



## Explain the basic concepts of S3: Bucket, Object, Key, Version ID.

### Basic Concepts of Amazon S3

Concept	What it is	Example
<b>Bucket</b>	A container that holds your data (like a folder at the top level).	A bucket named my-app-uploads
<b>Object</b>	The actual file/data you store inside a bucket.	A photo, a PDF, a video, etc.
<b>Key</b>	The <b>unique name</b> (full path) of an object inside a bucket.	images/2025/profile1.jpg
<b>Version ID</b>	A unique identifier for <b>different versions</b> of the same object (if versioning is enabled).	Version 1: abc123, Version 2: xyz456

### ◆ Simple example:

Imagine S3 like a **giant online drive**:

- **Bucket** = my-travel-photos
- Inside the bucket, you store:
  - /india/2025/tree.jpg
  - /usa/2024/mango.jpg

Here:

- tree.jpg is an **object**.
- india/2025/tree.jpg is the **key** (the path and name combined).
- If you **replace** tree.jpg later (say, edited it), S3 can keep **multiple versions**:
  - Old photo: Version ID = v1

- New photo: Version ID = v2

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### ◆ Quick Definitions:

Term	Short Definition
<b>Bucket</b>	Like a main folder.
<b>Object</b>	The actual stored file.
<b>Key</b>	The <b>path+filename</b> that identifies the object uniquely inside a bucket.
<b>Version ID</b>	ID to track multiple versions of the same object over time.

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### ◆ Imp points:

- **Bucket names must be globally unique** across all AWS accounts.
  - **Keys are case-sensitive** (`image.jpg` and `Image.jpg` are different keys).
  - **Versioning is optional**, but very useful to prevent accidental overwrites/deletes.
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### ◆ Basic S3 URL format:

`https://<bucket-name>.s3.<region>.amazonaws.com/<key>`

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### ◆ Example:

Suppose:

- **Bucket** = `my-travel-photos`
- **Region** = `ap-south-1` (Mumbai)
- **Object** = a photo file
- **Key** = `india/2025/tree.jpg`

The **S3 URL** would be:

```
bash
CopyEdit
https://my-travel-photos.s3.ap-south-1.amazonaws.com/india/2025/tree.jpg
```

✅ This URL will directly fetch your uploaded file!

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### ◆ If Versioning is enabled:

You can add the **Version ID** as a query parameter:

`https://my-travel-photos.s3.ap-south-1.amazonaws.com/india/2025/tree.jpg?versionId=abc123xyz456`

✓ This URL will fetch **that specific version** of `tree.jpg`.

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### ◆ Quick Visual:

#### S3 Structure:

```
Bucket: my-travel-photos
├── Key: india/2025/tree.jpg (Object: photo file)
│   └── Version ID: abc123xyz456 (optional)
```

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### What does the "key" represent in object storage?

- A) The encryption used for an object
- B) The public access URL
- C) The unique name or full path of the object inside a bucket
- D) The metadata of the object

**Correct Answer:** C

### Which of the following is a valid example of a key?

- A) my-app-uploads
- B) abc123
- C) profile1.jpg
- D) images/2025/profile1.jpg

**Correct Answer:** D

### Which of the following statements about a key is NOT true?

- A) A key uniquely identifies an object in a bucket.
- B) A key can include folder-like paths such as `images/2025/profile.jpg`.
- C) The key is the physical storage path on the server's hard drive.
- D) Each object in a bucket must have a unique key.

**Correct Answer:** C

*(Keys represent logical paths, not actual physical file paths on disk.)*

### Which of the following is NOT true regarding object storage systems?

- A) Each object is stored inside a bucket and has a key.
- B) You can store multiple versions of the same object if versioning is enabled.

- C) The object's key changes automatically every time a new version is uploaded.
- D) Objects can include metadata like content type and size.

**Correct Answer: C**

*(The key remains the same; only the version ID changes for new versions.)*