

System design—Problem and solution

I needed to design a system that should hold the following items:

- Accommodate increased load
- Managing complex data processing
- Ensuring high availability
- Maintaining security under strict constraints

I would perform the following actions for each item described above.

Accommodate increased load

- Open database, design tables/fields and normalize database tables so that it can be easy reading and fast access onto records.

Managing complex data processing

- Use libraries like Spark framework or similar kind, in order to provide data, the meaning or shape that user is expecting.
- Use intrinsic functions and/or tools from the motor of database, in order to provide data, the meaning or shape that the user is expecting.

Ensuring high availability

- Use data caching when the application is alive.
- Use threading to get the user request and give the response to the user by making small requests (based on the original request) in an asynchronous manner.
- Use server load balancing as a strategy

Maintaining security under strict constraints

- Create Primary Key, Foreign Key, Check constraints for database tables' fields.
- Create API(s) that may connect to database.
- Create user authentication by user-password, google authenticator factor, or face recognition.
- Create roles, profiles, permissions for application' users.