Software Requirements Specification for EquaSpace

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Service Oriented Systems

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Contents

1 Introduction

This document serves as the Software Requirements Specification (SRS) for EquaSpace. It provides a comprehensive overview of the system, outlining its objectives, functionalities, and constraints. This document is intended for stakeholders, developers, testers, and other personnel involved in the project to ensure a clear understanding of the system's requirements and expectations.

1.1 Purpose

The purpose of this document is to define the requirements for EquaSpace. It aims to provide a structured and detailed description of the system to facilitate its development and implementation. The primary objectives include:

- Defining the scope and functionalities of the system.

- Establishing clear guidelines for developers and designers.

- Serving as a reference for validation and verification of the final product.

- Ensuring all stakeholders have a common understanding of the project.

This document will serve as the foundation for the design and development phases, ensuring that the final product meets the specified requirements effectively and efficiently.

1.2 Document Conventions

This document follows standard documentation conventions to ensure clarity and consistency:

- **Bold headings** indicate major sections.

- **Subheadings** to break major sections and make it more readable.

- **List points** are used to list key points concisely.

- **References to external documents** are formatted in [brackets].

1.3 Intended Audience and Reading Suggestions

This document is intended for:

- **Project Stakeholders:** To understand the overall system requirements and goals.

- **Developers and Designers:** To use as a reference during the development phase.

- **Testers:** To validate and verify that the software meets the specified requirements.

- **End Users:** To understand the features and functionalities of the system.

Readers are encouraged to first review the introduction and project scope before diving into detailed requirements to get a high-level understanding of the system.

1.4 Project Scope

The scope of EquaSpace includes:

- Developing a system that meets the specified functional and non-functional requirements.

- Providing a user-friendly interface for seamless interaction.

- Ensuring scalability and security for future enhancements.

- Integrating with third-party services as necessary.

- Supporting multiple user roles with appropriate access levels.

The system aims to improve efficiency, reduce manual workload, and provide a streamlined experience for users.

1.5 References

The following documents and sources were referenced in the creation of this SRS:

- Template for this SRS Document : Template

2 Overall Description

2.1 Product Perspective

EquaSpace is an innovative and comprehensive video conferencing platform designed to revolutionize remote communication. Unlike traditional video conferencing tools, EquaSpace goes beyond basic functionality to offer a truly inclusive and feature-rich experience.

The product is conceived as a standalone system, but it's designed with integration capabilities in mind. For instance, it can seamlessly connect with popular calendar and email systems, enhancing its utility in professional environments. This integration allows for smooth scheduling and invitation processes, making EquaSpace a natural extension of existing workflow tools.

EquaSpace is not just another video chat app - it's a response to the evolving needs of a diverse global user base. In the post-pandemic world, where remote work and digital communication have become the norm, EquaSpace aims to bridge the gaps left by current solutions, especially in terms of accessibility and inclusivity.

The system is built on a robust, scalable cloud infrastructure, ensuring reliability and performance even as user numbers grow. This cloud-based approach also facilitates rapid updates and feature rollouts, keeping EquaSpace at the cutting edge of video conferencing technology.

2.2 Product Features

EquaSpace boasts an impressive array of features designed to cater to a wide range of user needs:

- **Real-time Video and Audio Conferencing:** High-quality, low-latency video and audio communication. The platform uses advanced codecs and adaptive streaming to ensure smooth conversations even in challenging network conditions.

- **Intelligent Chat System:** Beyond just text, the chat feature includes smart emoji reactions, seamless media sharing, and even AI-powered sentiment analysis to gauge meeting mood.

- **Advanced Meeting Management:** Hosts can easily schedule, start, and manage meetings. Features include customizable waiting rooms, breakout sessions for small group discussions, and flexible participant controls.

- **Screen Sharing and Collaborative Whiteboarding:** Share your screen with a single click, or use the interactive whiteboard for brainstorming sessions. Multiple users can annotate and contribute simultaneously.

- **AI-Powered Live Transcription:** Real-time speech-to-text conversion makes meetings more accessible and allows for easy note-taking and review.

- **Sign Language Recognition and Translation:** A groundbreaking feature that recognizes American Sign Language (ASL) and British Sign Language (BSL), translating them into text for non-signers.

- **Accessibility Mode for Visually Impaired Users:** This mode optimizes the interface for screen readers and includes features like vibration-based braille notifications for mobile devices.

- **Virtual Backgrounds and Noise Suppression:** Maintain privacy and professionalism with customizable backgrounds, while AI-driven noise cancellation ensures clear audio.

- **Engagement Tools:** Interactive polls, Q&A sessions, and hand-raising features to keep participants engaged and meetings productive.

- **End-to-End Encryption:** State-of-the-art security measures ensure that your conversations remain private and protected.

- **Comprehensive Analytics:** Gain insights into meeting patterns, participant engagement, and usage trends to optimize your communication strategies.

- **Temporary Conversation Mode:** For sensitive discussions, this feature ensures that no traces of the conversation remain once the meeting ends.

2.3   User Classes and Characteristics

EquaSpace caters to a diverse user base, each with unique needs and expectations:

- **General Users:** These are individuals who need reliable video conferencing for personal or casual professional use. They value ease of use and basic functionality.

- **Business Professionals:** This group requires advanced features like screen sharing, meeting recording, and integration with business tools. They prioritize reliability, security, and professional presentation.

- **Educators and Students:** For virtual classrooms and remote learning, this group needs features like breakout rooms, interactive whiteboards, and robust moderation tools.

- **Healthcare Providers:** Medical professionals conducting telemedicine consultations require HIPAA compliance, high-quality video for accurate diagnoses, and seamless integration with healthcare systems.

- **Users with Disabilities:** This group benefits greatly from EquaSpace's accessibility features. Deaf users can utilize sign language recognition, while visually impaired users can leverage the screen reader-optimized interface and braille notifications.

- **IT Administrators:** Responsible for deploying and managing EquaSpace within organizations, they need robust admin controls, usage analytics, and integration capabilities.

- **Event Organizers:** For large-scale virtual events, these users require features like breakout sessions, audience engagement tools, and scalable participant management.

2.4 Operating Environment

EquaSpace is designed to function seamlessly across a variety of platforms and environments:

- **Web Browsers:** The application is optimized for modern browsers including Chrome, Firefox, Safari, and Edge. It leverages the latest web technologies like WebRTC for real-time communication.

- **Network Requirements:** While EquaSpace is optimized for various network conditions, it performs best with a stable internet connection of at least 1 Mbps upload/download. The application includes adaptive quality settings to accommodate lower bandwidths.

- **Cloud Infrastructure:** The backend is hosted on robust cloud platforms like AWS or Azure, ensuring high availability, scalability, and global reach. This infrastructure is designed to handle sudden spikes in usage, making EquaSpace reliable even during peak times.

2.5 Design and Implementation Constraints

While EquaSpace aims to be as flexible and powerful as possible, there are some constraints to consider:

- **Regulatory Compliance:** The application must adhere to various data protection regulations like GDPR, CCPA, and HIPAA. This impacts data storage, processing, and user consent mechanisms.

- **Browser Limitations:** While WebRTC is widely supported, some older browsers may not be compatible with all features. The application must gracefully degrade in such cases.

- **Network Variability:** Real-time communication quality is inherently dependent on network conditions, which can be unpredictable, especially for users in areas with poor internet infrastructure.

- **Integration Challenges:** While EquaSpace aims to integrate with various third-party services, the extent of integration may be limited by the APIs and policies of these services.

- **AI Model Limitations:** Features like sign language recognition and sentiment analysis rely on AI models which may not be 100% accurate in all scenarios.

2.6 User Documentation

EquaSpace is committed to providing comprehensive and user-friendly documentation:

- **Interactive In-App Tutorials:** New users are guided through key features with interactive walkthroughs.

- **Contextual Help:** Each feature has easily accessible help content that can be accessed without leaving the current screen.

- **Comprehensive User Manuals:** Detailed guides are available for different user roles (e.g., participants, hosts, administrators) in multiple formats including PDF and interactive web pages.

- **Video Tutorials:** A series of short, engaging videos demonstrate how to use various features effectively.

- **Regularly Updated FAQ and Troubleshooting Guide:** This living document addresses common questions and issues, updated based on user feedback and support tickets.

- **Developer Documentation:** For organizations looking to integrate EquaSpace with their systems, detailed API documentation and code samples are provided.

- **Accessibility Guide:** A specialized guide for users with disabilities, explaining how to best utilize EquaSpace's accessibility features.

2.7 Assumptions and Dependencies

The development and operation of EquaSpace are based on several key assumptions and dependencies:

Assumptions:

- Users have access to devices that meet the minimum hardware requirements (e.g., camera, microphone, sufficient processing power).

- The majority of users have access to a stable internet connection.

- Users are willing to grant necessary permissions for features like camera and microphone access.

Dependencies:

- Continued support and development of WebRTC technology by major browser vendors.

- Availability of cloud infrastructure services that can meet the scalability and performance requirements.

- Access to high-quality AI and machine learning models for features like speech recognition and sign language translation.

- Ongoing compliance with evolving data protection and privacy regulations worldwide.

- Stability of third-party services used for integration (e.g., calendar systems, email providers).

- Availability of skilled developers familiar with the required tech stack for ongoing development and maintenance.

By considering these factors, EquaSpace aims to deliver a robust, scalable, and innovative video conferencing solution that meets the diverse needs of its user base while navigating the complex landscape of modern software development.

3 System Features

3.1 User Management Service

3.1.1 Description and Priority

The User Management Service takes care of user authentication, registration, and role-based access control (hosts, admins, and participants). It ensures that only authorized users can access different levels of the application. This feature is of High Priority as it forms the foundation for user identity and access control.

Priority Components:

- Benefit: 9 (Essential for secure access control)

- Penalty: 8 (Lack of authentication leads to security vulnerabilities)

- Cost: 5 (Moderate development effort for OAuth, SSO, and RBAC integration)

- Risk: 6 (Potential for security breaches if implemented incorrectly)

3.1.2 Stimulus/Response Sequences

- User Registration: User provides email, password, and optional profile details → System validates input and creates user account.

- Login: User enters credentials → System authenticates and grants access.

- Role Assignment: Admin assigns roles (host, participant, admin) → System enforces access control based on roles.

- Password Recovery: User requests password reset → System sends reset link to registered email.

3.1.3 Functional Requirements

- REQ-1: The system shall support user authentication via OAuth 2.0 and Single Sign-On (SSO).

- REQ-2: The system shall provide role-based access control (RBAC) to define permissions.

- REQ-3: The system shall encrypt and store user credentials using secure hashing algorithms.

- REQ-4: The system shall implement multi-factor authentication (MFA) for added security.

- REQ-5: The system shall allow users to update their profiles, including name, email, and profile picture.

3.2 Video and Audio Streaming Service

3.2.1 Description and Priority

This service enables real-time, low-latency video and audio communication using WebRTC. It ensures seamless connectivity and adaptive streaming based on network conditions. This feature is of High Priority as it is the core feature of the application.

Priority Components:

- Benefit: 9 (Core functionality for video conferencing)

- Penalty: 9 (Without it, the application loses its purpose)

- Cost: 7 (Significant development effort required)

- Risk: 8 (Challenges in ensuring low latency and high quality)

3.2.2 Stimulus/Response Sequences

- User Joins Call: User clicks on a meeting link $\rightarrow$ System establishes WebRTC connection.

- Network Adaptation: User's network fluctuates $\rightarrow$ System adjusts bitrate and resolution dynamically.

- Mute/Unmute: User toggles mute button $\rightarrow$ System stops/resumes audio transmission.

- Video On/Off: User toggles video on/off button $\rightarrow$ System stops/resumes video transmission.

3.2.3 Functional Requirements

- REQ-6: The system shall use WebRTC for real-time media transmission.

- REQ-7: The system shall support adaptive streaming to adjust video quality based on network conditions.

- REQ-8: The system shall allow users to mute/unmute audio and enable/disable video.

- REQ-9: The system shall provide end-to-end encryption (DTLS-SRTP) for secure communication.

3.3 Chat Service

3.3.1 Description and Priority

This feature enables in-call text messaging, media sharing, and reactions. It enhances communication when audio/video is not feasible. This feature is of Medium Priority as it is a supporting feature.

Priority Components:

- Benefit: 7 (Useful for silent communication and notes)

- Penalty: 5 (Not core, but enhances usability)

- Cost: 4 (Moderate complexity)

- Risk: 3 (Lower security risks compared to video/audio streaming)

3.3.2 Stimulus/Response Sequences

- Message Sent: User types and sends a message → System delivers message in real-time.

- Reaction Added: User clicks on an emoji reaction → System updates message with reaction.

- File Shared: User uploads a file → System ensures secure delivery and previews where applicable.

3.3.3 Functional Requirements

- REQ-10: The system shall allow real-time text-based messaging.

- REQ-11: The system shall support emoji reactions and threaded replies.

- REQ-12: The system shall enable media and document sharing.

- REQ-13: The system shall provide moderation tools for chat (e.g., message deletion, reporting).

3.4 Accessibility Features

3.4.1 Description and Priority

This feature ensures inclusivity by providing real-time sign language recognition, AI transcription, and vibration-based notifications. High Priority as it differentiates the application from competitors and enhances usability for disabled users.

Priority Components:

- Benefit: 9 (Increases accessibility for all users)

- Penalty: 7 (Without it, the app is less inclusive)

- Cost: 8 (AI models require significant development)

- Risk: 6 (Accuracy and real-time performance challenges)

3.4.2 Stimulus/Response Sequences

- Sign Language Detection: User signs in front of camera → System translates signs into text.

- AI Live Transcription: User speaks → System converts speech into real-time text captions.

- Vibration Notification: System detects unread messages for visually impaired users → Device vibrates with a pattern.

3.4.3 Functional Requirements

- REQ-14: The system shall provide real-time AI-powered transcription for spoken communication.

- REQ-15: The system shall detect and translate sign language into text/audio.

- REQ-16: The system shall generate haptic (vibration) notifications for visually impaired users.

- REQ-17: The system shall offer an accessibility mode where all speech is converted to text for users with hearing impairments.

3.5 Meeting Management

3.5.1 Description and Priority

This service allows users to schedule and manage meetings with unique links. High Priority for structured meeting organization.

3.5.2 Stimulus/Response Sequences

- User Login: User enters credentials → System authenticates user and grants access.

- Meeting Scheduling Request: User navigates to the scheduling page and enters meeting details (date, time, participants) → System checks for scheduling conflicts with existing meetings.

- Conflict Resolution: If a conflict exists, the system suggests alternative time slots; else, the system proceeds with scheduling.

- Meeting Confirmation: System generates a unique meeting link → System notifies participants via email or in-app notifications → User receives confirmation of successful meeting scheduling.

3.5.3 Functional Requirements

- REQ-13: The system shall allow meeting scheduling and link generation.

- REQ-14: The system shall enable host controls for session management.

3.6 Recording & Security

3.6.1 Description and Priority

This feature ensures secure recording storage and compliance with GDPR. High Priority for security and compliance.

3.6.2 Stimulus/Response Sequences

- User Joins Meeting: User enters meeting using a valid meeting link.

- Recording Initiation: User with recording permissions clicks on the "Start Recording" button → System confirms recording initiation and notifies all participants.

- Recording Storage: System securely uploads the recording to cloud storage and encrypts the recorded file to ensure data protection.

- Playback and Download: User selects a recording and chooses to either play or download it.

3.6.3 Functional Requirements

- REQ-15: The system shall provide cloud-based recording storage.

- REQ-16: The system shall ensure end-to-end encryption.

- REQ-17: The system shall comply with GDPR regulations.

4   External Interface Requirements

4.1   User Interfaces

The User Interface (UI) is the primary way users interact with the application. The design will focus on usability, accessibility, and responsiveness to provide a seamless experience across different devices.

Key UI Components :

1. **Authentication & User Profile:** Users can log in via email/password authentication or OAuth-based social login (Google, Microsoft, etc.). Profile management allows updating personal details, passwords, and preferences.

2. **Dashboard:** A central hub where users can view scheduled meetings, upcoming events, and system notifications. Quick-action buttons for starting, joining, or scheduling a new meeting.

3. **Meeting Interface (Real-Time Communication UI):**

   - **Video Conferencing:** Users can see video feeds of participants in grid view or speaker view.
   - **Audio Controls:** Options to mute/unmute, control volume, and switch audio devices.
   - **Screen Sharing:** Users can share their screen and use annotation tools.
   - **Chat Panel:** A dedicated chat space for real-time messaging, emoji reactions, and file sharing.
   - **Live Transcription:** AI-powered real-time speech-to-text conversion for accessibility.
   - **Sign Language Recognition:** Detects and translates sign language for deaf or hard-of-hearing users.

4. **Error Handling & Notifications:** Standard error messages for connection issues, authentication failures, etc. Popup notifications for incoming messages, low network alerts, or user join/leave actions.

5. **Accessibility Features:** Dark Mode & High Contrast Mode for better visibility. Keyboard Shortcuts for quick actions (e.g., Ctrl + M to mute/unmute). Braille Notifications & Haptic Feedback for visually impaired users.

4.2   Hardware Interfaces

This section covers how the software interacts with physical hardware devices.

1. **Supported Devices:**

   - Client Devices: The system will support desktops, laptops, smartphones, and tablets running Windows, macOS, Linux, iOS, or Android.
   - Cameras & Microphones: Compatible with built-in and external webcams, microphones, and headphones.

- Speakers & Headphones: Works with Bluetooth and wired audio devices.

- Storage Hardware: If needed, recordings will be stored in local or cloud-based storage.

- Network Devices: Supports Wi-Fi, Ethernet, and 5G/4G networks.

2. **Data Flow Between Software and Hardware:**

- **Audio & Video Processing:** The application captures video/audio from the device, encodes it, and transmits it over the network.

- **Screen Sharing & Recording:** Captures user screen output and streams it to participants.

- **Peripheral Interaction:** Detects external input devices such as game controllers, styluses, or virtual whiteboards.

4.3   Software Interfaces

This describes how the system interacts with other software components.

- **Frontend and Backend:**

  - Frontend Technologies: Built using React.js or Angular, ensuring a responsive and dynamic user experience.

  - Backend Technologies: Uses Node.js (Express.js) or Python (Django/FastAPI) for handling API requests and business logic.

- **Database & Storage:**

  - PostgreSQL (Relational Database): Stores structured data such as user information, chat messages, and meeting logs.

  - MongoDB (NoSQL Database): Handles unstructured data like live transcripts and AI processing results.

  - Cloud Storage (AWS S3, Google Cloud Storage): Used for saving meeting recordings, shared files, and logs.

- **APIs & Services:**

  - Authentication APIs: Uses OAuth 2.0 and JWT tokens for secure user authentication.

  - WebRTC API: Manages real-time audio/video communication between participants.

  - AI APIs (TensorFlow, OpenAI Whisper, Google Speech-to-Text): Used for speech recognition, sentiment analysis, and real-time transcription.

  - Messaging APIs (WebSockets): Enables real-time chat and notifications.

  - Payment API (Stripe, PayPal): If a premium model is needed, integrates with payment gateways.

4.4   Communication Interfaces

Defines how the system communicates over networks, ensuring seamless and secure data exchange.

- **Supported Network Protocols:**

  - WebRTC (Real-Time Communication Protocol): Facilitates low-latency video and audio transmission.

  - HTTP/HTTPS (REST API): Used for user authentication, fetching meeting details, and managing user data.

  - WebSockets: Enables real-time chat messaging and instant notifications.

- **Security & Encryption:**

  - TLS/SSL Encryption: Ensures secure data transfer over HTTPS.

  - End-to-End Encryption (E2EE): Encrypts voice, video, and chat messages so that only participants can decrypt them.

  - OAuth 2.0 & Multi-Factor Authentication (MFA): Prevents unauthorized access.

- **Data Transfer & Synchronization:**

  - Cloud-Based Synchronization: Meeting details, user preferences, and chat history are synced across devices.

  - Bandwidth Optimization: Dynamically adjusts video resolution and frame rate based on network speed.

- **Third-Party Integrations:**

  - Google Calendar & Outlook API: Allows users to schedule and sync meetings.

  - Email Notifications (SMTP, SendGrid): Sends meeting invites and reminders.

  - Slack & Microsoft Teams API: Can be integrated to notify users about upcoming meetings.

5 Other Nonfunctional Requirements

5.1 Performance Requirements

Response time:

- **Login/Authentication:** The system should be able to authenticate users within 2 seconds of submitting credentials.

- **API Response Time:** Backend APIs should respond to requests within 1s for typical operations (e.g., RESTful APIs, Python APIs).

- **Loading Time:** Pages should load within 3 seconds on average for a smooth user experience. Complex pages like the interview scheduling interface may take up to 5 seconds.

- **Message Delivery:** The system shall ensure that chat messages are delivered with a maximum delay of 1 second.

Data Storage & Retrieval:

- The database should support fast read/write operations (less than 300 ms for data retrieval and submission) for user credentials, user preferences, chats, etc.

Concurrency:

- The system shall support a minimum of 100 concurrent users per session without performance degradation.

- The system shall dynamically allocate server resources to handle peak loads efficiently.

5.2 Safety Requirements

Authentication & Authorization:

- **OAuth 2.0:** The system must implement OAuth 2.0 to ensure secure authentication for all users (admins, hosts, and participants).

- **Role-Based Access Control (RBAC):** The system should implement role-based access control to restrict access to data and actions based on the user's role.

Data Protection:

- The system shall provide a fail-safe mechanism to gracefully handle server crashes without data loss.

Video and Communication:

- The system shall notify users before ending a session due to inactivity.

- The video conference link should be unique and time-limited to prevent unauthorized access.

5.3   Security Requirements

Data Encryption:

- The system shall enforce end-to-end encryption (E2EE) for all video sessions to ensure no unauthorized users can intercept the communication.

- All data transmitted between the client and server must be encrypted using Transport Layer Security (TLS) to prevent man-in-the-middle attacks.

- **Encryption at Rest:** All sensitive data stored in the database like user credentials, chats must be encrypted using AES-256 or an equivalent industry-standard encryption algorithm to protect from unauthorized access.

APIs Security:

- OAuth 2.0 tokens or API keys should authenticate all API calls to ensure only authorized services are able to access the backend APIs.

Audits:

- The system shall conduct periodic security audits to identify and mitigate vulnerabilities.

- The system shall log all access attempts and provide audit trails for security monitoring.

5.4   Software Quality Attributes

- **Reliability:** The system shall provide 99.9% uptime availability to ensure reliability.

- **Scalability:** The system shall be designed with a modular architecture to support future scalability and feature enhancements.

- **Compatibility:** The system shall maintain cross-browser and cross-platform compatibility.

- **Usability:** The system shall undergo regular usability testing to ensure an intuitive user experience.

- **Availability:** The system shall be operational and accessible to users whenever needed.

- **Portability:** The system shall be able to run across various platforms and devices without any major changes.

- **Interoperability:** The system shall be able to work seamlessly with other platforms without any crashes.

- **Security:** The system should be able to protect the user's data from any unauthorized access or external attacks.

- **Flexibility:** The system should be able to adapt to changing technologies or requirements without significant effort.

Appendix A: Glossary

A

- **AI (Artificial Intelligence)** – The use of machine learning algorithms to provide features like transcription and sign language recognition.

- **Audit Trail** – A secure log that tracks all access attempts and modifications for security monitoring.

- **Authentication** – The process of verifying user identity before granting access.

- **Authorization** – The process of granting or restricting access to system features based on user roles.

C

- **Cloud Storage** – A remote storage solution for saving meeting recordings and other data securely.

- **Concurrency** – The ability of the system to support multiple users and actions simultaneously.

- **Cross-Browser Compatibility** – The system's ability to function correctly across different web browsers.

- **Cross-Platform Compatibility** – The ability of the system to work across various operating systems and devices.

- **Compliance** – Adhering to legal and security regulations such as GDPR.

D

- **Data Encryption** – The process of converting data into a secure format to prevent unauthorized access.

- **Dynamic Resource Allocation** – A technique used to optimize server resources in response to real-time demand.

E

- **E2EE (End-to-End Encryption)** – A security measure ensuring that only the sender and recipient can access communication data.

F

- **Fail-Safe Mechanism** – A system feature that ensures continuity and prevents data loss in case of server crashes.

- **Feature Scalability** – The ability of the system to add new features without affecting existing functionality.

G

- **GDPR (General Data Protection Regulation)** – A European data privacy law that regulates how user data is collected, stored, and processed.

H

- **Haptic Feedback** – The use of vibrations to provide notifications, enhancing accessibility for visually impaired users.

- **High Availability** – A system's ability to maintain uptime and remain accessible with minimal downtime.

L

- **Latency** – The time delay between user action and system response, critical for real-time communication.

- **Link Generation** – The process of creating unique URLs for meetings and chat sessions.

M

- **Media Sharing** – The ability to send images, videos, and documents within the chat service.

- **Meeting Management** – A feature allowing users to schedule, organize, and manage virtual meetings.

- **Message Moderation** – The ability to delete, report, or control chat messages to maintain security and compliance.

- **Multi-Factor Authentication (MFA)** – A security system requiring multiple verification methods before granting access.

N

- **Nonfunctional Requirements (NFRs)** – System properties such as performance, security, and usability that do not define specific functionalities but are essential for system effectiveness.

- **Notification System** – A mechanism for informing users about important updates, such as scheduled meetings and security alerts.

P

- **Peak Load Handling** – The system's capability to efficiently manage high user traffic without performance degradation.

- **Privacy Policy** – A legal statement detailing how user data is collected, used, and stored.

R

- **RBAC (Role-Based Access Control)** – A security model that grants permissions based on predefined roles (e.g., admin, participant).

- **Real-Time Messaging** – The ability to send and receive text messages instantly during a meeting.

- **Recording Storage** – The process of securely saving and managing meeting recordings in the cloud.

S

- **Scalability** – The system's ability to handle growth in users and features without performance issues.

- **Scheduling Conflict Resolution** – A feature that detects overlapping meetings and suggests alternative time slots.

- **Security Audit** – A process of systematically reviewing the system to identify and mitigate security vulnerabilities.

- **Sign Language Recognition** – An AI-powered feature that translates sign language gestures into text or speech for accessibility.

U

- **Uptime Guarantee** – A commitment to ensuring system availability for a specified percentage of time (e.g., 99.9%).

- **Usability Testing** – A process of evaluating the system's interface and user experience to improve accessibility and functionality.

W

- **WebRTC (Web Real-Time Communication)** – A technology that enables real-time video, audio, and data sharing in web browsers without additional plugins.

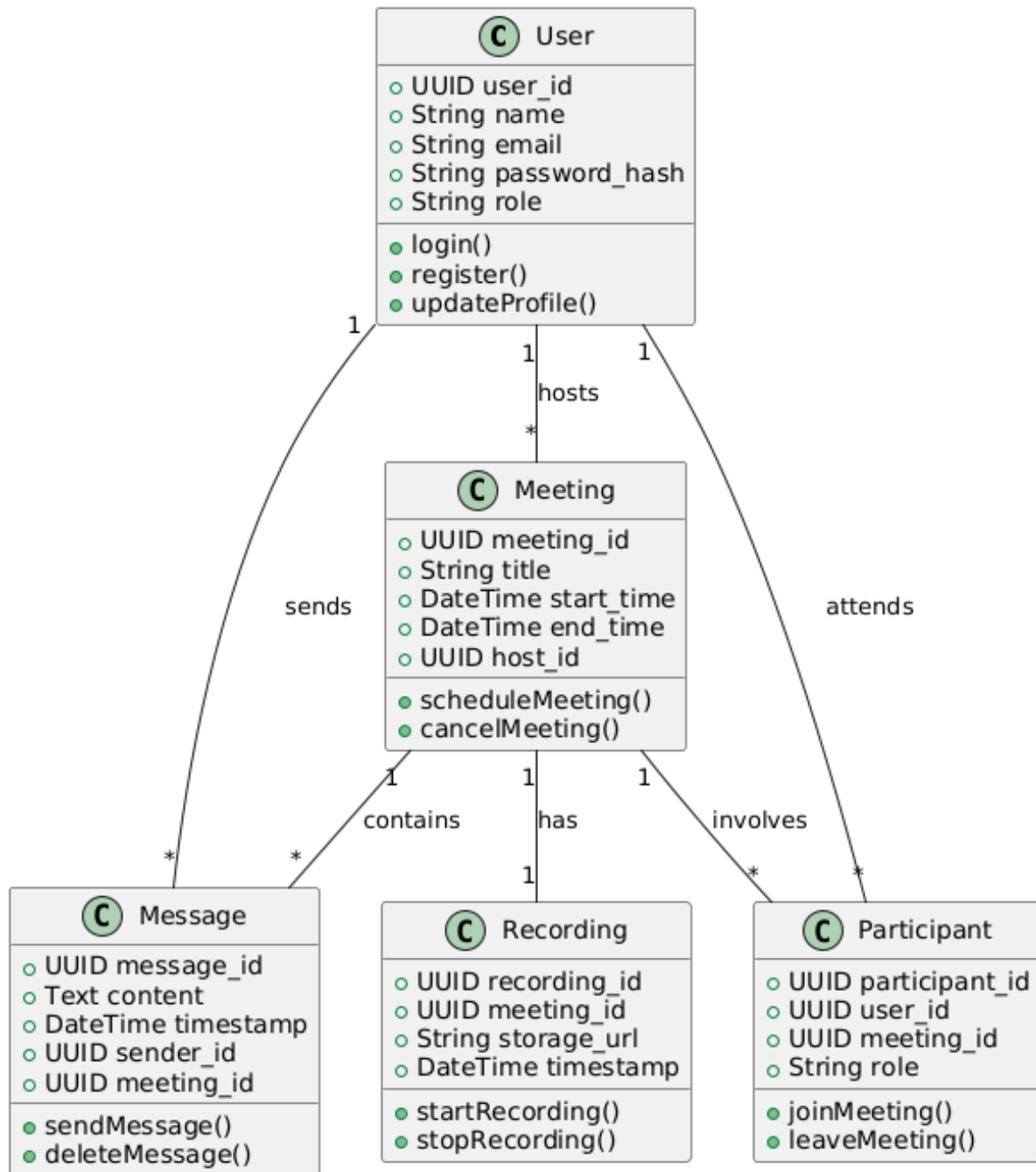# Appendix B: Analysis Models

B.1   Class Diagram

Figure 1: Class Diagram for EquaSpace

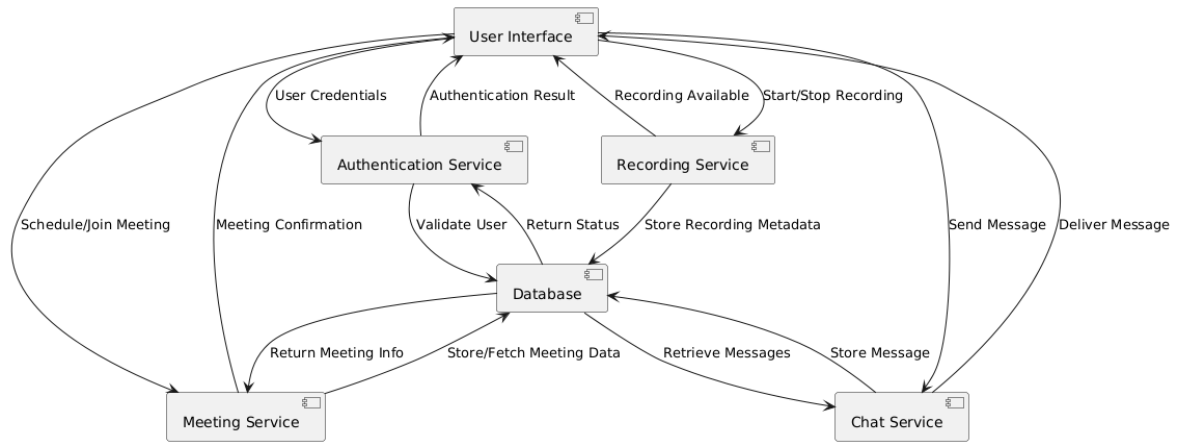## B.2 Component Diagram

Figure 2: Component Diagram for EquaSpace
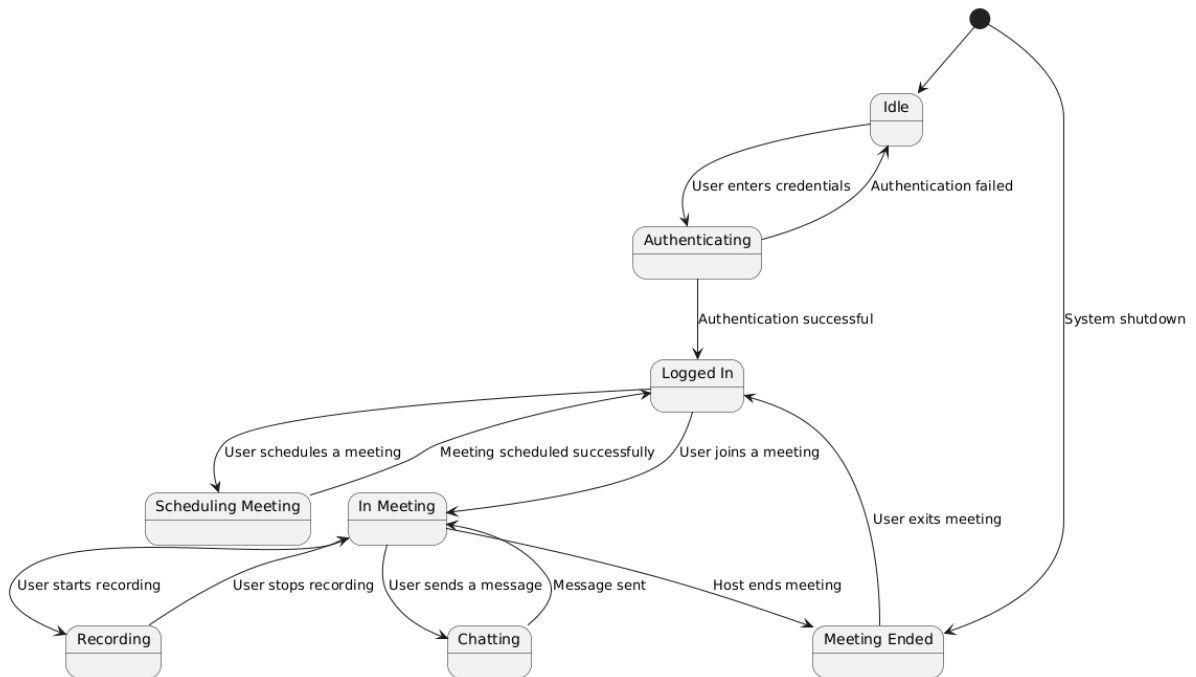
B.3 State Transition Diagram

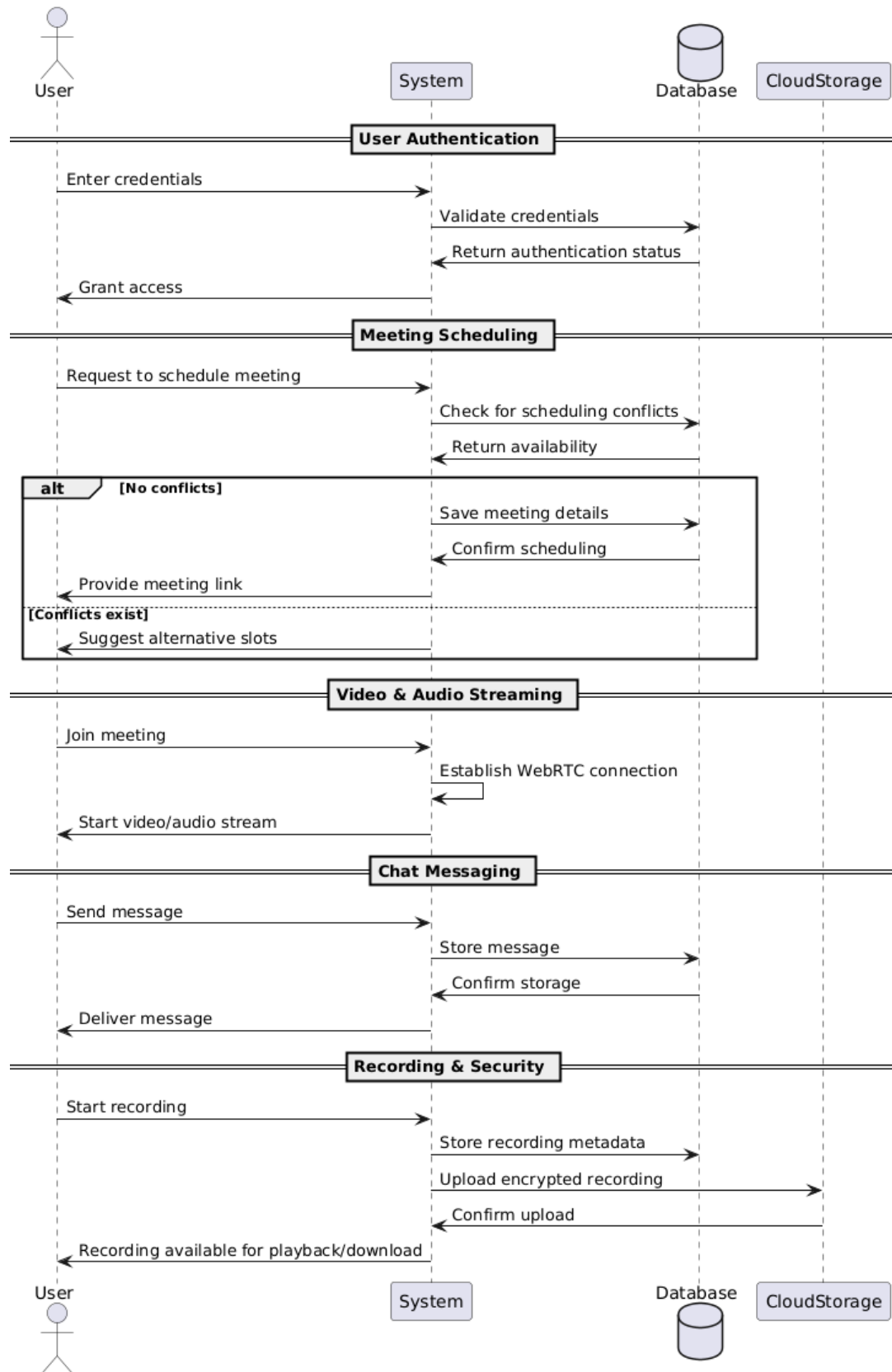Figure 3: State Transition Diagram for EquaSpace

B.4   Sequence Diagram

Figure 4: Sequence Diagram for EquaSpace