Amazon EFS Service Presentation

What is EFS?

* Serverless, fully elastic file storage.
* Designed for sharing file data.
* No need to provision or manage storage capacity and performance.

Key Capabilities

* Integrates with both AWS services and on-premises resources.
* Scales seamlessly to petabytes on demand.
* Zero disruption to applications during scaling.

Ideal Use Cases

* Broad Spectrum: From home directories to business-critical applications.
* Specific Examples:
  + Containerized & Serverless Applications
  + Big Data Analytics
  + Web Serving & Content Management
  + Application Development & Testing
  + Media & Entertainment Workflows
  + Database Backups

Core Capabilities of Amazon EFS

Elastic Scalability

* Automated Capacity Adjustment: Storage automatically scales up or down with your data volume.
* Effortless Management: Eliminates the need for manual provisioning or intervention.

High Availability & Durability

* Built-in Resiliency: Data is stored redundantly across multiple Availability Zones (AZs).
* Enhanced Data Protection: Designed for high availability and robust data durability.

Broad Compatibility

* Standard Protocol Support: Utilizes the Network File System (NFS) protocol.
* Seamless Integration: Compatible with a wide range of operating systems and applications.

Robust Security

* Integrated Security: Leverages AWS IAM for access control, AWS VPC for network isolation, and AWS KMS for encryption.
* Comprehensive Protection: Ensures strong security measures for your file data.

**Set up Amazon EFS**

**Step 1: Create an Amazon EFS File System**

**Action:** Provision Shared Storage

* **Navigate:** AWS Management Console -> EFS service.
* **Initiate:** Click "Create file system."
* **Configure:**
  + Select your target **VPC**.
  + Choose **Availability Zones (AZs)** and corresponding **Subnets** for EFS mount targets.
  + Define **performance and throughput modes** (e.g., General Purpose, Bursting).
* **Finalize:** Review settings and click "Create."

**Step 2: Configure Security Groups**

**Action:** Enable NFS Traffic Flow

* **EC2 Instance Security Groups:**
  + Edit inbound rules.
  + Allow **NFS traffic (Port 2049)** from relevant sources (e.g., your IP, or other security groups).
* **EFS File System Security Group:**
  + Edit inbound rules.
  + Allow **NFS traffic (Port 2049)** from the **security groups of your EC2 instances**.
  + *(Ensures secure communication between EC2 and EFS)*

**Step 3: Mount EFS on EC2 Instances**

**Action:** Integrate Storage with Web Servers

* **Install NFS Utilities (on EC2):**
  + SSH into your EC2 instance.
  + Run: sudo yum install nfs-utils -y (for Amazon Linux)
  + *(This client is essential for NFS communication.)*
* **Mount EFS to Web Root:**
  + Use the **DNS Name** of your EFS file system (e.g., fs-xxxxxxxxxxxxxxxx.efs.us-west-1.amazonaws.com).
  + Execute:

Bash

sudo mount fs-xxxxxxxxxxxxxxxx.efs.us-west-1.amazonaws.com:/ /var/www/html/

* + *(This mounts EFS to Apache's document root.)*
* **Repeat for Other Instances:** Apply the same nfs-utils installation and mount command to all other EC2 instances intended to share the EFS.

🡪**Initial Web Server Setup (if not already done)**

**Action:** Prepare EC2 for Web Content (if applicable)

* SSH into your EC2 instance.
* Run the following commands:

Bash

sudo yum install httpd -y # Install Apache HTTP Server

sudo systemctl start httpd # Start Apache service

sudo systemctl enable httpd # Enable Apache to start on boot

* *(This ensures your web server is running and ready to serve content from the mounted EFS.)*

**Step 4: Verification**

**Action:** Confirm Shared Storage Functionality

* **Test on First Instance:**
  + SSH into one EC2 instance.
  + Create a test file in the mounted EFS directory:

Bash

sudo echo "<h1>Hello from EFS Shared Storage!</h1>" | sudo tee /var/www/html/index.html

* **Verify on Second Instance:**
  + SSH into a different EC2 instance connected to the same EFS.
  + Check for the presence of the file:

Bash

ls /var/www/html/

cat /var/www/html/index.html

* + *(The file should be immediately visible, demonstrating successful shared storage.)*
* **Browser Check:** Access the Public IP/DNS of both EC2 instances in a web browser. Both should display the content of index.html from EFS.