System Design Document

1. Project Overview

This project is a simple URL Shortener built using a React-based frontend that integrates with the CleanURI API for shortening URLs. Additionally, a logging middleware built with Express.js captures user actions and sends log entries to a server.

2. Folder Structure

• frontend/ – React app to shorten URLs and send logs. • loggingMiddleware/ – Express server to receive and display logs. • README.md – Describes setup and usage instructions. • SystemDesign.pdf – This document. • .gitignore – Lists files/folders to ignore in version control.

3. Architecture Flow

• User accesses the frontend React app. • Enters a long URL and clicks 'Shorten URL'. • The app sends a POST request to the CleanURI API to generate a short URL. • At the same time, a log is sent to the logging middleware via Axios. • The log server receives and prints the log to the console. • The short URL is displayed on the screen.

4. Logging Middleware

• Built using Node.js and Express. • Listens on port 4000. • Receives logs with message, timestamp, and level. • Displays logs in the terminal with appropriate formatting.

5. Deployment & Testing

• Run the logging server: `node index.js` inside loggingMiddleware folder. • Start the frontend: `npm run dev` inside frontend folder. • Open the browser at `http://localhost:5173`. • Enter a URL, shorten it, and verify that logs are shown in the terminal.

6. Conclusion

This system shows how frontend and backend components interact in a simple microservice-based architecture. It demonstrates React frontend integration with external APIs and logging of user actions through a custom middleware.