AWS EFS

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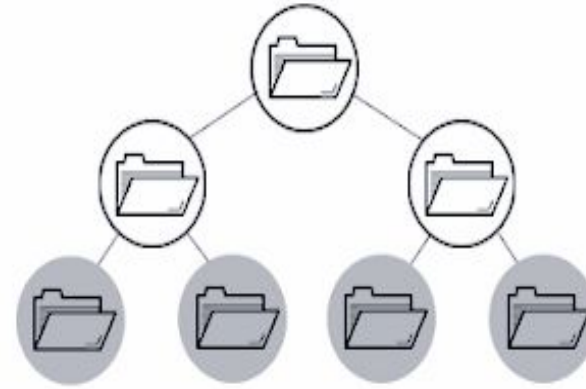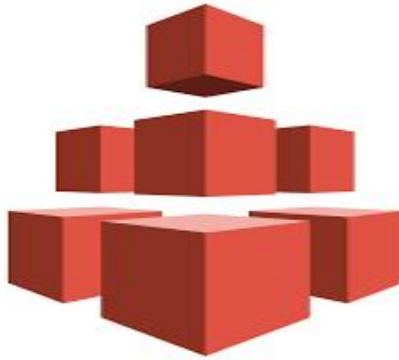
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1 Introduction to EFS

Introduction to EFS

What is EFS?

- Simple, scalable, fully managed Elastic NFS file system.
- Amazon elastic file system (amazon efs) is service that provides a simple, scalable, fully managed elastic nfs file system.
- It offers a traditional file storage concept, with data organized into directories and subdirectories.

Introduction to EFS

What is EFS?

An EFS is a Network File System (NFS) that organizes data in a logical file hierarchy. Data is stored in a path-based system, where data files are organized in folders and sub-folders.

Mapped file server drives and detachable USB drives both use hierarchical file systems, so the concept should be familiar to anyone who has ever dealt with personal computers and servers.

EFSs are ideal candidates for storing:

Organizational data
File server
Individual data
Application data

Amazon states that a single EFS can be simultaneously connected to thousands of Elastic Compute Cloud (EC2) instances or on-premise resources, allowing you to share EFS data with as many resources as needed. Access to shared EFS folders and data is provided through native operating system interfaces.
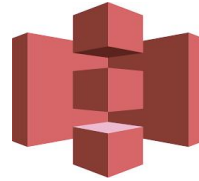
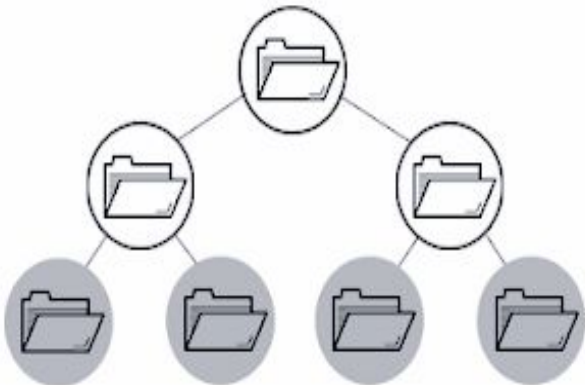# Introduction to EFS

Recap of the Storage Options
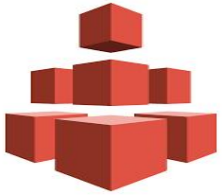
Amazon EFS

S3

Amazon Elastic Block Storage (EBS)

File Storage

HTTP(S) Interface

Object Storage

Block Storage

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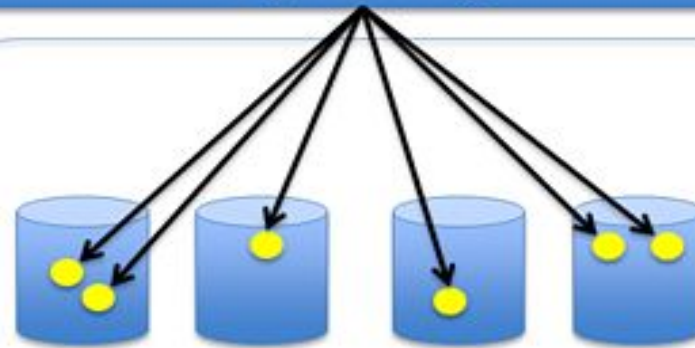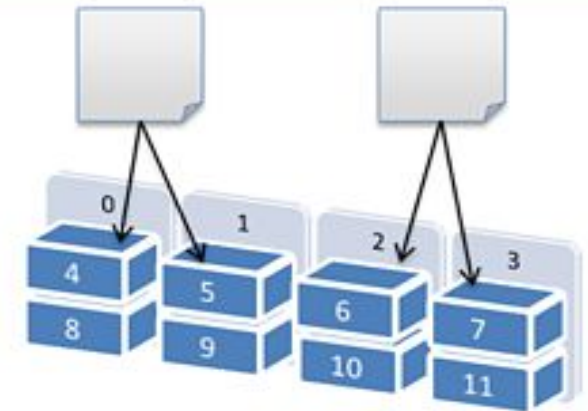
2 Features of EFS

Features of EFS

Scalability-Cost

- Since EFS is scalable, it increases and decreases the storage capacity automatically as you add and delete files,

- There is no minimum fee or setup cost.

Features of EFS

Attaching

İnstance Store

Elastic
Block Storage

HYPERVISOR (VMM)
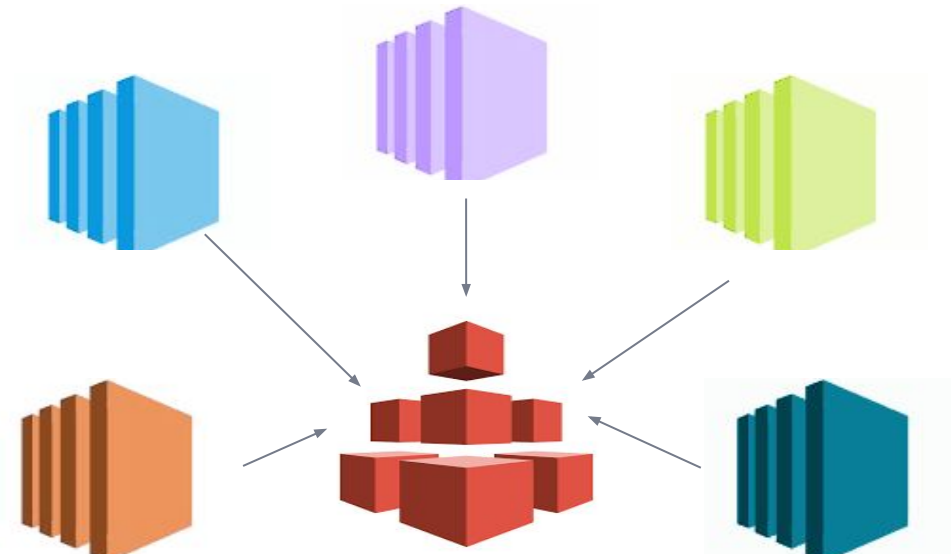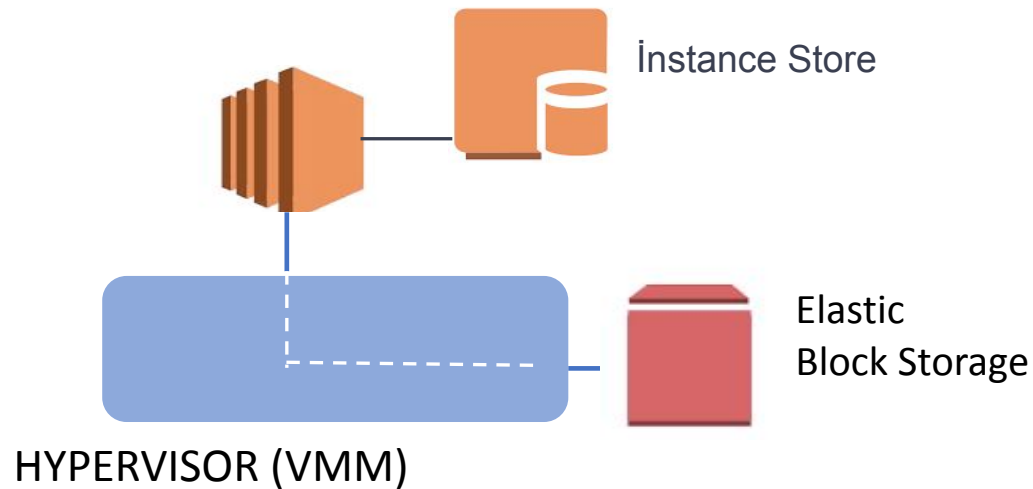
- Unlike *EBS, **multiple Amazon EC2** instances (**Linux only**) even **in different AZ's** can be attached Amazon **EFS** file system **at the same time**.

*Except Nitro-based instances in the same Availability Zone.

EFS Structure : Mount Target (for Regional Storage Class)
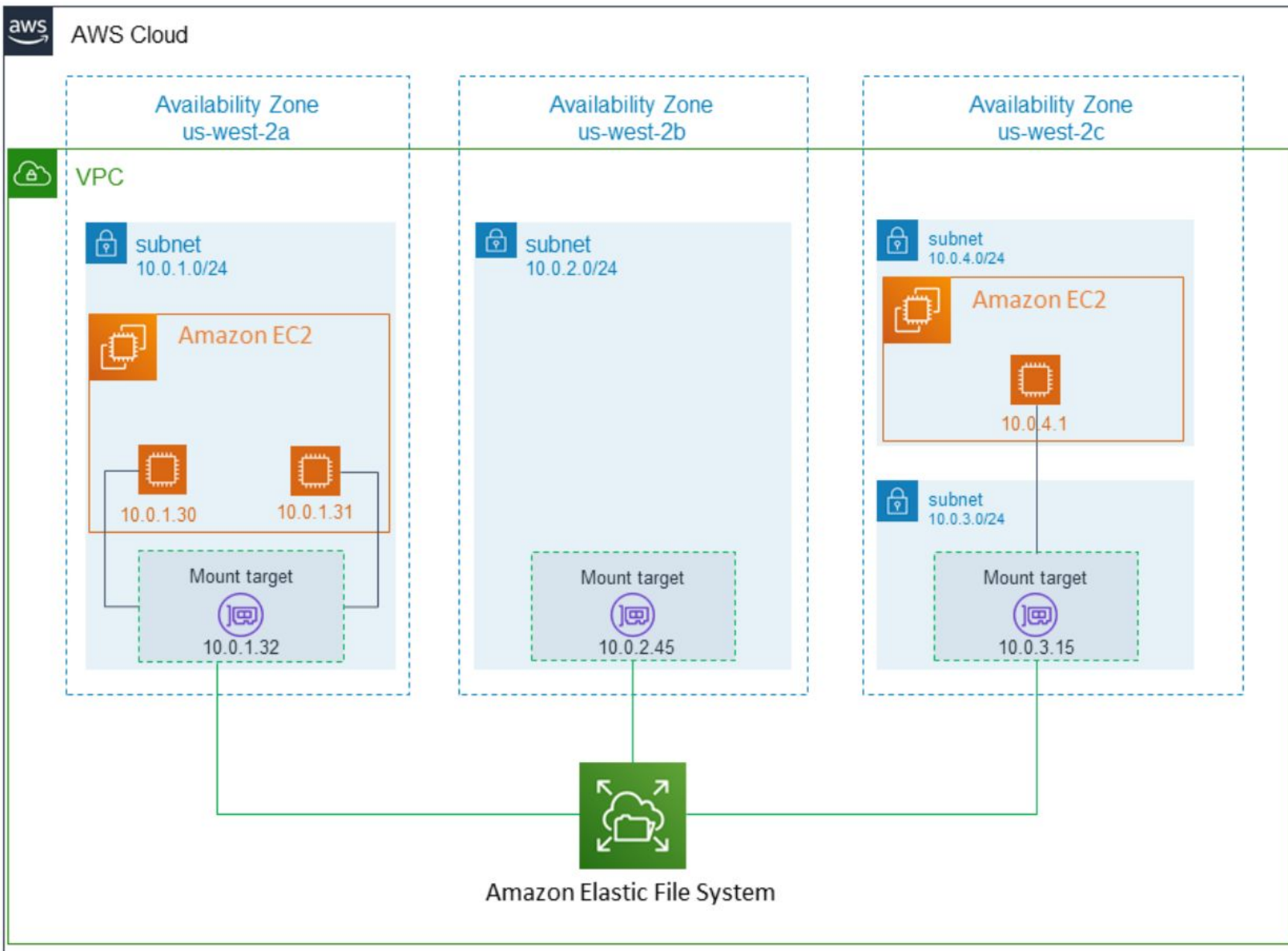
- Mount Target is a AZ based component.

- You can create only one Mount Target in a AZ

- It will be located only in one subnet of the relevant AZ.

- EFS mount targets are not "servers", but elastic network interfaces which expose EFS to our VPC. Our client access EFS by connecting to the mount targets (i.e. ENIs).

- If our VPC spans 3 AZs, to ensure high availability of access to our file system, a good practice is to create a mount target for each AZ.

EFS Structure : Mount Target (for One-Zone Storage Class)
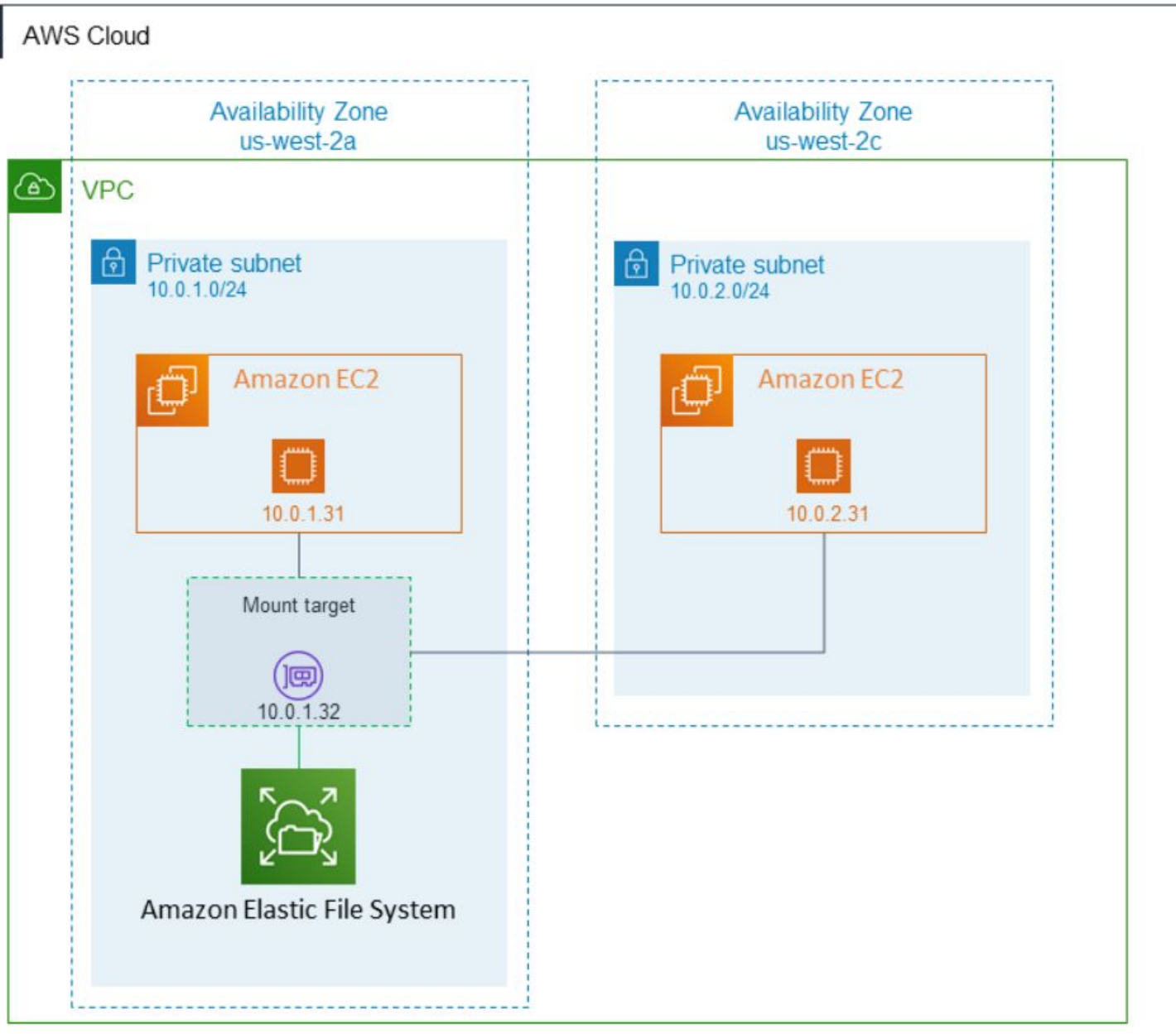
- Mount Target is created only in one subnet in relevant AZ.

- Other AZs also uses this Mount Target to communicate with EFS

- Amazon EFS file systems that use One Zone storage classes support only a single mount target which is located in the same Availability Zone as the file system.
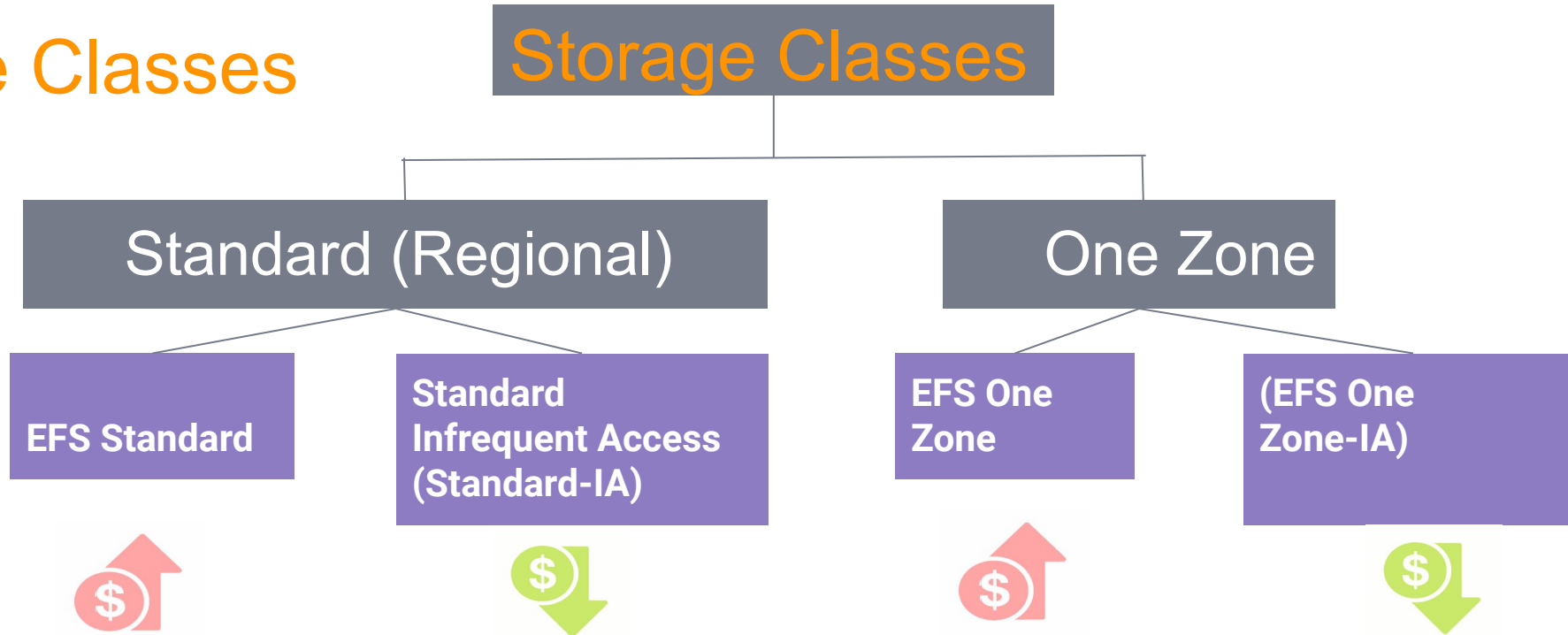
Features of EFS

Storage Classes

```
                    ┌─────────────────────┐
                    │  Storage Classes    │
                    └─────────────────────┘
                       │              │
        ┌──────────────────────┐  ┌──────────────────┐
        │  Standard (Regional) │  │    One Zone      │
        └──────────────────────┘  └──────────────────┘
          │            │              │            │
    ┌───────────┐ ┌──────────────┐ ┌─────────┐ ┌─────────────┐
    │           │ │  Standard    │ │ EFS One │ │  (EFS One   │
    │ EFS       │ │  Infrequent  │ │ Zone    │ │  Zone-IA)   │
    │ Standard  │ │  Access      │ │         │ │             │
    │           │ │  (Standard-IA)│ │        │ │             │
    └───────────┘ └──────────────┘ └─────────┘ └─────────────┘
```

Amazon efs offers two main storage classes, **Standard** and **OneZone** storage classes.

EFS **standard** and **standard-ia** storage classes are regional storage classes that are designed to provide continuous availability to data, even when one or more availability zones in an aws region are unavailable. They offer the highest levels of availability and durability by storing data across multiple separated availability zones within a region.The efs standard storage class is used for frequently accessed files. The standard–ia storage class reduces storage costs for files that are not accessed every day.

EFS **one zone** and **one zone–ia** storage classes are designed to provide continuous availability to data within a single availability zone.

Features of EFS

Disadvantages of Using EFS

Amazon EFSs do have a couple limitations:

- No Windows instances. Amazon EFSs are not supported on AWS Windows EC2 instances. EFS volumes can only be used with non-Windows instances, such as Linux, that support NFS volumes.

- No system boot volumes. Amazon EFS volumes also cannot be used for system boot volumes. AWS EC2 instances must use Elastic Block Store (EBS) volumes for booting their systems. EBS volumes are like EFS volumes with one exception. An EBS volume can only be connected to one EC2 instance or server, while EFS volumes can be connected to several EC2 instances and on-premises resources.
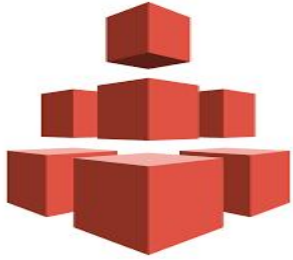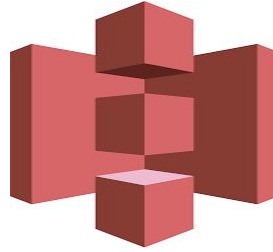
3 Comparison of Storage System

Comparison of Storage Systems

Amazon EFS   S3   EBS

- Cost Optimized   : S3 > EBS > EFS
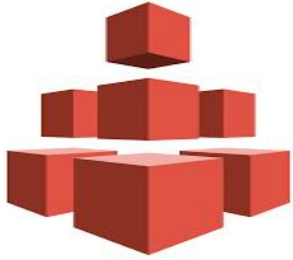
- Speed   : EBS , EFS >S3

- EC2 mount   : S3   : No
                       EBS : Single*
                       EFS : Multiple
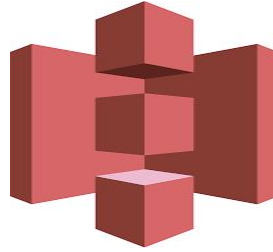
- Storage Capacity : S3, EFS = ∞ vs. EBS =16 TB

Comparison of Storage Systems

Amazon EFS

S3

EBS

- Large quantities of data,
- Large analytic workloads.
- Global content management

-Website images and videos,
-Data analytics of mobile/web applications.
- Data which is needed to be accessed from anywhere.

- High IOPS required data ,
- Database management.

Comparison of Storage Systems

		File Amazon EFS	**Object** Amazon S3	**Block** Amazon EBS
Performance	Per-operation latency	Low, consistent	Low, for mixed request types, and integration with CloudFront	Lowest, consistent
	Throughput scale	Multiple GBs per second	Multiple GBs per second	Single GB per second
Characteristics	Data Availability/Durability	Stored redundantly across multiple AZs	Stored redundantly across multiple AZs	Stored redundantly in a single AZ
	Access	One to thousands of EC2 instances or on-premises servers, from multiple AZs, concurrently	One to millions of connections over the web	Single EC2 instance in a single AZ
	Use Cases	Web serving and content management, enterprise applications, media and entertainment, home directories, database backups, developer tools, container storage, big data analytics	Web serving and content management, media and entertainment, backups, big data analytics, data lake	Boot volumes, transactional and NoSQL databases, data warehousing & ETL

THANKS!

Any questions?

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