

System Design Document

Project: URL Shortener Microservice

Track: Full Stack (Frontend + Backend)

1. Overview:

This app allows users to shorten up to five URLs at once with optional custom shortcodes and expiration periods. It has a React frontend and Node.js + Express backend, with logging middleware and SQL database storage.

2. Key Design Choices:

- Frontend: React + Material UI for modular, responsive design.
- Backend: Express.js for flexibility and middleware support.
- Logging: Custom middleware with Axios to send logs to a remote server.
- Database: SQL (MySQL/SQLite) for reporting and structured data capabilities.

3. Data Models:

- urls table: Stores original URL, shortcode, timestamps.
- clicks table: Logs clicks with timestamp, referrer, and location.

4. API Endpoints:

- POST /shorturls: Create shortened URLs with optional shortcode and expiry.
- GET /:shortcode: Redirects to original URL, logs the click.
- GET /stats: Returns stats including creation/expiry time and click data.

5. Technologies Used:

- Frontend: React, Material UI
- Backend: Node.js, Express.js
- Database: MySQL or SQLite
- Logging: Axios to remote logging API
- Tools: Postman, Nodemon, VS Code