



AWS EFS





Table of Contents

- ▶ Introduction to EFS (Elastic File System)
- ▶ Features of EFS
- ▶ Comparison of Storage Systems



1

Introduction to EFS

What is File System?



It is a system used by an operating system to manage files. The system controls how data is saved or retrieved



Shirts

Accessories

Skirts

Jackets

Shoes

Pants

What is File System?



It is a system used by an operating system to manage files. The system controls how data is saved or retrieved





What is File System?

Operating system stores files and directories in an organized and structured way

System configuration file = Folder A

User files = Folder B

Log files = Folder C

Commands or scripts = Folder D and so on

There are many different types of filesystems. In general, improvements have been made to filesystems with new releases of operating systems and each new filesystem has been given a different name

e.g. ext3, ext4, ext5, xfs, NTFS, FAT etc.

Introduction to 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.

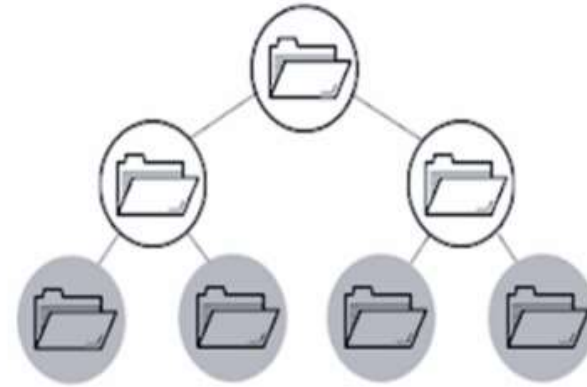
EFSs are ideal candidates for storing:

- 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

What is EFS?



- Simple, scalable, fully managed Elastic NFS file system.

Introduction to EFS

Recap of the Storage Options



Amazon EFS



S3



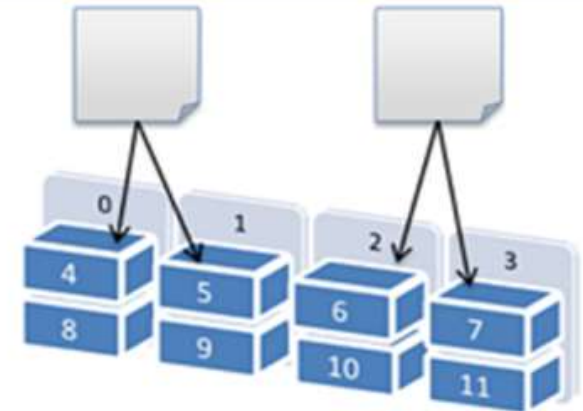
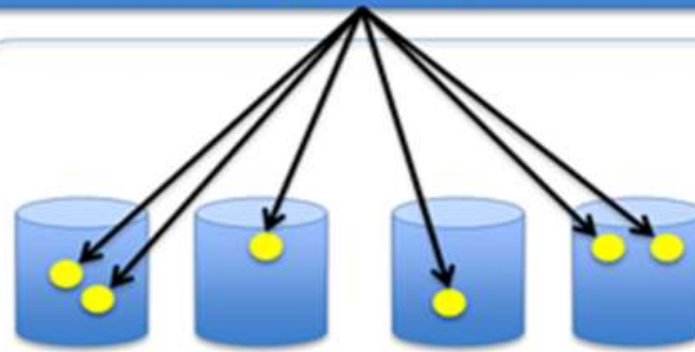
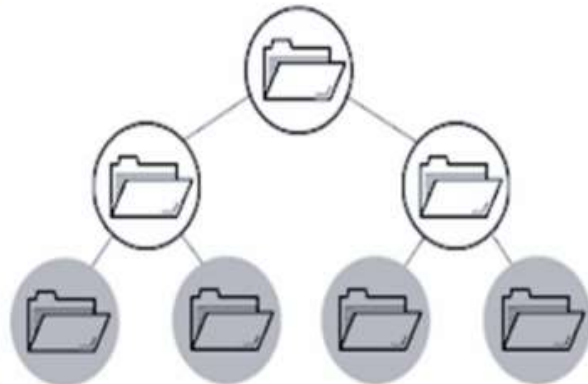
Amazon Elastic
Block Storage
(EBS)

File Storage

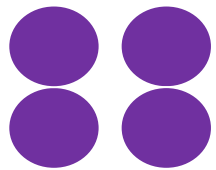
HTTP(S) Interface

Block Storage

Object Storage



Block Based

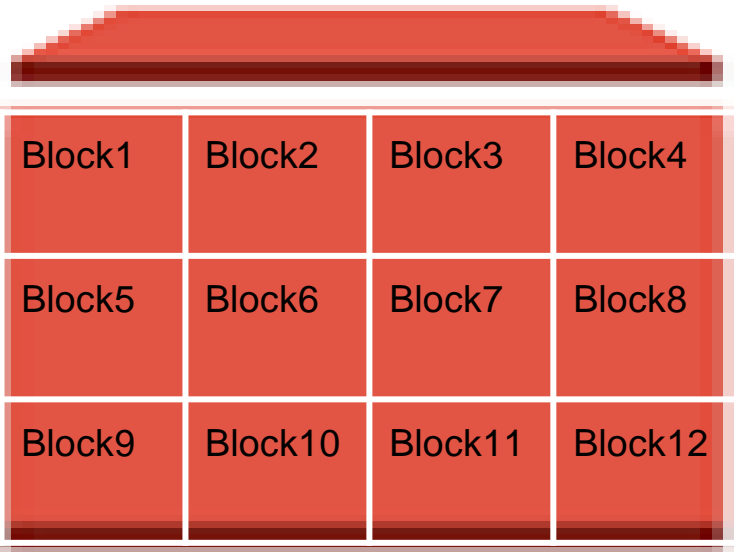


Totally = 16KB in size

Divide your object into the blocks max 4KB in size

Each Block=4KB in size

EBS



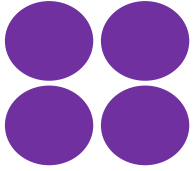
Each Block= 4KB in size

Total blocks number= 12

Totally = 48KB

Who can call the data?=Only related EC2

Object Based

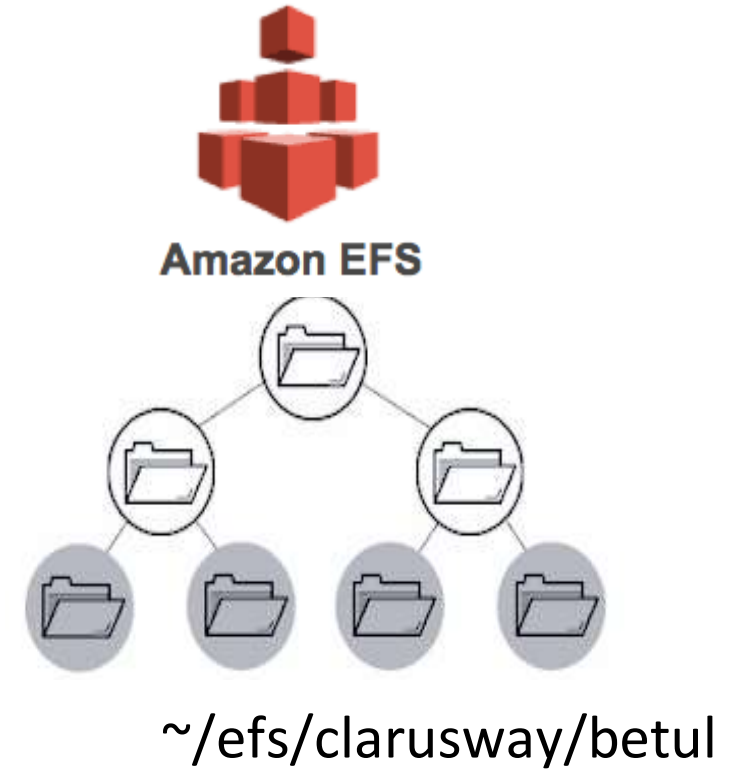
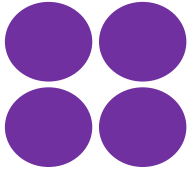


Totally = 16KB in size



Who can call the data? = Anybody with public **internet** and permission

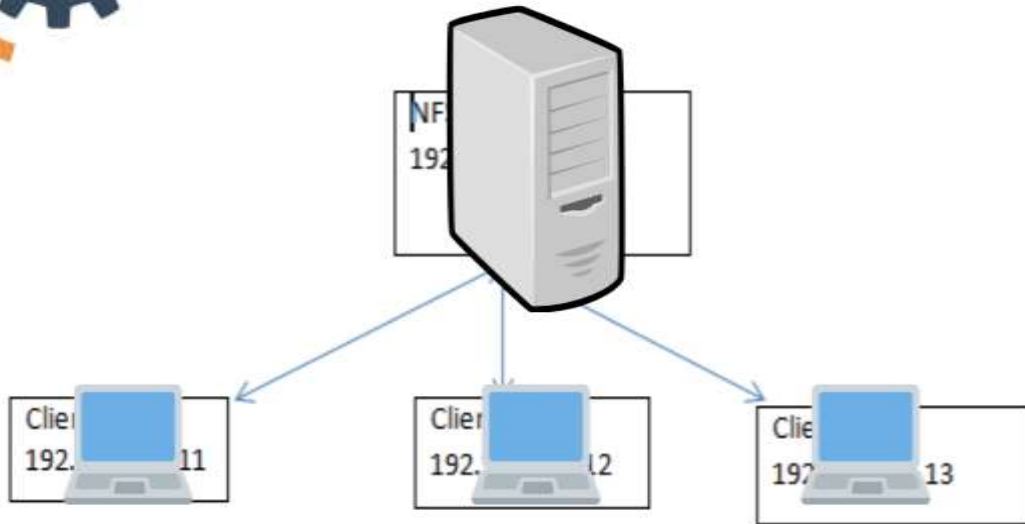
File Based



Who can call the data? = Multiple or single EC2

Network Attached Storage (NAS)

NFS Server



Storage Area Network (SAN)- Block Device DAS (direct-attached storage)





2

Features of EFS

Features of EFS



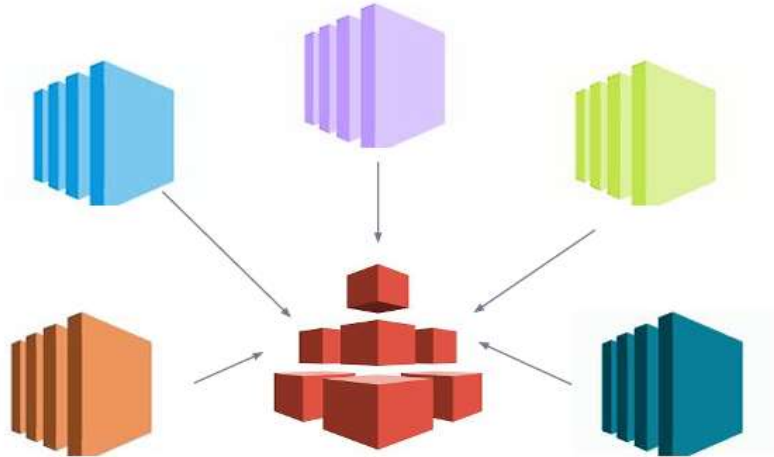
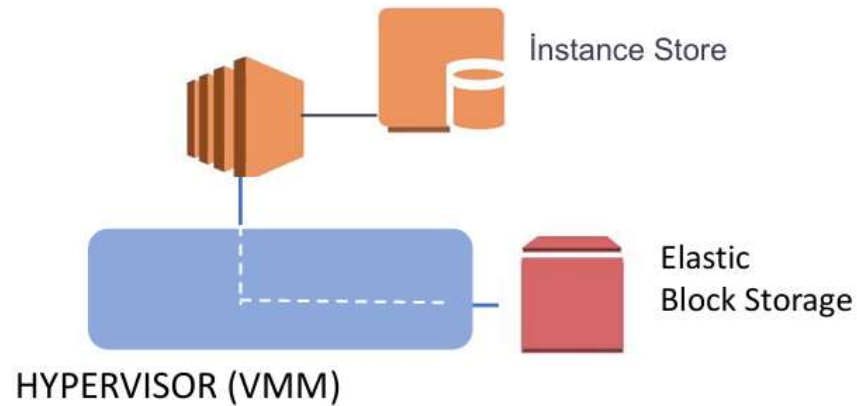
Scalability-Cost



- 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

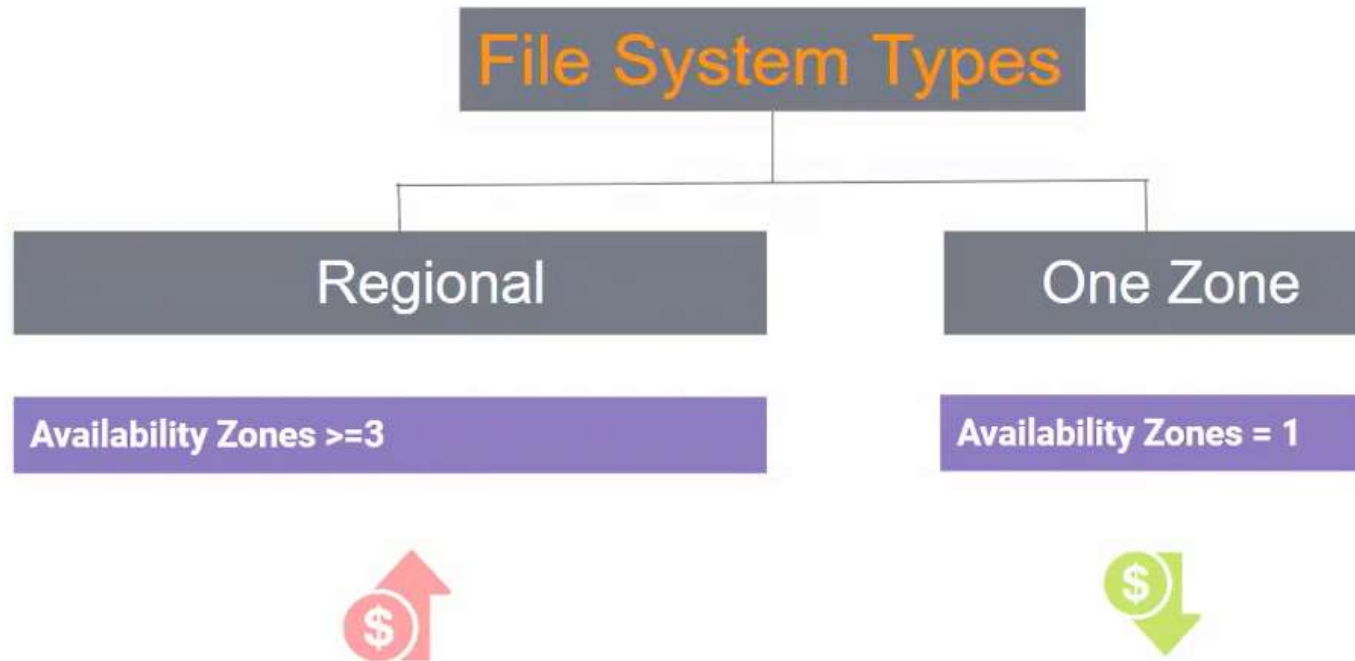


- Unlike *EBS, **multiple Amazon EC2 instances (Linux only) even in different AZ's** can be attached to Amazon **EFS** file system **at the same time**.

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

► Features of EFS

EFS File System Types

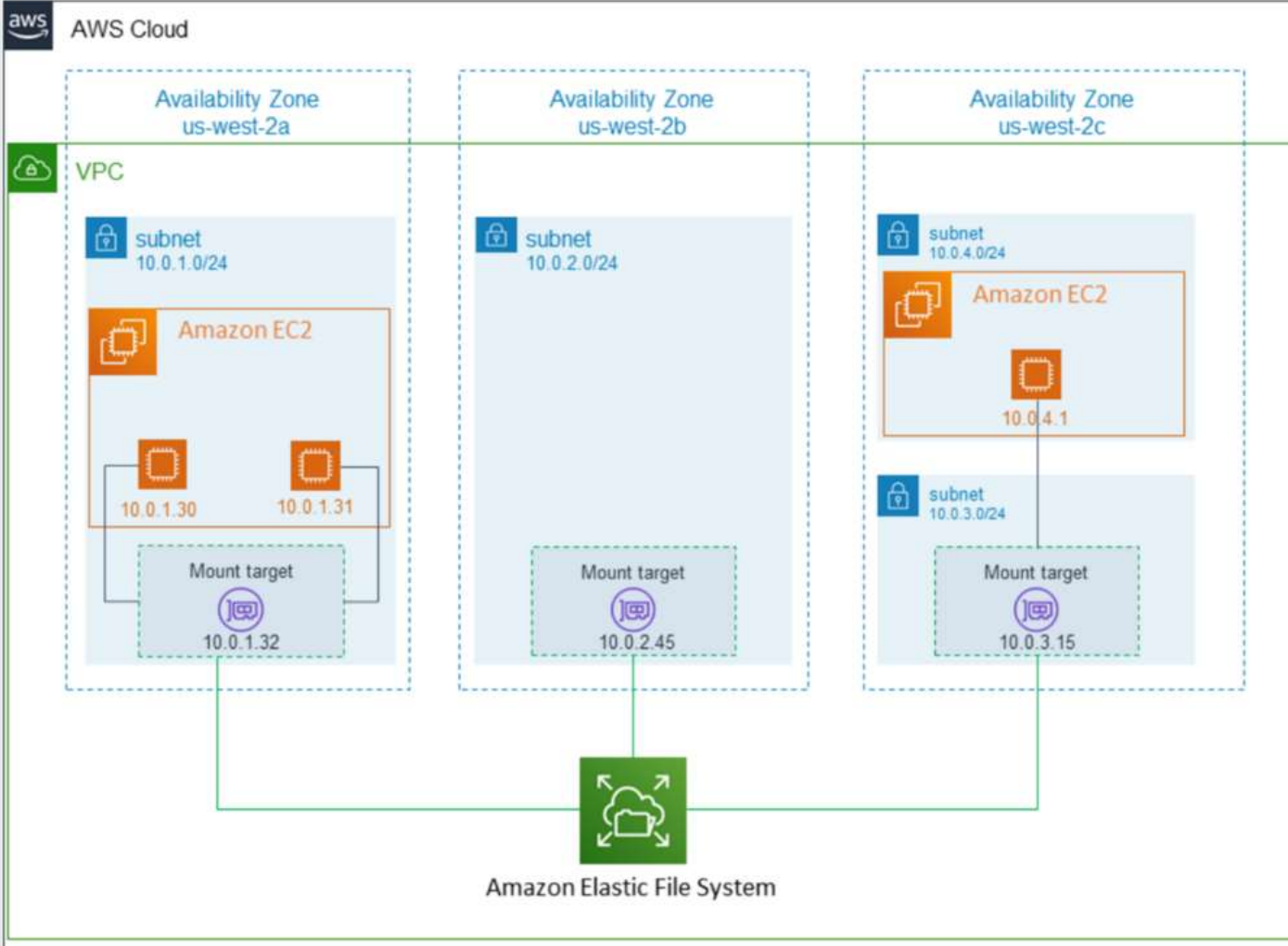


Features of EFS

Storage Classes



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.

us-east-1a

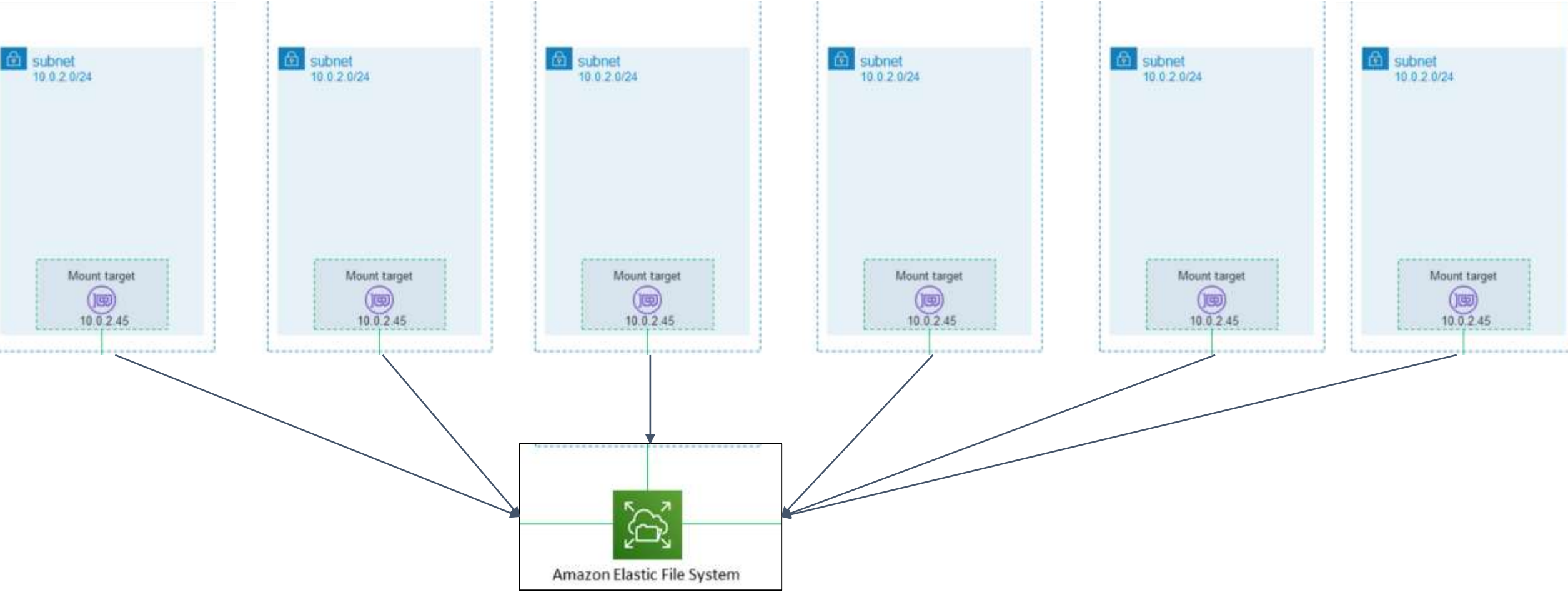
us-east-1b

us-east-1c

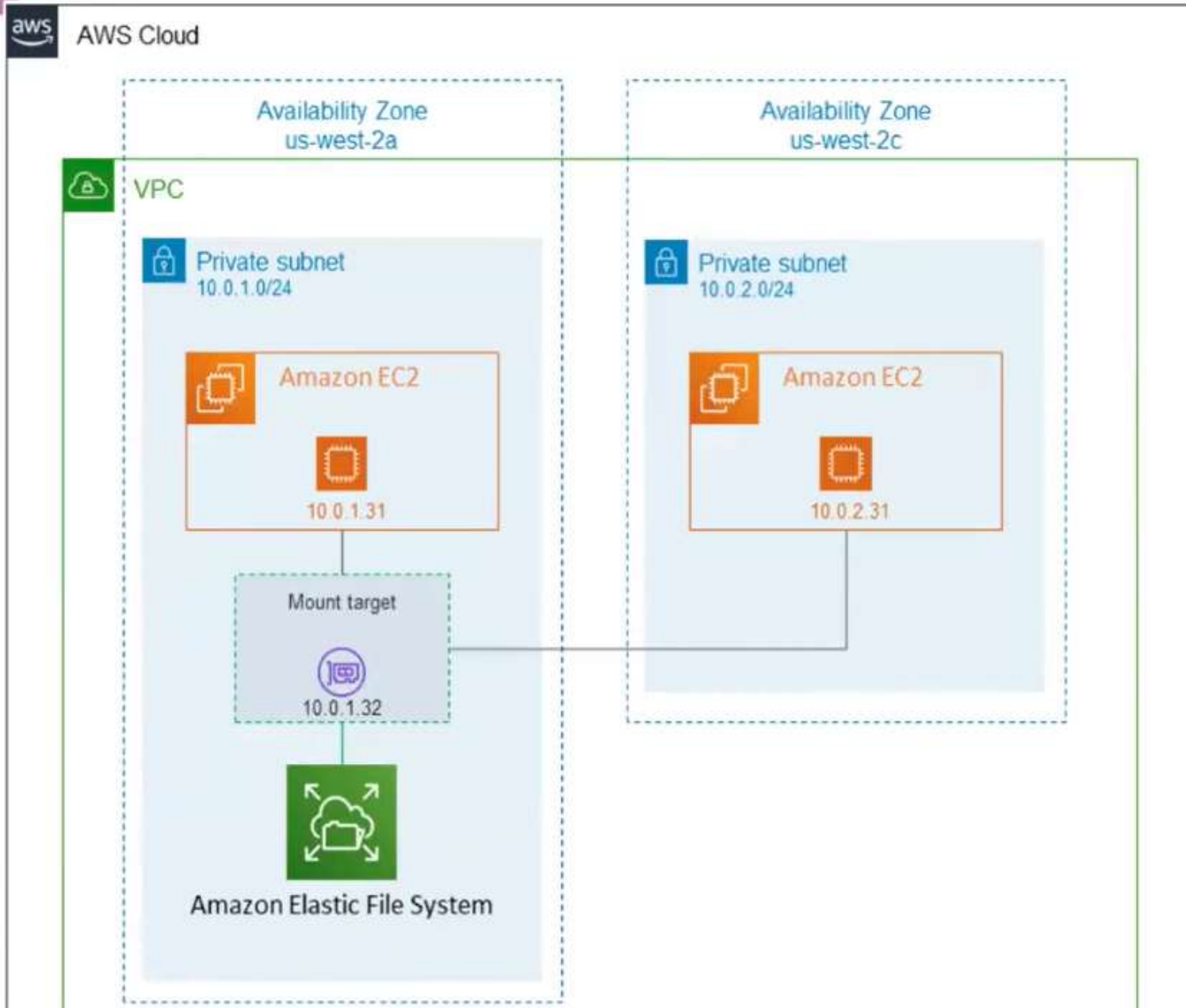
us-east-1d

us-east-1e

us-east-1f



EFS Structure : Mount Target (for One-Zone Storage Class)



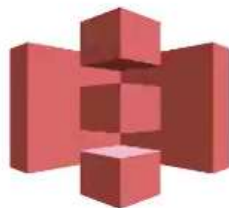
- Mount Target is created only in one subnet in relevant AZ.
- Other AZs also uses this Mount Target to communicate with EFS



Comparison of Storage Systems



Amazon EFS



S3

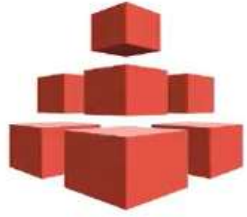


EBS

- Cost Optimized : S3 > EBS > EFS
- Speed : EBS , EFS > S3
- EC2 mount : S3 : No
EBS : Single*
EFS : Multiple
- Storage Capacity : S3, EFS = ∞ vs. EBS = 64/16 TiB

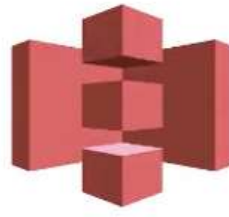


Comparison of Storage Systems



Amazon EFS

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



S3

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




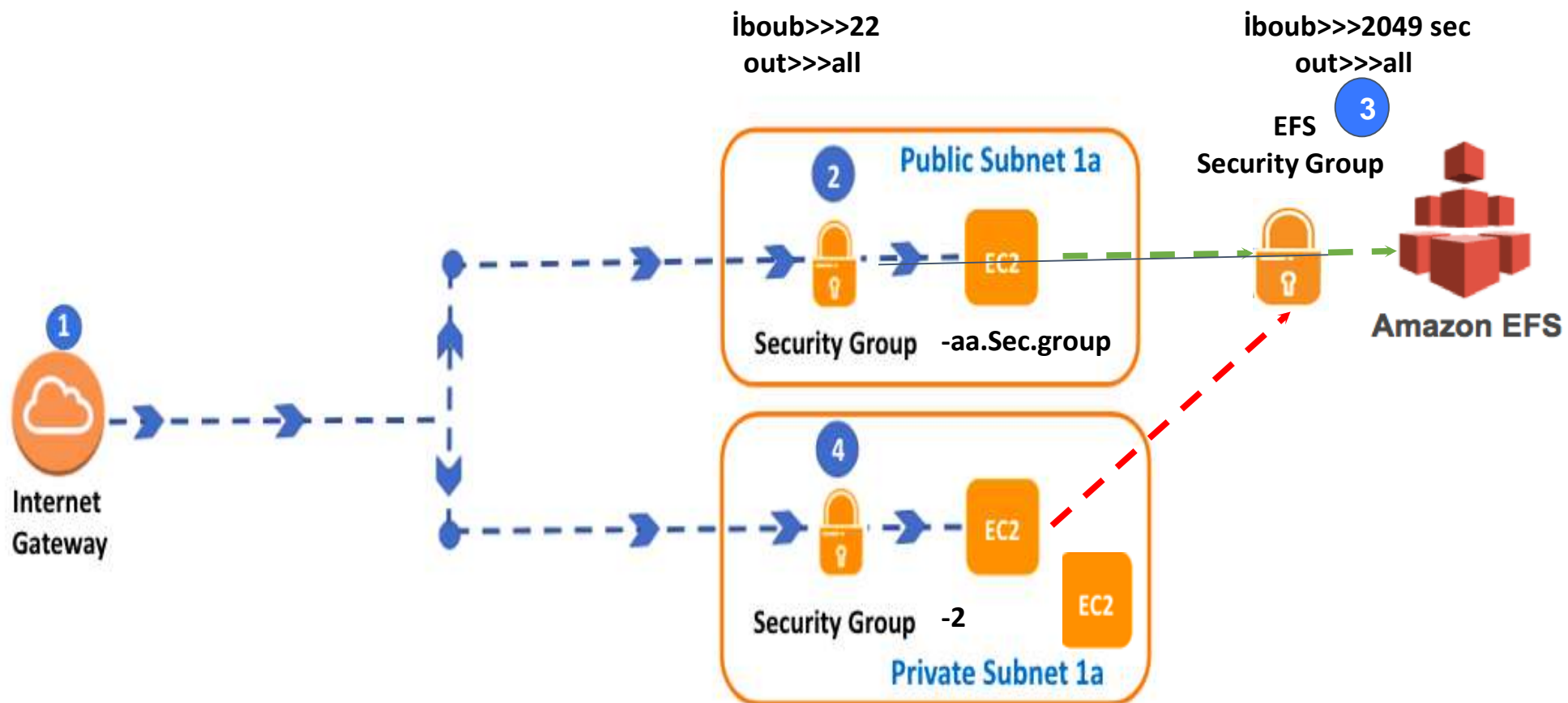
EBS

- High IOPS required data ,
- Database management.



Comparison of Storage Systems

		File Amazon EFS	Object Amazon S3	Block Amazon EBS
	Performance	Low, consistent	Low, for mixed request types, and integration with CloudFront	Lowest, consistent
Characteristics	Throughput scale	Multiple GBs per second	Multiple GBs per second	Single GB per second
	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





IOPS



Throughput

Karşılaştırma Tablosu:

Mod	Performans Yönetimi	En Uygun Senaryo	Maliyet Yapısı
Bursting	Otomatik (depolama ile)	Küçük sistemler, az erişilen veriler	Depolama bazlı
Provisioned	Manuel (sen belirliyorsun)	Sürekli yüksek performans gereken işler	Sabit throughput ücreti
Elastic	Otomatik (kullanıma göre)	Değişken, tahmin edilemeyen iş yükleri	Kullandıkça öde
Enhanced	Gelişmiş ayarlar	Karmaşık, özelleşmiş uygulamalar	Değişken

Terminal



Messenger



NFS Client

2049



Amazon EFS

SSH-22

2049

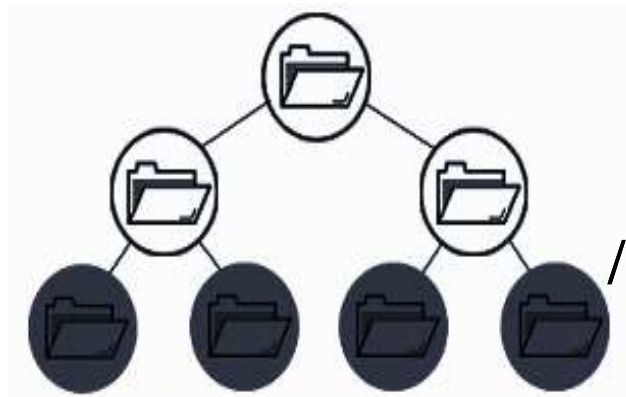
EFS mount
helper:

Automatically
select the
instance AZ.

AZ-1A



Linux



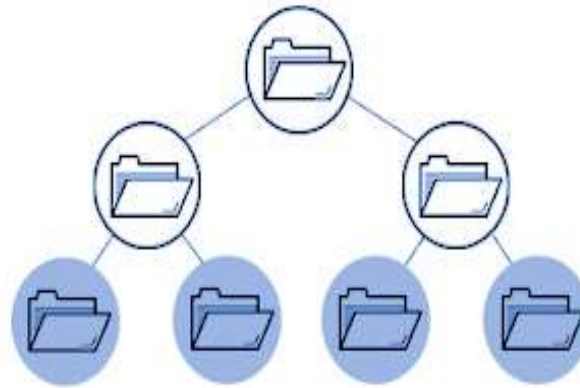
/efs

example

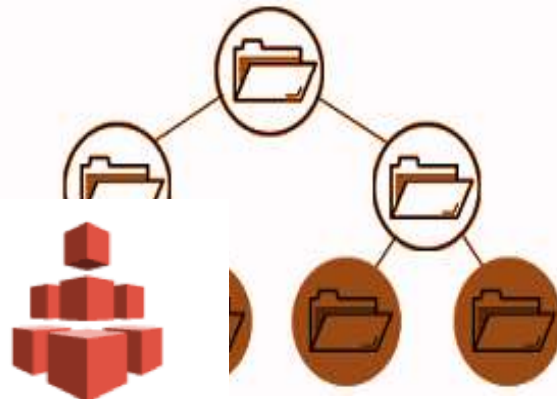
AZ-1B



Linux

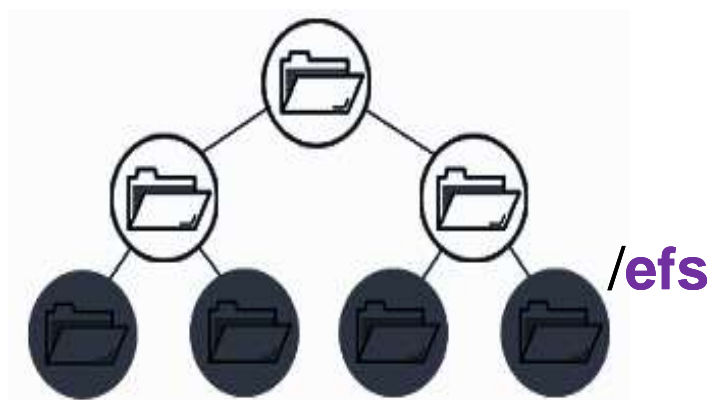
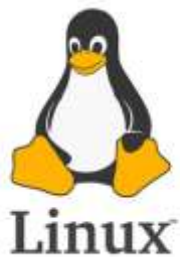


/efs

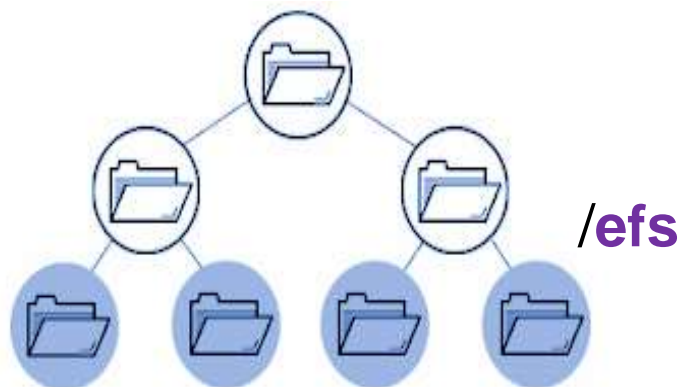


Amazon EFS

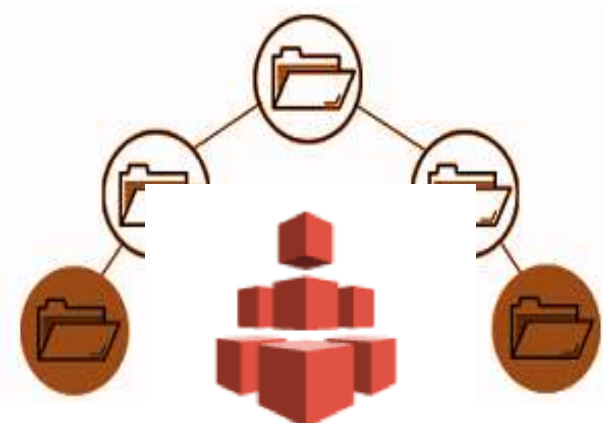
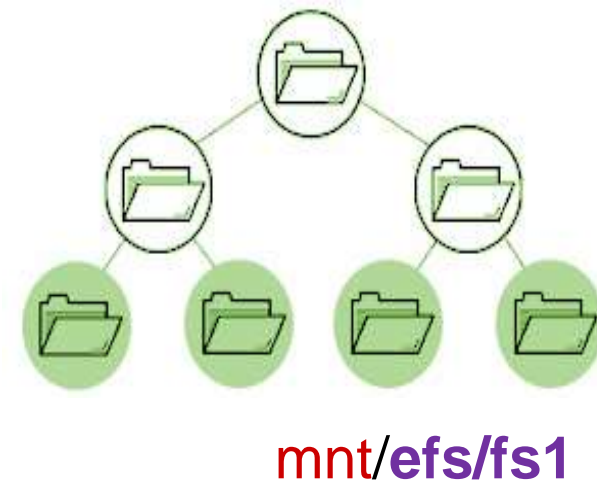
AZ-1A

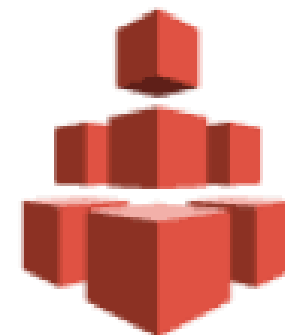
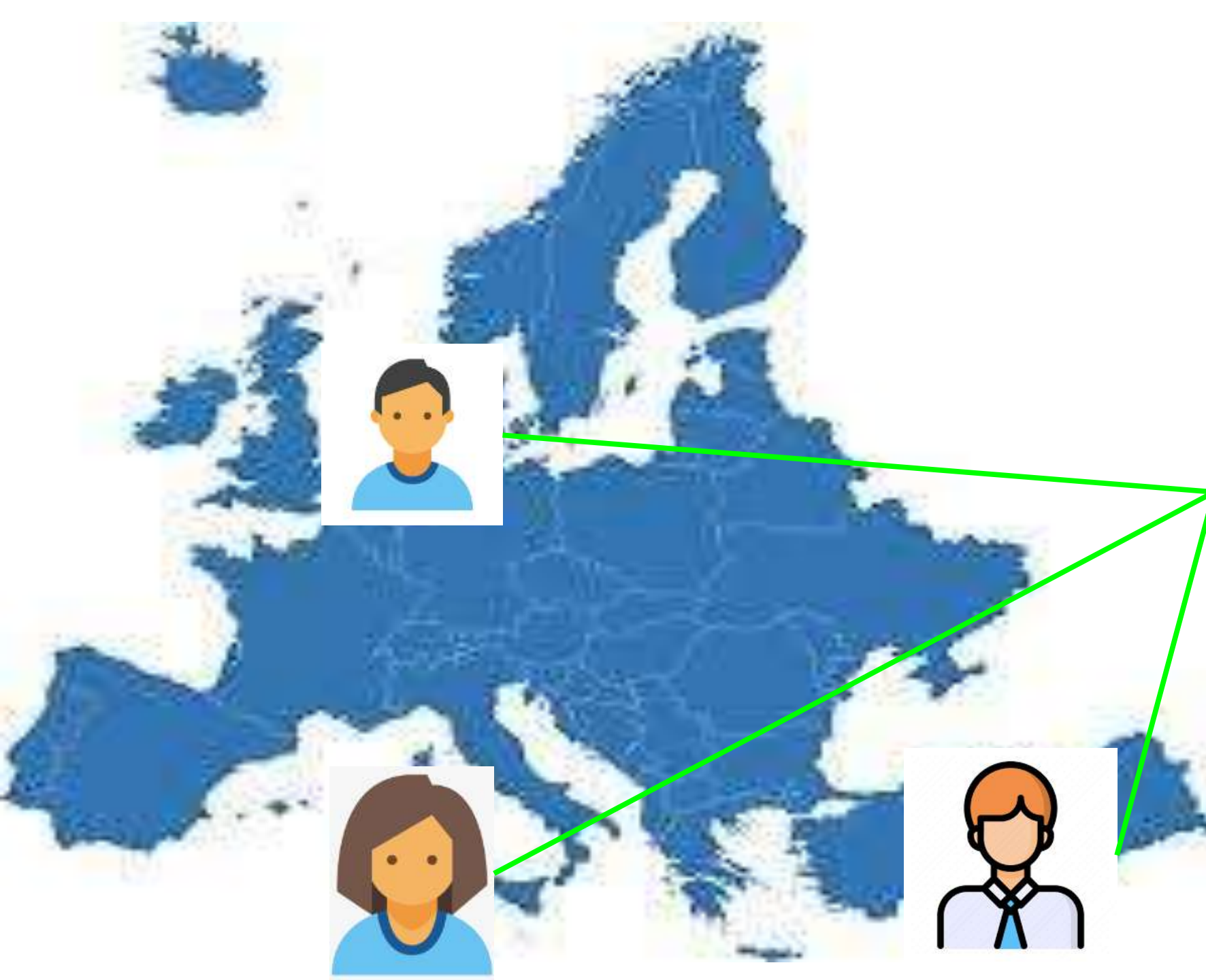


AZ-1B

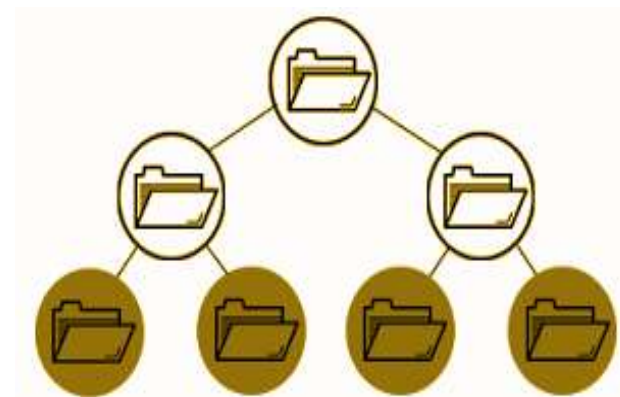


AZ- 1C
Automatic Attach














Amazon EFS



CIFS vs NFS vs SMB (2025'e güncel)

Özellik	CIFS (<i>Eski SMB 1.0</i>)	NFS (<i>Network File System</i>)	SMB (<i>SMB 2.x / 3.x</i>)
 Açılım	Common Internet File System	Network File System	Server Message Block
 Geliştirici	Microsoft	Sun Microsystems (şimdi Oracle)	Başlangıç: IBM, Modern: Microsoft
 Tasarım	Eski, sorunlu, "chatty" yapı	Daha hafif, basit, ama ilk versiyonları güvensiz	Modern, optimize, daha az komutla çalışır
 Fonksiyon	Dosya paylaşımı (client-server)	Dosya paylaşımı (client-server)	Dosya + yazıcı paylaşımı, oturum, kimlik vb.
 Güvenlik	Zayıf, önerilmez	NFSv3 zayıf, NFSv4 daha güvenli	SMB 3.0 ile uçtan uca şifreleme, AES
 Destekleyen Sistemler	Windows (eski sürümler)	Linux, Unix, Windows	Windows (native), Linux/macOS (Samba ile)
 Durum	Artık kullanılmıyor / obsolete	Aktif kullanılıyor (özellikle Linux)	Güncel ve önerilen SMB 3.1.1
 Tipik Kullanım	Eski Windows sistemler	Linux sunucular arası dosya paylaşımı	Kurumsal ağlar, Active Directory ile paylaşımlar
 Port	445 / 139	2049	445 (modern SMB'ler için)





THANKS!

Any questions?

