SOFTWARE DESIGN SPECIFICATION

ConnectTree Application

Version 1.0

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1 System Description

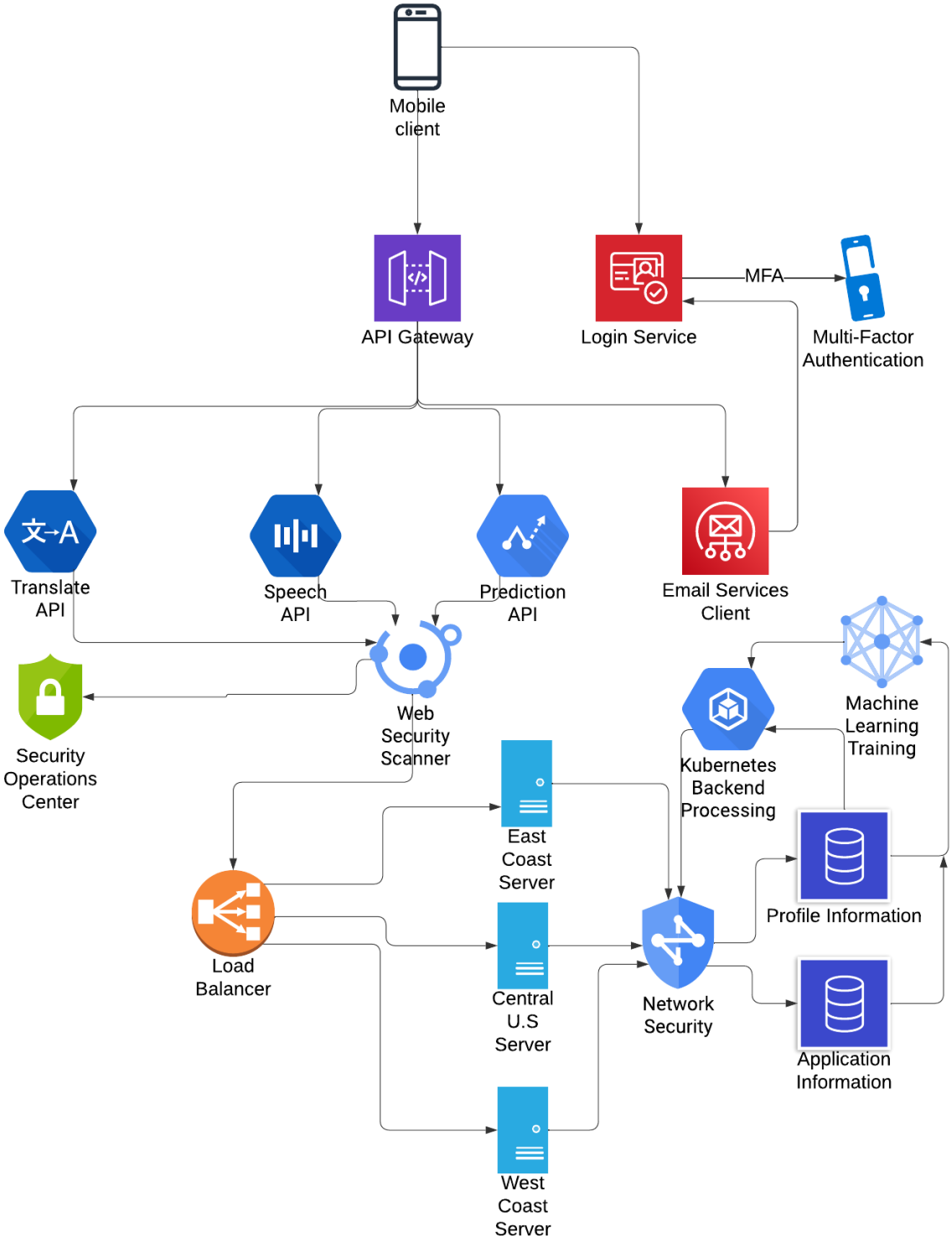
Purpose

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.

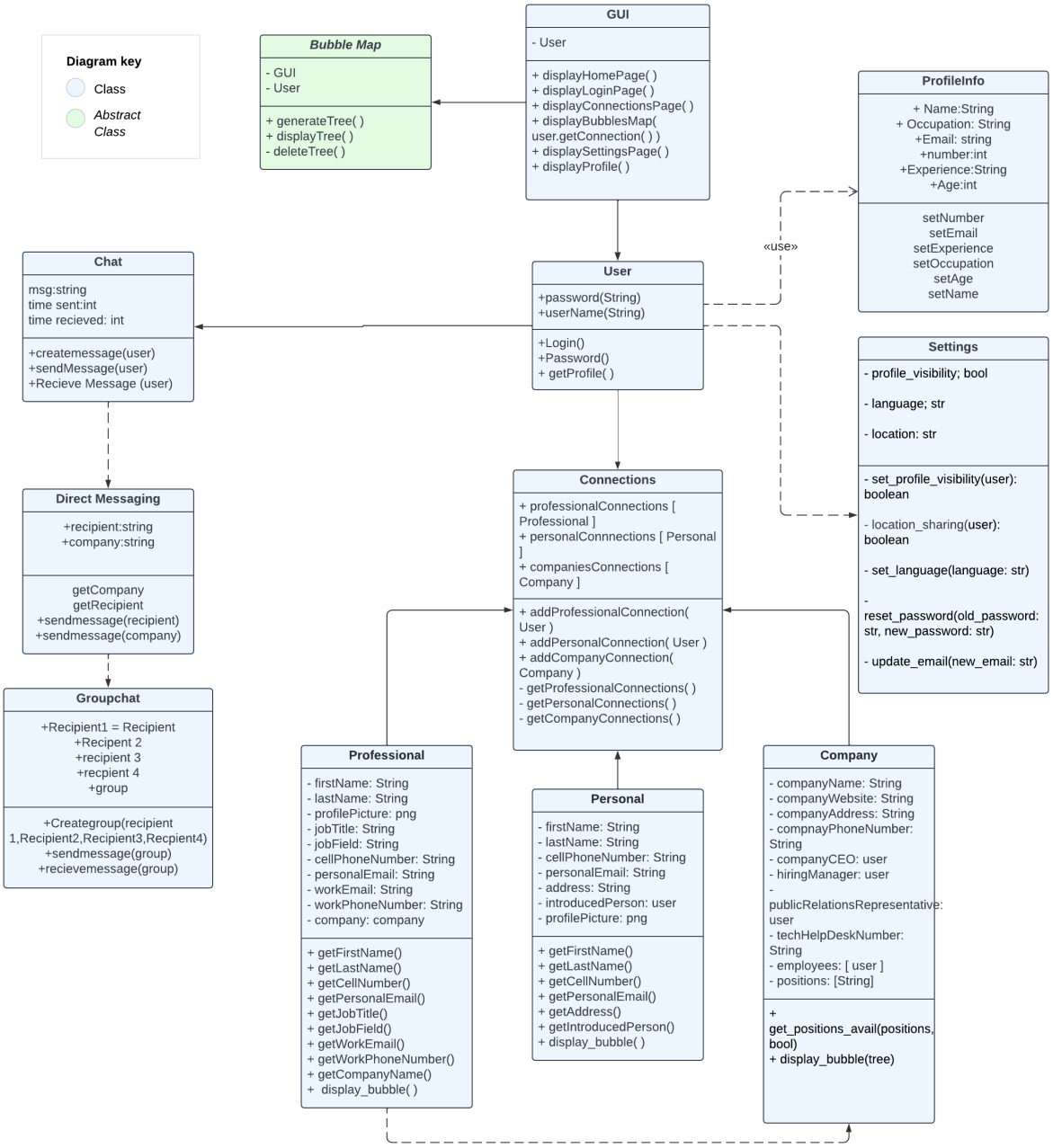
2 Software Architecture Overview



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:
  - Speech API:
  - Prediction API:
  - Email Services 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:
  - Application Information:
- Machine Learning Training:
- Kubernetes Backend Processing:

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 stories, 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 for ConnectTree, 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 (Swift UI), including user interfaces and bubble map navigation for connections	Developer 1	4
	Implement back-end services (Swift, iOS SDK) 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 Apple guidelines and security tests for connections and messaging	Developer 3	2
5. Deployment	Prepare ConnectTree for submission to Apple 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