

Optimus Drive – Project Report

Introduction

Cloud computing provides a secure, scalable way to store and manage files without requiring physical infrastructure. Optimus Drive is a cloud-based file storage platform that lets users upload, store, and download files securely via the web. This project demonstrates how different cloud services can work together to manage data.

Objectives

- Build a cloud storage platform with AWS tools
- Implement backend using AWS Lambda and API Gateway
- Upload and download files through signed pre-signed URLs
- Design user interface using HTML
- Demonstrate how different cloud services work together

Architecture

Optimus Drive follows a serverless architecture built with AWS Services. Amazon S3 handles file storage. AWS Lambda handles the functions needed to upload and download files. API Gateway handles the connection between frontend and backend components. IAM ensures that the cloud platform can securely store files.

Technology Stack

- Amazon S3 – file storage
- AWS Lambda – serverless backend
- API Gateway – API management
- IAM – security
- HTML/CSS – frontend design
- JavaScript – frontend and backend functionality

Workflow

1. The user selects a file and uploads it to the platform.
2. The frontend requests a signed URL from the backend.
3. Lambda generates a pre-signed URL.
4. Using the signed URL, the file uploads to S3.

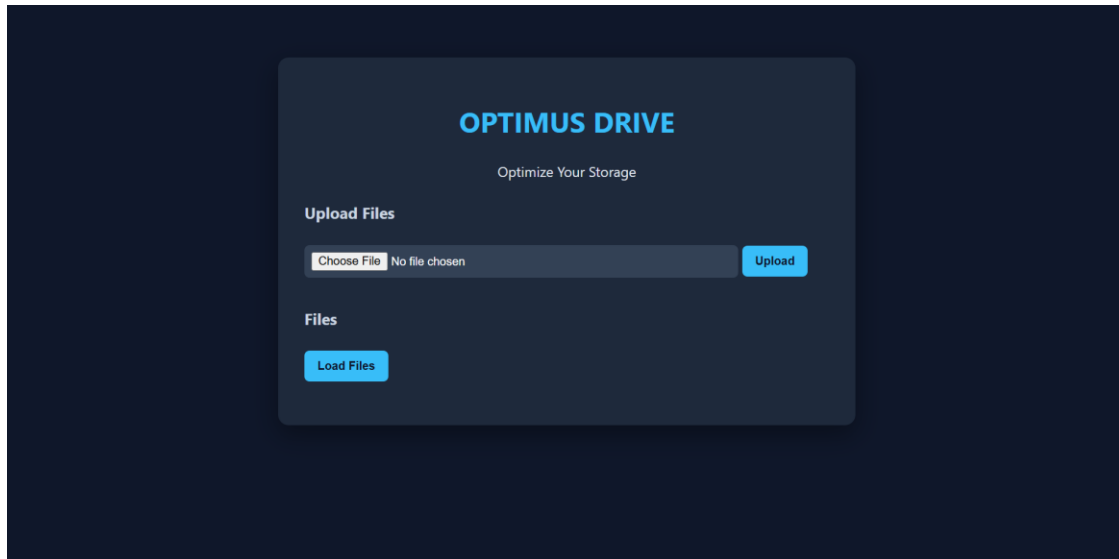


Figure 1: The user can click "Choose File" to browse files and then "Upload" to upload the selected file to the platform.

5. The user can view files that are uploaded.
6. The user can download files through a secure link.
7. The user can delete a file by sending a request to the backend.

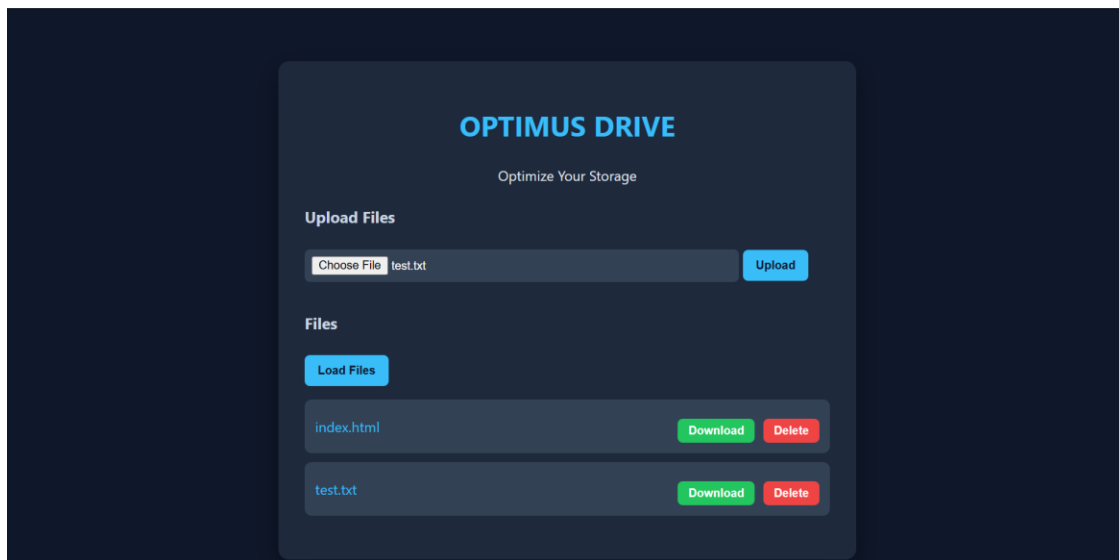


Figure 2: The user can view, download, and delete files uploaded to the server.

Functionality

1. File Upload: The user browses a file to choose. Once a user chooses a file, the frontend sends the file information to the backend. The backend generates a signed URL for securely uploading the file.
2. File Storage: The system retrieves a list of files uploaded to S3.
3. File Download: A signed URL is generated to download the file.
4. File Deletion: The frontend sends a request to the backend to delete stored files.

Security

- Pre-signed URLs allow files to be uploaded securely
- Public S3 access is not required to store files
- CORS configuration restricts API communication
- Sensitive credentials are not exposed to the frontend

Challenges

- Blocked API requests (resolved using CORS configuration)
- Incorrect file request formats (resolved with Content-Type and JSON structure)
- Delete functionality errors due to missing API route and IAM permissions (resolved by adding the DELETE route in API Gateway and updating IAM permissions)

Results

Core functionality has been implemented in Optimus Drive. Users can securely upload files, view stored files, download files through a secure link, and delete files from cloud storage. This project demonstrates the effective integration of AWS services and architecture.

Conclusion

Optimus Drive is an example of how different cloud services can be combined to create simple applications. Using AWS services such as S3, Lambda, API Gateway, and IAM, the platform provides a platform to manage and store files efficiently.