AIdvisory

Democratizing Algorithmic-Trading

High Level Technical Documentation

Executive Brief

A comprehensive Trading-as-a-Service platform that brings institutional-grade algorithmic trading capabilities to the mass market through a sophisticated microservices architecture, democratizing access to advanced trading strategies, technologies previously available only to hedge funds and investment banks.

January 28, 2026

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1 Executive Summary

The financial markets are experiencing a fundamental transformation. While institutional investors leverage sophisticated algorithmic trading systems generating billions in profits, retail traders and smaller funds remain locked out of these capabilities due to prohibitive costs and technical complexity. AIdvisory bridges this gap through a revolutionary Trading-as-a-Service platform that democratizes access to institutional-grade trading infrastructure.

1.1 The Market Opportunity

The global algorithmic trading market, valued at $15.5 billion in 2023, is projected to reach $42.9 billion by 2030 [1]. However, current solutions present significant barriers:

- **High Entry Costs**: Traditional trading systems require millions in infrastructure investment
- **Technical Complexity**: Building and maintaining trading infrastructure requires specialized expertise
- **Scalability Challenges**: Existing solutions struggle to serve multiple users efficiently
- **Limited Market Access**: Most platforms focus on single markets or asset classes

1.2 The AIdvisory Solution

AIdvisory has developed a cloud-native, microservices-based platform that transforms how algorithmic trading is delivered and consumed. Through our modular architecture, we provide:

Core Value Propositions

1. **Democratized Access**: Institutional capabilities available to users with no capital barriers
2. **Infinite Scalability**: Serve thousands of users concurrently at marginal cost
3. **Multi-Market Coverage**: Unified access to centralized and decentralized crypto exchanges, with rapid expansion to traditional finance. Designed for seamless integration of emerging technologies and markets
4. **Zero Infrastructure Burden**: Complete abstraction of technical complexity
5. **Robust Security**: Enterprise-grade security and compliance features
6. **Simple to Integrate**: Our solution can be simply integrated with existing trading workflows

2 Platform Architecture Overview

2.1 Design Philosophy

AIdvisory's architecture embodies three fundamental principles that enable unprecedented scalability and reliability:

Architectural Principles

1. Microservices Decomposition: Each trading function operates as an independent service, enabling horizontal scaling and fault isolation.
2. Event-Driven Communication: Services communicate through message queues, ensuring resilience and enabling real-time processing.
3. Cloud-Native Design: Leveraging serverless computing and managed services for infinite scalability without infrastructure overhead.

2.2 System Architecture

The platform can be grouped into four functional layers of interconnected microservices:

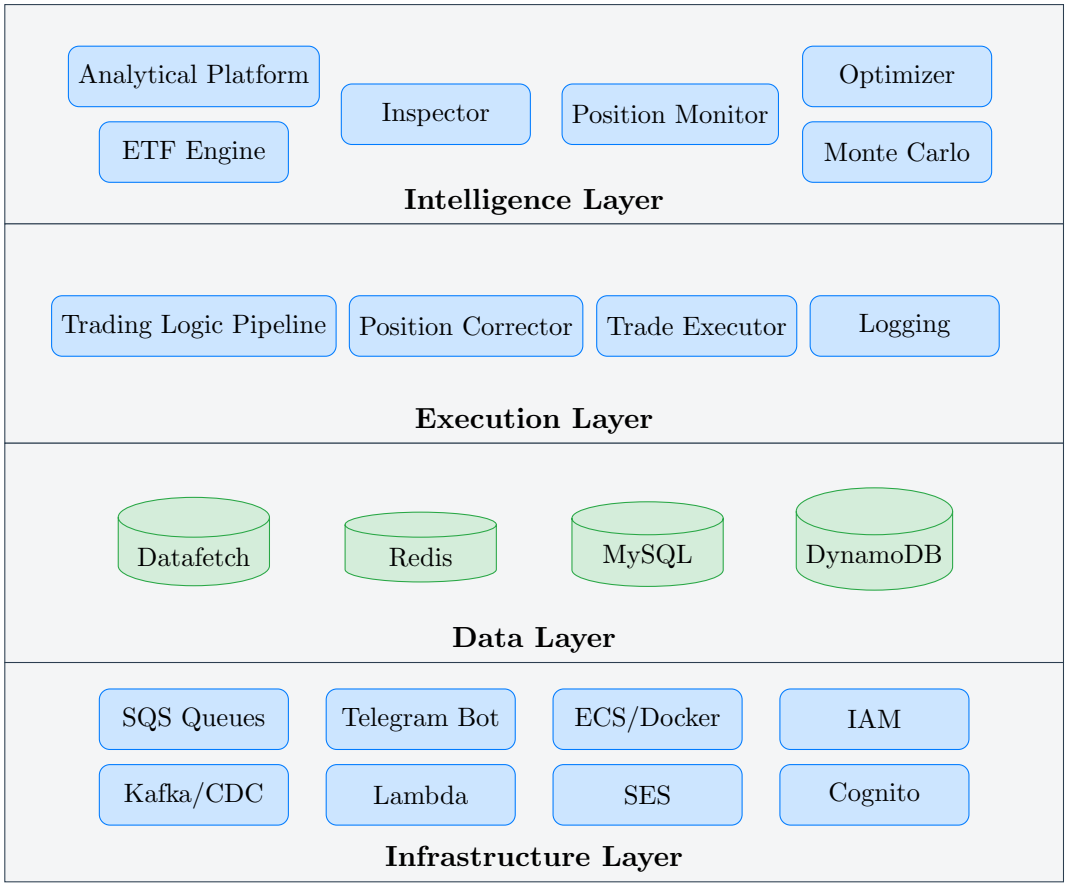


Figure 1: AIdvisory Platform Architecture - Four-layer microservices design enabling horizontal scaling

The services are arranged across multiple network segments with strict access controls, ensuring security and compliance as briefly depicted below:

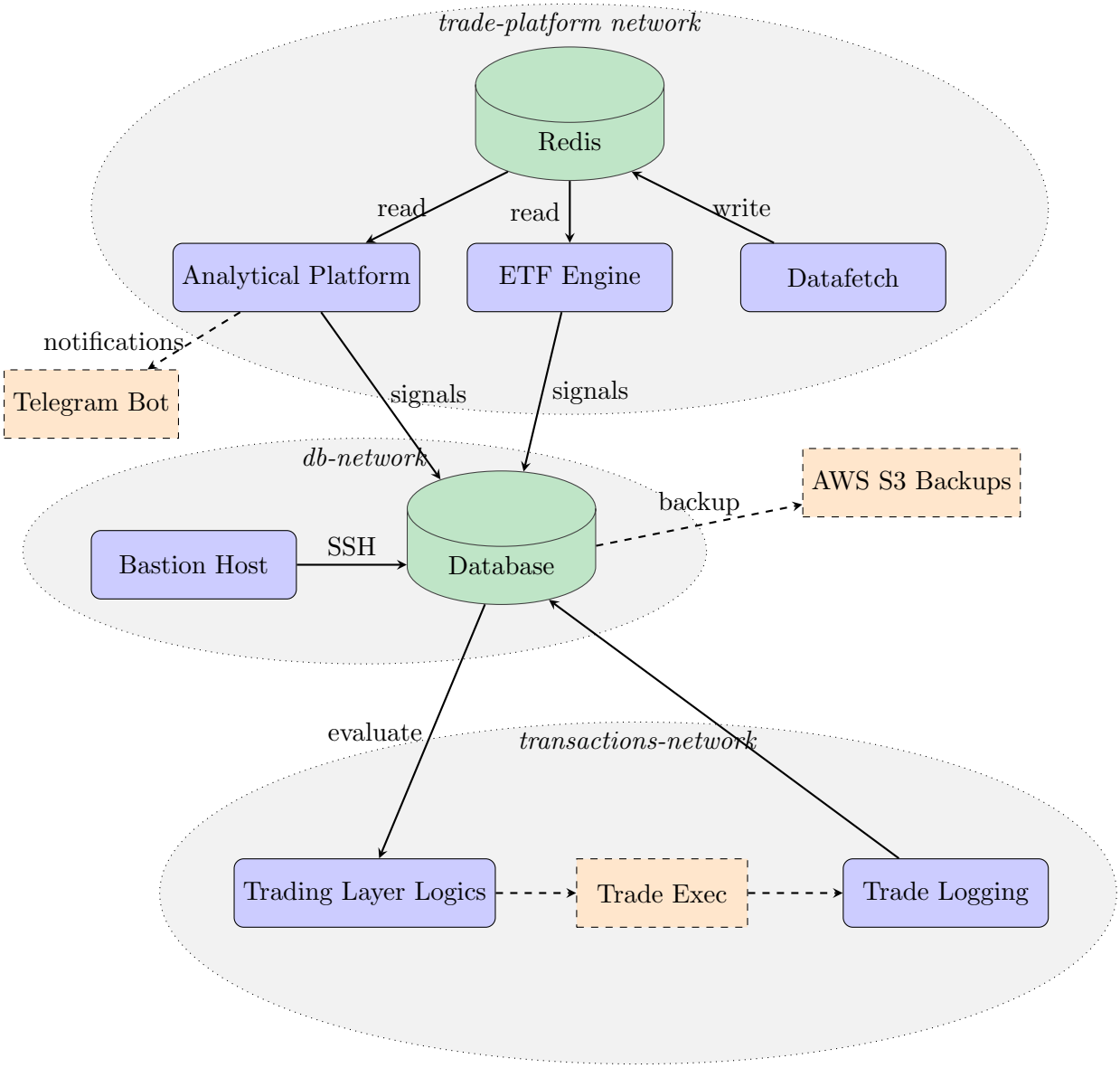


Figure 2: Local Microservice Architecture with Network Segmentation

Services can scale independently based on demand, allowing the platform to efficiently handle thousands of concurrent users and millions of data points.

2.3 Scalability Metrics

Our architecture delivers exceptional performance characteristics:

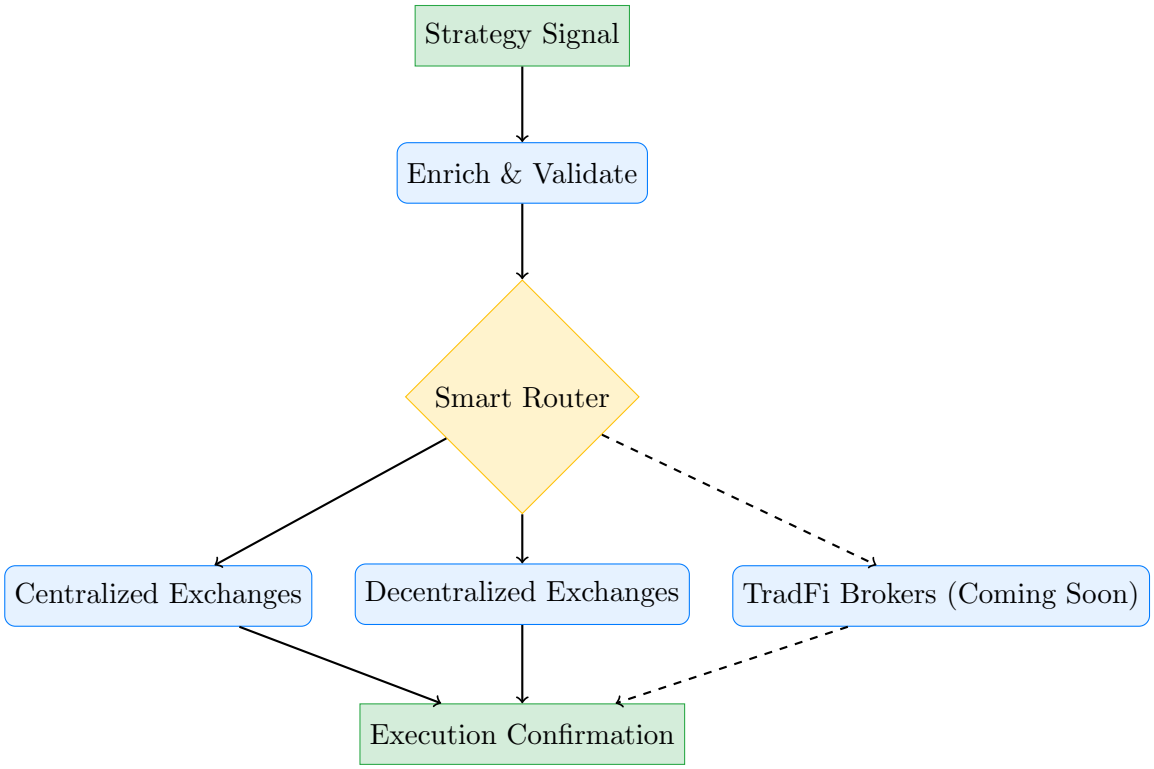
Metric	Current Performance	Scalability
Orders per minutes	10,000+	With possibility to increase
Strategy Backtests	100+ parallel	Unlimited with cloud resources
Service Availability	99.9% SLA	Multi-region failover to be developed
Strategy Deployment Time	$<$ 10 minute	Unlimited
Infra Deployment Time	$<$ 30 seconds	Zero-downtime updates

Table 1: Platform Performance and Scalability Metrics

3 Core Trading Infrastructure

3.1 Unified Execution Layer

The execution infrastructure represents the heart of our platform, with capabilities to replicate thousands of transactions across centralized and decentralized exchanges with institutional-grade reliability at low cost. Our focus has been abstracting away the complexity of exchange APIs, providing a seamless trading experience across 10+ major CEX and DEX venues. Thanks to its modular design the execution layer can be easily extended. We are continuously integrating more exchanges upon users and partners requests, with the aim to expand towards traditional finance markets in the coming months.



Execution P95 happens in under 5 seconds from signal generation to market fill

Figure 3: Trade Execution Flow - Unified interface abstracting exchange complexity

3.1.1 Key Capabilities

- **Multi-Exchange Abstraction**: A single interface serves 10+ CEX and DEX venues
- **Extensibility**: Modular design for rapid addition of new exchanges and markets (TradFi, Prediction Markets, etc.)
- **Position Management**: Automated tracking across all user positions
- **Risk Controls**: Real-time position limits and exposure management
- **Audit Trail**: Immutable record of all trading activity logged
- **High Availability**: 99.9% SLA with automatic failover
- **Low Latency**: P95 execution time under 5 seconds
- **Scalability**: Supports 10,000+ orders per minute with horizontal scaling
- **Logging**: Centralized logging for audit and debugging

3.2 Real-time Data Infrastructure

Our data pipeline processes millions of market data points per second, providing strategies with clean, normalized data across all supported markets.

Data Processing Capabilities

- **Latency**: WebSocket solution written in Golang, to deliver data from market to strategy in milliseconds
- **Reliability**: Automatic failover between data providers
- **Normalization**: Unified data schema across exchanges
- **Scalability**: Horizontal scaling ready
- **Extensibility**: Easy integration of new data sources
- **Data Quality**: Real-time anomaly detection and self-correction
- **Backfilling**: Historical data retrieval limited only by data provider capacity

3.3 Strategy Development Platform

The Analytical Platform provides a unified environment where strategies seamlessly transition from conception to production, with built-in safeguards at every stage. By enforcing a single-codebase philosophy — identical strategy code runs in both backtesting and live trading — we eliminate the translation errors that plague traditional quant workflows.

Development Platform Capabilities

- **Single Environment**: Develop, optimize, validate, and deploy strategies without switching tools or rewriting code
- **50+ Strategy Templates**: Pre-built blueprints spanning momentum, mean-reversion, trend-following, and hybrid approaches
- **250+ Configurations**: Production-tested parameter sets ready for deployment across multiple assets and timeframes
- **25+ Performance Metrics**: Comprehensive analytics suite covering risk-adjusted returns, drawdown profiles, and execution quality
- **Interactive Visualization**: Real-time charting and reporting for strategy evaluation and comparison
- **Automated CI/CD**: From validated strategy to containerized production deployment in minutes
- **Modular Architecture**: Strategies, data sources, and execution targets are independently extensible

3.4 Live Trading Dashboard

The Live Trading Platform bridges the gap between signal generation and trade execution at scale. Traders create and manage orders through a web dashboard, while serverless execution engines automatically replicate trades across thousands of subscriber accounts with full audit trails.

Live Trading Capabilities

- **Serverless Order Management**: Persistent order queue ensures no trades are lost due to transient failures or system restarts
- **Parallel Subscriber Execution**: A single trader action triggers precision execution across all subscribed portfolios simultaneously
- **Extensible Strategy Framework**: Pluggable execution logic supports limit orders, dollar-cost averaging, grid strategies, and custom implementations
- **Position-Aware Intelligence**: Automatic detection of order intent (open, reinforce, or close) without manual tracking
- **Human-in-the-Loop**: Web dashboard enables supervised, semi-automated trading alongside fully automated strategies
- **Complete Auditability**: Every order state change recorded with timestamps for compliance and portfolio tracking
- **Real-time Notifications**: Instant execution alerts via Telegram integration

4 Advanced Intelligence Capabilities

4.1 Portfolio Optimization Engine

Our proprietary optimization framework transforms raw trading strategies into institutional-grade portfolios through advanced mathematical techniques.

4.1.1 Multi-Paradigm Optimization Framework

The platform employs a multi-paradigm optimization engine that intelligently searches vast parameter spaces using the most suitable technique for each problem class:

Optimization Capabilities

Optimizer Families

- **Bayesian Optimization**: Gaussian Process modeling for efficient exploration of smooth parameter landscapes
- **Evolutionary Algorithms**: Genetic optimization (NSGA-II) for multi-objective discovery and complex search spaces
- **Tree-based Estimators**: Tree-structured Parzen Estimators for high-dimensional, conditional parameter tuning
- **Quasi-Random Search**: Low-discrepancy sampling for uniform coverage of parameter spaces
- **Adaptive Methods**: Covariance Matrix Adaptation for continuous optimization with automatic step-size control

Validation & Robustness

- **Walk-Forward Optimization**: Temporal validation ensuring strategies generalize across market regimes, not just historical data
- **Multi-Modal Discovery**: Cluster-based analysis identifies diverse parameter archetypes, avoiding single-point fragility
- **Statistical Gatekeeper**: Deflated Sharpe Ratio, Probability of Backtest Overfitting, and Probabilistic Sharpe Ratio provide academic-grade confidence before production deployment
- **15+ risk-adjusted metrics** including Sharpe, Sortino, and custom multi-objective targets
- **Cloud-parallel execution** for large-scale optimization across hundreds of configurations

4.2 Monte Carlo Risk Validation

Our Monte Carlo framework goes beyond simple backtesting, generating thousands of synthetic market scenarios to validate strategy robustness.

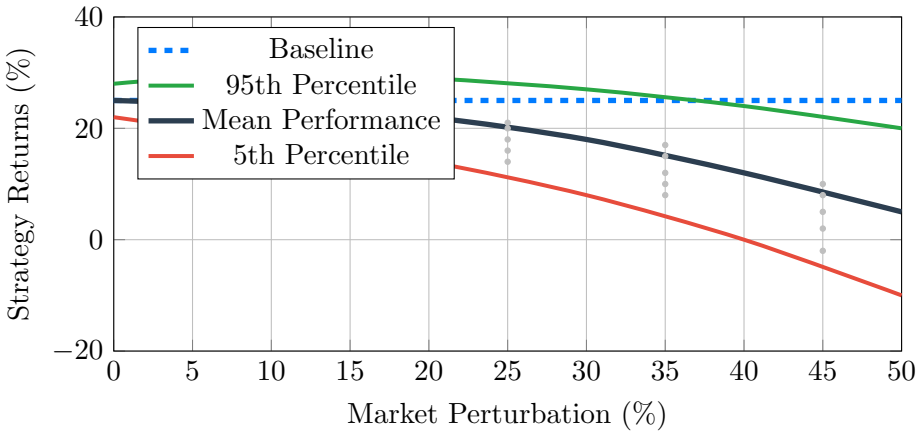


Figure 4: Monte Carlo Validation - Strategy performance across 1000+ market scenarios

Monte Carlo Innovation

Our framework preserves critical market microstructure while exploring extreme scenarios:

- **ARIMA-GARCH Modeling**: Captures volatility clustering and fat tails
- **IAAFT Surrogate Generation**: Preserves frequency spectrum
- **Full OHLCV Generation**: Not just close prices but complete candlesticks
- **Statistical Validation**: Ensures synthetic data maintains market properties

4.3 Intelligent Portfolio Analysis

The Strategy Inspector transforms gigabytes of backtest data into actionable portfolio allocations using modern portfolio theory:

- **Markowitz Optimization**: Efficient frontier generation in seconds
- **Risk Analytics**: VaR, CVaR, and tail risk metrics
- **Interactive Visualization**: Real-time portfolio rebalancing analysis
- **Portfolio Construction**: Automated portfolio generation from multiple strategies
- **Extensibility & Integration**: Easily incorporate new risk models and metrics, seamlessly integrates with optimization and execution layers
- **User-Friendly**: Intuitive interface for non-quant users

5 User Experience and Accessibility

User Experience

1. **Registration** User signs up at www.aidvisory.ai and verifies email
2. **Register API** Connects exchange API keys
3. **Select Portfolio** Selects from marketplace of curated sets of strategies the desidered based on risk profile

Result: User benefit institutional-grade strategies without any upfront investment and entry barriers

Quant Developer Experience

1. **Strategy Development** Quant develops strategy in Python using our SDK with 50+ templates
2. **Backtests** Strategy gets backtested using historical data with identical production code
3. **Optimization** Multi-paradigm optimizers (Bayesian, Evolutionary, Tree-based) search parameter spaces with Walk-Forward temporal validation to prevent overfitting
4. **Validation** Statistical validation suite (Deflated Sharpe Ratio, Probability of Backtest Overfitting) and Monte Carlo stress testing across 1000+ synthetic scenarios ensure production-readiness
5. **Production** Validated strategies get containerized and deployed to production in minutes via automated CI/CD
6. **Live Trading** Automated execution runs in our stack, in parallel with other strategies. Orders gets seamlessly replicated across subscriber accounts
7. **Monitoring** Customer gets notified via Telegram about strategy operations, monitoring analytics are provided to the engineering team through Grafana, CloudWatch and centralized logging

Result: Quant moves from idea to execution in rapid manner, leveraging the Single Environment approach and avoiding the burden of maintaining any infrastructure or dealing with complex deployment tasks

Trader Experience

1. **Strategy Development** Trader leverages our team/consultants to develop supervised strategies in Python using our SDK with 50+ templates
2. **Validation** Test gets validated to ensure logical correctness in Development environment, which is always in sync with Production
3. **Production** Once validated, strategies approved gets containerized and deployed to production in minutes via automated CI/CD
4. **Live Trading** Manage orders via the Live Trading Dashboard for manual or semi-automated execution replicated across subscriber accounts
5. **Monitoring** On top at the Monitoring services provided in Box 5, Trader can monitor via Telegram, strategy operations executed

Result: Trader can scale his business horizontally, by providing discretional trading strategies to his subscribers, without dealing with any infrastructure or complex deployment tasks

6 Technology Stack and Infrastructure

6.1 Cloud-Native Architecture

Our infrastructure leverages best-in-class cloud services for unlimited scalability:

Component	Technology	Purpose
Compute	AWS Lambda / Docker Container	Serverless execution
Storage	S3 / DynamoDB	Object and NoSQL storage
Messaging	SQS / Kafka	Event-driven communication
Database	MySQL / Redis	Transactional and cache data
Orchestration	Docker Swarm / K8s	Container management
CI/CD	GitHub Actions	Automated deployment
Monitoring	CloudWatch / Grafana	System observability

Table 2: Technology Stack - Enterprise-grade components ensuring reliability

6.2 Security and Compliance

Security Measures

- **Zero-Trust Architecture**: Every service authenticated and authorized
- **Low Attack Surface**: Everything runs in isolated VPCs
- **Audit Trail**: Immutable log of all trading activity
- **API Security**: Read-only exchange credentials, no withdrawal capability
- **Network Isolation**: Segregated VPCs for different service tiers
- **Disaster Recovery**: Automated backups and multi-region failover capability

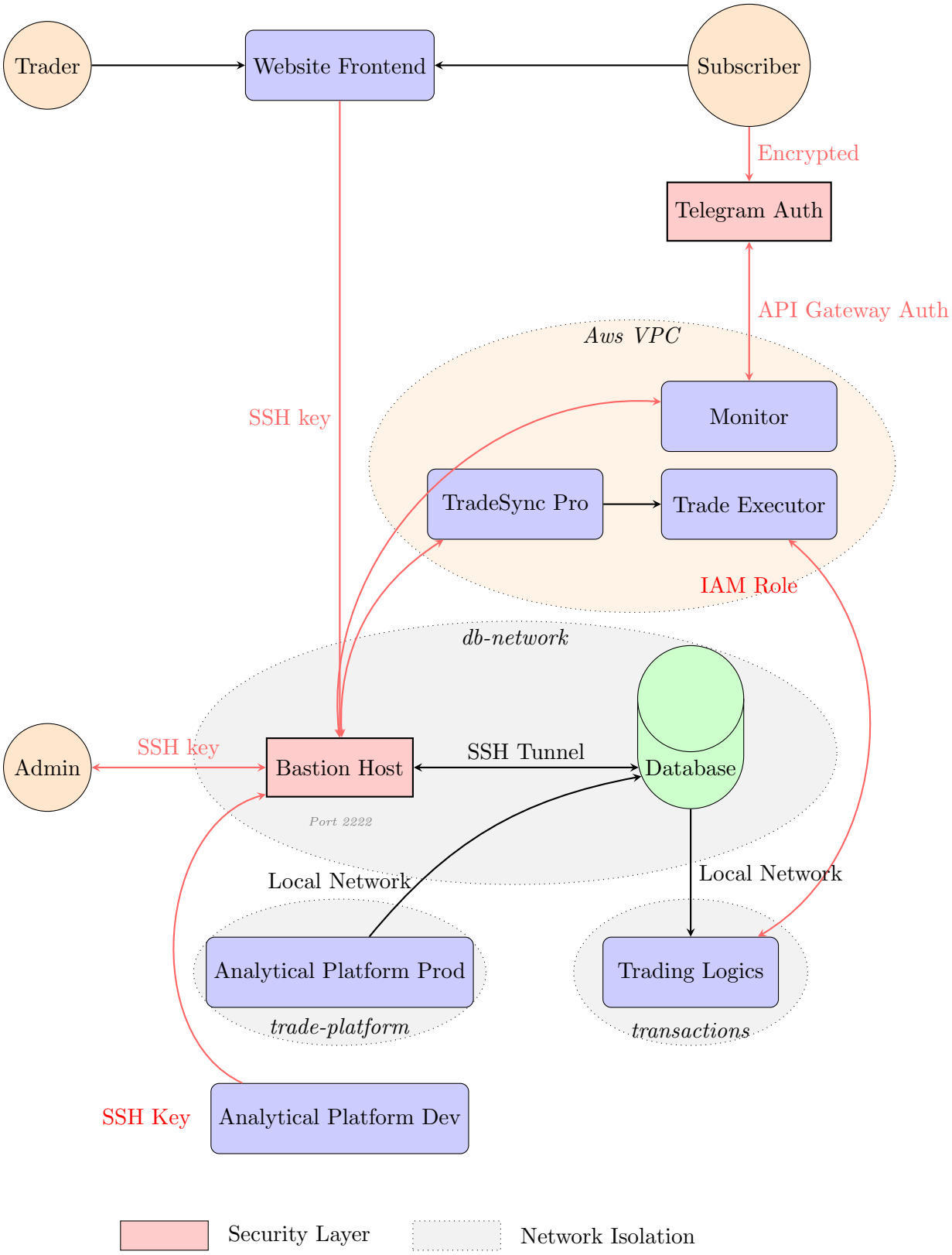


Figure 5: Security Architecture and Access Control

7 Competitive Advantages

7.1 Technical Differentiation

AIdvisory's architecture provides fundamental advantages over traditional trading platforms:

Traditional Platforms	Current Competitors	AIdvisory
Monolithic architecture	-	Full microservices
Single user focus	-	Thousands concurrent users
Manual scaling	-	Horizontal auto-scaling
Single market	Limited markets	Multi-market ready
Days to deploy	Hours to deploy	Minutes to deploy
High infrastructure costs	High maintainance costs	Marginal cost per user
Unlimited data sources	Limited data sources	Unlimited data sources
Advanced optimization & validation	Basic backtesting	Advanced optimization & validation
Basic logging	Basic logging	Immutable audit trail

Table 3: Competitive Architecture Comparison

7.2 Model Efficiency

Our Trading-as-a-Service architecture dramatically reduces operational costs:

- **Infrastructure**: Dramatic reduction vs traditional servers
- **Development**: Ship new features into market in minutes
- **Scaling**: Near-zero marginal cost per additional user
- **Maintenance**: Infrastructure as a Service, no humans required
- **Reliability**: 99.9% uptime with automatic failover
- **Security**: Built-in cloud security features
- **Flexibility**: Easily adapt to new markets and asset classes
- **Ecosystem**: Seamless integration with popular tools and platforms
- **Compliance**: Built-in compliance features for regulatory adherence

8 Market Expansion Roadmap

8.1 Current Capabilities

Live Today

- **Cryptocurrency Markets**: 10+ major CEX and DEX integrated
- **Spot and Futures**: Full derivatives support
- **Algorithmic Strategies**: 20+ strategies in production
- **User Base**: Serving retail customers, approaching institutional clients
- **Performance**: 99.9% uptime, P95 execution under 5 seconds
- **Scalability**: Supports 10,000+ orders per minute
- **Security**: Zero-trust architecture, funds always under user control
- **User Experience**: Intuitive web interface and Telegram integration
- **Support**: Customer support and comprehensive documentation
- **Data Infrastructure**: Real-time and historical data access
- **Optimization and Validation**: Advanced Bayesian optimization and Monte Carlo validation frameworks
- **Monitoring and Analytics**: Real-time monitoring with Grafana dashboards
- **Partnerships**: Collaborations with key industry players
- **Mobile Access**: Responsive design for mobile and tablet users
- **Live Trading Dashboard**: Web-based order management with automated subscriber replication
- **Multi-Paradigm Optimization**: Bayesian, Evolutionary, Tree-based, and Adaptive optimizers with Walk-Forward validation
- **Statistical Validation Suite**: Academic-grade overfitting detection ensuring production-readiness

8.2 Near-term Expansion (3-6 months)

DeFi Expansion

With DEX already integrated and live, our architecture is proven for decentralized exchange execution. Near-term focus:

- **Additional DEX Support**: Uniswap, SushiSwap, and further on-chain venues
- **Smart Contract Integration**: Direct on-chain execution (Optional)

8.3 Strategic Vision (12-18 months)

Traditional Finance Expansion

Leveraging our modular architecture for traditional markets:

- **Equity Markets**: NYSE, NASDAQ integration via FIX protocol
- **Forex Trading**: Major currency pairs through prime brokers
- **Predictive Markets**: Kalshi, Polymarket and similar platforms
- **Commodities**: Futures and options on CME, ICE
- **Fixed Income**: Bond trading capabilities
- **Regulatory Compliance**: Licenses and certifications for traditional markets

The same microservices architecture that powers crypto trading can be rapidly adapted to traditional markets, requiring only new exchange adapters while the core infrastructure remains unchanged.

9 Business Model Innovation

9.1 Trading-as-a-Service (TaaS)

Our primary offering democratizes algorithmic trading through a subscription model:

Service Tiers

- **Lite**: Basic strategies, multi-exchange - $50/month
- **Advanced**: Advanced strategies, TradeSyncPro feature - $100/month
- **Dedicated & Institutionals**: Custom strategies, dedicated resources - Revenues share model

Each tier includes:

- Strategy optimization and backtesting
- Automated execution across configured exchanges
- Real-time monitoring and notifications
- Comprehensive performance analytics

9.2 Platform-as-a-Service (PaaS)

For institutional clients, we offer white-label infrastructure:

- **Private Cloud Deployment**: Dedicated infrastructure
- **Custom Integration**: Proprietary strategy support
- **Compliance Package**: Audit trails and reporting

- **SLA Guarantees**: 99.99% uptime commitment
- **Dedicated Support**: 24/7 technical assistance
- **Training and Onboarding**: Comprehensive training programs
- **Consulting Services**: Strategy development and optimization consulting
- **Dedicated Ecosystem**: Early access to new features and dedicated integrations

10 System Reliability

Our platform demonstrates exceptional reliability in production:

Metric	Performance
System Uptime	99.9% over 12 months
Average Latency (P95)	< 5 seconds signal to execution
Error Recovery	Automatic retry with exponential backoff
Data Accuracy	100% reconciliation daily
Order Throughput	10,000+ orders per minute

Table 4: Production Performance Metrics

11 Technology Moat

11.1 Proprietary Innovations

While leveraging open-source components, AIdvisory has developed significant proprietary technology:

Core Innovations

1. **Unified Execution Engine**: Abstraction layer handling exchange-specific nuances
2. **Secure Architecture**: Zero-trust transactions model
3. **Strategy SDK**: Python-based framework for rapid strategy development
4. **Monte Carlo Framework**: Advanced market simulation with microstructure preservation
5. **Optimization Algorithms**: Proprietary Bayesian optimization techniques
6. **Dynamic Position Manager**: Real-time portfolio synchronization across exchanges
7. **AI-Driven Insights**: Leveraging machine learning for strategy improvement
8. **Scalable Microservices Architecture**: True cloud-native design enabling infinite scalability
9. **Data Infrastructure**: Real-time and historical data processing at scale
10. **Monitoring and Analytics**: Comprehensive observability and alerting systems
11. **Continuous Deployment Pipeline**: Automated CI/CD for rapid feature delivery
12. **Cost Optimization Techniques**: Infrastructure cost reduction meaning fractionary cost per user
13. **Integration Framework**: Modular design allowing for rapid feature expansion (i.e., DeFi, TradFi)
14. **Multi-Paradigm Optimization Engine**: Five optimizer families with Walk-Forward temporal validation and cluster-based multi-modal discovery
15. **Statistical Validation Suite**: Deflated Sharpe Ratio, Probability of Backtest Overfitting, and Probabilistic Sharpe Ratio as production gatekeepers
16. **Live Trading Dashboard**: Serverless order management with automated parallel execution across subscriber accounts

12 Risk Management Framework

12.1 Operational Risk Controls

Multiple layers of risk management ensure platform stability:

Risk Mitigation Strategies

Technical Risks

- Circuit breakers prevent cascade failures
- Automatic failover for critical services
- Rate limiting prevents system overload
- Dead letter queues capture failed transactions

Financial Risks

- Real-time strategies prevent over-leveraging
- Portfolio are build to avoid concentration risk
- Post-trade reconciliation ensures data integrity

Operational Risks

- Automated monitoring and alerting
- Zero-downtime deployment procedures
- Comprehensive audit logging
- Strict access controls and IAM policies
- Data transit on encrypted channels
- Regular software updates and patch management

13 Customer Success Framework

13.1 Onboarding Excellence

Our platform provides comprehensive support for new users:

- **Guided Setup**: Step-by-step exchange connection
- **Strategy Selection**: Curated strategies based on risk profile
- **Simulator Suite**: Verify portfolio performance and drawdowns in the last years
- **Education Resources**: Documentation and video tutorials
- **Community Support**: Access to trader community

13.2 Continuous Improvement

The platform continuously evolves based on user needs:

- **Market Analytics**: Improvements driven by market evolution
- **Feature Requests**: Prioritized based on user feedback

- **Regular Updates**: Nightly feature releases
- **Performance Monitoring**: Proactive issue resolution

14 Investment Opportunity

14.1 Market Positioning

AIdvisory sits at the intersection of three massive trends:

Market Convergence

1. **Algorithmic Trading Growth**: $42B market by 2030 [1]
2. **Retail Trading Democratization**: 100M+ active traders globally [2] [5]
3. **Artificial Intelligence and Cloud Infrastructure Adoption**: Powering new possibilities [3] [4]

14.2 Competitive Advantages Summary

- **Technical Superiority**: True microservices architecture vs monolithic competitors
- **Scalability**: Serve thousands at marginal cost vs linear scaling costs
- **Time to Market**: Add new markets in days vs months
- **Cost Structure**: Relief costs of the traditional platforms
- **Serverless**: Remove all the burden of infrastructure management
- **Security**: Zero-trust architecture with funds always under user control
- **Market Timing**: Positioned to capture convergence of retail, algo trading, and AI
- **Expansion Ready**: CEX and DEX live; architecture supports rapid entry into TradFi and additional DeFi venues

15 Conclusion

AIdvisory represents a paradigm shift in how algorithmic trading infrastructure is delivered and consumed. By combining sophisticated microservices architecture with advanced quantitative techniques, we've created a platform that democratizes access to institutional-grade trading capabilities at budget.

15.1 Key Takeaways

Platform Advantages

1. **Security First**: Zero-trust design with funds always under user control
2. **AI Powered**: Not a buzzword, we embraced Artificial Intelligence to power trading strategies since day one
3. **Proven Technology**: Already serving thousands of trades daily with 99.9% reliability
4. **Market Timing**: Positioned to capture the convergence of retail and algorithmic trading
5. **Economic Efficiency**: Dramatic cost reduction enables profitable scaling
6. **Revolutionary Architecture**: True cloud-native microservices enabling infinite scale
7. **Expansion Ready**: CEX and DEX live; architecture supports rapid entry into TradFi and additional DeFi venues

15.2 Vision Forward

AIdvisory is building the infrastructure layer for the future of trading. Just as AWS democratized computing infrastructure, we're democratizing trading infrastructure, enabling anyone to access tools that used to be accessible only to the world's most successful hedge funds.

Our modular, scalable architecture positions us to become the default platform for algorithmic trading, serving everyone from individual traders with $1,000 to institutions managing billions.

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Building the future of algorithmic trading, one microservice at time.

Technical Documentation
AIdvisory White Paper
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