

AWS, Azure & GCP Service Comparison for Data Science & AI

Service Type	Description	AWS	Azure	Google Cloud
Storage	Object storage	For storing any files you regularly use	Simple Storage Service (S3)	Blob Storage
	Archive storage	Low cost (but slower) storage for rarely used files	S3 Glacier Instant, Glacier Flexible, Glacier	Blob Cool/Cold/Archive tiers
	File storage	For storing files needing hierarchical organization	Elastic File System (EFS), FSx	Avers vFXT, Files
	Block storage	For storing groups of related files	Elastic Block Storage	Disk Storage
	Hybrid storage	Move files between on-prem & cloud	Storage Gateway	StorSimple, Migrate
	Edge/offline storage	Move offline data to the cloud	Snowball	Data Box
	Backup	Prevent data loss	Backup	Backup and Disaster Recovery
Database	Relational DB management	Standard SQL DB (PostgreSQL, MySQL, SQL Server, etc.)	Relational Database Service (RDS), Aurora	SQL, SQL Database
	NoSQL: Key-value	Redis-like DBs for semi-structured data	DynamoDB	Cosmos DB, Table storage
	NoSQL: Document	MongoDB/CouchDB-like DBs for hierarchical JSON data	DocumentDB	Cosmos DB
	NoSQL: Column store	Cassandra/HBase-like DBs for structured hierarchical data	Keyspaces	Cosmos DB
	NoSQL: Graph	Neo4j-like DBs for connected data	Neptune	N/A
	Caching	Redis/Memcached-like memory for calculation	ElastiCache	Cache for Redis, HPC Cache
	Time Series DB	DB tuned for time series data	Timestream	Time Series Insights
	Blockchain	Dogecoin, etc.	Managed Blockchain	Blockchain Service, Blockchain Workbench, Confidential Ledger
Compute	Virtual machines	Software-emulated computers	Elastic Compute Cloud (EC2)	Virtual Machines
	Spot virtual machines	Cost-effective VMs	EC2 Spot Instances	Spot Virtual Machines
	Autoscaling	Autoscaling Adjust resources to match demand	EC2 Auto Scaling	Virtual Machine Scale Sets
	Functions as a service (Serverless computing)	Execute code chunks without worrying about infrastructure	Lambda	Functions
	Platform as a service	Manage applications without worrying about infrastructure	Elastic Beanstalk, Red Hat OpenShift on AWS	App Service, Cloud Services, Spring Cloud, Red Hat OpenShift
	Batch scheduling	Run code at specified times	Batch	Batch, Cloud Scheduler
	Isolated servers	VM on your own machine, for high security	Dedicated Instances	Dedicated Host
	On-premise/Ed	Cloud-services on your own hardware	Outposts, Snow	Modular
	On-premise/Edge devices	Cloud-services on your own hardware	Outposts, Snow Family	Modular Datacenter, Stack Hub, Stack HCI, Stack Edge
	Quantum computing	Determine if cat is alive or dead	Braket	Quantum
Analytics	Data Warehouse	Data Warehouse Centralized platform for all your data	RedShift	Synapse Analytics
	Big data platform	Run Spark, Hadoop, Hive, Presto, etc.	EMR	Data Explorer, HDInsight
	Business analytics	Dashboards and visualization	Quicksight, FinSpace	Power BI Embedded, Graph Data Connect
	Real-time analytics	Streaming data analytics	Kinesis Data Analytics, Kinesis Data Streams, Managed Streaming for Kafka	Stream Analytics, Event Hubs
	Extract-Transform-Load (ETL)	Preprocessing and importing data	Glue, Kinesis Data Firehose, SageMaker Data Wrangler	Data Factory
	Workflow orchestration	Build data and model pipelines	Data Pipeline, Managed Workflows for Airflow	Data Factory
	Data lake creation	Import data into a lake	Lake Formation	Data Share
	Managed search	Enterprise search	CloudSearch, OpenSearch Service, Kendra	Cognitive Search
	Data Catalog	Metadata management	Glue Data Catalog	Purview, Data Explorer
ML & AI	Machine Learning	Train, fit, validate, and deploy ML models	SageMaker	Machine Learning
	Jupyter notebooks	Write data analyses and reports	SageMaker Notebooks	Notebooks
	Data science/machine learning VM	Virtual machines tailored to data work	Deep Learning AMIs	Data Science Virtual Machines
	AutoML	Automatically build ML models	SageMaker	Machine Learning Studio, Automated ML
	Natural language Processing AI	Analyze text data	Comprehend	Text Analytics
	Recommendation AI	Product recommendation engine	Personalize	Personalizer
	Document capture	Extract text from printed text & handwriting	Textract	Form Recognizer
	Computer vision	Image classification, object detection & other AI with image data	Rekognition, Panorama, Lookout for Vision	Cognitive Services for Vision
	Speech to text	Speech transcription	Transcribe	Cognitive Services for Speech to Text, Cognitive Services for Speaker Recognition
	Text to speech	Text to speech Speech generation	Polly	Cognitive Services for Text to Speech
	Translation AI	Convert text between human languages	Translate	Cognitive Services for Speech Translation, Translator
	Video Intelligence	Video indexing and asset search	Rekognition Video	Video Indexer
Networking & Content Delivery	AI agents	Virtual assistants and chatbots	Lex, Alexa Skills kit	Bot Service, Cognitive Services for Conversational Language Understanding
	Human-in-the-loop	Human-based quality control for AI	Augmented AI (A2I)	Cognitive Services Content Monitor
	Content delivery network	Serve content to users	CloudFront	Content Delivery Network
	Application Programming Interface (API) management	Build and deploy APIs	API Gateway	API Apps, API Management
Containers	Domain Name System (DNS)	Route end users to applications	Route 53	DNS
	Load balancing	Distribute work evenly across machines	Elastic Load Balancing (ELB)	Application Gateway, Load Balancer, Traffic Manager
	Managed containers	Run and deploy containers	Elastic Kubernetes Service, Elastic Container Service	Kubernetes Service, Container Apps
Management & Security, Identity	Container registration	Manage container images	Elastic Container Registry	Container Registry
	Access management	User permissions and authentication	Identity and Access Management (IAM)	Entra ID
	Activity tracking	Track user activity	CloudTrail	Monitor Activity Log
	Security	Protect your data, network and applications	Security Hub	Security
	Monitoring	Monitor network traffic and detect anomalies	CloudWatch, Transit Gateway Network Manager	Monitor, Anomaly Detector
	Automation	Perform processes automatically	OpsWorks	Automation
Management & Security, Identity	Cost optimization	Reduce your cloud spend	Cost Optimization	Cost Management
				Recommender