

TECHNICAL REPORT

TradingAgents Platform - Architecture & Maintenance

1. TECHNOLOGY STACK

1.1 Frontend

- Framework: Next.js 16.0.6 (React 19.2.0)
- Language: TypeScript 5.9.3
- Styling: TailwindCSS 4.1.17
- Bundler: Webpack (Turbopack disabled due to Unicode issues)
- PDF Export: jsPDF 3.0.4

1.2 Backend

- Framework: FastAPI 0.116.2
- Language: Python 3.12
- ORM: SQLAlchemy 2.0.45 (async)
- Agent Framework: LangGraph 1.0.1
- LLM Integration: Google GenAI, OpenAI, Anthropic

1.3 Infrastructure

- Containerization: Docker & Docker Compose
- Database: PostgreSQL 16
- Management UI: PgAdmin 4

2. SYSTEM ARCHITECTURE

2.1 Core Structure

- Frontend: Next.js Pages (Generate, History, Contact), WebSocket Client
- Backend: FastAPI REST Endpoints + WebSocket Handler
- Agent System: TradingAgentsGraph (LangGraph)
- Data Layer: PostgreSQL (ExecutionHistory, ReportResult)

2.2 Multi-Agent Teams

- Market Analyst: Technical indicators (RSI, MAXD, SMA, etc.)
- News/Social Analyst: Sentiment tracking (Reddit, Mastodon)
- Fundamentals Analyst: Valuation & Financials
- Bull/Bear Researchers: Debate framework
- Risk Management: Conservative/Aggressive/Neutral analysis

3. ALGORITHMIC & API FEATURES

3.1 Real-time Analysis

- Streaming: WebSocket-based live updates
- Tracking: Per-agent progress monitoring

3.2 Security

- Auth: JWT-based authentication
- Hashing: bcrypt password protection

4. KNOWN ISSUES & STATUS

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4.1 Critical Issues

Turbopack Unicode: Status: [WORKAROUND] using Webpack fallback

Google API Quota: Status: [OPEN] Monitoring needed

4.2 Resolved Issues

Env Loading: Status: [FIXED] Explicit path loading implemented

Port Conflicts: Status: [MITIGATED] Termination scripts provided

5. PERFORMANCE CHARACTERISTICS

- API Initial Start: ~2-5 seconds
- Agent Execution: 30-120 seconds (Research depth dependent)
- Report Generation: 5-10 seconds
- Backend Memory: 500MB - 1GB
- Frontend Bundle: ~2-3MB (gzipped)

6. MAINTENANCE STATUS

6.1 System Health: [OK] OPERATIONAL

- Frontend: Port 3000 [OK]
- Backend: Port 8000 [OK]
- Database: PostgreSQL 16 [OK]

6.2 Recent Fixes

- [FIX] pandas_ta module installed
- [FIX] Google API Authentication (Application Default Credentials)
- [FIX] UnboundLocalError in exception handling

7. STRATEGIC RECOMMENDATIONS

7.1 Immediate (1-2 Weeks)

- Implement quota exhaustion detection
- Add model fallback mechanism

7.2 Medium-term (1-2 Months)

- Add monitoring dashboard
- Implement caching layer for common queries

8. SUMMARY

- System is fully operational for core trading tasks.
- Primary maintenance focus: Quota management & Error handling.
- Overall Health: GREEN (Good)