

Gradey Cullins  
Zak Peters



Peer-to-Peer File Storage

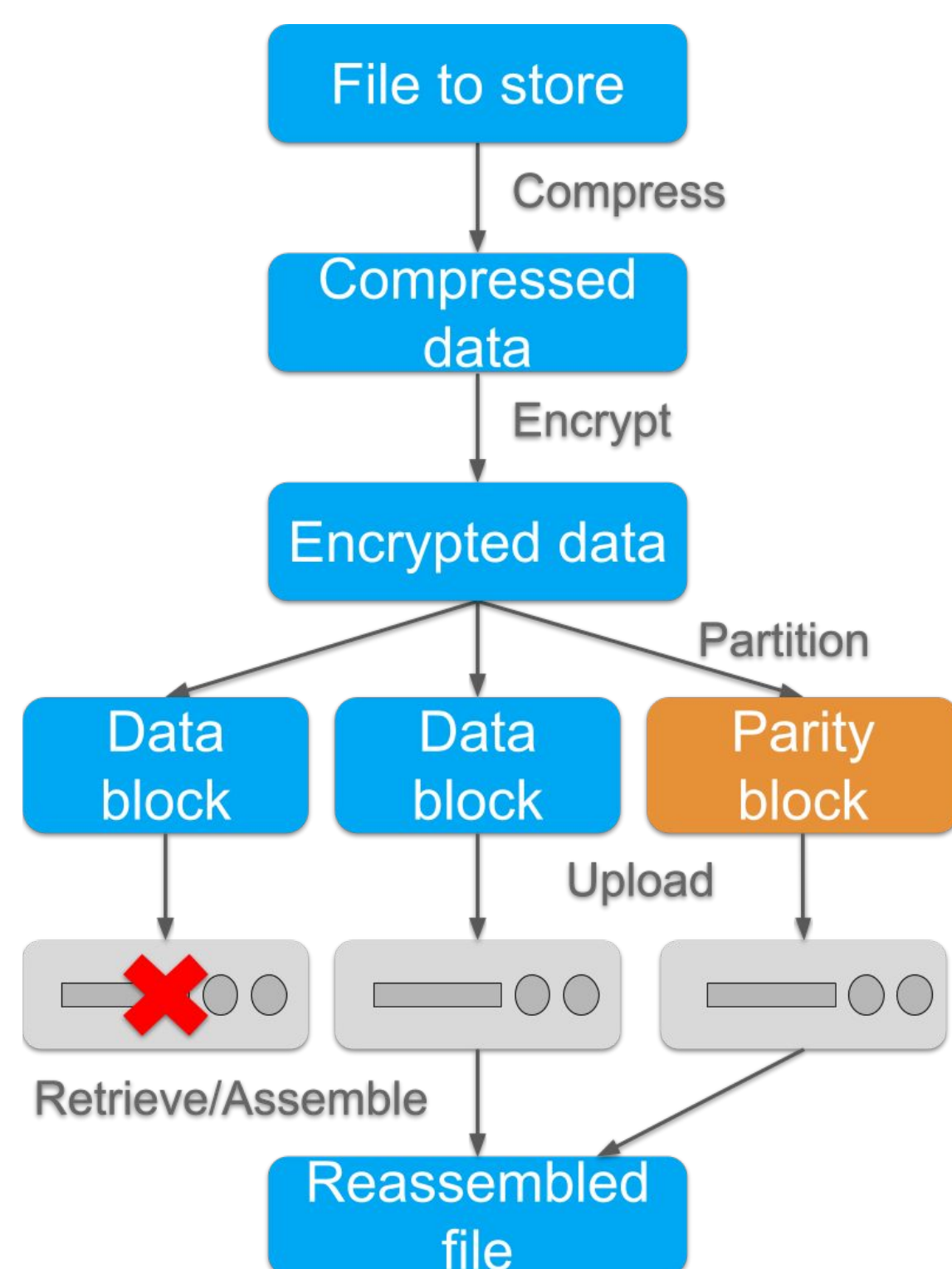
Kincaid Savoie  
Alex Steele

## What is SkyBin?

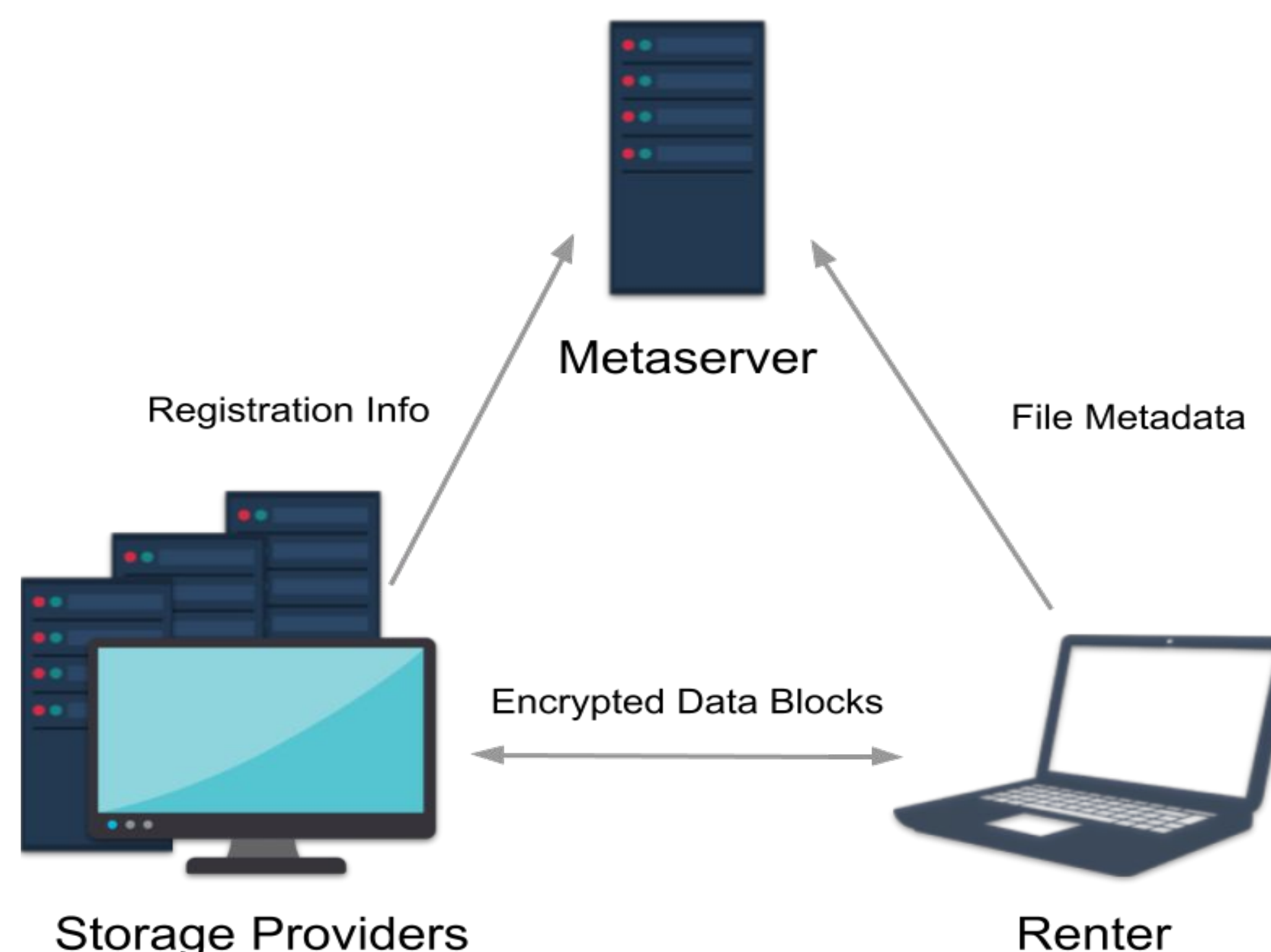
SkyBin is a peer-to-peer file storage system where users can rent space on each other's machines. It aims to provide a private, secure alternative to centralized cloud storage options like DropBox or Google Drive.

## Features

- File storage
- Sharing
- Versions
- Storage audits
- Peer payments
- Corruption detection and recovery
- Automated storage pricing



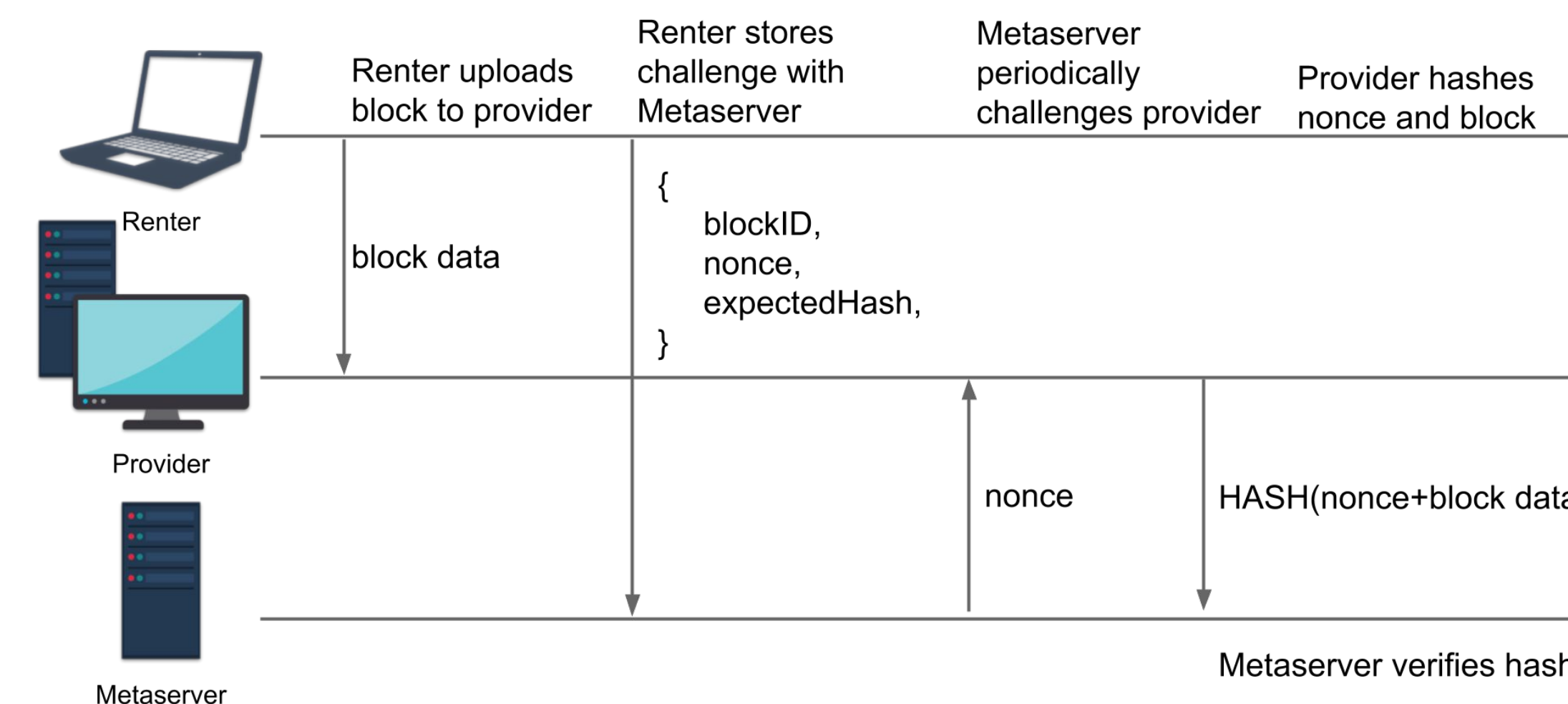
File storage: Files are compressed, encrypted, chunked, and stored with peers. Redundant parity blocks allow file recovery with partial data loss.



**Renter** - Rents space on peers' machines. Stores files with peers  
**Provider** - Stores file chunks for peers in return for cash  
**Metaserver** - Stores file metadata, brokers payments, serves as rendezvous for renters and providers

## Corruption and Loss Recovery

SkyBin uses erasure coding and periodic storage audits to protect against loss and ensure high availability. With erasure coding, parity blocks are computed from file data and stored with peers. If part of a file is lost or corrupted, the file can still be reconstructed from a combination of data and parity blocks.



Storage audit process: SkyBin periodically verifies that providers are correctly storing blocks using a hash-based challenge scheme

## Security

SkyBin encrypts files end-to-end using a two key scheme. This ensures only the file owner and users the file is shared with can access the file. When a file is uploaded:

1. SkyBin encrypts the file with a unique AES key.
2. The AES key is encrypted with the owner's private key and stored on the metaserver.
3. When the owner shares the file, the file's AES key is re-encrypted with the recipient's public key.

## Technology

