **AWS Resource Access Manager (AWS RAM)** * **AWS License Manager** | * **AWS IAM Identity Center (AWS Single Sign-On)** * **Amazon Cognito** * **AWS Identity and Access Management (IAM)** * **AWS Key Management Service (AWS KMS)** * **AWS CloudHSM** * **AWS Certificate Manager (ACM)** * **AWS Secrets Manager** * **Amazon Macie** * **Amazon GuardDuty** * **AWS Security Hub** * **AWS Network Firewall** * **AWS WAF** * **AWS Shield** * **AWS Firewall Manager** * **AWS Audit Manager** * **AWS Artifact** * **Amazon Inspector** * **Amazon Detective** * **AWS Config** | * **Amazon EC2** * **AWS Elastic Beanstalk** * **Amazon Lightsail** * **AWS Outposts** * **AWS Local Zones** * **AWS Wavelength** * **Amazon Elastic Container Service (Amazon ECS)** * **Amazon Elastic Kubernetes Service (Amazon EKS)** * **Amazon Elastic Container Registry (Amazon ECR)** * **Amazon VPC** * **AWS Direct Connect** * **AWS VPN** * **AWS Global Accelerator** * **Amazon Route 53** * **AWS Auto Scaling** * **AWS CloudFormation** * **Amazon S3** * **Amazon S3 Glacier** * **Amazon EFS** * **Amazon FSx** * **AWS Backup** * **Amazon Elastic Block Store (Amazon EBS)** * **AWS Elastic Disaster Recovery** * **Amazon API Gateway** * **Amazon CloudFront** | * **Amazon S3** * **Amazon S3 Glacier** * **Amazon EFS** * **Amazon FSx** * **AWS Batch** * **AWS Lambda** * **AWS Fargate** * **AWS Snow Family** * **AWS Transfer Family** * **Amazon EC2** * **Amazon Lightsail** * **AWS Outposts** * **AWS Local Zones** * **AWS Wavelength** * **Amazon Elastic Container Service (Amazon ECS)** * **Amazon Elastic Kubernetes Service (Amazon EKS)** * **Amazon Elastic Container Registry (Amazon ECR)** * **AWS Amplify** * **AWS AppSync** * **AWS IoT Core** * **AWS IoT Greengrass** * **Amazon Athena** * **Amazon EMR** * **Amazon Kinesis** * **Amazon Managed Streaming for Apache Kafka (Amazon MSK)** * **Amazon OpenSearch Service** * **AWS Glue** * **Amazon QuickSight** * **Amazon Redshift** * **AWS Data Exchange** * **AWS Step Functions** * **Amazon Simple Queue Service (Amazon SQS)** * **Amazon Simple Notification Service (Amazon SNS)** * **Amazon EventBridge** | * **AWS Cost and Usage Report** * **AWS Cost Explorer** * **AWS Budgets** * **AWS Billing Conductor** * **AWS Cost and Usage Report** * **AWS Cost Explorer** * **AWS Marketplace** * **AWS Activate for Startups** |

### AWS CAF

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| **Platform** | **Governance** | **Security** | **Operations** | **People** | **Business** |
| * Amazon EC2 * AWS Elastic Beanstalk * Amazon Lightsail * AWS Local Zones * AWS Outposts * AWS Wavelength * Amazon Elastic Container Registry (Amazon ECR) * Amazon Elastic Container Service (Amazon ECS) * Amazon Elastic Kubernetes Service (Amazon EKS) * Amazon API Gateway * Amazon CloudFront * AWS Direct Connect * AWS Global Accelerator * Amazon Route 53 * Amazon VPC * AWS VPN | * AWS Artifact * AWS Audit Manager * AWS Certificate Manager (ACM) * AWS CloudFormation * AWS CloudTrail * Amazon CloudWatch * AWS Config * AWS Control Tower * AWS License Manager * AWS Management Console * AWS Organizations * AWS Resource Groups and Tag Editor * AWS Service Catalog * AWS Systems Manager * AWS Trusted Advisor * AWS Well-Architected Tool | * AWS Key Management Service (AWS KMS) * AWS CloudHSM * Amazon GuardDuty * AWS Identity and Access Management (IAM) * AWS IAM Identity Center (AWS Single Sign-On) * AWS Directory Service * AWS Network Firewall * AWS Shield * AWS WAF * Amazon Inspector * AWS Secrets Manager * Amazon Macie * AWS Resource Access Manager (AWS RAM) * Amazon Cognito * AWS Firewall Manager * Amazon Detective * AWS Security Hub | * AWS CloudFormation * AWS CloudTrail * Amazon CloudWatch * AWS Systems Manager * AWS Trusted Advisor * AWS Auto Scaling * AWS Compute Optimizer * AWS Config * AWS Control Tower * AWS Health Dashboard * AWS Launch Wizard * AWS Management Console * AWS Service Catalog * AWS Trusted Advisor | * AWS Activate for Startups * AWS IQ * AWS Training and Certification * AWS Support * AWS Managed Services (AMS) | * AWS Marketplace * AWS Billing Conductor * AWS Budgets * AWS Cost and Usage Report * AWS Cost Explorer |

### Pricing

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| **Always Free** | **Free Trail** | **12-Months Free** |
| * Amazon CloudWatch * Amazon Cognito * Amazon Simple Email Service (SES) * Amazon Simple Notification Service (SNS) * Amazon Simple Queue Service (SQS) * AWS CloudFormation * AWS CloudTrail * AWS CodeArtifact * AWS CodeBuild * AWS CodeCommit * AWS CodePipeline * AWS Control Tower * AWS Database Migration Service (DMS) * AWS Key Management Service (KMS) * AWS License Manager * AWS Service Catalog * AWS Step Functions * AWS Systems Manager * AWS WAF * AWS Well-Architected Tool * AWS X-Ray * AWS Application Migration Service (MGN) * AWS Storage Gateway * Amazon Connect * Amazon Elastic Transcoder * Amazon Lex * Amazon MQ * Amazon Pinpoint * Amazon Transcribe * Amazon Translate * AWS Audit Manager * AWS Data Pipeline | * Amazon DynamoDB * AWS Application Discovery Service * AWS Glue * AWS Lambda * AWS Storage Gateway * Amazon API Gateway * Amazon AppStream 2.0 * Amazon Detective * Amazon DocumentDB * Amazon EC2 * Amazon Elastic Container Registry (ECR) * Amazon ElastiCache * Amazon GuardDuty * Amazon Inspector * Amazon Kendra * Amazon Lightsail * Amazon Macie * Amazon MemoryDB for Redis * Amazon Neptune * Amazon OpenSearch Service * Amazon QuickSight * Amazon RDS * Amazon Redshift * Amazon SageMaker * Amazon Simple Storage Service (S3) * Amazon Textract * AWS Amplify * AWS AppSync * AWS Device Farm * AWS Secrets Manager * AWS Security Hub | * AWS IoT Greengrass * Amazon Comprehend * Amazon Polly * Amazon Rekognition * Amazon CloudFront |

**AWS Services tied to the Availability Zone**

* Amazon EC2 (Elastic Compute Cloud)
* Amazon EBS (Elastic Block Store)
* Amazon RDS (Relational Database Service)
* Amazon Aurora
* Amazon ElastiCache
* Amazon Redshift
* Amazon S3 (Simple Storage Service)
* Amazon VPC (Virtual Private Cloud)
* AWS Elastic Load Balancing (ELB)
* Amazon FSx
* Amazon Elastic Kubernetes Service (EKS)
* Amazon EMR (Elastic MapReduce)
* Amazon Elastic File System (EFS)

**AWS Services supports PaaS model**

* AWS Elastic Beanstalk
* AWS Lambda
* Amazon RDS (Relational Database Service):
* AWS Fargate
* AWS Amplify

**AWS Services supports IaaS model**

* Amazon EC2 (Elastic Compute Cloud)
* Amazon S3 (Simple Storage Service)
* Amazon VPC (Virtual Private Cloud)
* Amazon EBS (Elastic Block Store)
* Amazon Route 53

**AWS Services supports SaaS model**

* Amazon WorkSpaces
* Amazon QuickSight
* AWS Marketplace
* Amazon Connect