Cloud Computing and Security

SIMLESS Project

Execution steps:

To run the Backend:

- **python app.py**
- **Running on http://127.0.0.1:5000/**

To run the frontend:

- **npm run start**

Folder Structure:

```
simless-project/
 ├── backend/
 │   ├── app.py
 │   ├── hashing.py
 │   ├── encryption.py
 │   ├── decryption.py
 │   ├── deduplication.py
 │   ├── ownership.py
 │   ├── uploads/
 │  └── temp/
 ├── frontend/
 │  └── (React project files)
```

Route-by-Route Execution Guide:

/upload:

POST a file to be uploaded, deduplicated, encrypted, and stored.

🔧 **How to Test in Postman**

- **Method**: POST
- **URL**: http://127.0.0.1:5000/upload
- **Body → form-data**
  - Key: file
  - Type: File
  - Value: *Choose a file*

What Happens

- File is saved temporarily.
- Its hash is calculated (pHash, SimHash, or video keyframe hash).
- Compared with stored hashes (deduplication).
- If unique:
  - File is encrypted with AES.
  - Encrypted file is uploaded to S3.
  - Hash stored in MongoDB.
- If duplicate:
  - Upload is rejected.

/verify:

POST a file to verify its ownership using fuzzy proof-of-ownership.

🔧 **How to Test in Postman**

- **Method**: POST
- **URL**: http://127.0.0.1:5000/verify
- **Body → form-data**
  - Key: file
  - Type: File
  - Value: *Upload the original file*

What Happens

- File is saved temporarily.
- Appropriate hash is generated.
- Checked against MongoDB.
- File is removed **only if not owned**.

/delete:

POST a filename to delete it from S3 and database.

🔧 **How to Test**

- **Method**: POST
- **URL**: http://127.0.0.1:5000/delete
- **Body → raw → JSON**

What Happens

- File is deleted from uploads/ (if exists).
- Entry removed from MongoDB.
- Deleted from S3 as well.

/download

POST a filename and return the decrypted file for download.

🔧 How to Test

- **Method**: POST
- **URL**: http://127.0.0.1:5000/download
- **Body → raw → JSON**

What Happens

- Encrypted file fetched from S3.
- Decrypted using stored key.
- Returned for browser download.

Output

- You get a **file download** prompt in browser/Postman.
- Status code: 200 OK

Testing the Full Flow (Frontend + Backend)

1. Open React frontend: http://localhost:3000
2. Upload a file → should show success or duplicate
3. Select a file from dropdown
4. Click:
    - ✅ Download → downloads and decrypts
    - 🗑️ Delete → removes from S3 and DB
    - 👤 Verify → checks ownership