

Encompass Application Architectural Patterns Documentation

Overview

This documentation provides an overview of the architectural patterns used in the design of our Encompass application. The application utilises a combination of multi-tier architecture, publish-subscribe pattern, layered architecture, and Command Query Responsibility Segregation (CQRS) pattern to ensure scalability, flexibility, and maintainability.

Publish-Subscribe (Pub-Sub) Architecture:

The publish-subscribe architecture, also known as the event-driven architecture, allows Encompass users to subscribe to specific communities of interest. When a client publishes a message to a channel, all subscribed clients receive the message. This pattern facilitates real-time communication and enables the creation of chat rooms or group conversations.

Event Sourcing and CQRS:

The Encompass application incorporates the CQRS pattern to separate the responsibilities of commands (write operations) and queries (read operations) for improved scalability and performance. Key aspects of CQRS include:

Commands:

Responsible for modifying the state of the chat system.

Processes message sending, user authentication, and other write operations.

Writes events to the event store.

Queries:

Responsible for retrieving data from the chat system.

Handles message retrieval, user profile display, and other read operations.

Reads events from the event store and generates query-specific views.

Event Store:

Stores all events representing state changes in the chat system.

Maintains an append-only log of events for auditing and rebuilding the system's state.

Provides event sourcing capabilities.

Multi-Tier Architecture

The multi-tier architecture divides the Encompass application into three distinct tiers: the presentation tier, the application/business logic tier, and the data/storage tier. This separation enables modular development, scalability, and ease of maintenance.

Presentation Tier

The presentation tier is responsible for handling user interactions and displaying the app interface. It includes components such as the user interface (UI) and the client-side application logic.

Application/Business Logic Tier

The application/business logic tier contains the core logic of the Encompass application. It handles user authentication, message processing, AI, and business rules. This tier communicates with the presentation tier and the data/storage tier.

Data/Storage Tier

The data/storage tier handles the persistence and retrieval of relevant data to the Encompass app user..