
aws
AWSOME DAY
ONLINE CONFERENCE
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Introduction to AWS services
Compute, storage & databases

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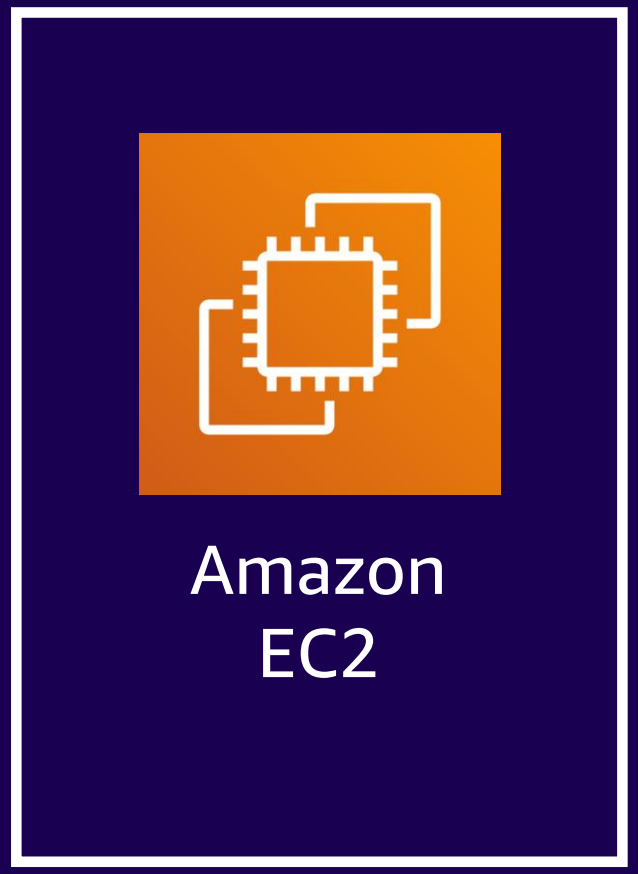
Amazon Web Services

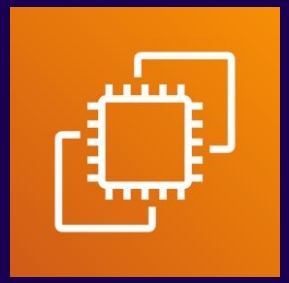
Compute

Amazon Elastic Compute Cloud (Amazon EC2)



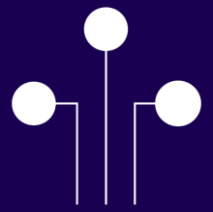
- Resizable compute capacity
- Complete control of your computing resources
- Reduced time required to obtain and boot new server instances

Virtual machines vs. physical servers



Amazon EC2 can solve some problems that are more difficult with an on-premises server

When using disposable resources

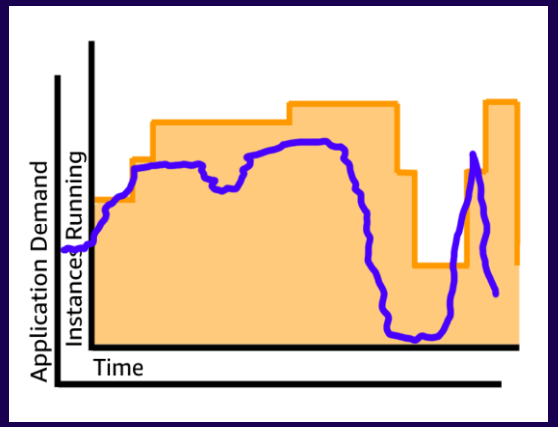


Data-driven decisions

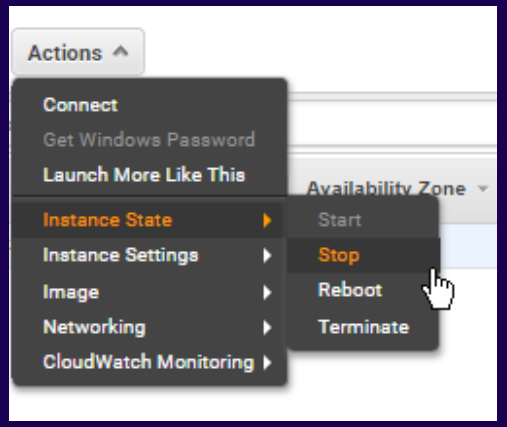
Quick iterations

Free to make mistakes

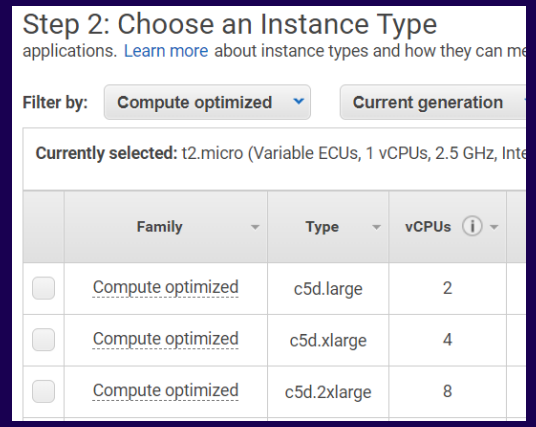
Benefits of Amazon EC2



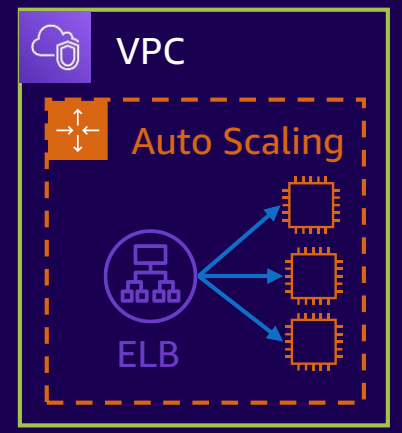
Elasticity



Control

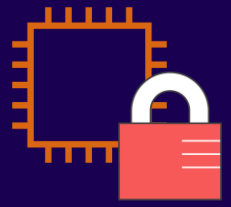


Flexibility



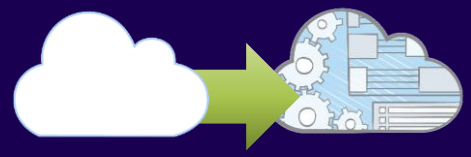
Integrated

Reliable



Secure

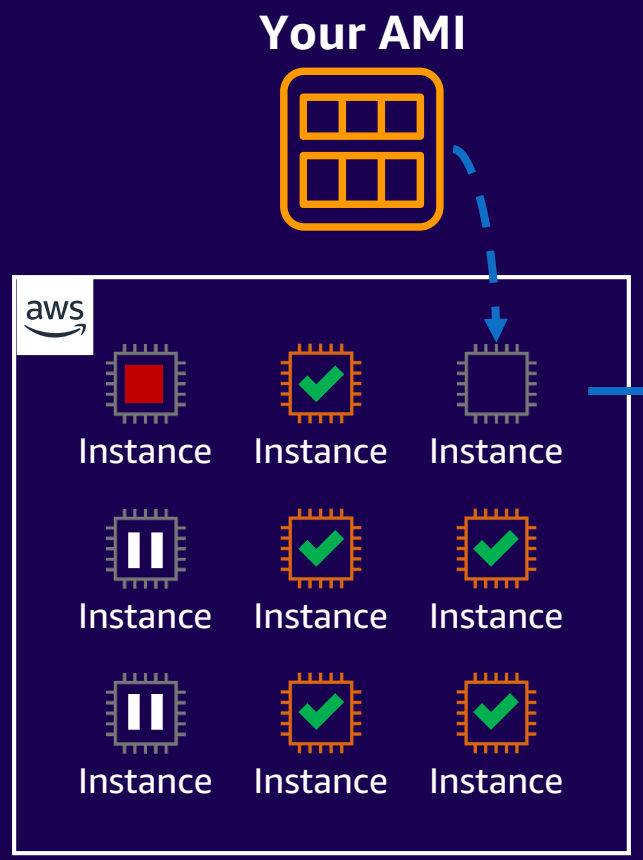
Inexpensive



Simple

Amazon EC2

Amazon EC2 provides pay-as-you-go pricing and a broad selection of hardware and software that's available via the AWS Marketplace by using Amazon Machine Images (AMIs)



Template for
- Storage volumes
- Launch permissions
- A block device mapping

Examples
- ✓ Application server
- ✓ Web server
- ✓ Database server
- ✓ Game server
- ✓ Mail server
- ✓ Media server
- ✓ Catalog server
- ✓ File server

Amazon EC2 instance families and names

Choosing the correct type is very important for
efficient use of your instances and cost reduction

Instance family	Use cases
General purpose *e.g., A1, T3, T3a, T2, M6g, M5*	• Low-traffic websites and web applications • Small databases and midsize databases
Compute optimized *e.g., C5, C5n, C4, C7g*	• High-performance web servers • Video encoding
Memory optimized *e.g., R5, R5n, X1e, X1, z1d*	• High-performance databases • Distributed memory caches
Storage optimized *e.g., I3, I3en, D2, H1*	• Data warehousing • Log or data processing applications
Accelerated computing *e.g., P3, P2, Inf1, G4, G3, F1*	• 3D visualizations • Machine learning

Amazon EC2 pricing

Unmanaged services compared to managed services

Unmanaged

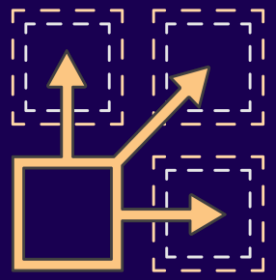
You manage scaling, fault tolerance, and availability

Managed

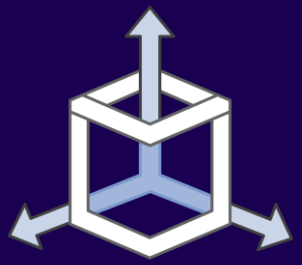
Scaling, fault tolerance, and availability are typically built in to the service

What is serverless computing?

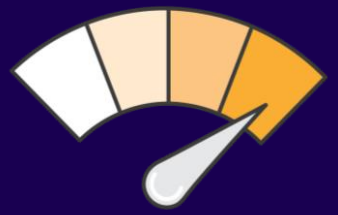
Building and running applications and services without managing servers



No servers to provision or manage



Scales with usage



Never pay for idle

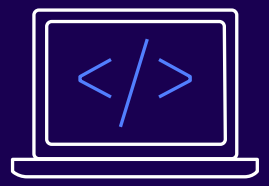
Availability and fault tolerance built in

AWS Lambda

- Fully managed compute service
- Runs stateless code
- Supports multiple languages
- Runs your code on a schedule or in response to events (for example, changes to data in an Amazon S3 bucket or Amazon DynamoDB table)

Demo:
AWS Lambda
Amazon S3

Serverless application use cases

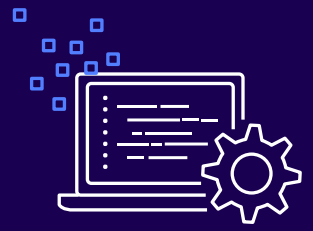


Web applications

Static websites

Complex web applications

Packages for Flask and Express

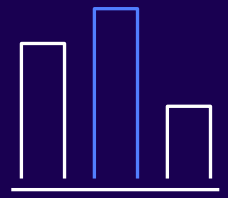


Backends

Applications and services

Mobile

IoT



Data processing

Real time

MapReduce

Batch

Machine learning inference

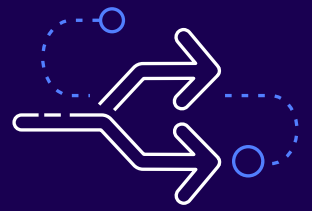
Chatbots

Powering chatbot logic

Amazon Alexa

Powering voice-enabled applications

Alexa Skills Kit



IT automation

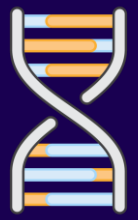
Policy engines

Extending AWS services

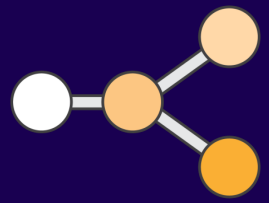
Infrastructure management

Amazon Elastic Container Service (Amazon ECS)

Amazon
ECS



Orchestrates the execution of containers



Maintains and scales the fleet of nodes running your containers

Removes the complexity of standing up the infrastructure

Key Takeaways

- EC2 instances – Servers in the cloud!
  - Pay as you go pricing
  - Scale in/out as needed automatically
  - Different instance types (hardware) for your workloads
- Amazon ECS
  - Orchestration for your container deployments
- Serverless
  - You create the code, AWS manages the underlying compute
  - Lambda – On demand, per-request pricing to run code

Storage

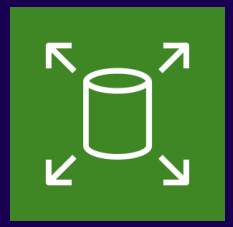
AWS storage options

Amazon S3
Scalable, highly durable object storage in the cloud

Amazon S3 Glacier
Low-cost, highly durable archive storage in the cloud

Amazon EFS
Scalable network file storage for Amazon EC2 instances

AWS Storage Gateway
Hybrid cloud storage service that gives you on-premises access to virtually unlimited cloud storage.



Amazon EBS
Network-attached volumes that provide durable block-level storage for Amazon EC2 instances

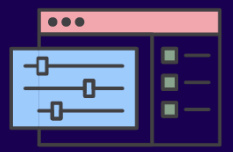
Amazon FSx
Fully managed, cost-effective file storage offering the capabilities and performance of popular commercial and open-source file systems

Amazon S3

Amazon S3

Object-level storage

Designed for 99.999999999% durability



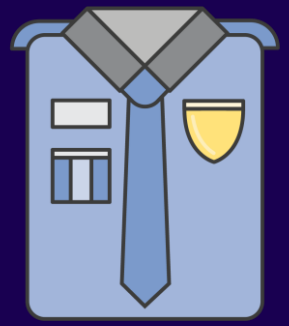
Event triggers

Use cases

- Content storage and distribution
- Backup and archiving
- Big data analytics
- Disaster recovery
- Static website hosting

Choosing a Region

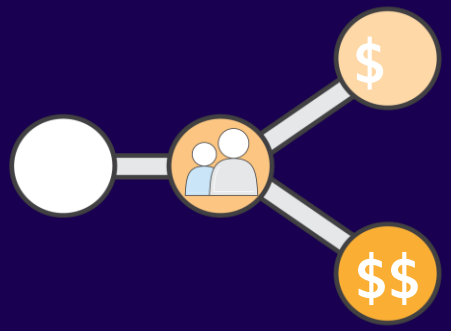
Data residency regulatory compliance



Are there relevant Region data privacy laws?

Can customer data be stored outside the country?

Proximity of users to data



Small differences in latency can impact customer experience

Choose the Region closest to your users

Cost-effectiveness

Costs vary by Region

Evaluate cost-effectiveness of replicating data to another Region

File services use cases

Amazon EFS

- Simplify Development Operations (DevOps)
- Modernize application development
- Enhance content management systems
- Accelerate data science

Amazon FSx for Lustre

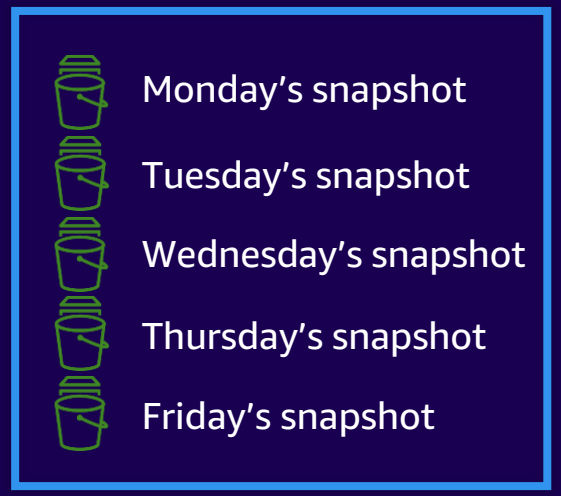
- Accelerate machine learning
- Enable high performance computing
- Unlock big data analytics
- Increase media workload agility

Amazon FSx for Windows

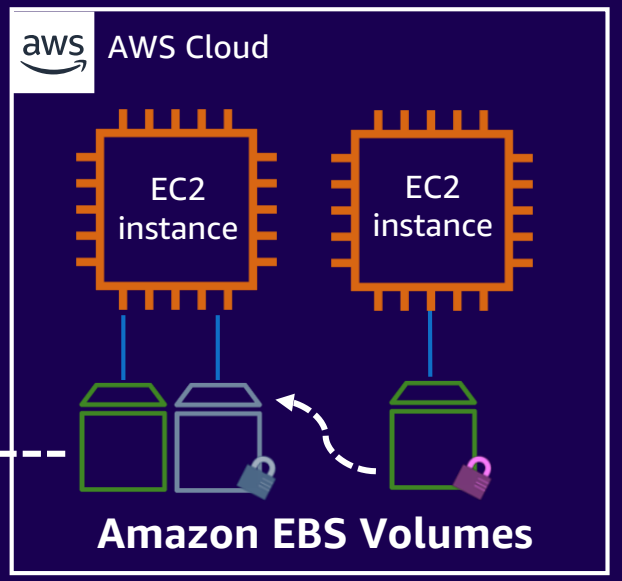
- Migrate Windows file servers to AWS
- Accelerate hybrid workloads
- Reduce Microsoft SQL Server deployment cost
- Simplify virtual desktops and streaming

Amazon Elastic Block Store (Amazon EBS)

- Persistent block storage for instances
- Protected through replication
- Different drive types
- Scale up or down in minutes
- Pay for only what you provision
- Snapshot functionality
- Encryption available



Create volume snapshots for backup and recovery



Detach and reattach volumes to other EC2 instances

Key takeaways

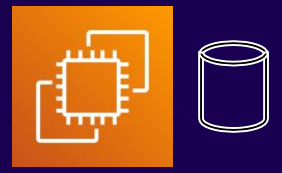
AWS provides a variety of storage options

- Object (Amazon S3)
- File (Amazon EFS and Amazon FSx)
- Block storage (Amazon EBS)

- **Customers are using our storage services to build:**
  - Home directories
  - Data lakes
  - Modern and business-critical applications

Databases

DIY (Unmanaged services) compared to AWS database services (managed services)



Databases on Amazon EC2

- Operating system access
- Need features of specific application

AWS database services

- Simple to set up, manage, maintain
- Push-button high availability
- Focus on performance
- Managed infrastructure

Purpose-built databases

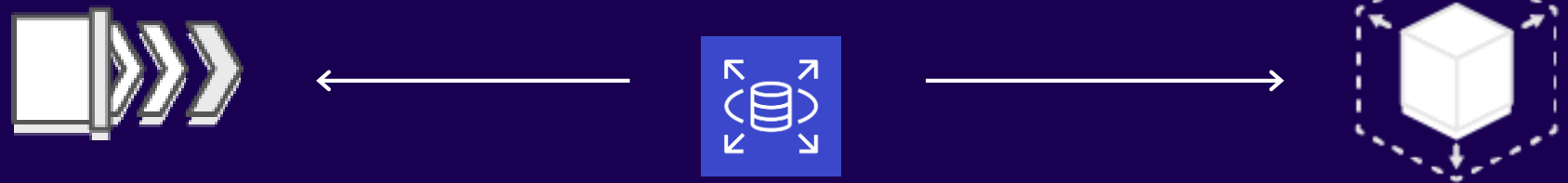
Relational	Non Relational (NoSQL) databases for specific data models and have flexible schemas for building modern applications					
	Key-value	In-memory	Document	Wide-Column	Graph	Ledger	Time Series
 Amazon RDS	 Amazon DynamoDB	 Amazon ElastiCache	 Amazon DocumentDB	 Amazon Keyspaces (for Apache Cassandra)	 Amazon Neptune	 Amazon QLDB	 Amazon Timestream
 Amazon Aurora							
 Amazon Redshift		 Amazon MemoryDB for Redis					

AWS database options

	SQL	NoSQL
Transactional databases	 Amazon RDS	 Amazon DynamoDB
Data analytics or relationships	 Amazon Redshift	 Amazon Neptune
In-memory data store and cache		 Amazon ElastiCache

Amazon RDS

Set up, operate, and scale a relational database in the cloud with just a few clicks



Simple to set up and operate

Amazon RDS

Scales

Amazon Aurora

Microsoft SQL Server

MariaDB Foundation

ORACLE

PostgreSQL

MySQL

Database engines

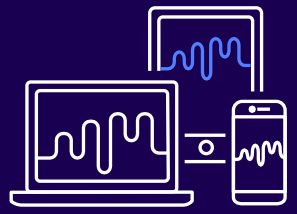
Amazon Aurora

Relational database built for the cloud; compatible with MySQL and PostgreSQL

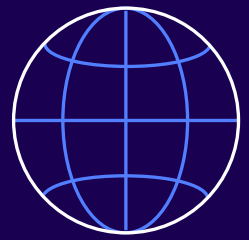
High availability and durability

Amazon Aurora

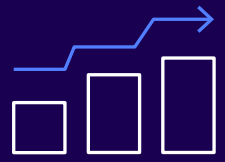
Compatible



High performance



Multi-Region



High scalability

Amazon DynamoDB

Fast and flexible NoSQL database service for any scale

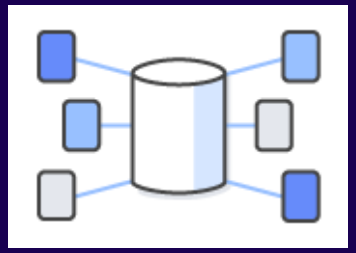
Fully managed

Fine-grained access control

Amazon DynamoDB

Fast, consistent performance

Flexible



Key takeaways

AWS provides a variety of database options

- Relational (Amazon Aurora, Amazon RDS, Amazon Redshift)
- Nonrelational (Amazon DynamoDB, Amazon Neptune, Amazon DocumentDB, Amazon Keyspaces, Amazon ElastiCache, Amazon QLDB, Amazon Timestream)

- NoSQL databases are widely recognized for their ease of development, functionality, and performance at scale

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