Architectural Design Specification

System Design Documentation

Music Space Project

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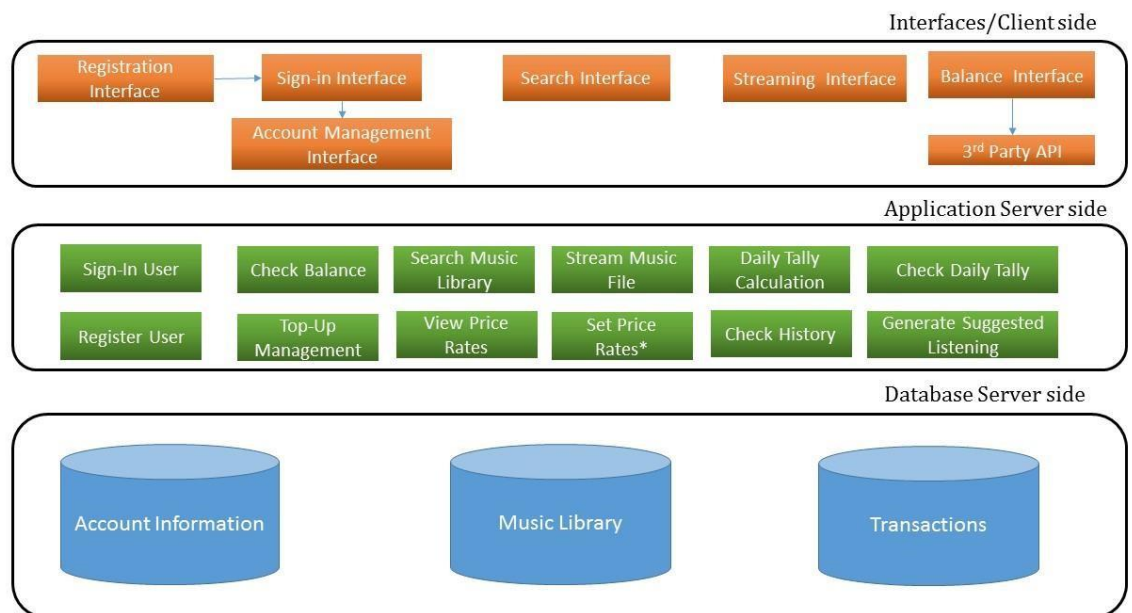
Table of Contents

1. Additional functionalities

R1. Suggested Listening: The service will take into account music that a given user listens to, and provide suggestions of other music that user may like, based on associated acts, genre, tone, etc.

R2. Social Media Link-up: as part of the Registration interface, users have the option to register via their social media rather than providing account information i.e. the service can gather user registration information (username, email, first and last names, etc.) from a social media linkup (e.g. Facebook).

2. System architecture

3-tier system architecture diagram

3. Components description

3.1. Interfaces/Client-side:

- **Account Management Interface:**
  a) Purpose: This component provides a user with account information details and allows users to make amendments to account details.

b) Associated Data: all account information associated particular to the authorized user. Including but not limited to, user ID and password, Email, payment history, daily song tally, account balance, etc.

- **Registration Interface:**
  a) Purpose: This component allows new users to sign up with user details and stores those details in the Account Information Database. Once registered the user is then forwarded to the Sign-In Interface. Alternatively, a user can opt to register for the service through various social media profiles. e.g. Facebook, google+, etc.
  b) Associated Data: all account information associated particular to the authorized user. Including but not limited to, user ID and password, full name, date of birth, gender, address, security question and answer, and (optionally) telephone numbers and secondary email addresses.

- **Sign-In Interface:**
  a) Purpose: This component allows already registered users to sign in to the service.
  b) Associated Data: user ID, password and, in the event of a forgotten user ID or password, an account retrieval form utilising the security question.

- **Search Interface:**
  a) Purpose: Allows logged-in users to search the music library, and returns the results of those searches. The searches may focus on artists, playlists, individual tracks, albums, genre, year of release, etc. This interface also integrates the generation of suggested listening, which is displayed beneath the search box and results.
  b) Associated Data: A string, inputted by the user, used to query the Music Library database. Data returned will include the details of each result, including metadata on all tracks/albums matching the search query.

- **Streaming Interface:**
  a) Purpose: Acts as a music player for the media selected by the user (log-in required).
  b) Associated Data: The track to be played, the tally track tally (to be incremented with each song use), the metadata of the track played, and cover art (where appropriate), and the current user's balance (only to be used if the track tally exceeds limit, queried to allow/disallow the track to be played (pending authorisation of payment for the track in question)).

- **Balance Interface:**
  a) Purpose: This component displays and allows for the topping up of the current user's monetary balance (top-up achieved via 3rd Party API). Transactional history and current track pricing can also be retrieved here.
  b) Associated Data: Account balance, transactional history, track pricing, user details.

- **3rd Party API:**
  a) Purpose: Allows the user to top up their account balance.
  b) Associated Data: User details, specifically user ID and account balance, payment details.

3.2. <u>Application Server-side:</u>

- **Check Balance:**
  a) Purpose: Allows the user to query their current account balance.
  b) Associated Data: User details, specifically user ID, and the associated account balance.

- **Top-Up Management:**
  a) Purpose: Allows the user to top up their current account balance, via the 3rd Party API.
  b) Associated Data: User ID, payment details, verification details, top-up details (amount, etc.).

- **Search Music Library:**
  a) Purpose: Allows the user to search the music library and returns the results of the search.
  b) Associated Data: A string, inputted by the user, used to query the Music Library database. Data returned will include the details of each result, including metadata on all tracks/albums matching the search query.

- **View Price Rates:**
  a) Purpose: Provides the user with access to the current price rates specified by the company providing the service.
  b) Associated Data: Current price rates.

- **Stream Music File:**
  a) Purpose: Provides the user with the requested music file, provided said user either is within the daily free-listening limit, or their balance is sufficiently large to process the request.
  b) Associated Data: Daily track tally, account balance, music file, user ID.

- **Set Price Rates:**
  a) Purpose: Allows the company providing the service, and only those users meeting that criteria, to alter the price rates for the music of the service.
  b) Associated Data: Price Rates, user ID.

- **Daily Tally Calculation:**
  a) Purpose: Keeps track of how many times any given user has accessed service content for free up to the limit on a given day. Once any given day has elapsed the tally will be reset to 0.
  b) Associated Data: User ID, Current Tally, fixed limit.

- **Check History**
  a) Purpose: retrieve all user history of tracks access and payment information if included
  b) Associated Data: Track library, track meta data, past transactions, current balance, user ID.

- **Check Daily Tally:**
  a) Purpose: Checks how many songs of the daily limit a user has used.
  b) Associated Data: User ID, Current Tally.

- **Generate Suggested Listening:**
  a) Purpose: Based off of the music already listened to by the current user, this function will suggest other music of a similar taste/genre to the user.
  b) Associated Data: User ID, track history, track metadata.

- **Register User:**
  a) Purpose: This component allows new users to sign up with user details and stores those details in the Account Information Database. Alternatively, a user can opt to register for the service through various social media profiles. e.g. Facebook, google+, etc.
  b) Associated Data: all account information associated particular to the authorized user. Including but not limited to, user ID and password, full name, date of birth, gender, address, security question and answer, and (optionally) telephone numbers and secondary email addresses.

- **Sign-In User:**
  a) Purpose: This component allows already registered users to sign in to the service.
  b) Associated Data: user ID, password and, in the event of a forgotten user ID or password, an account retrieval form utilising the security question.

3.3. Database Server-side:

- **Account Information Database:**
  a) Purpose: Stores all data pertaining to user account information.
  b) Associated Data: Account information of all registered users, including but not limited to, user IDs and passwords, Email addresses, daily song tallies, first and last names, home addresses, playlists created and their IDs, account balances, and (where appropriate) social media linkup data.

- **Music Library Database:**
  a) Purpose: Stores all data pertaining to the media files utilised by the system and its various interfaces.
  b) Associated Data: All media files and all associated metadata.

- **Transaction Database:**

a) Purpose: Stores all data pertaining to all users' transactional history, including both monetary transactions and media access history.
b) Associated Data: Payment and top-up histories for all users, media access histories for all users.

4. Component diagram