AWS Overview

Getting Started with Amazon Web Services

Understanding AWS Global Infrastructure, Services, and Pricing

Prepared By: Rashi Rana
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What is Amazon Web Services (AWS)?

Amazon Web Services (AWS) is a comprehensive cloud computing platform provided by Amazon that offers a wide range of infrastructure services, platform services, and software services.

Key Benefits of AWS

- **Scalability:** Scale resources up or down based on demand
- **Cost-Effective:** Pay only for what you use
- **Reliability:** 99.99% uptime SLA for many services
- **Security:** Enterprise-grade security and compliance
- **Global Reach:** Available in multiple regions worldwide

AWS Service Categories

- **Compute:** EC2, Lambda, ECS, EKS
- **Storage:** S3, EBS, EFS, Glacier
- **Database:** RDS, DynamoDB, Aurora, Redshift
- **Networking:** VPC, CloudFront, Route 53, ELB
- **Security:** IAM, KMS, WAF, Shield

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AWS Global Infrastructure

AWS operates the world's most extensive global cloud infrastructure, designed to provide high availability, fault tolerance, and low latency for applications worldwide.

🌍 33 Regions

Geographically separated areas containing multiple Availability Zones

🏢 105 Availability Zones

Isolated data centers within regions for high availability

🚀 600+ Edge Locations

Content delivery network endpoints for faster content delivery

🌐 245+ Countries

Global presence serving customers worldwide

Infrastructure Design Principles

- **Fault Isolation:** Each component is designed to fail independently
- **High Availability:** Multiple redundant systems ensure continuous operation
- **Scalability:** Infrastructure can grow to meet increasing demands
- **Security:** Multiple layers of security controls and monitoring

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AWS Regions

An AWS Region is a physical location around the world where AWS clusters data centers. Each Region consists of multiple, isolated, and physically separate Availability Zones within a geographic area.

Key Characteristics of Regions

- **Geographic Separation:** Regions are geographically distributed to reduce risk
- **Independent:** Each region operates independently with its own infrastructure
- **Data Sovereignty:** Data stored in a region stays in that region unless explicitly moved
- **Service Availability:** Not all AWS services are available in all regions

How to Choose a Region

📍 Proximity to Users

Choose regions closest to your users to minimize latency

⚖️ Compliance Requirements

Consider data residency and regulatory requirements

🛠️ Service Availability

💰 Pricing

Pricing varies between regions based on local costs

Ensure required AWS services are available in the region

Example Regions: US East (N. Virginia), US West (Oregon), Europe (Ireland), Asia Pacific (Singapore), South America (São Paulo)

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Availability Zones (AZs)

Availability Zones are one or more discrete data centers with redundant power, networking, and connectivity in an AWS Region. AZs give customers the ability to operate production applications and databases that are more highly available, fault tolerant, and scalable.

AZ Characteristics

- **Physical Separation:** Located in separate facilities, typically miles apart
- **Low Latency:** Connected via high-speed, low-latency networking
- **Fault Isolation:** Designed to be isolated from failures in other AZs
- **Redundancy:** Each AZ has independent power, cooling, and networking

Aspect Single AZ Multi-AZ Availability 99.5% - 99.9% 99.99% - 99.999% Fault Tolerance Single point of failure Survives AZ failures Cost Lower Higher (due to redundancy) Use Case Development, Testing Production, Critical workloads

> **Best Practice:** Always design applications to span multiple AZs for high availability and fault tolerance.

Edge Locations & CloudFront

Edge Locations are AWS data centers designed to deliver services with the lowest latency possible. They are part of the Amazon CloudFront content delivery network (CDN).

What are Edge Locations?

- **Content Caching:** Cache frequently accessed content closer to users
- **Global Distribution:** 600+ locations across 90+ cities in 47 countries
- **Low Latency:** Reduce response times by serving content from nearby locations
- **DDoS Protection:** Provide protection against distributed denial-of-service attacks

Services Using Edge Locations

☁️ CloudFront

Content Delivery Network for web content, videos, and APIs

🌐 Route 53

DNS service with global anycast network

AWS Shield

DDoS protection service

AWS WAF

Web Application Firewall

Benefits of Edge Locations

- Improved user experience with faster content delivery
- Reduced load on origin servers
- Enhanced security and DDoS protection
- Global reach without managing infrastructure

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AWS Pricing Model

AWS follows a pay-as-you-go pricing model, allowing you to pay only for the resources you consume without upfront costs or long-term commitments.

Core Pricing Principles

💰 Pay-as-you-go

No upfront costs, no termination fees. Pay only for what you use, when you use it.

📊 Pay less when you reserve

Save up to 75% with Reserved Instances for predictable workloads.

📈 Pay less with volume-based discounts

The more you use, the less you pay per unit for services like S3 and data transfer.

Pricing Factors

- **Compute:** Instance hours, CPU utilization, memory usage
- **Storage:** Amount of data stored, storage class, requests
- **Data Transfer:** Data in/out of AWS, between regions/AZs
- **Requests:** API calls, function invocations, database queries

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AWS Pricing Models

Pricing Model Description Savings Best For **On-Demand** Pay by the hour/second with no commitments 0% (baseline) Variable workloads, testing **Reserved Instances** 1 or 3-year commitment for capacity Up to 75% Steady-state workloads **Spot Instances** Bid for unused EC2 capacity Up to 90% Fault-tolerant, flexible workloads **Savings Plans** Flexible pricing for compute usage Up to 72% Consistent compute usage

Free Tier

> **AWS Free Tier** provides new customers with free access to AWS services for 12 months, including:
>
> - 750 hours of EC2 t2.micro instances per month
> - 5 GB of S3 standard storage
> - 25 GB of DynamoDB storage
> - 1 million Lambda requests per month

Getting Started with AWS

Step 1: Create an AWS Account

- Visit aws.amazon.com and click "Create an AWS Account"
- Provide email, password, and account name
- Enter contact information and billing details
- Verify identity via phone or SMS
- Choose a support plan (Basic is free)

Step 2: Secure Your Account

🔐 Enable MFA

Multi-Factor Authentication for root account

👤 Create IAM Users

Don't use root account for daily tasks

🛡️ Set Up Billing Alerts

Monitor costs and set spending limits

📊 Use AWS CloudTrail

Log and monitor account activity

Step 3: Explore Core Services

- **EC2:** Launch your first virtual server
- **S3:** Store and retrieve files
- **RDS:** Set up a managed database
- **VPC:** Create your private network

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AWS Management Tools

Ways to Interact with AWS

🖥️ AWS Management Console

Web-based interface for managing AWS services

- User-friendly graphical interface
- Mobile app available
- Best for beginners and visual management

⌨️ AWS CLI

Command-line interface for AWS services

- Scriptable and automatable
- Available for Windows, macOS, Linux

- Best for automation and DevOps

🔧 AWS SDKs

Software Development Kits for programming languages

- Available for Java, Python, .NET, etc.
- Integrate AWS into applications
- Best for developers

📋 AWS CloudFormation

Infrastructure as Code service

- JSON/YAML templates
- Version control infrastructure
- Best for repeatable deployments

Best Practices

- Start with the Management Console to learn services
- Use CLI/SDKs for automation and scripting
- Implement Infrastructure as Code for production
- Use AWS CloudShell for quick CLI access

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Next Steps in Your AWS Journey

Learning Path

1. **Fundamentals:** Complete AWS Cloud Practitioner certification
2. **Core Services:** Learn EC2, S3, RDS, and VPC in depth
3. **Security:** Master IAM, security groups, and best practices
4. **Architecture:** Study Well-Architected Framework
5. **Specialization:** Choose a path (Solutions Architect, Developer, SysOps)

Hands-on Practice

🧪 AWS Free Tier

Practice with free resources for 12 months

🎯 AWS Workshops

Follow guided tutorials and labs

🏗️ Build Projects

Create real-world applications

📚 AWS Training

Take official AWS training courses

Useful Resources

- **AWS Documentation:** docs.aws.amazon.com
- **AWS Training:** aws.amazon.com/training
- **AWS Well-Architected:** Framework for building secure, reliable systems

- **AWS Pricing Calculator:** calculator.aws for cost estimation

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Thank You!

Questions & Discussion

Ready to start your AWS journey?

Visit: **aws.amazon.com**
Free Tier: **aws.amazon.com/free**

Training:

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