

Train Ticket Reservation API

The Problem

Booking train tickets can be a tedious process, often requiring visiting multiple websites or calling rail companies directly. This is inconvenient for both customers and businesses. Customers waste time searching for tickets, and businesses miss out on potential sales due to a lack of efficient booking options.

The Impact

A successful train ticket reservation API would streamline the booking process for both customers and businesses. Customers would benefit from a single platform to search for and book tickets, while businesses could integrate the API into their websites and applications, increasing sales and improving customer experience.

Key User Stories

- **As a traveler**, I want to search for train tickets by origin, destination, and date so that I can easily find available routes and fares.
- **As a travel agent**, I want to book train tickets on behalf of my clients through the API so that I can offer a more efficient and comprehensive travel booking service.
- **As a train operator**, I want to expose my train inventory and fares through the API so that I can reach a wider audience of potential customers and increase ticket sales.

Implementation

The API will be implemented as a RESTful API with JSON payloads for both requests and responses. This allows for easy integration with various programming languages and platforms.

Authentication

Developers will gain access to the API through a secure OAuth 2.0 authentication protocol. This ensures secure access and allows for granular control over permissions.

Other Things Considered

- **Event-driven architecture:** While a RESTful API is suitable for this scenario, an event-driven architecture could be considered for real-time updates on ticket availability and booking confirmations.
- **Authentication strategies:** API keys were considered as an alternative to OAuth for simpler integration, but OAuth provides better security and control.

Inputs, Outputs (REST)

Here are some of the key API endpoints:

Endpoint	Method	Input	Output	Description
/search	GET	* Origin station * Destination station * Travel date (optional)	* List of available trains with fares and durations	Search for trains based on specified criteria.
/booking	POST	* Passenger details * Train ID * Selected fare class * Payment information	* Confirmation ID or error message	Book a train ticket for a specific train and fare class.
/availability	GET	* Train ID * Date	* Available seats by fare class	Check the availability of seats for a specific train on a particular date.

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Errors

HTTP status code	Error code	Verbose error	Description
400	BAD_REQUEST	Missing required parameter	A required parameter is missing from the request.
401	UNAUTHORIZED	Invalid API key	The provided API key is invalid or

			does not have permission to access the resource.
404	NOT_FOUND	Train not found	The requested train ID does not exist.
409	CONFLICT	Seat already booked	The requested seat is no longer available.
500	INTERNAL_SERVER_ERROR	An unexpected error occurred	The server encountered an error while processing the request.

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This is a high-level overview of the train ticket reservation API. The specific implementation details will depend on the chosen technology stack and specific business requirements.