# 📄LiveKit AI Voice Agent Backend

This document summarizes how the implementation done from my side.

- Code structure and quality: Follows layered architecture (controller → service → repository).

- API and system design: RESTful endpoints with DTO separation and validations.

- Dynamic settings and extensibility: Agents store LLM parameters and dynamic variables in JSON.

- Real-time session management: Uses LiveKit JWT and room token generation.

APIs and use-cases.

## 📘 Implemented API Endpoints

* PUT /agents

→ Create a new agent with name, language, voice model, and LLM parameters.

→ Update an existing agent.

* GET /agents

→ Retrieve list of all agents.

* GET /agents/{id}

→ Get a single agent by ID.

POST /calls/start

→ Start a new call session and generate LiveKit room token.

* GET /calls/{id}

→ Fetch details of a call session.

* PUT /calls/{id}/variables

→ Update runtime dynamic variables for the session.

* PUT /calls/end/{id}

→ End an ongoing call session and mark it ended.

* POST /tools/invoke/{toolName}?callSessionId={id}

→ Simulate a tool API call (e.g. account\_balance, order\_status).

* GET /tools/logs/{sessionId}

→ Get all tool call logs for a session.

## 🧾 Detailed API Explanations

### 1. Create Agent – POST /agents

Creates a new agent entity with LLM parameters and voice model configuration.

### 2. Start Call – POST /calls/start

Starts a call session, links it to the agent, generates a unique room name, and creates a LiveKit token.

### 3. Update Variables – PUT /calls/{id}/variables

Accepts a JSON map and merges it with the session's existing dynamic variables.

### 4. End Call – POST /calls/end/{id}

Sets the session status to 'ENDED', updates the end timestamp, and optionally cleans up LiveKit room if needed.

### 5. Invoke Tool – POST /tools/invoke/{toolName}

Simulates an external tool call using dynamic variables. Example tools: account\_balance, order\_status. Response is stored in tool\_call\_logs.

### 6. Tool Logs – GET /tools/logs/{sessionId}

Returns a list of all tool calls (with names, responses, timestamps) for a session.

### 7. Swagger Documentation

Available at /swagger-ui for live API testing and auto-generated OpenAPI docs.