

What is Cloud Computing?

Cloud computing is the on-demand delivery of IT resources—such as computing power, storage, databases, networking, software—over the internet with pay-as-you-go pricing.

Cloud Service Models (SPI Model)

Model	Description	Examples
IaaS (Infrastructure as a Service)	Provides virtualized computing resources over the internet.	Amazon EC2, Azure VM, Google Compute Engine
PaaS (Platform as a Service)	Provides hardware and software tools over the internet (for developers).	Azure App Services, Google App Engine, AWS Elastic Beanstalk
SaaS (Software as a Service)	Provides access to software applications over the internet.	Microsoft 365, Gmail, Salesforce

Deployment Models

Model	Description	Example Use Case
Public Cloud	Services delivered over the public internet (owned by providers).	AWS, Azure, GCP
Private Cloud	Cloud infrastructure used exclusively by one organization.	VMware vSphere in an on-prem data center
Hybrid Cloud	Combination of public and private clouds.	Azure Arc, AWS Outposts
Multi-Cloud	Using services from more than one public cloud provider.	Using AWS for compute and GCP for AI

Key Technologies Used in Cloud

Technology	Purpose
Virtualization	Creates virtual machines (VMs) to run multiple OS on one host. (VMware, Hyper-V, KVM)
Containers	Lightweight, portable execution units. (Docker, Podman)
Container Orchestration	Automates deployment, scaling. (Kubernetes, Amazon EKS, Azure AKS)
Serverless Computing	Run code without managing servers. (AWS Lambda, Azure Functions)
Storage Technologies	Object (S3), Block (EBS), File (EFS/Azure Files)
Networking	VPC, Subnets, Load Balancers, VPN, Direct Connect, ExpressRoute

Cloud Security

Feature	Description
IAM (Identity and Access Management)	Manages who can access what (e.g., AWS IAM, Azure AD).
Encryption	Encrypt data at rest and in transit.
Firewall and Security Groups	Control inbound/outbound traffic.
Compliance	GDPR, HIPAA, ISO certifications.
Zero Trust Security	Never trust, always verify (identity-centric).

Cost Models

Model	Description
Pay-as-you-go	Pay only for what you use.
Reserved Instances	Pre-pay to get a discount for long-term use.
Spot Instances	Buy unused capacity at a discount.

Major Cloud Providers & Their Offerings

AWS (Amazon Web Services)

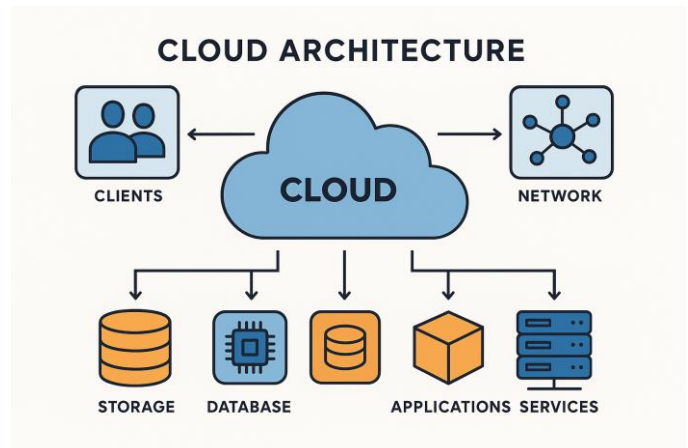
- **Compute:** EC2, Lambda
- **Storage:** S3, EBS
- **Database:** RDS, DynamoDB
- **AI/ML:** SageMaker
- **Monitoring:** CloudWatch

Microsoft Azure

- **Compute:** Azure VM, Functions
- **Storage:** Blob, Files
- **Database:** Azure SQL, Cosmos DB
- **DevOps:** Azure DevOps, GitHub Actions
- **Hybrid:** Azure Arc, Stack

Google Cloud Platform (GCP)

- **Compute:** Compute Engine, Cloud Run
- **Storage:** Cloud Storage
- **Database:** Cloud SQL, Bigtable, Firestore
- **AI/ML:** Vertex AI
- **Big Data:** BigQuery, Dataflow



Study Links for AWS

S.No	Content Name	Official URL to Read more
1	Amazon Aurora	Read More
2	Amazon CloudFront	Read More
3	Amazon CloudWatch	Read More
4	Amazon DynamoDB	Read More
5	Amazon EBS	Read More
6	Amazon EC2	Read More
7	Amazon ElastiCache	Read More
8	Amazon Glacier	Read More
9	Amazon RDS	Read More
10	Amazon Redshift	Read More
11	Amazon Route 53	Read More
12	Amazon S3	Read More
13	Amazon Simple Email Service (SES)	Read More
14	Amazon Simple Notification Service (SNS)	Read More
15	Amazon Simple Queue Service (SQS)	Read More
16	Amazon Simple Workflow Service (SWF)	Read More
17	Amazon VPC	Read More
18	AWS Auto Scaling	Read More
19	AWS Cloud Best Practices	Read More
20	AWS CloudFormation	Read More

21	AWS CloudHSM	Read More
22	AWS CloudTrail	Read More
23	AWS Config	Read More
24	AWS Direct Connect	Read More
25	AWS Identity and Access Management	Read More
26	AWS Key Management Service	Read More
27	AWS Lambda	Read More
28	AWS Management Console	Read More
29	AWS OpsWorks	Read More
30	AWS Server Migration Service (SMS)	Read More
31	AWS Shield	Read More
32	AWS Snowball	Read More
33	AWS Step Functions	Read More
34	AWS Storage Gateway	Read More
35	AWS Systems Manager	Read More
36	AWS VPN	Read More
37	AWS WAF	Read More
38	AWS Elastic Load Balancing (ELB)	Read More
39	AWS Well-Architected Framework Whitepapers	Read More

Study Links for Azure

Category	Key Services	Official Documentation
Compute	Virtual Machines, App Service, Functions, AKS, Container Instances, Batch	Azure Compute Docs (learn.microsoft.com)
Storage	Blob, File, Disk, Queue, Table, Data Lake, NetApp Files	Azure Storage Docs
Databases & Analytics	SQL DB, Cosmos DB, Synapse, Data Factory, Stream Analytics	Azure Data & Analytics (see under "Databases" / "Analytics")
Networking	Virtual Network, Load Balancer, VPN Gateway, CDN, Traffic Manager	Azure Networking Docs (see "Networking")
Security & Identity	Entra ID (Azure AD), Key Vault, Security Center, Sentinel	Azure Security Docs (see "Security" / "Identity")
Integration	Logic Apps, API Management, Service Bus, Event Grid	Azure Integration Docs (see "Integration")
Containers	AKS, Container Instances, Container Apps, Container Registry	Azure Containers Docs (see "Containers")
Hybrid & Multicloud	Arc, Stack Edge, IoT Edge, ExpressRoute	Hybrid + multicloud Docs
Developer Tools & DevOps	DevOps, Pipelines, Repos, Artifacts, Monitor	Azure DevOps & Developer Tools
AI & Machine Learning	Cognitive Services, Machine Learning, OpenAI, Anomaly Detector	Azure AI + Machine Learning
Internet of Things	IoT Hub, IoT Central, Digital Twins, IoT Edge	Azure IoT Docs
Migration & Backup	Migrate, Site Recovery, Backup, Database Migration	Migration & Backup Docs

Practical links

- [Creating Resource Group in Azure](#)
- [Create an Azure Virtual Network](#)
- [Create a Linux virtual machine in the Azure portal](#)
- [Create a Windows virtual machine in the Azure portal](#)
- [Create an Azure storage account](#)
- [Accessing the Azure storage using File explorer](#)
- [Host a web application with Azure App Service](#)
- [Build your first static web app](#)

Note – click on the appropriate link and follow the steps.