BOSSCODER ACADEMY

Request A Callback

HLD - 8

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Designing Google Drive Continued: Blob Splitters and Database Design

Blob Splitters:

Blob splitters are crucial components in systems that handle large binary objects (blobs) like files. They break down large files into smaller chunks for

Key-Value Document Database Design:

To design a system like Google Drive, a key-value document database is suitable. The schema could be structured as follows:

```
{
"Name": "file_name",
"parent_folder": "parent_folder_id",
"id": "file_id",
"owner": "user_id",
"blobs/chunks": ["chunk_id_1", "chunk_id_2", ...]
}
```

Options:

- **Rename:** Allowing users to rename files.
- **Move File:** Supporting file movement between folders.
- **Delete File:** Enabling users to delete files.
- **Download:** Facilitating file download by assembling chunks.

Scaling for 1 Billion Entries:

To handle 1 billion entries efficiently:

- **Sharding:** Distribute data across multiple database instances, sharding by user ID.
- **Indexing:** Create indexes on frequently used fields like user ID, file ID, etc.

Garbage Collection:

Implement a garbage collection mechanism to remove unused or deleted files, freeing up storage space and improving performance.

Designing Airbnb

Requirement Gathering:

- **Rental/Host Side:** Determine if the platform caters to renters, hosts, or both.
- **Features:**
- **Rental Side:** Browse listings, make bookings, manage bookings, make payments, provide ratings.
- **Host Side:** Upload and manage rooms, view bookings.

Locking Mechanism for Bookings:

Implement a locking mechanism to ensure data consistency when multiple users attempt to book the same property simultaneously. Use techniques like optimistic or pessimistic locking to prevent conflicts.

Global/Local:

- **Global Locking:** Locking at a global level can lead to contention and reduced scalability.
- **Local Locking:** Use local locks for specific resources to reduce contention and improve scalability.

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In designing platforms like Google Drive and Airbnb, considering the storage architecture, database design, and mechanisms for data management, scaling, and user interactions are crucial. The use of advanced techniques like blob splitters, sharding, and locking mechanisms ensures seamless functionality and user experience.

Assessment: https://www.bosscoderacademy.com/blog/hld-8-assessment

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