

AWS EC2 Cheat Sheet (2025 Edition)

By: <https://awslearningzone.com>

Overview

Amazon Elastic Compute Cloud (EC2) provides scalable virtual servers in the cloud. It allows flexible compute capacity, instance customization, and integration with other AWS services.

Key Concepts

Term	Description
Instance	A virtual server running on AWS infrastructure.
AMI (Amazon Machine Image)	Template containing OS, software, and configuration for launching instances.
Instance Type	Defines CPU, memory, storage, and networking capacity.
EBS (Elastic Block Store)	Persistent block storage for EC2 instances.
Security Group	Virtual firewall controlling inbound/outbound traffic.
Key Pair	Used for SSH access and authentication.
Elastic IP	Static public IPv4 address for dynamic cloud computing.
Placement Group	Logical grouping of instances for performance optimization.
Auto Scaling	Automatically adjusts instance count based on demand.
Elastic Load Balancer (ELB)	Distributes incoming traffic across multiple instances.

Instance Families

Family	Use Case	Examples
General Purpose	Balanced compute, memory, and networking.	t4g, t3, m7g, m6i
Compute Optimized	High-performance compute workloads.	c7g, c6i, c5
Memory Optimized	Memory-intensive applications.	r7g, r6i, x2idn
Storage Optimized	High I/O and storage throughput.	i4i, d3, h1
Accelerated Computing	GPU/FPGA workloads.	p5, g6, inf2

Common Commands (AWS CLI)

```
# List all instances
aws ec2 describe-instances

# Launch a new instance
aws ec2 run-instances --image-id ami-xxxxxx --instance-type t3.micro --key-name MyKeyPair

# Stop an instance
aws ec2 stop-instances --instance-ids i-xxxxxx

# Start an instance
aws ec2 start-instances --instance-ids i-xxxxxx

# Terminate an instance
aws ec2 terminate-instances --instance-ids i-xxxxxx

# Create a key pair
aws ec2 create-key-pair --key-name MyKeyPair --query 'KeyMaterial' --output text > MyKeyPair.pem

# Allocate Elastic IP
aws ec2 allocate-address

# Associate Elastic IP
aws ec2 associate-address --instance-id i-xxxxxx --allocation-id eipalloc-xxxxxx
```

Storage Options

Type	Description	Use Case
EBS (gp3, io2, st1, sc1)	Block-level storage volumes.	Boot volumes, databases.
Instance Store	Temporary local storage.	High-speed cache, ephemeral data.
EFS (Elastic File System)	Managed NFS file system.	Shared file storage.
FSx	Managed Windows or Lustre file systems.	Windows apps, HPC workloads.

Networking

Feature	Description
VPC (Virtual Private Cloud)	Isolated network environment for EC2.
Subnet	Segment of a VPC for organizing resources.
Internet Gateway	Allows internet access for VPC resources.
NAT Gateway	Enables private instances to access the internet.
Elastic Network Interface (ENI)	Virtual network card for EC2 instances.

Pricing Models

Model	Description
On-Demand	Pay per second/minute with no commitment.
Reserved Instances	1–3 year commitment for cost savings.
Savings Plans	Flexible pricing model for consistent usage.
Spot Instances	Bid for unused capacity at lower cost.
Dedicated Hosts	Physical servers dedicated to one customer.

Monitoring & Management

Service	Purpose
CloudWatch	Monitor metrics, logs, and alarms.
CloudTrail	Track API calls and user activity.
Systems Manager (SSM)	Manage and automate EC2 operations.
Trusted Advisor	Provides optimization and security recommendations.

Best Practices

- Use **IAM roles** instead of embedding credentials.
- Enable **detailed monitoring** for performance insights.
- Regularly **patch and update** AMIs.
- Use **Auto Scaling Groups** for high availability.
- Encrypt **EBS volumes** and **snapshots**.
- Implement **security groups** and **NACLs** for layered security.

- Use **Elastic Load Balancing** for fault tolerance.

Quick Reference

Task	Service/Feature
Launch instance	EC2 Console / CLI
Attach storage	EBS
Scale automatically	Auto Scaling
Distribute traffic	ELB
Monitor performance	CloudWatch
Secure access	IAM, Security Groups
Backup data	Snapshots, AMIs

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For more details, visit aws.amazon.com/ec2