Project 8: Data Backup System with AWS S3 & Lambda

Project Title:

Data Backup System with AWS S3 & Lambda

1. Problem Statement:

In today's digital age, data is a critical asset. However, manual backups or unforeseen system failures often result in significant data loss. This issue is especially prevalent among individuals and startups who may lack the resources for a robust IT infrastructure. There is a need for a simple, cost-effective, and automated solution that ensures data is safely backed up and accessible in case of emergencies.

2. Objective:

To design and implement an automated data backup system using AWS services such as S3 and Lambda. The system should automatically upload files to an S3 bucket, trigger a Lambda function upon upload, and notify the user via email using AWS SNS. This solution aims to enhance data reliability, minimize human intervention, and provide real-time backup notifications.

3. Requirements:

- AWS S3: For secure, scalable file storage.
- AWS Lambda: To automate processing tasks post-upload.
- AWS SNS: To send email notifications upon backup success/failure.
- Triggering Mechanism: Using S3 upload events or scheduled (cron) jobs.
- IAM Roles: For secure and controlled access among services.

Project 8: Data Backup System with AWS S3 & Lambda

4. System Workflow:

Step 1: A file is added/uploaded to a designated folder on the user's system.

Step 2: The file is automatically uploaded to an AWS S3 bucket using an AWS CLI or SDK script.

Step 3: The S3 bucket has an event trigger configured to invoke an AWS Lambda function upon upload.

Step 4: The Lambda function processes the file (e.g., validate, log metadata) and publishes a message to an SNS topic.

Step 5: The SNS topic sends a notification (email/SMS) to the user informing them of the backup status.

This ensures real-time automation, monitoring, and alerts for the entire backup process.

5. Advantages:

- Automation eliminates manual errors and improves reliability.
- Scalable and secure storage using AWS S3.
- Serverless architecture using Lambda reduces maintenance overhead.
- Notifications provide assurance and traceability.
- Cost-effective solution for small businesses and individual users.

6. Sample Output Flow Diagram:

Project 8: Data Backup System with AWS S3 & Lambda