FanDraft - Decentralized Fantasy Football Platform

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Overview

FanDraft is a decentralized fantasy football platform built on the Chiliz Chain Testnet. It combines the engagement of fantasy sports with the transparency and trust of blockchain. Players join drafts, select their fantasy teams, and compete for CHZ token rewards. Everything from game logic to prize distribution is managed by smart contracts.

System Architecture

Frontend Architecture

- **Framework:** React 18 (TypeScript)
- **Routing:** Wouter
- **State Management:** TanStack Query (React Query)
- **UI Design:** Tailwind CSS + Radix UI (shadcn/ui)
- **Web3:** Ethers.js for blockchain interaction

Backend Architecture

- **Framework:** Node.js + Express.js

- **Language:** TypeScript (with ESModules)
- **Sessions:** Express sessions with PostgreSQL store

Database Architecture

- **Database:** PostgreSQL 16 (Neon serverless)
- **ORM:** Drizzle ORM
- **Migration Tool:** Drizzle Kit

Smart Contract Architecture

Key Smart Contract Features

- **Draft Lifecycle Management:** Creation, participation, resolution
- **Player Selection:** On-chain storage of selected players
- **Prize Distribution:** Automatic transfer of CHZ rewards
- **Leaderboard System:** Tracks user performance stats

Contract Deployment

- **Blockchain:** Chiliz Chain Testnet
- **Chain ID:** 88882
- **Current Contract Address:** `0xcb4626a80F60b713525192862191881e4Daf2CD8`

Features and Functionality

User Flow

1. Connect MetaMask wallet
2. Browse and join active drafts
3. Select 11 players from the pool
4. Confirm entry with CHZ token payment
5. Await draft resolution
6. View results and claim rewards (if won)

Admin Flow

- Only the contract owner can:
- Create new drafts
- Set deadlines and entry fees
- Resolve drafts and declare winners
- Withdraw accumulated platform revenue

Game Mechanics

- Each draft has a set deadline and entry fee
- Users must select exactly 11 players
- Players are identified by numeric IDs
- The winner is manually resolved by the admin (to be replaced with decentralized voting)

Prize Distribution Logic

- **1st Place:** 90% of prize pool
- **Platform Fee:** 10%
- **Payment Handling:** Using low-level `call{value:}` for reward distribution

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Security Considerations

- `onlyOwner` modifier restricts admin functions
- Prize transfers use `require(sent)` checks to ensure success
- Entry validation includes:
- Non-zero payment
- Unique user participation
- Player count validation

External Dependencies

Blockchain

- **MetaMask**: Wallet provider
- **Chiliz Chain Testnet**: Smart contract deployment
- **Ethers.js**: Web3 interaction library

UI/UX

- **Tailwind CSS**
- **shadcn/ui (Radix + Tailwind)**
- **Lucide Icons**
- **React Hook Form**

Dev Tools

- **Vite** (Frontend dev server & bundler)
- **ESBuild** (Backend bundling)
- **PostgreSQL** (via Neon)

Deployment Strategy

Development

- **Frontend:** Vite on port 5000
- **Backend:** Node with TSX hot-reload
- **Database:** Neon serverless
- **Blockchain:** Chiliz testnet

Production

- **Host:** Replit Autoscale Deployment
- **Port Mapping:** External 80 -> Internal 5000
- **Database:** PostgreSQL (Neon) with backup

Changelog (Key Milestones)

- Draft system now uses indexed `draftNames` array to avoid `MCOPY` opcode error
- Leaderboard stats integrated from real blockchain values
- Integrated player selection UI with position filter and image previews
- Redesigned dashboard with glassmorphism and gradients for SportFi theme
- Introduced draft history tracking, personal stats, and leaderboard rankings
- Added `getLeaderboard()` to track games played, wins, winnings, and win rate

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For technical documentation of the smart contract ABI, events, and interaction functions, see the separate `SmartContractReference.md` (not included here).