Experiment - 1

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Subject Name: System Design
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Aim:

To design and analyze a URL Shortener system by identifying its functional and non-functional requirements and representing the system design using a draw.io diagram.

Objectives:

1. To understand the working of a URL Shortener system
2. To identify functional requirements of the system
3. To identify non-functional requirements such as performance and scalability
4. To design a high-level system flow using draw.io
5. To improve understanding of real-world system design concepts

Procedure-

1. Studied the concept of URL Shortener systems used in real-world applications.
2. Identified the core functionalities required for URL shortening and redirection.
3. Listed the functional requirements such as short URL creation, custom URL support, expiration handling, and redirection.
4. Identified non-functional requirements including low latency and scalability.
5. Designed a structured system diagram using draw.io, representing the requirements clearly.
6. Reviewed the diagram to ensure clarity, correctness, and completeness.

Functional Requirements -

- Create a short URL from a long URL
- Support optional custom short URLs
- Provide default and custom expiration dates
- Redirect users from short URL to original URL

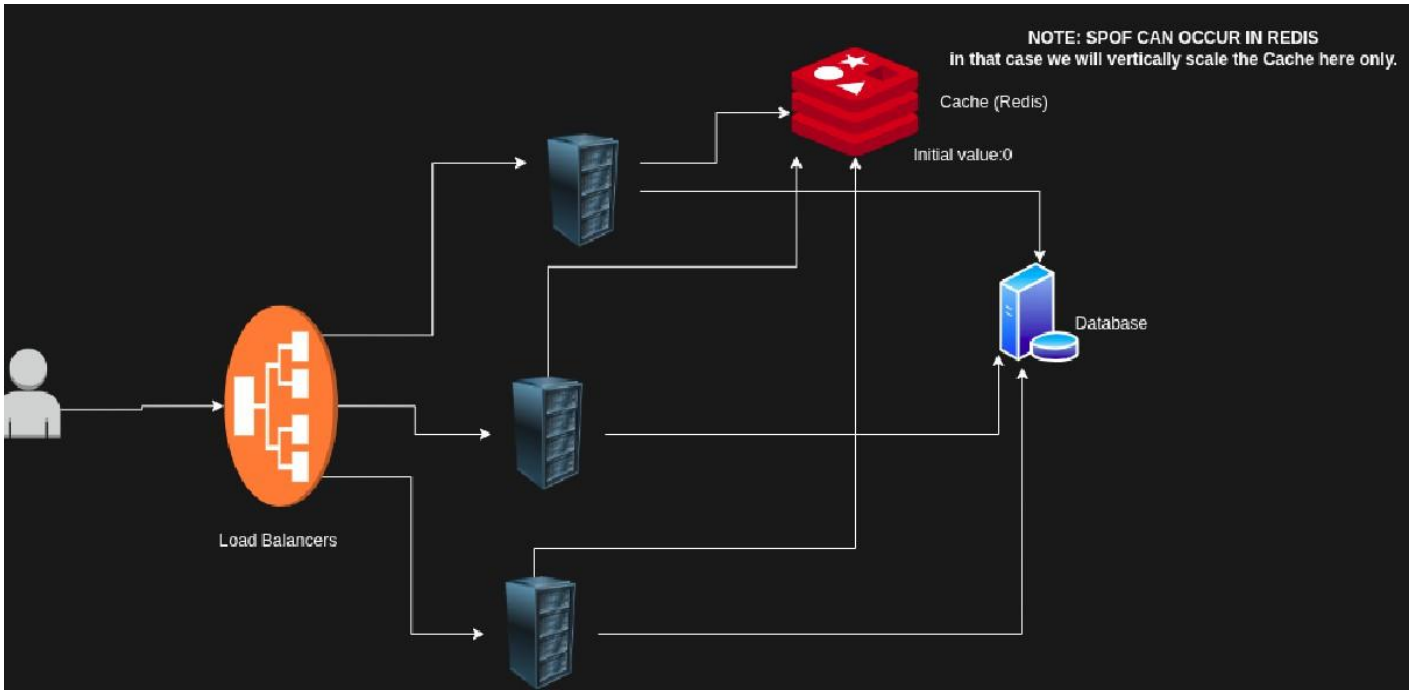
Non-functional Requirements:

- Low latency with response time less than 200 ms
- Scalability to support 100 million daily active users
- Ability to shorten up to 1 billion URLs
- Data consistency and reliability.
- Secure URL handling.

Learning Outcomes/Result:

- Successfully designed a URL Shortener system using draw.io.
- Clearly identified functional and non-functional requirements.
- Understood real-world system design considerations such as performance and scalability.
- Gained practical exposure to requirement analysis and system design.

High Level Design:



Low Level Design: