1. What is Amazon EFS and how is it different from EBS and S3?
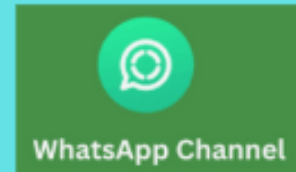
Amazon EFS = Elastic File System

Think of EFS like a shared Google Drive folder.
- Multiple people (EC2 instances) can open, edit, and save files at the same time.
- It grows or shrinks automatically based on how much data you keep.

🔄 EFS vs EBS vs S3 – Real-world Analogy

Service	Analogy	Access	Best Use
EBS	A personal external hard drive	One EC2 only	Databases, OS disk
EFS	A shared Google Drive folder	Many EC2s at once	App logs, shared configs
S3	A locker room with labeled boxes	Not mountable	Backups, static files

2. What is shared file storage and how does EFS support it?

Imagine a team working on a single Excel file stored in a shared drive.
- Everyone (EC2s) accesses the same version of the file.
- EFS enables this using NFS (Network File System).
- Any EC2 (even in different AZs) can mount and read/write files like it's on their local machine.

- Shared file storage = multiple servers access same data concurrently.
- EFS supports this via **NFS protocol** (NFSv4.1/4.2).
- EC2s across **AZs** can mount and read/write same files.

3. What are EFS performance modes (General Purpose vs Max I/O)?
- **General Purpose**: Default, low latency, best for web apps.
- **Max I/O**: Higher throughput, more latency; good for big data, analytics.
- Choose based on app performance needs.

4. What are EFS throughput modes (Bursting vs Provisioned)?
- **Bursting**: Default, scales with usage; earns burst credits.
- **Provisioned**: Set fixed throughput, independent of storage size.
- Use Provisioned for high, predictable workloads.

5. How does EFS ensure high availability and durability?

- Data is stored across **multiple AZs** automatically.
- EFS is designed for **99.999999999% (11 9s)** durability.
- Fully managed, redundant, and scalable.

6. What is an EFS Mount Target and why is it needed?

- Mount Target = entry point to access EFS in a VPC subnet.
- Each AZ must have its own mount target for high availability.
- EC2 mounts EFS via mount target using NFS.

7. What are the main use cases of EFS in a DevOps environment?

- Shared config files or logs across EC2s.
- Persistent storage for containers (e.g., EKS, ECS).
- CI/CD pipelines storing build artifacts.
- Central repo for scripts, binaries, tools.

How do you create NFS on AWS ?

◆ 1. Create a VPC (if not already available)

- Go to **VPC Dashboard** → Create a VPC with public/private subnets.
- Ensure **subnets are in different AZs** for high availability.

◆ 2. Create a Security Group for EFS

- In **EC2 > Security Groups**, create a new security group.
- Allow **inbound NFS traffic**:
    - Protocol: TCP
    - Port: **2049**
    - Source: IP/CIDR or Security Group of your EC2 instances.

◆ 3. Create Amazon EFS

- Go to **EFS Console** → Click **"Create file system"**.
- Select:
    - VPC
    - Availability Zones and subnets (recommended: all AZs for HA)
    - Attach the security group created earlier.
- Choose **Throughput mode** and **Performance mode** (General Purpose or Max I/O).
- Click **Create**.

◆ 4. Create Mount Targets

- While creating EFS, AWS automatically creates mount targets in each subnet.
- Ensure they are created in **all required AZs**.

◆ 5. Launch an EC2 Instance

- Launch an **Amazon Linux 2 EC2 instance** in the same VPC.
- Attach the **security group** that allows NFS (TCP port 2049).

🔷 6. Mount EFS on EC2 using NFS

SSH into your EC2 instance, then:

```
# Install NFS client
sudo yum install -y amazon-efs-utils

# Create a directory
sudo mkdir /mnt/efs

# Mount EFS (replace fs-xxxx with your EFS ID)
sudo mount -t efs fs-xxxxxxxx:/ /mnt/efs
```

1. What is the main benefit of using Amazon EFS?

A. It can only be attached to one EC2 instance
B. It is an object storage service
C. It allows multiple EC2 instances to share the same file system
D. It stores data in local SSD and very fast
✅ **Answer:** C

2. Which protocol does Amazon EFS use for file access?

A. HTTP
B. NFS (Network File System)
C. FTP
D. SMB
✅ **Answer:** B

3. How is Amazon EFS different from Amazon EBS?

A. EFS is cheaper
B. EFS is only used for backups
C. EFS supports multiple EC2 instances accessing the same data
D. EBS is object storage
✅ **Answer:** C