NFT Ticketing & Anti-Scalping Platform – Short Description Document

System Overview:
The NFT Ticketing & Anti-Scalping Platform is a decentralized application designed to digitize and secure the event ticketing process using blockchain technology. Each ticket is represented as a unique ERC■721 NFT, guaranteeing authenticity, traceability, and transparency across all transactions. The system prevents ticket scalping by enforcing controlled resale prices, verifying buyer identities, and logging all activities on-chain. It integrates a smart contract layer for ticket issuance and resale, a backend API for event management, and a user-friendly interface that allows users to purchase, transfer, or scan NFT tickets in real time. The overall architecture connects smart contracts, off-chain databases, and monitoring tools to ensure seamless and secure operations.

Actors and Main Processes:
Actors:
– **Attendee (User):** Purchases and owns NFT tickets, views purchase history, and accesses events.
– **Event Organizer:** Creates events, sets ticket prices, and monitors ticket sales and resales.
– **Admin:** Manages disputes, oversees system data, and maintains platform integrity.
– **Scanner:** Validates NFT ownership during event entry via QR/NFT check.
– **System Components:** Smart contracts, database, and monitoring modules handle backend automation.

Main Processes:
1. **Ticket Purchase Flow:** User connects wallet → selects event → smart contract mints NFT → event data stored in database → success confirmation shown.
2. **Ticket Resale Flow:** User lists ticket → smart contract validates price cap → buyer purchases → NFT ownership transferred → metrics updated.
3. **Event Validation Flow:** Scanner verifies ticket ownership and updates status on-chain to prevent reuse.

Key Entities:
– **Event:** Holds details about each concert or venue (title, date, organizer, price, capacity).
– **Ticket (NFT):** ERC■721 token linked to an event and wallet address; includes mint date and usage status.
– **Wallet:** Represents blockchain user identity; stores purchased or resold tickets.
– **Order:** Tracks purchase and resale transactions between users.
– **Scan:** Logs ticket validations at the event entrance.
– **Metrics:** Stores monitoring data (sales, event lag, fraud flags) for the admin dashboard.

Assumptions and Limitations:
– Users must have a connected crypto wallet (e.g., MetaMask) and sufficient testnet balance to complete transactions.
– The MVP operates on a testnet blockchain; mainnet deployment will require gas optimization and compliance validation.
– Fraud detection is based on simple heuristic models (e.g., multiple mints within short intervals).
– Temporary network delays may affect real-time updates or dashboard metrics.
– Scalability and interoperability (multi-chain support) are reserved for future iterations.