Snotify Architecture & Product Overview

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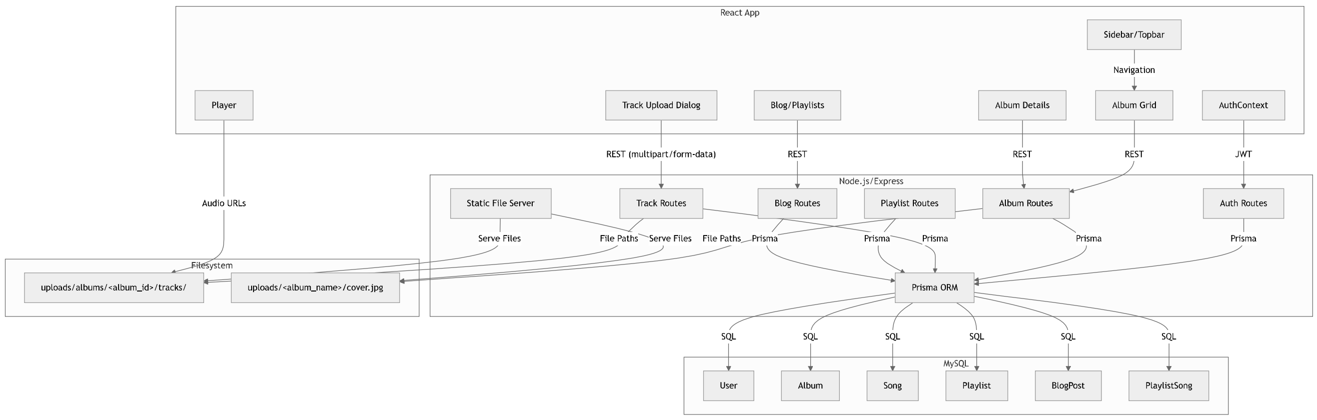
1. Product Vision

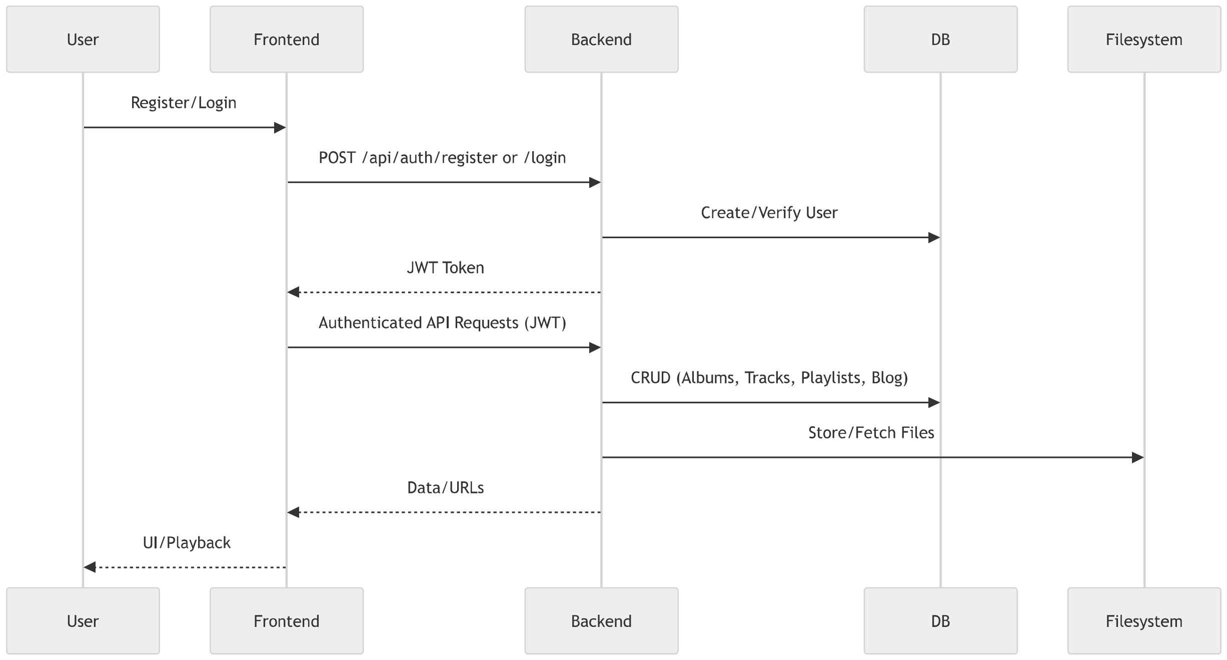
Snotify is a modern, maintainable music storage and player application with playlists, albums, and a blog. It features a responsive, user-friendly UI, secure JWT authentication, and stores all media as files (not blobs) for performance and simplicity. The app is designed for easy extensibility and robust user experience.

2. High-Level Architecture

2.1. System Overview (Mermaid Diagram)



2.2. App Flow (Mermaid Diagram)



2.3. Key Technologies

- **Frontend:** React, TypeScript, shadcn/ui, Heroicons/lucide-react, React Context, React Router
- **Backend:** Node.js, Express, Prisma ORM, JWT, Multer, music-metadata
- **Database:** MySQL (Prisma-managed)
- **Storage:** Filesystem (uploads directory, paths in DB)
- **Styling:** Tailwind CSS

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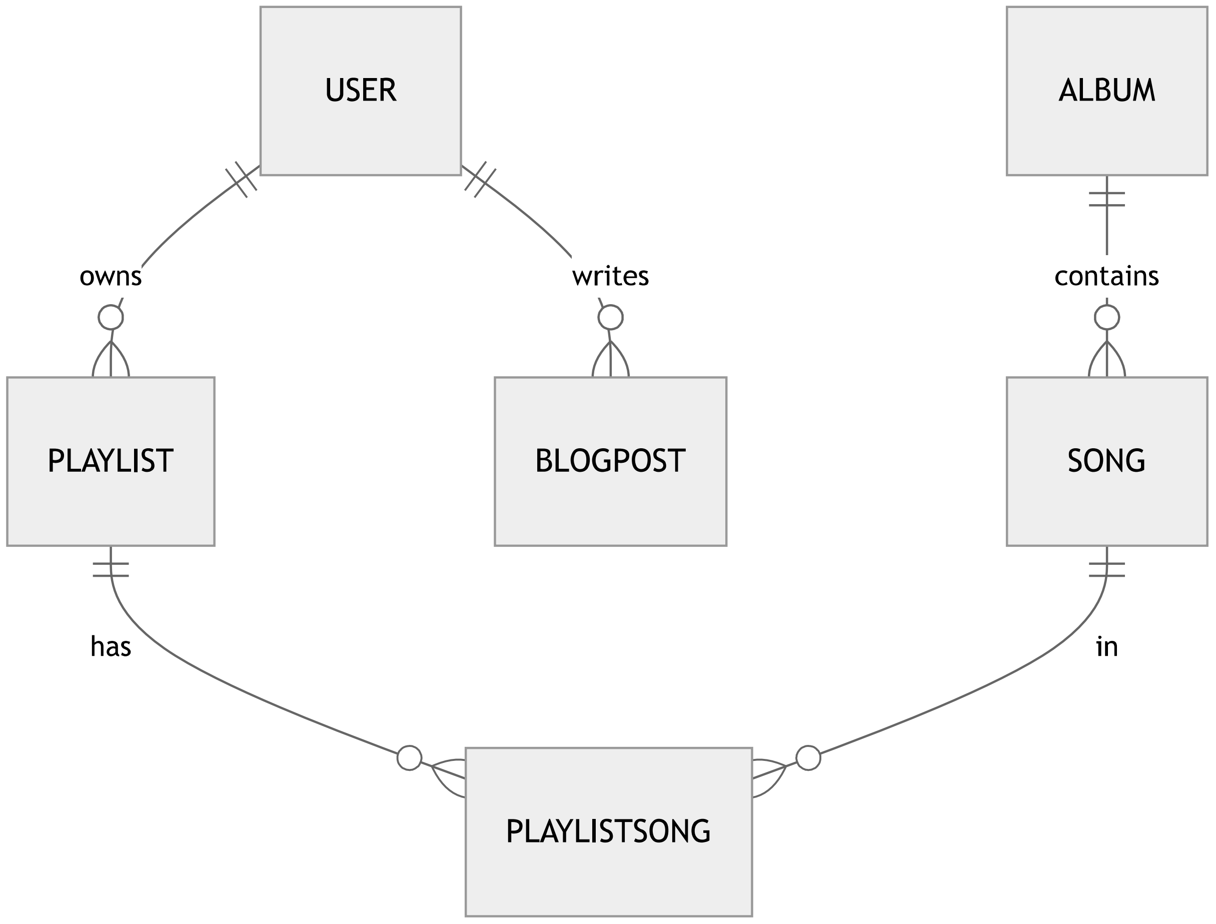
3. Backend Architecture

3.1. Database Schema (Mermaid ER Diagram)



Prisma Schema (Summary)

- **User:** id, email, password, createdAt, updatedAt
- **Album:** id, title, artist, image_url, year, track_count, duration, createdAt, updatedAt
- **Song:** id, title, artist, url, albumId, duration, genre, createdAt, updatedAt
- **Playlist:** id, name, userId, createdAt, updatedAt
- **PlaylistSong:** id, playlistId, songId
- **BlogPost:** id, title, content, userId, createdAt, updatedAt

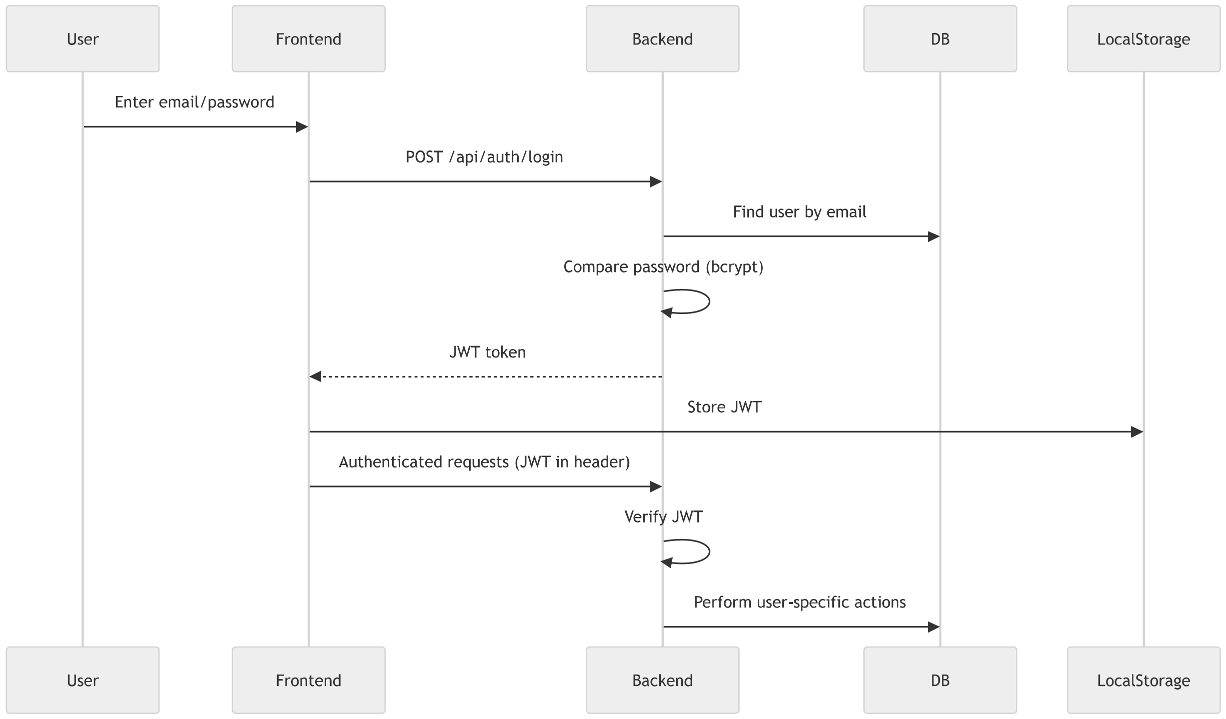
3.2. API Routing & Logic

- **/api/auth:** Register, login (JWT), health check.
- **/api/albums:** CRUD for albums, image upload (multer), fetch by artist.
- **/api/albums/:id:** Get album details.
- **/api/albums/:albumId/tracks:** Upload track (multer), fetch tracks.
- **/api/playlists, /api/blog:** CRUD stubs.

3.3. File Storage

- **Images:** `uploads/<album_name>/cover.jpg`
- **Tracks:** `uploads/albums/<album_id>/tracks/<unique>.mp3`
- **DB:** Only relative file paths stored.
- **Static Serving:** Express serves `/uploads` as static.

3.4. Authentication Flow (Mermaid Diagram)



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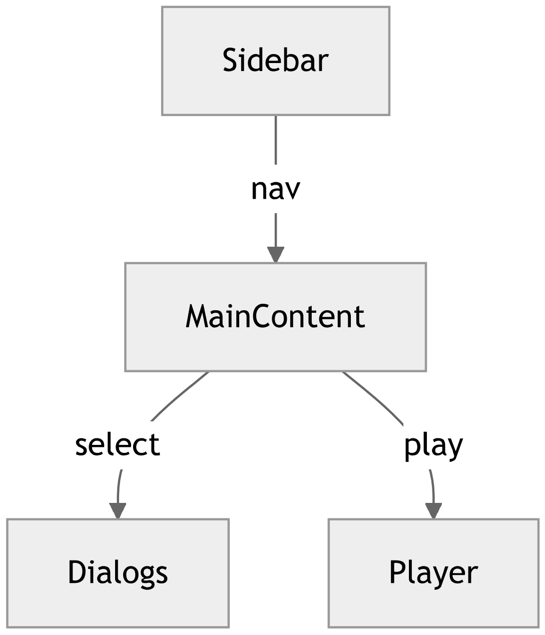
4. Frontend Architecture

4.1. UI Structure

- **Sidebar:** Navigation, responsive, collapsible, keyboard shortcut.
- **Top Bar:** (Planned/partial) for quick actions, user info.
- **Main Content:** Album grid, album details, blog, playlists.
- **Dialogs:** Add album, add track, update album art.
- **Player:** Fixed bottom, plays selected track.


$$\begin{tikzcd}
 & \text{Sidebar} \arrow[d, "\text{nav}"] & \\
 & \text{MainContent} \arrow[dl, "\text{select}"'] \arrow[dr, "\text{play}"] & \\
\text{Dialogs} & & \text{Player}
\end{tikzcd}$$

4.2. State Management

- **AuthContext:** Handles user state, login, logout, registration.
- **Local State:** Album/tracks/related loading, error, selection.
- **Toasts:** Feedback for actions (success/error).

4.3. Responsive Design

- **shadcn/ui:** Modern, accessible, mobile-first.
- **Tailwind CSS:** Utility classes for layout, color, spacing.
- **Sidebar:** Collapses on mobile, uses Sheet for drawer.
- **Album Grid:** Responsive columns, cards adapt to screen size.

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5. Developer Experience

- **TypeScript:** Type safety throughout (types, interfaces, zod validation).
- **Prisma:** Type-safe DB access, easy migrations, seed scripts.
- **Modular Components:** UI split into logical, reusable pieces.
- **Hooks:** Custom hooks for album data, audio, mobile detection.
- **.env Config:** Uploads path, JWT secret, DB URL.
- **Testing:** (Recommend adding unit/integration tests for all CRUD and UI flows.)

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6. Product Management View

- **Core Features:**
    - User registration/login (JWT)
    - Album CRUD with image upload
    - Track upload (mp3/m4a), duration extraction
    - Playlist and blog (CRUD stubs)
    - Responsive, modern UI
- **User Stories:**
    - As a user, I can browse albums and see cover art.
    - As a user, I can view album details and play tracks.
    - As a user, I can upload new albums and tracks.
    - As a user, I can manage playlists and read blog posts.
- **KPIs:**
    - Upload success rate
    - Track play reliability
    - Auth/session security
    - Mobile usability

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7. Security & Compliance

- **Passwords:** Hashed with bcryptjs.
- **JWT:** Signed with secret, expiry set.
- **Uploads:** Only file paths in DB, files stored outside web root.
- **Validation:** zod for forms, server-side checks for required fields.
- **Error Handling:** Robust try/catch, user feedback via toasts.
- **Edge Cases:** Handles missing files, invalid IDs, duplicate users.

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8. Extensibility & Future Roadmap

- **Planned/Recommended:**
  - Full CRUD for playlists and blog.
  - User roles/permissions.
  - Track reordering, album editing.
  - Search and filter for albums/tracks.
  - Social features (sharing, comments).
  - API rate limiting, audit logging.
  - Automated tests (Jest, Cypress).
  - CI/CD integration.

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9. Directory Structure

```text
Snotify/
  prisma/           # Prisma schema, migrations, seed
  src/
    components/     # UI components (album, player, sidebar, etc.)
    context/        # React context (Auth, Theme)
    hooks/          # Custom React hooks
    lib/            # Backend logic (routes, API, server)
    pages/          # Main page components (Album, Blog, etc.)
    types/          # TypeScript types
    utils/          # Utility functions
    integrations/   # DB and (legacy) supabase integration
  uploads/          # Album images and track files
  public/           # Static assets
  .env              # Environment variables
```

This document is auto-generated for architectural, developer, and product management reference. For questions, see the codebase or contact the maintainers.