SOFTWARE DESIGN SPECIFICATION

ConnectTree Application

Version 1.0

Jordan Kelley
Buchard Joseph
David Martinez

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Contents

1 System Description

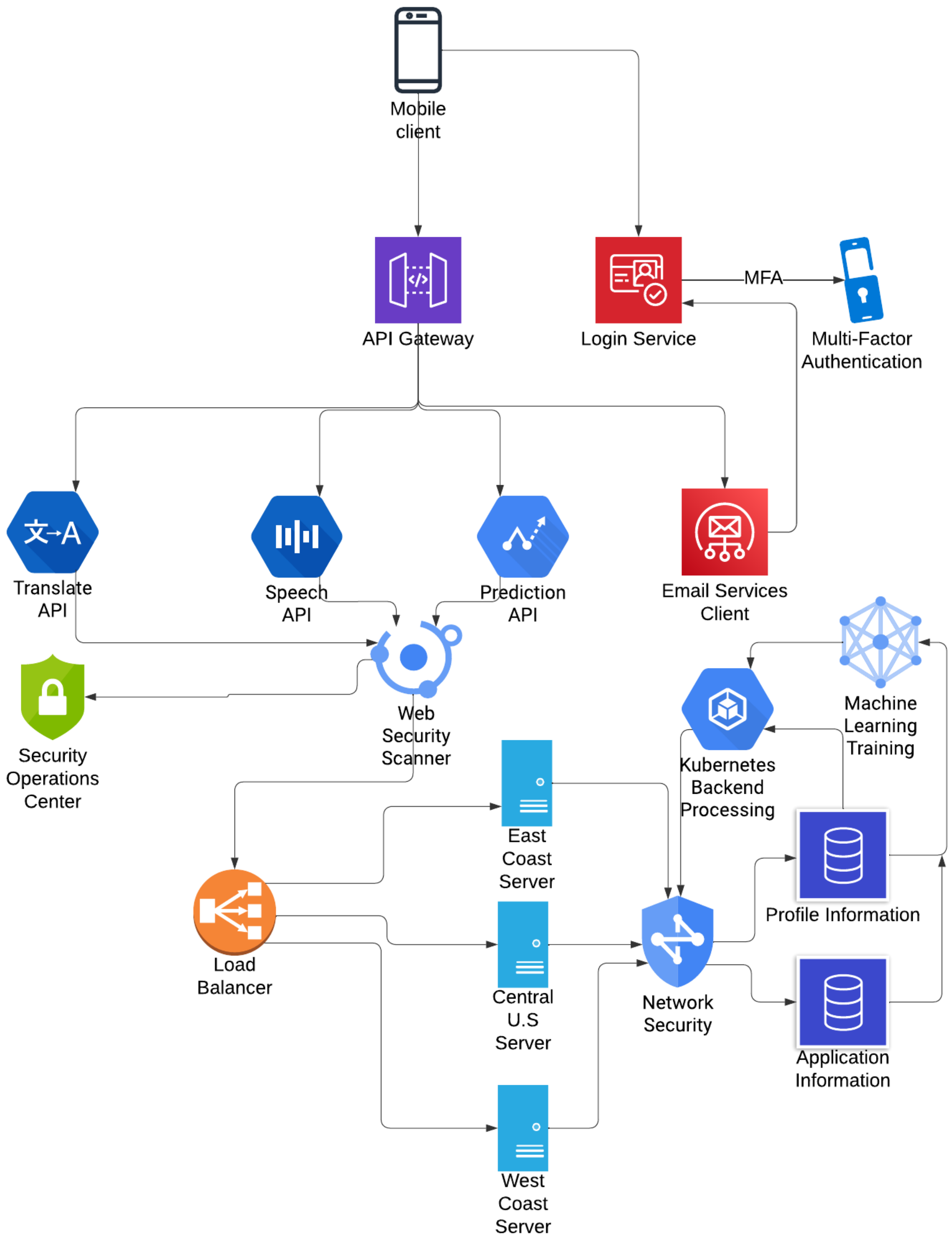
Purpose

This system is designed to create a networking tool for both professionals and the everyday person. Unlike other networking tools, this app aims to be less focused on the social media aspect of things and rather having a social network within easy grasp. Different views will allow the user to view their contacts as lists, categories, and even a broad web of connected bubbles.

Target Audience

The primary audience for the application will be professionals looking to have a structured and organized network of contacts. However, the secondary audience will be application to a normal customer base.

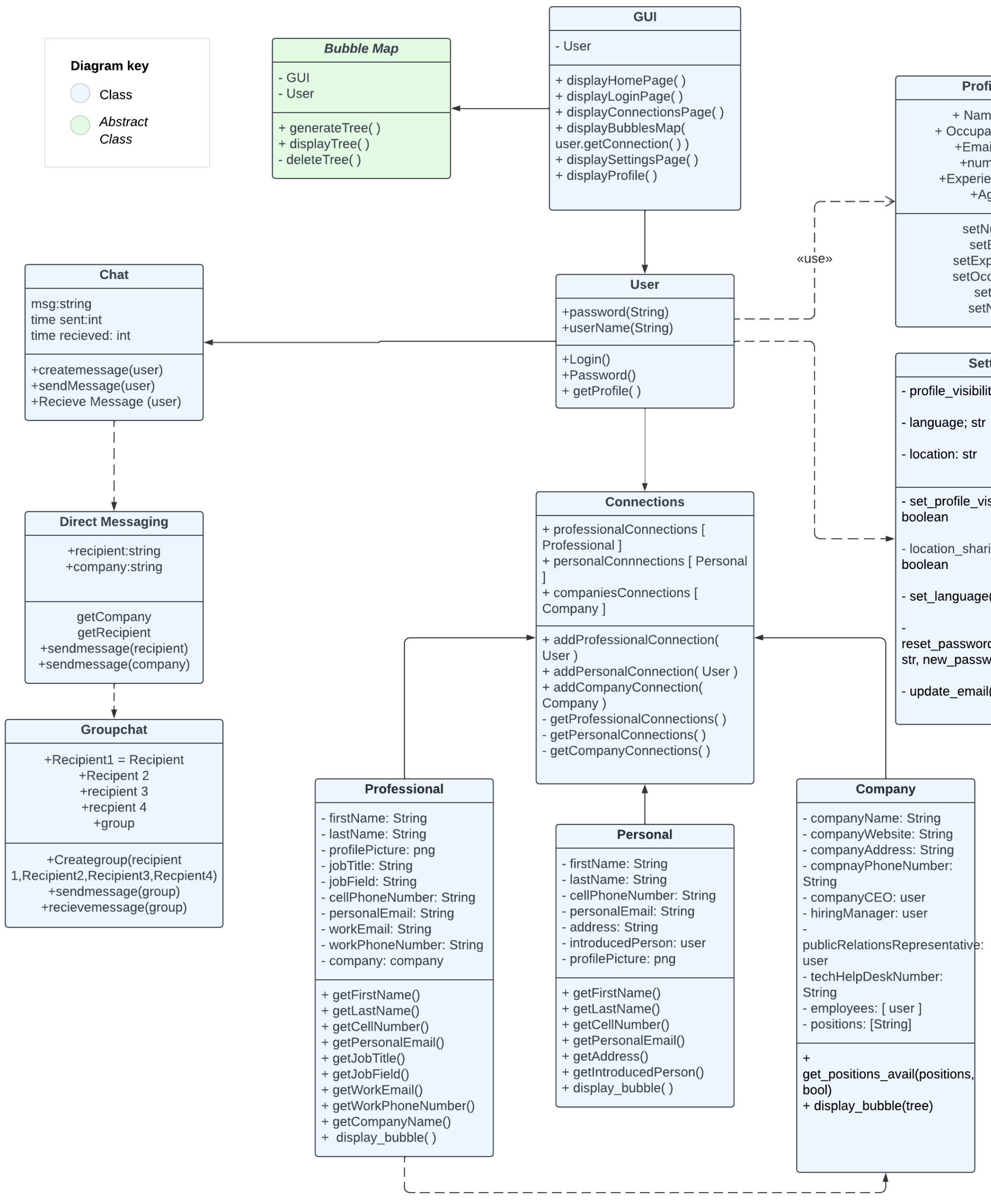
2 Software Architecture Overview



2.1 Architecture Diagram Descriptions

- User: User first logs in through the login service. From there the login service will use a Multi-Factor Authentication (MFA) for better security practices. Once the user has been verified, the login service will then return a valid certificate to the user device to then be used for access to the system.
- API Gateway: Once the user has a valid certificate, they get connected to the API gateway. This gateway will then connected the user to multiple API's to handle different tasks:
  - Translate API: Translates text from users through a 3rd party translation service.
  - Speech API: Takes speech from the user and transposes it to text.
  - Prediction API: Uses users previous system interactions to predict what they may do next.
  - Email Services Client: Connects User to outside email client.
- Web Security Scanner: After the API(S) perform their task, the traffic is then routed through a security software. If there exist any threat, the traffic is halted and a log is sent to the Security Operations Center (SOC).
  - SOC: This will be a third party security monitoring service that will access threats and then send sercurity patches to the web security scanner as needed.
- Load Balancer: This will take all incoming traffic and distriubte the traffic amongst three servers based on geographic location and server load.
  - East Coast Server: Handles all traffic with IP address from the east of 90 Degrees West.
  - Central U.S Server: Handles all traffic with IP address between 110 Degrees West and 90 Degrees West. This will also be the first server to take extra load from East and West Servers.
  - West Coast Server: Handles all traffic with IP address West of 110 Degrees West.
- Second Network Security Scanner: After being assigned a server, traffic between servers and Databases will require an additional security scan and encryption.
- Databases:
  - Profile Information: This database should hold all profiles and their relevant information.
  - Application Information: This database should hold all information relevant to the application framework. Think images, algorithms, API information, data analysis, etc...
- Machine Learning Training: This will take information from user interactions with the databases and then try and develop better data processing / storage methods and try and figure out how to analyze user interactions with the system.
- Kubernetes Backend Processing: Performs application rendering of information on the server side rather than the client side. This allows for the app to work with different levels of client software and neglects the need to consider client hardware capabilities.

2.2 ULM Class Diagram



3 Description of Classes, Attributes, and Operations

3.1 User

This class represents a system user with personal login capabilities.

Attributes

- **password (String)**: The user's password for login.
- **userName (String)**: The username for login.

Operations

- **Login()**: Authenticates the user.
- **Password()**: Verifies a password.
- **getProfile()**: Retrieves the user's profile information.

3.2 Connections

Handles the different types of connections a user can have.

Attributes

- Arrays of different connection types like professional, personal, and companies, suggesting each user can have multiple connections of each type.

Operations

- **addProfessionalConnection(User)**: Adds a professional connection.
- **addPersonalConnection(User)**: Adds a personal connection.
- **addCompanyConnection(Company)**: Adds a connection to a company.
- **getProfessionalConnections()**: Returns a list of professional connections.
- **getPersonalConnections()**: Returns a list of personal connections.
- **getCompanyConnections()**: Returns a list of company connections.

3.3 Settings

Manages user settings related to privacy and preferences.

Attributes

- **profile_visibility (bool)**: Boolean indicating if the profile is visible to others.
- **language (str)**: Preferred language setting.
- **location (str)**: User's location.

Operations

- **set_profile_visibility(user)**: Sets the visibility of the user's profile.
- **location_sharing(user)**: Shares or hides the user's location.
- **set_language(language)**: Sets the user's preferred language.
- **reset_password(old_password, new_password)**: Resets the user's password.
- **update_email(new_email)**: Updates the user's email.

3.4 ProfileInfo

Contains detailed personal information about the user.

Attributes

- **Name, Occupation, Email, Number, Experience, Age**: Basic profile information.

Operations

- Various setters (e.g., **setNumber**, **setEmail**, etc.) to update profile information.

3.5 Personal

Details a personal connection.

Attributes

- **firstName**, **lastName**, **cellPhoneNumber**, **personalEmail**, **address**, **introducedPerson**, **profilePicture**: Personal details of the connection.

Operations

- Getters for each attribute.
- **display_bubble()**: Method to display user details visually.

3.6 Company

Represents a company in the user's network.

Attributes

- Company-specific details such as **name**, **website**, **address**, **phone number**, **CEO**, and other relevant personnel.

Operations

- **get_positions_avail(positions, bool)**: Shows available positions within the company.
- **display_bubble(tree)**: Displays information in a visual format.

3.7 Professional

Details a professional connection.

Attributes

- Professional and contact details similar to those found in Personal.

Operations

- Getters for professional details.
- A method to display these details visually.

3.8 Direct Messaging

Facilitates messaging between users.

Attributes

- **recipient**, **company**: Identifiers for message recipients.

Operations

- **getCompany**, **getRecipient**: Retrieve details about the message recipient.
- **sendmessage(recipient/company)**: Send messages to either a company or an individual.

3.9 GUI

Manages the graphical user interface components.

Operations

- Methods to display different user interface pages like home, login, connections, settings, and profile pages.

3.10 Groupchat

Manages messaging within a group.

Attributes

- Recipients' list and a group identifier.

Operations

- **Creategroup**: Creates a new group chat.
- **sendmessage**, **recievemessage**: For sending and receiving messages in a group.

3.11 Bubble Map

Visual representation of connections or data.

Operations

- **generateTree**, **displayTree**, **deleteTree**: Manage visual representation of hierarchical data.

3.12 Chat

Manages chat messages.

Attributes

- **msg**, **time sent**, **time received**: Stores message data and timestamps.

Operations

- **createmessage**, **sendMessage**, **RecieveMessage**: Manage sending and receiving messages.

4 Development Plan and Timeline

Stage	**Tasks**	**Assigned to**	**Duration (Weeks)**
1. Requirements Analysis	Define app objectives, user interactions, and connection flow (user profiles, professional, personal connections)	Developer 1	1
	Gather and document detailed functional and non-functional requirements for ConnectTree	Developer 2	1
	Identify constraints, platform dependencies, security considerations for connections	Developer 3	1
2. System Design	Create UI/UX mockups, including connection bubbles, user interfaces	Developer 1	2
	Define software architecture, class diagrams, and data structures for tree connections	Developer 2	2
	Define API contracts for managing connections and messaging, database schema design	Developer 3	2
3. Implementation	Develop front-end, including user interfaces and bubble map navigation for connections	Developer 1	4
	Implement back-end services for handling professional, personal, and company connections	Developer 2	4
	Set up database integration, user authentication, and real-time messaging services	Developer 3	4
4. Integration and Testing	Unit testing of UI components and navigation	Developer 1	2
	Integration testing between front-end, back-end services, and database	Developer 2	2
	System testing, ensure compliance with Appstore guidelines and security tests for connections and messaging	Developer 3	2
5. Deployment	Prepare ConnectTree for submission to App Store	Developer 1	1
	Finalize and review all technical documentation and user manual	Developer 2	1
	Deploy app to TestFlight and collect feedback from beta testers	Developer 3	1
6. Maintenance	Monitor app performance, fix bugs, release updates based on user feedback	All Developers	Ongoing