

System Design

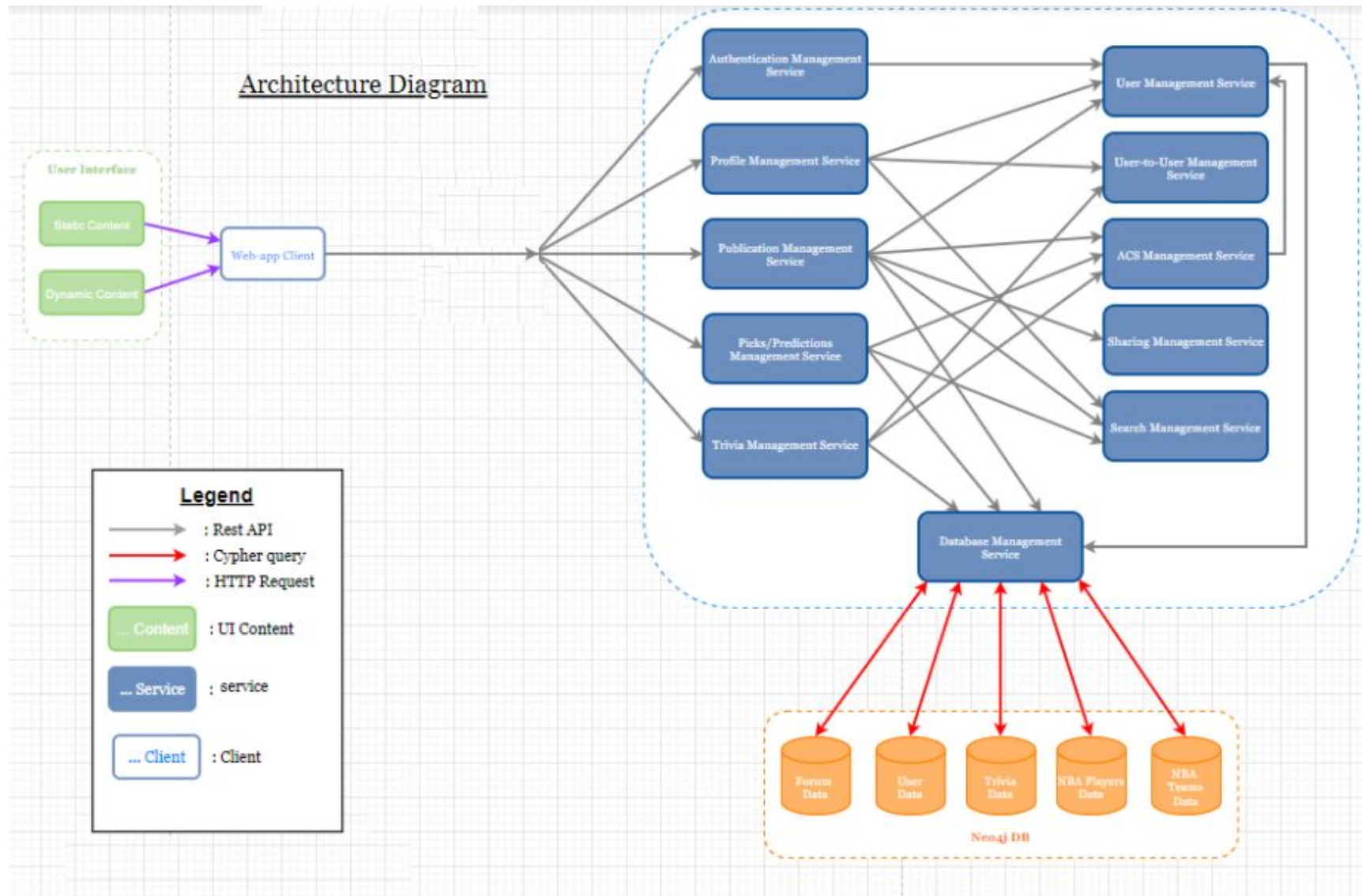
CSCC01 - CS GANG

Sprint 4

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Software Architecture Diagram



We have changed our architecture from Microservices to a monolithic Client-Server architecture. Doing this significantly lowered the latency on big requests (like fetching posts) and also made it much easier to implement long polling for notifications and multiplayer Trivia. We cannot use the common MVC pattern because in the React framework (which we are using for our frontend) has extremely tightly couple display and display logic, so the view and controller would essentially overlap.

Design patterns used in System Design (cannot be shown in architecture diagram):

Behavioral design pattern:

- Iterator: There will be an iterator interface that will be implemented by the Question, ConsumeRest, and Trivia class to sequentially traverse all the questions in the db to determine which questions the user is supposed to be shown
 - Collaborators: ConsumeRest, Trivia, Main

CRC Cards

===== Front-end classes =====

Class name: App

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Initialize Webpage
 - Set up UI theme
 - Set up routes

Collaborators: PrivateRoute, SignUp, Debate, OpenCourt, LogIn, Account, Trivia, Profile, PrivateRoute, SideBar, SearchUser, OpenCourtPost, VisitorOpenCourtPost, Predictions, Analysis, User, StrangerProfile, Leaderboards, SearchResults

Class name: Dashboard

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Add styling to SideBar

Collaborators: SideBar

Class name: Analysis

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Post question of the day to debate
- Maintain all attributes associated with the question of the day

Collaborators: UserPost, ApiCalls

Class name: Debate

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Post question of the day according to the user's tier level
- Accept user's answer and redirect to analysis

Collaborators: ApiCalls

Class name: UserPost

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Display a single user's name, profile pic, post and rating
- Allow user to send rating to post
- Anonymize user's info till reveal button is clicked

Collaborators: ApiCalls

Class name: Leaderboards

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displaying the leaderboards for global and tier based users
- Connects with backend to fetch data for different tiers

Collaborators: N/A

Class name: Login

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Check User's credentials and redirect them to The Zone if successful
 - Display error message in case incorrect user credentials
- Store JWT token when credentials are valid for future API requests

Collaborators: ApiCalls, SignUpScript

Class name: VisitorOpenCourtPost

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Show a single post to public (for non login user)
- Note: Because we need to share/repost our posts to other social networks, we need these pages for public access

Collaborators: FacebookShareButton, RedditShareButton, TwitterShareButton, TumblrShareButton

Class name: OpenCourtPost

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Show a single post (for login user)

Collaborators: Post

Class name: OpenCourtIndex (/open-court/index.js)

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Show uploadPost, so that users have the ability to upload new Post
- Show the list of Post, so that users can browse all current posts

Collaborators: uploadPost, Post, fetchUserProfilePic

Class name: UploadPost

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Display the avatar and name of the user who currently using The Zone
- Display an input field to allow users to enter post content (text)
- Display a picture input button, allowing users to edit pictures to post content (img format)
- Display upload button, allowing users upload the post content to create Post

Collaborators: N/A

Class name: Post

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Display post content and author information including (avatar, name, acs, email)
- Can be selected and enter a separate post page to display only one post
- Integrated with ShareMenu, Comment, Like and providing buttons to access their function
- Display PostComment

Collaborators: Like, ShareMenu, PostComment, FacebookEmbeds, TwitterEmbeds, RedditEmbeds, InsEmbeds

Class name: Like

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Provide like and dislike buttons, and update background information relatively
- When dislike is selected after like, the previous like will be cancelled, and vice versa

Collaborators: N/A

Class name: Comment

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- The user can edit the reply message in the input box
- The user can click the "Add Reply" button to reply to the current post
- When the user replied to a post, refresh current PostComment

Collaborators: Like

Class name: PostComment

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Support folding function, when it is turned on, only the latest comment of the current post is displayed

- Uniquely responsible and display all the comments with commenter for each different the zone post, and each different comment

Collaborators: N/A

Class name: ShareMenu

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Merge all share/repost functions to one drop-down button
- Uniquely responsible and displayed in each different the zone post

Collaborators: Post, FacebookEmbeds, TwitterEmbeds, RedditEmbeds, InsEmbeds

Class name: FacebookEmbeds

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Allow users to share/repost the current post to Facebook post
- Including the title, content, url and tag of The Zone Post

Collaborators: N/A

Class name: RedditEmbeds

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Allow users to share/repost the current post to Reddit post
- Including the title, content, url and tag of The Zone Post

Collaborators: N/A

Class name: TwitterEmbeds

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Allow users to share/repost the current post to Twitter post

- Including the title, content, url and tag of The Zone Post

Collaborators: N/A

Class name: insEmbeds

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Allow users to share/repost the current post to Instagram post
- Including the title, content, url and tag of The Zone Post

Collaborators: N/A

Class name: Predictions

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Display a carousel games for which predictions can be made
- Update user's predictions in the backend
- Allow user to sort between conferences for games

Collaborators: PredictionsCard

Class name: PredictionsCard

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Display a particular game between two team
 - Display team's city
 - Display date of game
- Allow user to make prediction

Collaborators: N/A

Class name: Account

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Stores details pertaining to the user used in profile

Collaborators: Profile

Class name: PostTable

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays posts (Post) posted by Profile user

Collaborators: N/A

Class name: DebateTable

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays debate posts (UserPost) posted by Profile user

Collaborators: N/A

Class name: AcsTable

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays ACS history of Profile user

Collaborators: N/A

Class name: Radar (FriendsList)

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays list of friends belonging to a current user

- Allows routing of client to a user profile if clicked on

Collaborators: InviteButton, EditFriend

Class name: EditFriend

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays friend/unfriend button of a profile, given the current user
- Clicking the button toggles the friend of a user and the viewed profile

Collaborators: N/A

Class name: OptionButton

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Provide a button to switch the function between profile and edit profile (mode)

Collaborators: N/A

Class name: otherProfile

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays stranger profiles in read only mode in search results

Collaborators: Friend

Class name: Profile

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays user profile information
- Takes user input to update user profile
- Gives link for connection to profile url

Collaborators: ProfileService, UploadPicPopup, OptionButton

Class name: ProfileTabs

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays tabs for user to select which component to display
- Instantiates AcsTable
- Instantiates PostsTable
- Instantiates DebateTable
- Instantiates FriendsList

Collaborators: AcsTable, PostsTable, DebateTable, FriendsList(Radar)

Class name: UploadPicPopup

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Allows user to upload a picture
- Uploads a picture to a user profile

Collaborators: N/A

Class name: ViewProfile

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays user profile in read only mode
- Does not allow edits, used only to display non-user profiles
- Displays profiles to outsiders (not logged in)

Collaborators: UserProfile

Class name: PrivateRoute

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Checks if user is hold valid JWT token while trying to access protected routes
- Stores email and other prop information in localStorage

Collaborators: Dashboard, ApiCalls

Class name: AllResults

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays all search results of user profiles and posts
- Uses post class to display posts
- Uses friend class to work with friend and unfriend options

Collaborators: InviteButton, Post, Friend

Class name: SearchResult

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- container for all search results
- instantiates the search tabs and search results components

Collaborators: Tabs

Class name: SearchTabs

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays search results of type corresponding to the tab selected
- If search user tab is selected, user results are displayed
- If search tab posts is selected, posts are displayed

Collaborators: FriendsList, AllResults

Class name: SearchBar

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displays search bar in the sidebar for user to enter search query

Collaborators: N/A

Class name: NotifBell

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Display notification to users
- Show alert for new unread notifications

Collaborators: DualTrivia

Class name: SideBar

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Display navigation bar to access different pages and functionality while logged in
- Holds search bar, notification bell, log-out button and routes to other pages

Collaborators: SearchBar, NotifBell

Class name: SignUp

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Allows user to sign up
 - Get their names, email, phone number and additional information
- Validate email doesn't already exist

Collaborators: N/A

Class name: ConsumeRest

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Query responsible for getting a question that's currently valid for a user
- Query responsible for removing a question relationship from a user

Collaborators: N/A

Class name: DualTrivial

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Displaying front end features for trivia players
- Hosting event listeners to allow for long polling requests from backend

Collaborators: N/A

Class name: InviteButton

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Allows a user to invite another user to a multiplayer trivia game
- Sends a notification to a user as a request

Collaborators: DualTrivia, Profile

Class name: Question

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Contains all details of a question queried from backend
- Attributes:
 - Question
 - Option1

- Option2
- Option3
- answer

Collaborators: Trivia, DualTrivia

Class name: Trivia

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Allows user to play single player trivia
- Communicates with backend when querying new questions and removing relationship between question and user

Collaborators: N/A

Class name: TriviaQuestions

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Create relationship between user and all questions
- Add questions to the database

Collaborators: N/A

Class name: ApiCalls

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Authentication upon login via JWT token
- Checks credentials are valid

Collaborators: N/A

Class name: ProfileService

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Fetches the user profile picture and exports the function for profile use

Collaborators: N/A

Class name: SignUpScript

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Adds relationship between a particular user and a particular question
- If question does not exist, add question first

Collaborators: N/A

===== Backend classes =====

Class name: auth

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Verify that email and password correspond to user in db
- Generate a JWT token for the user's session

Collaborators: N/A

Class name: debate

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- This class is responsible for creating and rating Debate posts
- Get the day's debate post and ratings for user
- Update all user's ACS and send notifications

Collaborators: debate-queries, notif

Class name: leaderboards

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Fetch data for tier-based leaderboards
- Fetch data for general leaderboards

Collaborators: leaderboards-queries

Class name: multiplayer-trivia

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Begin a session for two user to play multiplayer trivia
- Fetch questions that none of the user answered

Collaborators: trivia-queries, multiplayer-trivia-queries, notifis

Class name: notifis

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Send notification for a specified user
- Send invitation for a specified user

Collaborators: notifis-queries

Class name: open-court

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Get posts and comments data for user
- Allow user to post
- Allow user to comment on posts
- Allow user to upload picture to their post

Collaborators: open-court-queries

Class name: picks

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Get predictions and picks for user
- Allow user to make picks on upcoming games

Collaborators: picks-queries, notifis

Class name: profile

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Get user's profile data
- Allow user to edit their profile info
- Get user's acs history
- Get user's debate history
- Get user's open court history
- Get user's friends

Collaborators: profile-queries

Class name: search

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Initiates route paths for search http requests
- Gets search results for user
- Gets search result for profile
- Gets combined search results of both of them
- Flattens lists of result list

Collaborators: search-queries

Class name: signup

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Allow user to sign up with credentials
- Check for validity of credentials

Collaborators: signup-queries

Class name: trivia

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Get questions for trivia that user didn't answer
- Allow user to record their answers

Collaborators: trivia-queries

Class name: main

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- initializes all imports
- initializes all paths and gin router

Collaborators: auth, debate, leaderboards, multiplayer-trivia, notifis, open_court, picks, profile, search, signup, trivia

Class name: debate-queries

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Fetch daily debate question for user
- Fetch other user's responses to debate question
- Record user's response to question in db
- Record user's ratings of other responses in db

Collaborators: N/A

Class name: leaderboards-queries

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Queries responsible for getting global leaderboards
- Queries responsible for getting tier based leaderboards

Collaborators: N/A

Class name: multiplayer-trivia-queries

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Gets trivia queries

Collaborators: N/A

Class name: notifs-queries

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Gets notification information
- Add notification info
- Checks if new notifications for given user
- Removes notification

Collaborators: N/A

Class name: open-court-queries

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Contains all queries for open court

- Gets post's from a user's history
- Add posts to a user's history

Collaborators: N/A

Class name: picks-queries

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Query responsible for getting daily picks
- Query responsible for adding new predictions
- Query responsible for getting prediction and pick outcomes

Collaborators: N/A

Class name: profile-queries

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Query responsible for updating profile
- Query responsible for following a user
- Query responsible for checking if someone is a friend
- Query for getting all profile attributes of a user

Collaborators: N/A

Class name: search-queries

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Query user by email
- Query user by hashtag
- Overall, its intention is to validate sign up fields

Collaborators: N/A

Class name: trivia-queries

Parent class (if any): N/A

Classname Subclasses (if any): N/A

Responsibilities:

- Adds relationship between user and trivia question
- Removes relationship between user and trivia question
- Fetch question user has never seen before

Collaborators: N/A