

# 🌐 Swarms.World Integration - Intellitrade

## Overview

Intellitrade integrates with **Swarms.world** to create a hierarchical hedge fund structure powered by autonomous AI agents. This integration enables sophisticated agent coordination, communication, and portfolio management at scale.

## 🏢 Hedge Fund Architecture

### Organizational Structure

Intellitrade operates as a **Swarms AI Hedge Fund** with the following hierarchy:

- 👤 Intel CEO (Chief Executive Officer)
  - ├── 🏢 Funding Phantom (Head Trader)
  - ├── 🎯 Volatility Sniper (Quantitative Trader)
  - ├── 📊 Sentiment Sage (Research Trader)
  - └── ⚡ Arbitrage Ace (Quantitative Trader)

### Authority Levels

- **Level 5 (CEO):** Intel CEO - Full authority over all operations
- **Level 3 (Traders):** Trading agents with capital allocation authority
- **Level 1-2:** Reserved for future risk management and research roles

## 🔗 Integration Components

### 1. Swarms API Configuration

**File:** /nextjs\_space/lib/swarms-hedge-fund.ts

**Environment Variable:**

`SWARMS_API_KEY=your_swarms_api_key_here`

**API Base URL:**

<https://api.swarms.world/v1>

## 2. Core Features

### A. Hedge Fund Initialization

```
import { initializeHedgeFundStructure } from '@lib/swarms-hedge-fund';

await initializeHedgeFundStructure();
```

**What it does:** - Creates organizational hierarchy in Swarms.world - Assigns roles and authority levels to each agent - Registers total AUM (Assets Under Management) - Syncs agent balances and capital allocations

### B. CEO Capital Allocation

```
import { ceoAllocateCapital } from '@lib/swarms-hedge-fund';

const allocations = [
  {
    agentId: 'volatility-sniper',
    allocatedCapital: 50000,
    maxDrawdown: 10,
    targetReturn: 20,
    riskTolerance: 'MODERATE'
  }
];

await ceoAllocateCapital(allocations, 'Increasing allocation due to strong performance');
```

**Features:** - Performance-based capital allocation - Risk tolerance assignment (CONSERVATIVE, MODERATE, AGGRESSIVE) - Maximum drawdown limits - Target return objectives

### C. CEO Risk Override

```
import { ceoRiskOverride } from '@lib/swarms-hedge-fund';

await ceoRiskOverride(
  'funding-phantom',
  'HALT_TRADING',
  'Excessive drawdown detected - halting operations for review'
);
```

**Override Actions:** - HALT\_TRADING: Immediately stop agent trading - REDUCE\_POSITION: Scale down open positions - CLOSE\_ALL: Emergency close all positions - RESUME\_TRADING: Reactivate agent after review

## D. Daily CEO Reports

```
import { generateCEODailyReport } from '@lib/swarms-hedge-fund';

const report = await generateCEODailyReport();
```

**Report Contents:** - Total AUM across all agents - Daily P&L performance - Trade execution statistics - Win rate analysis - Best/worst performing agents - Agent-by-agent breakdown

## E. Agent Communication

```
import { agentCommunication } from '@lib/swarms-hedge-fund';

await agentCommunication(
  'volatility-sniper',
  'funding-phantom',
  'High volatility detected in BTC/USDT - consider reducing leverage',
  'HIGH'
);
```

**Priority Levels:** - LOW: Informational updates - MEDIUM: Strategic suggestions - HIGH: Risk warnings - URGENT: Immediate action required

## F. Portfolio Rebalancing

```
import { suggestPortfolioRebalance } from '@lib/swarms-hedge-fund';

const suggestions = await suggestPortfolioRebalance();
```

**Rebalancing Logic:** - Base allocation: 25% per agent - +15% for win rates > 60% - +10% for strong profitability - -15% for win rates < 30% - Min allocation: 10%, Max allocation: 40%

# III Data Synchronization

The integration syncs the following data with Swarms.world:

## Agent Data

- Agent ID and name
- Role and department
- Authority level
- Managed capital
- Real-time balances
- Trading status (active/inactive)

## Performance Metrics

- Win/loss records
- P&L calculations
- Trade execution history
- Risk-adjusted returns

## CEO Decisions

- Capital allocation changes
- Risk override actions
- Strategy adjustments
- Agent performance evaluations

## 🔒 Security & Permissions

### API Authentication

All requests to Swarms.world API include:

```
headers: {  
  'Authorization': `Bearer ${SWARMS_API_KEY}`,  
  'Content-Type': 'application/json'  
}
```

### Fallback Behavior

If Swarms API is unavailable: - ✓ All functions continue to work locally  
- ⚠ Warning messages logged - 💾 Decisions stored locally - 🔁 Auto-sync when API reconnects

## 🔧 Getting Started

### 1. Obtain Swarms API Key

Visit [swarms.world](https://swarms.world) to: 1. Create an account 2. Navigate to API settings 3. Generate a new API key 4. Copy the key

### 2. Configure Environment

Add to .env:

```
SWARMS_API_KEY=your_swarms_api_key_here
```

### 3. Initialize Hedge Fund

Run the initialization script:

```
cd nextjs_space
yarn tsx scripts/initialize-swarms-hedge-fund.ts
```

## 📌 Benefits of Swarms Integration

### 1. Hierarchical Coordination

- Clear chain of command
- CEO-level oversight and decision-making
- Structured portfolio management

### 2. Risk Management

- Real-time portfolio monitoring
- Automated risk overrides
- Capital allocation controls

### 3. Performance Analytics

- Daily CEO reports
- Agent-by-agent performance tracking
- Historical decision logging

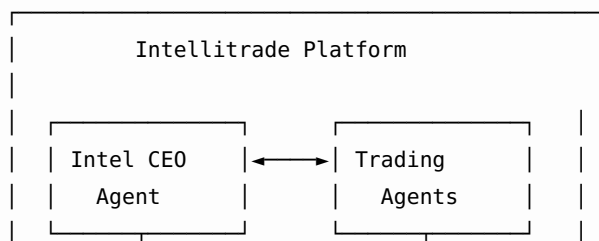
### 4. Scalability

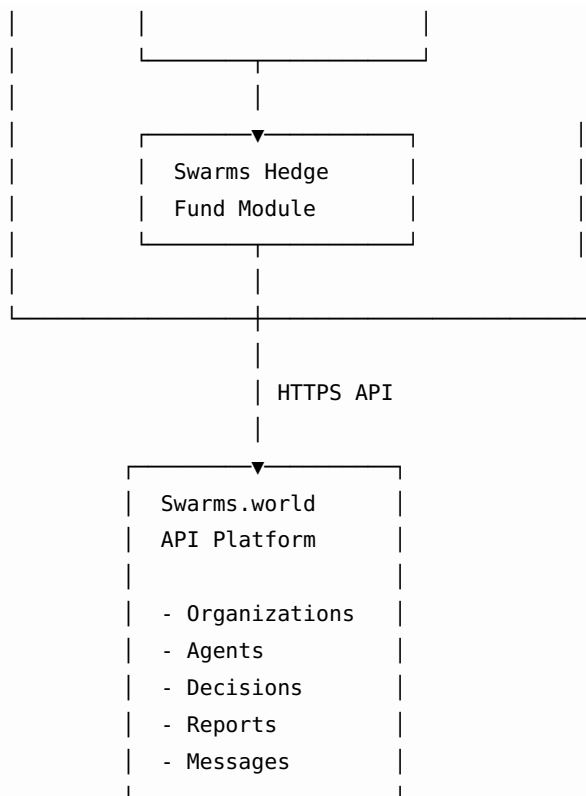
- Easy addition of new agents
- Dynamic role assignments
- Flexible organizational restructuring

### 5. Communication

- Inter-agent messaging
- Priority-based alerts
- Centralized coordination

## ⚙️ Technical Architecture





## Example Usage

### Complete CEO Workflow

```
import {
  initializeHedgeFundStructure,
  generateCEODailyReport,
  suggestPortfolioRebalance,
  ceoAllocateCapital,
  ceoRiskOverride
} from '@lib/swarms-hedge-fund';

// 1. Initialize on startup
await initializeHedgeFundStructure();

// 2. Generate morning report
const report = await generateCEODailyReport();

// 3. Get rebalancing suggestions
const suggestions = await suggestPortfolioRebalance();

// 4. Execute capital allocation
if (report.worstPerformer.winRate < 0.30) {
  await ceoRiskOverride(
```

```

        report.worstPerformer.agentId,
        'HALT_TRADING',
        'Performance below threshold'
    );
}

// 5. Rebalance portfolio
await ceoAllocateCapital(
    suggestions,
    'Monthly performance-based rebalancing'
);

```

## 🔧 Troubleshooting

### API Connection Errors

**Symptom:** ⚠ Swarms API not available, using local coordination

**Solutions:** 1. Verify SWARMS\_API\_KEY is set in .env 2. Check API key validity on swarms.world 3. Ensure network connectivity 4. Review Swarms.world API status

### Agent Not Found

**Symptom:** Error: Agent {id} not found

**Solutions:** 1. Ensure agents are created in database 2. Run yarn prisma generate 3. Verify agent IDs match database records

### Permission Denied

**Symptom:** 403 Forbidden

**Solutions:** 1. Regenerate API key on swarms.world 2. Check API key permissions 3. Verify account is active

## 📚 Additional Resources

- **Swarms.world Documentation:** <https://docs.swarms.world>
- **API Reference:** <https://api.swarms.world/docs>
- **Support:** [support@swarms.world](mailto:support@swarms.world)
- **Integration File:** /nextjs\_space/lib/swarms-hedge-fund.ts

## 🏷 Version History

- **v1.0.0:** Initial Swarms.world integration

- Hedge fund structure
- CEO decision-making
- Daily reports
- Agent communication
- Portfolio rebalancing

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**Status:** ✓ Fully Integrated

**Platform:** Intellitrade

**Last Updated:** December 2024