
🧪 AWS Storage Gateway Lab: File Gateway with S3 (NFS for Windows)

🎯 Goal

Set up a **File Gateway** that connects your **Windows system to S3** via **NFS**, allowing local access to Amazon S3 buckets as network shares.

🛠️ Prerequisites

- AWS account with permissions for Storage Gateway, EC2, S3, IAM
- Windows machine with NFS client installed
- Basic knowledge of AWS Console & EC2
- S3 bucket created (or create during lab)

📝 Step-by-Step Lab Instructions

✅ Step 1: Create an S3 Bucket

1. Go to **S3 Console** → Click **Create bucket**
2. Bucket name: `file-gateway-bucket-<your-name>`
3. Region: Same region where you'll deploy the gateway
4. Leave defaults, click **Create bucket**

🖥️ Step 2: Deploy the File Gateway VM (on-prem or EC2)

You can use:

- **On-premise VM** (VMware/Hyper-V/VirtualBox) – download from AWS
- **EC2 Appliance** – recommended for this lab

Option A: Using EC2 (Quick Start)

1. Go to **Storage Gateway Console** → Click **Create gateway**
2. Gateway type: `File Gateway`
3. Host platform: **Amazon EC2**
4. Choose EC2 instance type (e.g., `t3.medium`)
5. Select an existing VPC and public subnet
6. Allow the gateway to create a new SG or select one that allows:
    - Ports: **80, 443, 2049 (NFS), 22 (optional SSH)**

🔐 Step 3: Activate the Gateway

1. Once instance is ready, go back to **Storage Gateway Console**
2. It will detect the instance – click **Next**
3. Assign gateway name: `file-gateway-lab`
4. Time zone: select your region/time
5. Click **Activate Gateway**

📦 Step 4: Create a File Share

1. Click on your gateway → Go to **File shares**
2. Click **Create file share**
3. Select **Amazon S3 bucket**: use the one created earlier
4. Choose **NFS** as the protocol
5. Leave defaults or customize:
    - Enable **Guess MIME type**, **Requester Pays** (optional)
    - Permissions: allow access from your Windows IP (CIDR format: `X.X.X.X/32`)
6. Click **Create file share**

🔍 Step 5: Note the NFS Mount Point

After creation, you'll see a **Mount Command**, e.g.:

mount -o nolock <gateway-ip>:/file-share <mount-point>

Example:

mount -o nolock 192.168.1.10:/file-gateway-lab /mnt/s3share

Copy the DNS/IP and NFS export path.

🖥️ Step 6: Enable NFS Client on Windows

1. Open **Control Panel → Programs → Turn Windows features on or off**
2. Enable:
    - ✅ NFS Client
3. Click OK and **restart** your system

📁 Step 7: Mount NFS Share on Windows

1. Open **Command Prompt (Admin)** or **PowerShell**
2. Use the following command:

mount -o anon \\<gateway-ip>\file-share-name Z:

Example:

mount -o anon \\192.168.1.10\file-gateway-lab Z:

If it fails, try using the `mount` command in **Windows Subsystem for Linux (WSL)** or configure **Services for NFS**.

🔍 Step 8: Test the Connection

- Open `Z:` drive (or whichever drive you mapped)
- Create a file and verify it appears in the **S3 bucket** under the corresponding prefix

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📈 Monitoring

- Go to **CloudWatch** → **Logs** for gateway logs
- **Storage Gateway Console** → Metrics & Alerts

🔐 IAM and Access Control

- File gateway assumes an **IAM role** to access S3

- The role should have permissions like:

```
{
 "Effect": "Allow",
 "Action": [
  "s3:PutObject",
  "s3:GetObject",
  "s3:ListBucket",
  "s3:DeleteObject"
 ],
 "Resource": [
  "arn:aws:s3:::file-gateway-bucket-<your-name>",
  "arn:aws:s3:::file-gateway-bucket-<your-name>/*"
 ]
}
```

🧽 Cleanup (Important)

1. Unmount NFS share on Windows
2. Delete the File Share
3. Delete the Storage Gateway
4. Terminate EC2 instance (if used)
5. Delete S3 bucket (if created for testing)

❓ Troubleshooting

Issue	Solution
Cannot mount NFS	Check NFS Client on Windows, firewall rules (port 2049)
File not showing in S3	Refresh, check S3 path and prefix
Access Denied	Check IAM role attached to gateway

🧠 Learning Outcomes

- Connect local file systems to Amazon S3 via NFS
- Deploy and manage a File Gateway
- Integrate on-prem systems with AWS cloud storage
