

DRIVEMERGE

UNIFIED CLOUD STORAGE MANAGEMENT

TEAM

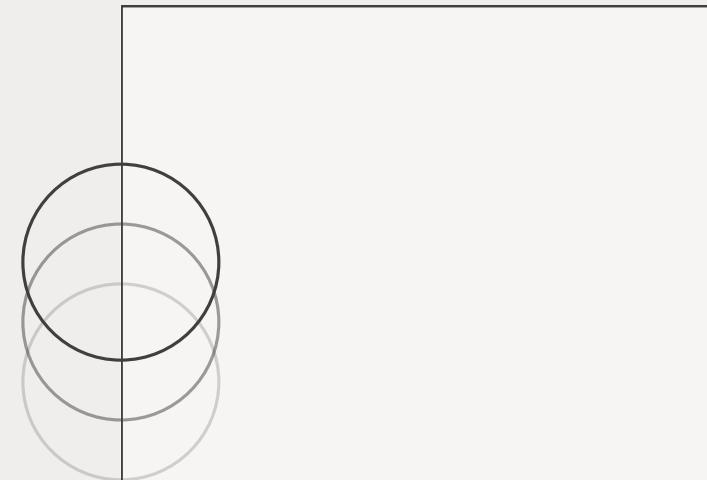
- CHARAN ADITHYA – 230075
- VIVEKANANDA – 230077
- ADITYA KAMMATI – 230145



Problem Statement

STORAGE LIMIT

Google Drive limits individual storage to 15 GB (free tier)



ACCOUNT SWITCHING OVERHEAD

Users must manage multiple accounts separately



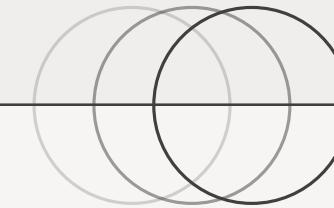
DUPLICATED FILE DISCOVERY

Files spread across accounts make search and discovery inconsistent.

IMPACT

Users cannot efficiently manage storage, upload large files, or maintain a unified view of their data.

Proposed Solution



UNIFIED INTERFACE

Seamlessly combines multiple Google Drive accounts into a single, intuitive interface for effortless management.

AUTOMATED SEGMENTATION

Files are automatically segmented and intelligently distributed across linked accounts to optimize total storage usage.

TRANSPARENT RECONSTRUCTION

Files are transparently reconstructed on download, providing a seamless user experience without manual intervention.

SECURE ACCESS

Leverages industry-standard OAuth 2.0 for secure, credential-less access to linked Google Drive accounts.

System Architecture

FRONTEND LAYER

React with TypeScript delivers a responsive, type-safe user interface with real-time storage visualisation and intuitive file management

BACKEND SERVICES

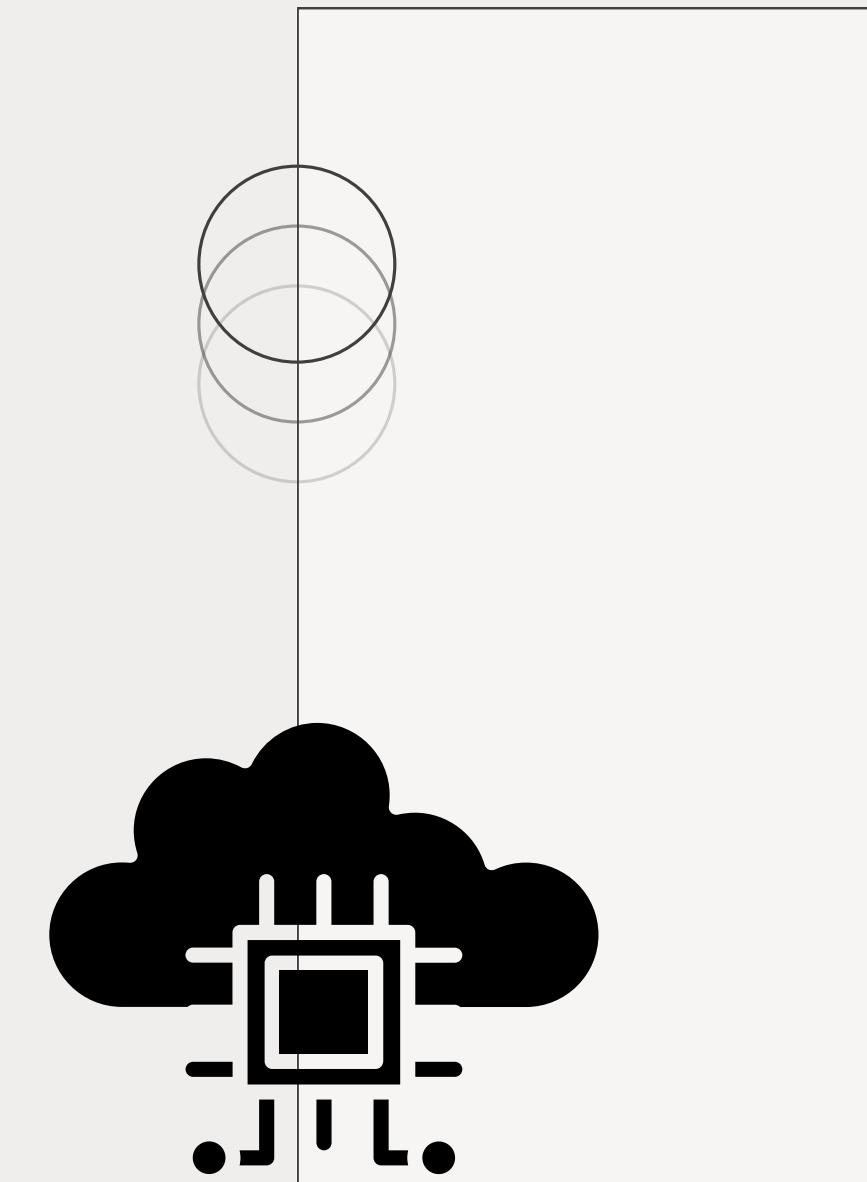
Node.js with Express handles API routing, OAuth flows, file chunking logic, and coordinates parallel upload operations

DATABASE LAYER

MySQL with Prisma ORM maintains user accounts, file metadata, chunk locations, and storage allocation mappings

CLOUD INTEGRATION

Google Drive API manages authentication, file operations, and storage quota monitoring across multiple accounts



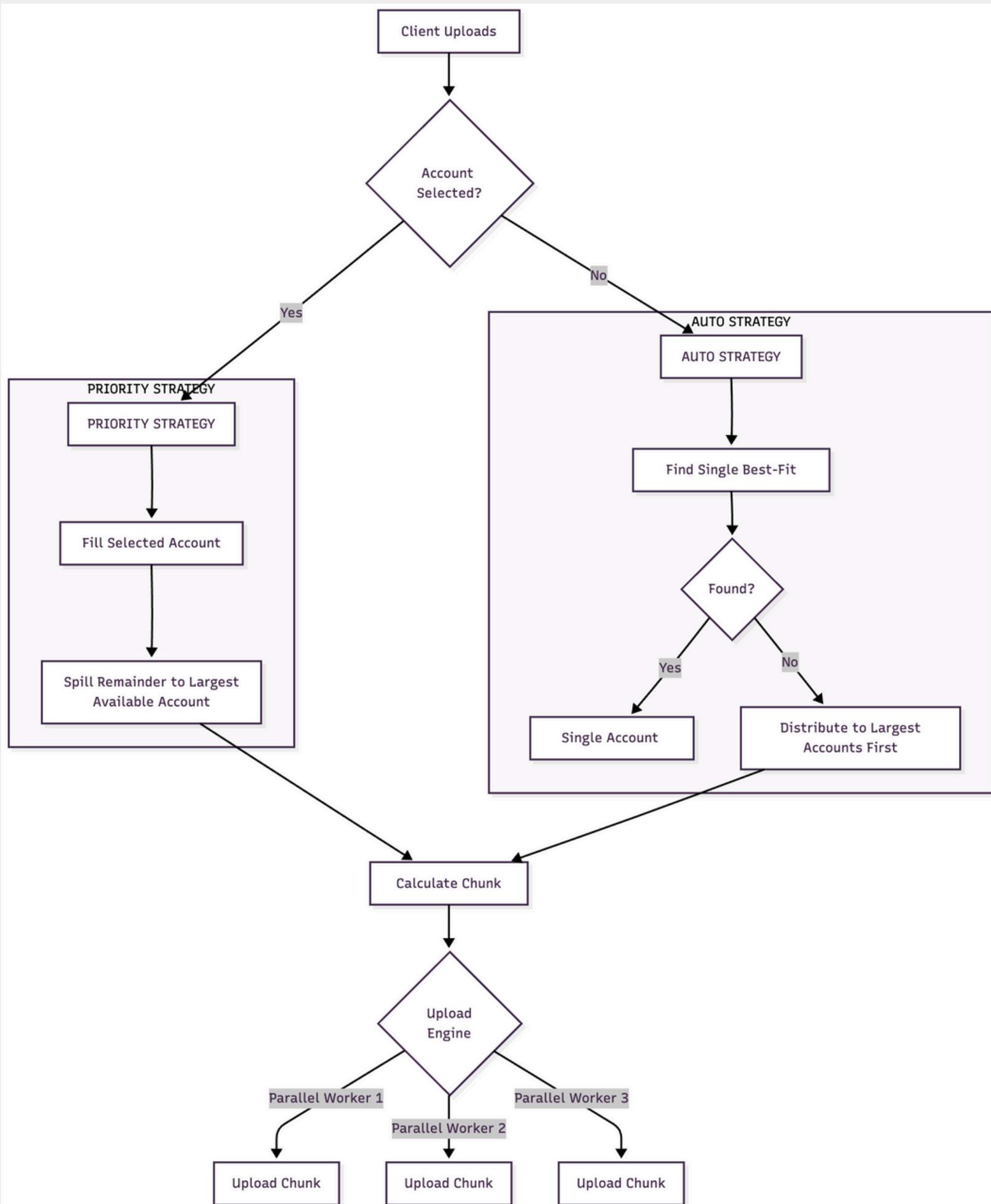


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SEGMENTATION LOGIC



Upload & Download Mechanisms

UPLOAD PROCESS



File Reception

Frontend uploads file to backend server for processing

Chunk Creation

File split into optimal segments based on storage analysis

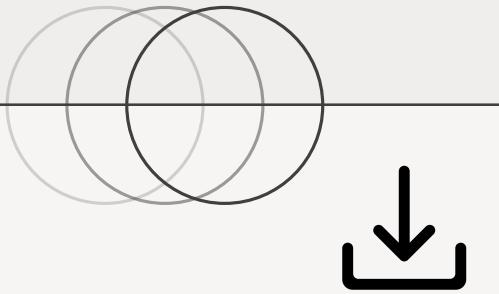
Parallel Distribution

3 concurrent uploads push chunks to designated accounts

Metadata Logging

Database records chunk locations and reconstruction map

Download Process



Request Initiation

User selects file for download from unified interface

Metadata Retrieval

System queries database for chunk locations across accounts

Sequential Fetching

Chunks retrieved in order for streaming reconstruction

File Assembly

Backend merges chunks and delivers complete file to user

Key Features

- Multi-account OAuth login
- Secure Google authentication and account linking
- Unified storage management interface
- Combined dashboard showing total & used storage
- Real-time storage capacity tracking
- Automatic file chunking and smart distribution
- Parallel chunk uploads to multiple accounts
- Account-priority upload support
- Seamless file reconstruction during download
- Memory-safe streaming downloads for large files



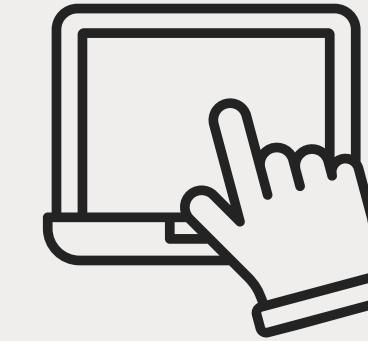


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DEMO



DriveMerge

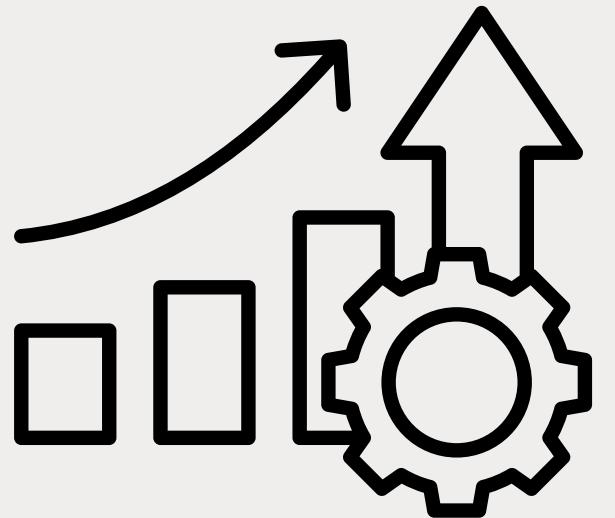


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Performance Evaluation



PARALLEL CHUNK UPLOADS

enable up to 3 concurrent transfers, significantly reducing overall upload time.

STORAGE-AWARE DISTRIBUTION

ensures efficient usage of available space across connected accounts.

LARGE FILE HANDLING

Supports uploads beyond single-account storage limits through automatic chunking.

UNIFIED AGGREGATION

Delivers seamless multi-account storage without user complexity.

Challenges & Learnings

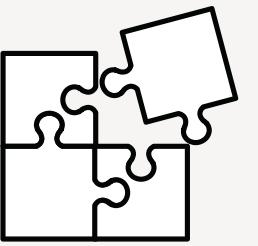
CHALLENGES

Handling OAuth for multiple accounts

Storage-aware chunk planning

Managing parallel uploads safely

Google Drive API test-mode restrictions



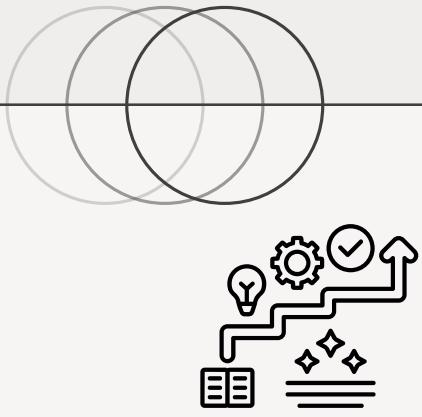
LEARNINGS

Concurrency handling

large files handling

OAuth workflows & token management

Real-world distributed storage concepts



Future Scope



END-TO-END ENCRYPTION

Client-side encryption before upload to ensure zero-knowledge data privacy and protection from unauthorized access.

MULTI-CLOUD SUPPORT

Extend integration to platforms like Dropbox, OneDrive, and other cloud providers for a universal storage aggregation system.

ADVANCED FILE VERSIONING

Introduce version control and rollback capabilities to track file changes and restore previous states across all connected accounts.

ADVANCED ANALYTICS DASHBOARD

Provide detailed insights on storage usage trends, distribution patterns across accounts, and system performance metrics.

Conclusion

Unified Storage Platform

Combines multiple Google Drive accounts into one easy-to-use system.

Efficient Large File Handling

Uses smart chunking and parallel uploads to overcome storage limits.

Seamless User Experience

Removes manual account switching and simplifies file management.

Scalable for Future Growth

Built to support encryption, analytics, and multi-cloud expansion.

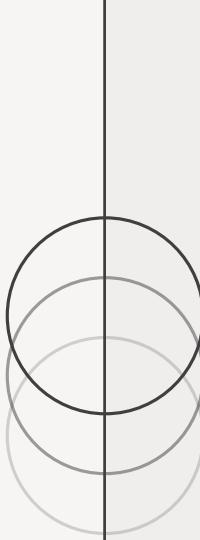




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THANK YOU