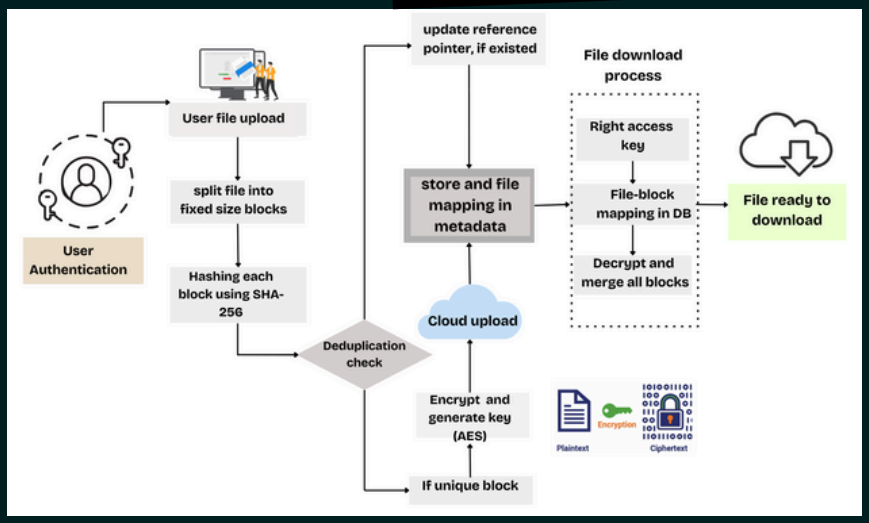
ENHANCING CLOUD DATA SECURITY AND STORAGE EFFICIENCY THROUGH DE-DUPLICATION AND AES

INTRODUCTION

Cloud storage suffers from redundant file uploads and rising costs. This project introduces a secure deduplication system using SHA-256 for block-level hashing and AES-256 for encrypting unique data, ensuring storage efficiency and data confidentiality.

ARCHITECTURE

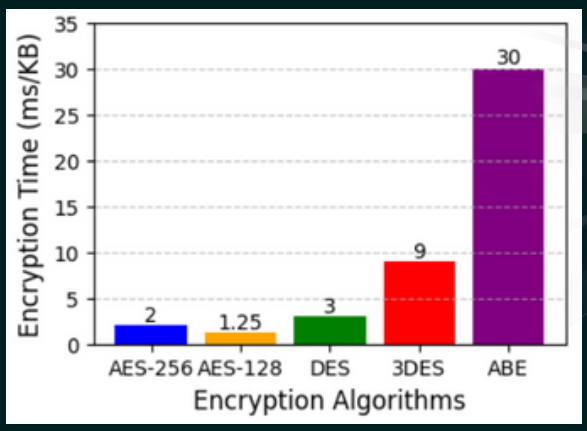


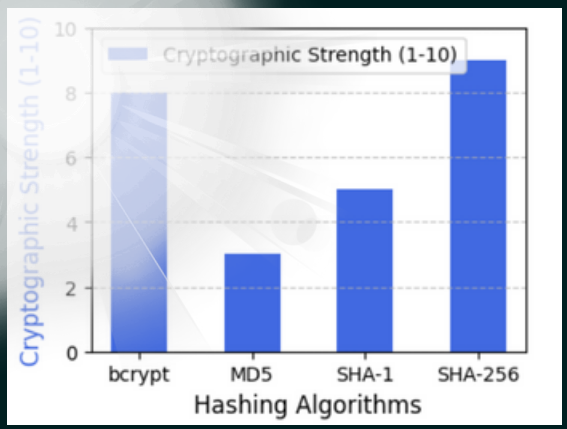
RESULTS

Metric	Without Dedup.	With Dedup.	Improvement
Cloud Storage Usage	800KB	440KB	45% less
Upload Latency (Avg.)	7.9 s	4.8 s	39% faster
Retrieval Time (Avg.)	30.6 s	21.7 s	29% faster
SHA-256 Hash Time	1.5 s	1.5 s	No Change
AES-256 Encrypt Time	3.9 s	3.9 s	No Change

FUNCTIONAL MODULES

- Verifies user identity
- manages access keys.
- File Splitting
- Hashing
- Deduplication
- Encryption
- Cloud Upload
- Metadata Management





CONCLUSION

The proposed system securely combines deduplication and encryption to reduce cloud storage usage while protecting user data. By using SHA-256 and AES-256, it ensures efficiency, privacy, and accuracy in multi-user environments.