CloudSync - Low-Level Design One-Pager

Team Members: Alex Gheorghe, Tuca Ovidiu Gabriel

Overview

CloudSync is a secure personal cloud storage system where users can upload, organize, and manage files from any device. Built with a focus on accessibility, modularity, and scalability, the application uses a RESTful Web API built in ASP.NET Core.

Low-Level Design Diagram (Module Breakdown)

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Front-End (Client)
- File Upload UI
- Folder Navigation
- Auth Forms
| - File Actions (DL, Del, Share) |
+----+
ASP.NET Core Web API
+----+
+ Auth Controller
+ File Controller
+ Share Controller
  Service Layer
- UserService
- FileService
- ShareService
Data Access Layer
- UserRepository
- FileRepository
   Database Layer
| - Users Table
| - Files Table
| - SharedLinks Table |
| File Storage |
```

```
| - Local / Cloud (e.g., AWS S3 in future) |
```

Modules & Responsibilities

- Authentication: Register/Login, Session Token Management
- File Management: Upload, Download, Delete, Move, Organize
- Sharing: Generate and validate public/private links
- Storage Manager: Track usage, file size limits
- Optional: Versioning: Track file changes and allow rollback

Design Patterns Used

- MVC (Model-View-Controller): For clean separation of concerns in ASP.NET Core.
- Repository Pattern: Abstracts data access logic from business logic.
- Singleton Pattern (Optional): For managing configuration or service access (e.g., StorageHandler).
- DTO Pattern: Data Transfer Objects for passing structured data between layers securely.

Tech Stack

- Back-End: ASP.NET Core Web API
- Front-End: HTML/CSS/JavaScript (Framework TBD)
- Database: SQL Server or SQLite (Development)
- File Storage: Local disk (upgradable to Cloud e.g., AWS S3)