INTRODUCTION TO CLOUD STORAGE

AMAZON S3

UNDERSTANDING S3 BUCKETS, STORAGE TYPES,
PERMISSIONS & ADVANCED CONCEPTS

Presented by Ayush Sharma

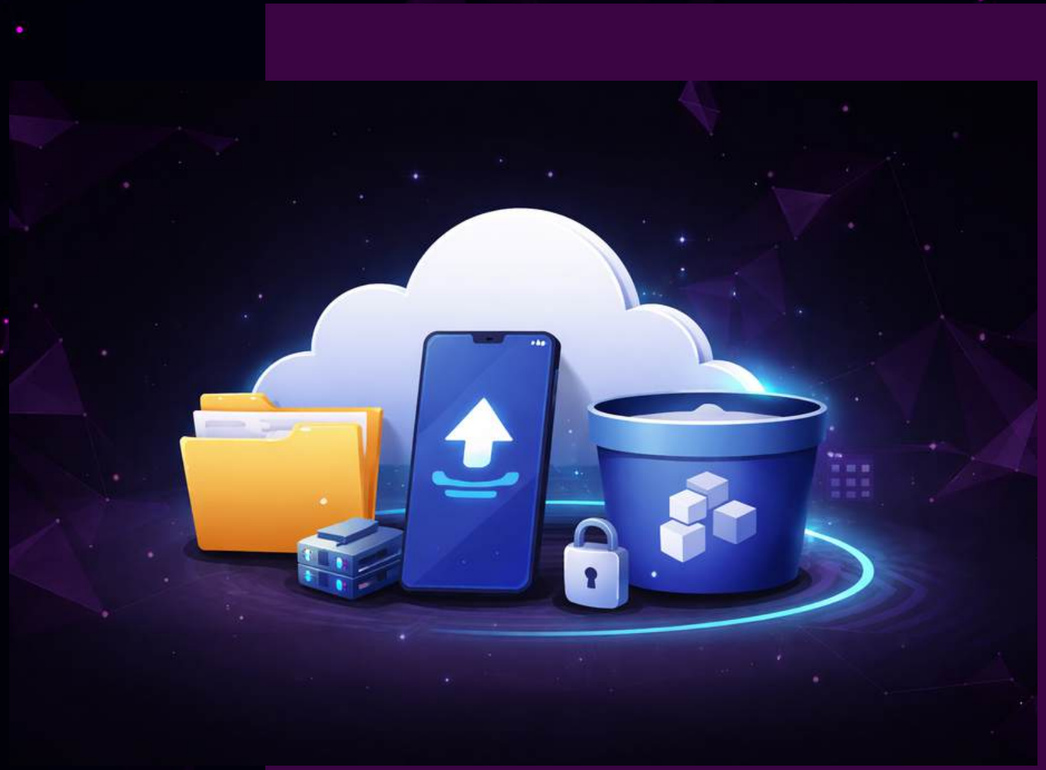
What is Cloud Storage?

Cloud Storage means storing data on the internet instead of a local computer or hard disk.

It allows users to access data from anywhere, without managing physical hardware.

Cloud storage is highly scalable, secure, and widely used in modern applications.

Examples: Google Drive, iCloud, Amazon S3



Types of Cloud Storage

Block Storage

High performance storage

File Storage

Shared file system

Object Storage

Highly scalable storage

Block Storage

Definition

Block Storage stores data in fixed-size blocks. Each block has a unique address and is managed directly by the operating system.

Real-Life Example

- Computer hard disk (C Drive)
- Mobile internal storage

Where Used

- Operating Systems
- Databases (MySQL, Oracle)
- High-performance applications

AWS Service

AWS Block Storage Service:
EBS (Elastic Block Store)

ayushsharma4571@gmail.com

File Storage

File Storage stores data as files and folders that can be easily shared between users.

It is commonly used for shared documents and website files.

Examples: Office shared folders, Google Drive

AWS File Storage Service:
EFS (Elastic File System)

ayushsharma4571@gmail.com

Object Storage

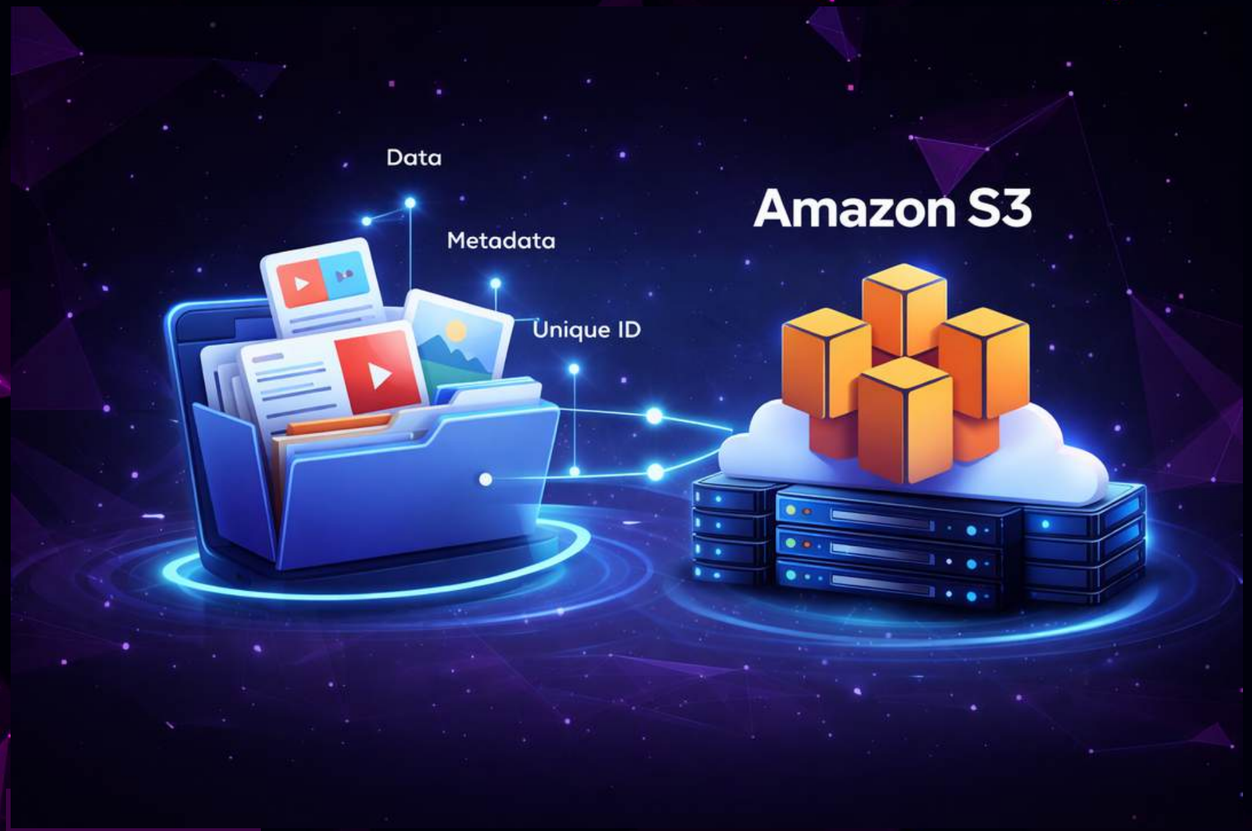
Object Storage stores data as objects instead of files or blocks.

Each object contains data, metadata, and a unique ID.

It is highly scalable and accessed over the internet.

Examples: Google Photos, YouTube videos

AWS Object Storage Service:
Amazon S3



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Block vs File vs Object Storage

Block Storage

Data is stored in fixed-size blocks.
Provides very high performance.
Used mainly with operating systems and databases.

Object Storage

Data is stored as objects with metadata and a unique ID.
Highly scalable and accessed over the internet.

File Storage

Data is stored as files and folders.
Supports easy sharing between users.
Commonly used for shared documents and website files.

AWS Services

AWS Block Storage → EBS
AWS File Storage → EFS
AWS Object Storage → Amazon S3

ayushsharma4571@gmail.com

What is a Cloud Service Provider (CSP)?

Definition

A Cloud Service Provider is a company that provides cloud services over the internet.

These services include computing, storage, database, networking, and more.

Examples

- AWS (Amazon Web Services)
- Microsoft Azure
- Google Cloud

👉 AWS is a CSP.

ayushsharma4571@gmail.com

What is Amazon S3?

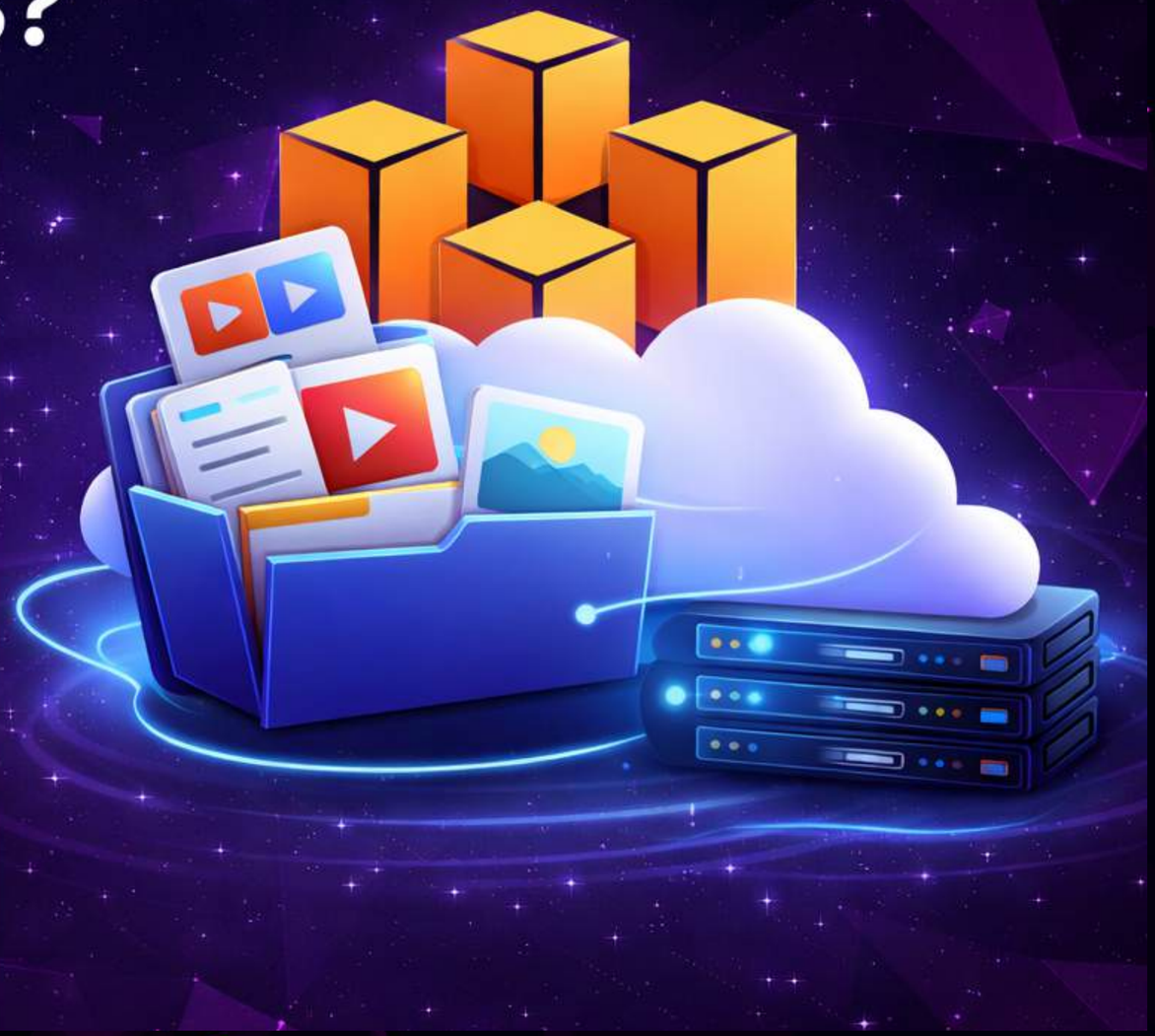
Definition

Amazon S3 (Simple Storage Service) is an object storage service provided by AWS that stores data securely over the internet.

Key Features

- Highly scalable
- Secure and durable
- Pay as you use
- *Pay as you use*
- Internet accessible

- Website images
- Videos
- Backups



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What is an S3 Bucket & Object?

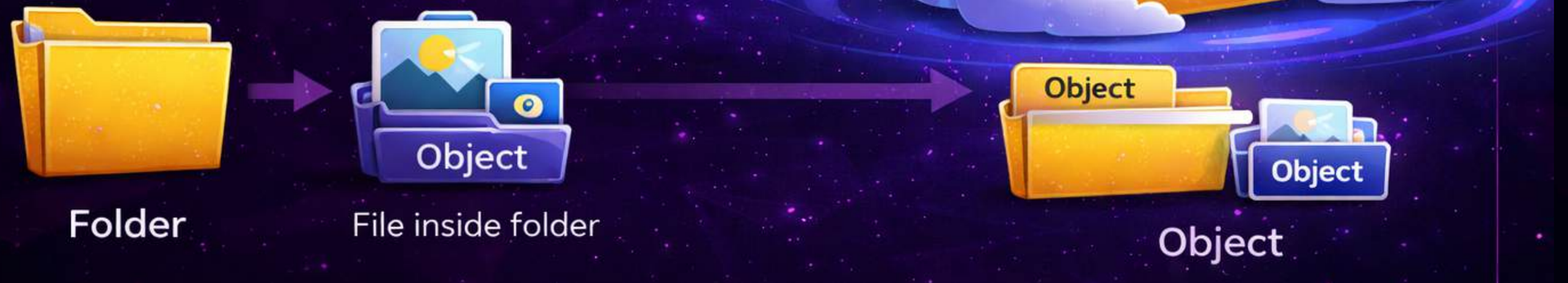
S3 Bucket

A bucket is a container that stores data.

Object

Any file stored inside a bucket is called an object.

Example



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S3 Permissions & Policies

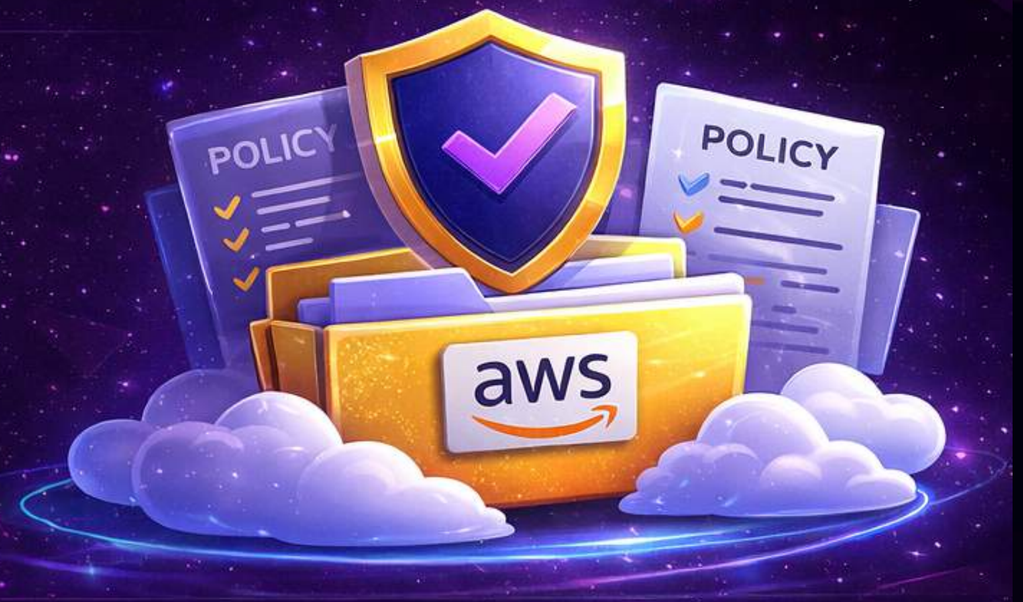
What are Permissions?

Permissions decide who can access the bucket or object.

Types

- IAM Policy
- Bucket Policy
- ACL

👉 **Best Practice: IAM + Bucket Policy**



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ARN, ACL & JSON

ARN (Amazon Resource Name)

A unique ID for every AWS resource.

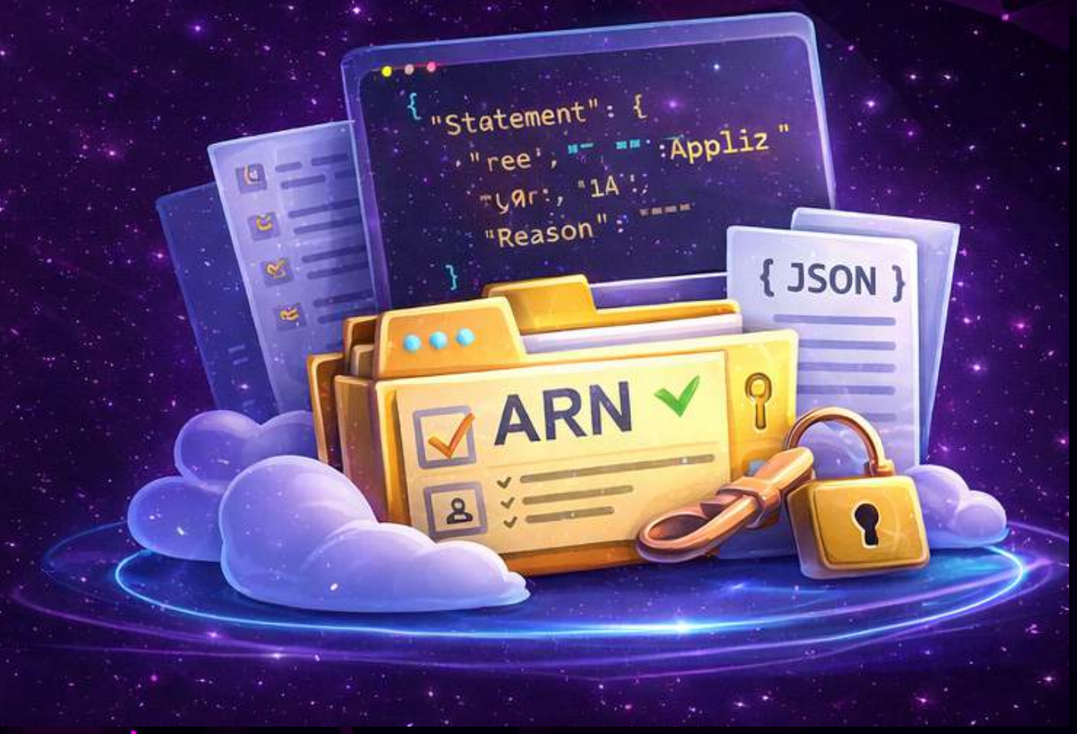
Example: `arn:aws:s3:::bucket-name`

ACL

Controls read/write access.

JSON

A format used to write AWS policies.



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S3 Storage Classes

Why Storage Classes?

Different data → different access → different cost

Examples

- **S3 Standard** → Frequently used data
- **Standard-IA** → Backup data
- **Glacier** → Archive data
- **Deep Archive** → Long-term records

👉 **Less access = lower cost**

ayushsharma4571@gmail.com

Lifecycle Policy & Versioning

Lifecycle Policy

Automatically moves or deletes old data.

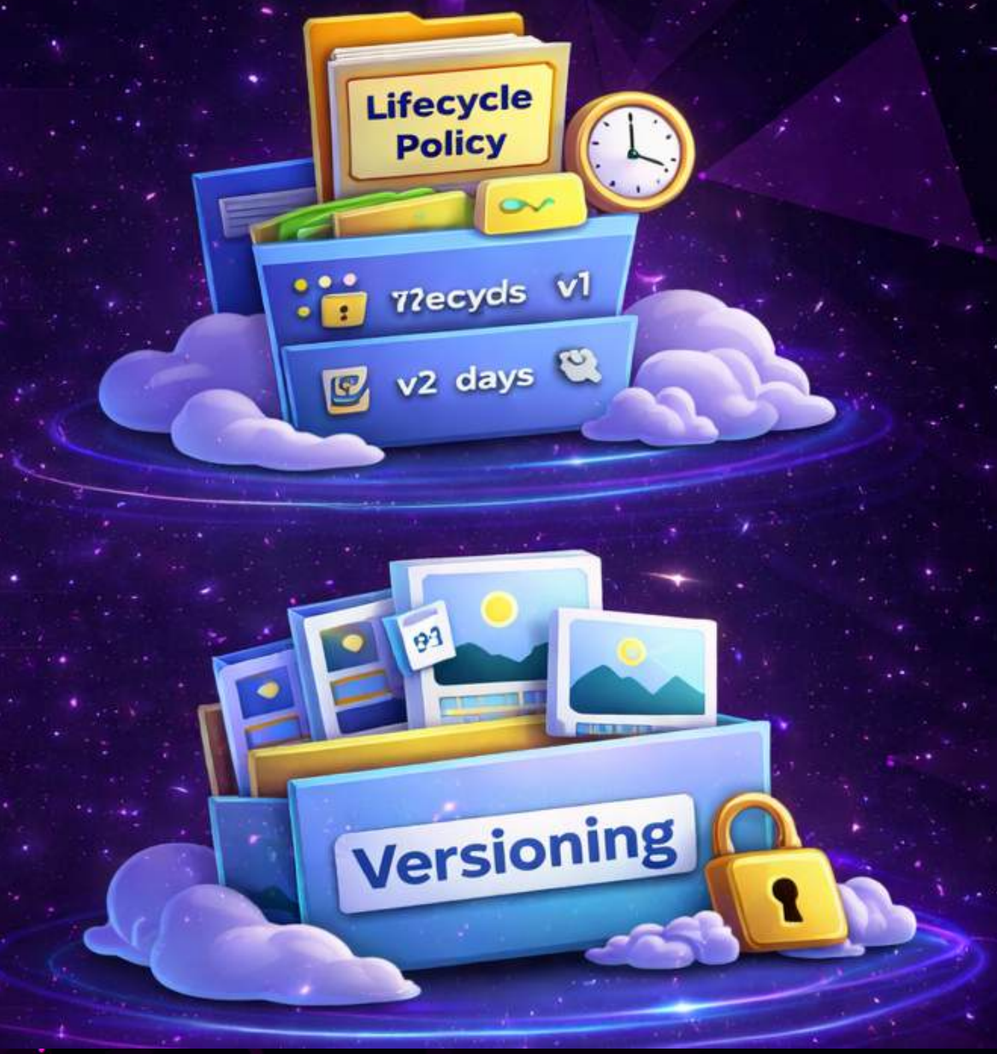
Example:

- 30 days → IA
- 90 days → Glacier

Versioning

Stores multiple versions of the same file.

👉 Data is not replaced, new version is created.



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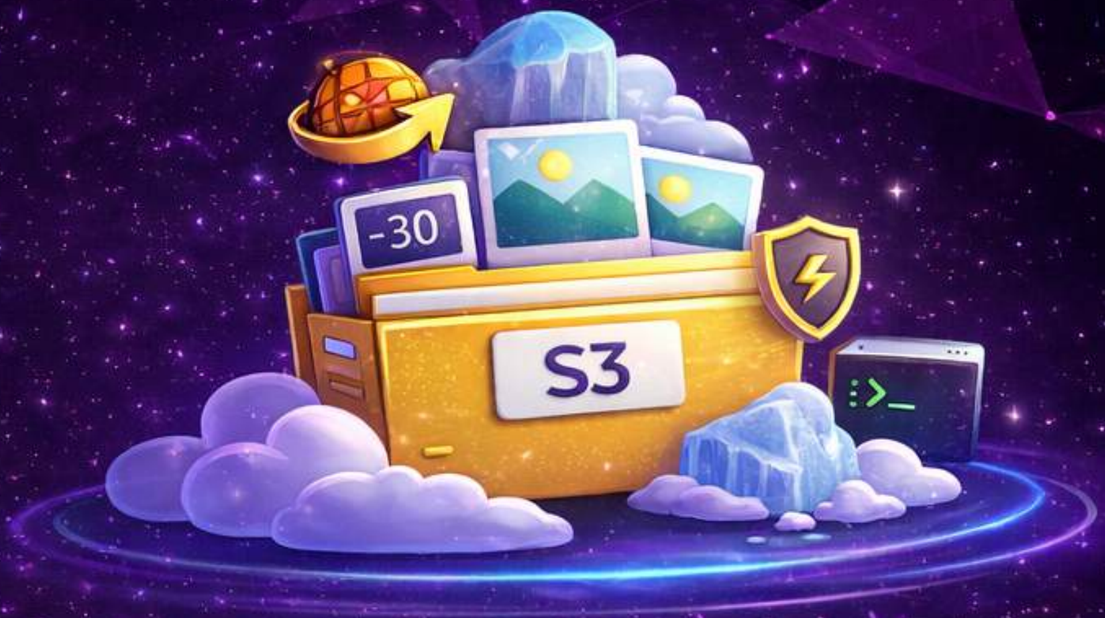
Advanced S3 Concepts

Key Learnings

- **S3 Replication** (SRR & CRR)
- Replication is Asynchronous
- Transfer Acceleration (Fast uploads)
- CDN (CloudFront)
- S3 Glacier for archives
- AWS CLI for automation



Conclusion

Amazon S3 is a powerful, scalable and cost-effective **storage service.**

ayushsharma4571@gmail.com