

LIVEDOCS: A PEER-TO-PEER REAL-TIME COLLABORATIVE DOCUMENT EDITOR USING WEBRTC AND CRDTS

A PROJECT REPORT

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in partial fulfillment for the award of the degree

of

BACHELOR OF TECHNOLOGY

in

INFORMATION TECHNOLOGY



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MAY 2025

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BONAFIDE CERTIFICATE

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ACKNOWLEDGEMENT

At this pleasing moment of having successfully completed our project report, we wish to convey our sincere thanks and gratitude to our beloved Pro-Chairman **Thiru R.S.K. Raguraam** and Chairperson **Tmt. K. Dhanalakshmi** who provided all the facilities to us.

We would like to express our sincere thanks to our beloved Principal **Dr. D. Vasudeven** for supporting the successful completion of the project.

We are also grateful to our Head of the Department **Dr. A. Vincent Antony Kumar** for his constructive suggestions and encouragement during our project work.

We also express our sincere thanks to **Mrs. S. T. Bharathi**, Project Coordinator, for her support and encouragement throughout the project.

We whole heartedly acknowledge the words of inspiration given by our Internal Guide **Mrs. A. Sangeetha**, Asst. Prof. for successfully completing this project work.

Finally, we would like to thank the almighty with whose blessings it has been possible for us to complete our project.

ABSTRACT

LiveDocs is a decentralized, real-time collaborative document editor designed to enable seamless and efficient collaboration without reliance on centralized servers. Unlike traditional cloud-based solutions such as Google Docs, LiveDocs utilizes WebRTC for direct P2P communication and Yjs (CRDTs) for distributed data synchronization. This architecture ensures low-latency collaboration, enhanced fault tolerance, and seamless scalability, supporting millions of concurrent users. Key features include real-time editing, and role-based access control, all powered by a resilient P2P network. Secure authentication is ensured through JWT-based access control, enabling efficient document indexing and user management while delivering a modern and sleek user experience. By eliminating centralized infrastructure, LiveDocs reduces server costs, enhances scalability, and improves fault tolerance, making it an ideal solution for teams, enterprises, and large-scale applications requiring secure and real-time document collaboration.

Keywords:

Peer-to-Peer Collaboration, Real-Time Document Editing, WebRTC, CRDTs (Yjs), Decentralized Collaboration, JWT Authentication.

TABLE OF CONTENTS

CHAPTER NO.	TITLE	PAGE NO.
	ABSTRACT	iv
	LIST OF FIGURES	vii
	LIST OF ABBREVIATIONS	viii
1	INTRODUCTION	1
	1.1 BACKGROUND AND MOTIVATION	1
	1.2 PROBLEM STATEMENT	1
	1.3 OBJECTIVES AND CONTRIBUTIONS	2
2	LITERATURE REVIEW	3
	2.1 SURVEY OF RELATED WORK	3
	2.2 OVERVIEW OF EXISTING SYSTEM	6
	2.3 LIMITATIONS OF CURRENT APPROACH	7
	2.4 POSITIONING OF THE PROPOSED WORK	8
3	SYSTEM ARCHITECHTURE	10
	3.1 OVERVIEW OF LIVEDOCS	10
	3.2 HARDWARE AND SOFTWARE REQUIREMENTS	10
	3.3 ARCHITECHTURAL DESIGN	12
	3.4 DATA SYNCHRONIZATION USING YJS	14
	3.5 AUTHENTICATION AND ACCESS CONTROL	14
	3.6 SCALABILITY AND FAULT TOLERANCE	14
4	IMPLEMENTATION DETAILS	15
	4.1 TECHNOLOGY STACK	14
	4.2 BACKEND IMPLEMENTATION	17
	4.3 FRONTEND IMPLEMENTATION	18
	4.4 PEER-TO-PEER COMMUNICATION WITH WEBRTC	19
	4.5 DATA CONFLICT HANDLING WITH CRDTS	19

	4.6 PROTOTYPE DEMONSTRATION	19
5	PERFORMANCE EVALUATION	23
	5.1 LATENCY	23
	5.2 SCALABILITY	23
	5.3 SYNCHRONIZATION ACCURACY	24
6	DISCUSSION	25
	6.1 STRENGTHS OF LIVEDOCS	25
	6.2 LIMITATIONS AND CHALLENGES	25
7	CONCLUSION	27
8	FUTURE ENHANCEMENTS	28
	APPENDICES	29
	APPENDIX A – SAMPLE CODE	29
	REFERENCES	56

LIST OF FIGURES

FIGURE NO.	NAME	PAGE NO.
3.1	Architecture Diagram	12
4.1	Landing Page	20
4.2	Document Page	21
4.3	Document Editor Page	21
4.4	Share Modal	22
4.5	User Profile Page	22

LIST OF ABBREVIATIONS

ABBREVIATION	EXPANSION
AI	Artificial Intelligence
API	Application Programming Interface
CRDT	Conflict-Free Replicated Data Type
CSS	Cascading Style Sheets
JSON	JavaScript Object Notation
JWT	JSON Web Token
NAT	Network Address Translation
ORM	Object-Relation Mapping
OT	Operational Transformation
P2P	Peer-to-Peer
SQL	Structured Query Language
STUN	Session Traversal Utilities for NAT
TURN	Traversal Using Relays around NAT
UI	User Interface
WebRTC	Web Real-Time Communication