Detailed Design Document: ChatSphere

1. Introduction

1.1 Purpose

This document aims to present a comprehensive overview of ChatSphere's design and architecture, encompassing features, functionality, and technical specifications.

1.2 Scope

ChatSphere, as a chatting app, endeavors to provide users with a dynamic platform for real-time communication, fostering seamless conversations, multimedia sharing, and interactive features to enhance the overall chatting experience.

1.3 Objectives

- ❖ Make it easy for users to chat by creating a simple and friendly interface in ChatSphere.
- ❖ Keep user information safe with strong security measures.
- ❖ Allow ChatSphere to grow and handle more users in the future.
- ❖ Let users work together by making it easy to share and collaborate on chats and activities..

2. System Overview

2.1 System Architecture

ChatSphere employs a client-server architecture with a responsive web-based front end for user interactions and a robust back-end server handling core logic, ensuring an efficient and dynamic chatting experience.

2.2 Key Features

- ❖ User registration and authentication
- ❖ Real-Time Chatting
- ❖ Notification System
- ❖ Video Calling
- ❖ Notification System
- ❖ Emoticons and Stickers

2.4 Technologies Used

- ❖ Front-end: React
- ❖ Back-end: Express
- ❖ Database: MongoDB
- ❖ Authentication: JWT
- ❖ Additional tools/libraries as needed.

3. Database Design

3.1 Entity-Relationship Diagram

User Entity:

- ❖ *UserID (Primary Key):* Unique identifier.
- ❖ *Username:* User's chosen name.
- ❖ *Email:* User's contact address.
- ❖ *Password:* Secure authentication.

Chat Entity:

- ❖ *ChatID (Primary Key):* Unique identifier.
- ❖ *Participants:* UserIDs in the chat.
- ❖ *CreatedAt:* Chat initiation timestamp.
- ❖ *ClosedAt:* Chat closure timestamp.

Message Entity:

- ❖ *MessageID (Primary Key):* Unique identifier.
- ❖ *ChatID (Foreign Key):* Associated chat.
- ❖ *SenderID:* Sender's UserID.
- ❖ *Content:* Message content.
- ❖ *SentAt:* Message timestamp.
- ❖ *ReadStatus:* Indicator of message read status.

Contact Entity:

- ❖ *ContactID (Primary Key):* Unique identifier.
- ❖ *UserID (Foreign Key):* Owner of the contact.
- ❖ *ContactUserID (Foreign Key):* UserID of the contact.

Status Entity:

- *StatusID (Primary Key):* Unique identifier.
- *UserID (Foreign Key):* User associated with the status.
- *Content:* Status update content.
- *PostedAt:* Status update timestamp.