Aspecta Atom Upgrade: Trustless Tokenization and Unified Liquidity for Illiquid Assets

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2025 November

Abstract

Since 2023, Aspecta has been developing a universal price discovery infrastructure for illiquid assets through BuildKey, Build Attestation, and Programmable Asset Infra. To date, this infrastructure has facilitated hundreds of millions USD in trading volume for illiquid assets, including Pre-markets, Pre-TGEs, Locked Tokens, NFTs, etc.

The current illiquid asset market relies on centralized authorization, trust-based trading and settlement. Growing demands from diverse interested parties to trade pre-market ICO/IDO allocations, airdrops, unvested equity/token shares remain constrained by two core challenges: **Trustless Tokenization** & **Unified Liquidity**.

In this paper, Aspecta introduces Atom Upgrade, a novel blockchain architecture that enables AMM-based unified spot-derivatives trading in a trustless framework. This upgrade aims to catalyze the next 100x potential of the illiquid asset market and achieve a trading and liquidity experience comparable to major digital assets like BTC, ETH, and BNB.

Disclaimer: This paper is a technical whitepaper for information and research purposes. This paper does not constitute financial, investment, or any form of advice. The implementation details are subject to change and may differ from what is described here.

1 Introduction

The spot and derivatives trading of ERC-20-standard assets has emerged as the dominant force in the blockchain space, owing to its simplicity, standardization, and scalability. However, illiquid assets such as pre-market ICO/IDO, airdrops, unvested equity/token allocations, and many others lack such standards, leading to poor liquidity. The reasons are as follows:

- Lack of transparency and difficulty in verifying ownership;
- Centralization and high trust cost for tokenization, trading authorization, and asset settlement;
- Inefficient trading mechanisms and fragmented liquidity

Building based on Aspecta 1.0, a full-set solution that includes BuildKey, Build Attestation, and Programmable Asset Infra, Aspecta proposed the latest Atom Upgrade: BuildKey V2, bringing in **Trustless Asset Tokenization** and **Unified Liquidity** for illiquid assets.

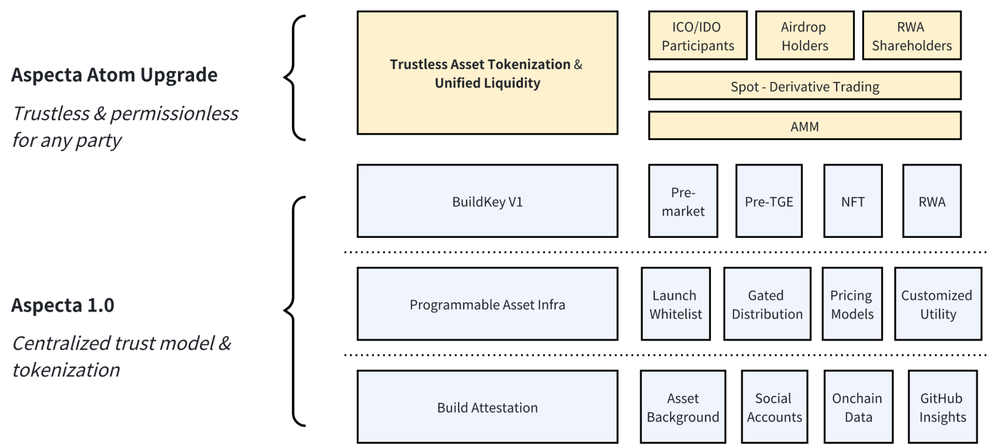

Figure 1: The overview of Aspecta 1.0 and Aspecta Atom Upgrade.

Through the Atom Upgrade, Aspecta introduces an innovative blockchain architecture that enables a novel AMM-based, unified spot and derivatives trading system within a fully trustless framework. This upgrade unleashes a 100x growth potential for the illiquid assets market. With millions more participants and billions more trading volume, a completely new on-chain financial ecosystem is going to be established.

1.1 Trustless Asset Tokenization

This is a trustless tokenization framework for illiquid assets, designed to eliminate reliance on centralized verification and authorization from original asset owners (e.g., project teams or companies). It enables any interested party to initiate or participate in trading and ensures settlement/fulfillment completion with zero counterparty risk. Example use cases:

- How can IDO/ICO participants or airdrop holders trade their allocations during the Pre-TGE stage, even though they haven't received the tokens yet?
- How can private equity or Pre-IPO investors trade their allocations if the verification or authorization is delayed, while still ensuring successful settlement upon liquidity events?

1.2 Unified Liquidity

Unified liquidity aims to deliver ERC-20-level trading experience and liquidity for illiquid assets.

- Spot + Derivative + DeFi: Supports both spot trading, derivative (long/short) trading, and more DeFi composability, across all types of illiquid assets.
- Algorithm Compatibility: Compatible with existing liquidity-matching algorithms and mechanisms, e.g., AMM, to provide efficient and smooth liquidity access.
- Permissionless: Enables all participants — including both asset owners and interested parties — to trade smoothly without centralized authorization.
- Full Lifecycle: Provides continuous liquidity from pre-liquid to fully liquid stages.

2 Aspecta Atom Upgrade

2.1 Overview

The Aspecta Atom Upgrade introduces BuildKey V2, featuring a highly streamlined trading interface, supported by an underlying layered system and a **Dual-Key Equilibrium Model**. The simple yet powerful interface delivers liquidity, compatibility, and scalability for illiquid assets equivalent to those of ERC-20 tokens — all within a decentralized and trustless architecture.

Through the Aspecta Atom Upgrade, illiquid assets will achieve the following trading liquidity, compatibility, and scalability features:

- **Permissionless Trading for Stakeholders**. Asset stakeholders can trade their holdings without relying on centralized, complex, or high-cost verification and authorization procedures. This includes ICO/IDO participants, airdrop holders, equity investors, and others.
- **Spot + Derivative + DeFi**: Efficient Liquidity and Smooth Trading Experience. Traders can execute transactions efficiently using mechanisms comparable to existing ERC-20 spot and derivative products — such as order books, AMMs, and perpetual contracts.
- **Trustless and Decentralized Asset Settlement**. The settlement process from on-chain credentials of illiquid assets to real liquid assets is standardized and decentralized. If asset buyers are unable to receive the underlying assets upon liquidity events, the smart contract will automatically execute compensation to buyers, effectively resolving the counterparty risk in a trustless way.
- **Liquidation Protection & Safe Hedging**. Take token pre-market for example, when trading with short positions, short traders will not be forcibly liquidated even if the pre-market price experiences short-term volatility. Instead, short users can still close the positions and win profit by finishing asset settlement post TGE. This mechanism significantly reduces the unreasonable liquidation risk for short users in the pre-market.

2.2 Use Cases at a Glance

Aspecta Atom Upgrade (BuildKey V2) supports various scenarios through its AMM-based trading mechanism.

- Open Long Position (Trade Long Key) to Buy Future Assets
  - Individual token buyers
  - Institutions and liquidity funds
  - Long-price speculators
- Open Short Position (Trade Short Key) to Sell Future Assets
  - Early-stage fundraisers (e.g., ICO, IDO, launchpad participants)
  - Users eligible for future liquidity assets (e.g., airdrop holders, investors)
  - Hedging traders
  - Short-price speculators

Participants can trade Long or Short BuildKeys to profit via the AMM mechanism, and settle positions at liquidity events (such as TGE, token vesting, or IPO) to receive tokens, BNB, or other equivalent assets.

2.3 Architecture

The Aspecta Atom Upgrade introduces a closed-loop financial system for illiquid asset trading, architected as three deeply interconnected layers that form a self-reinforcing economic flywheel. This is not a collection of standalone features, but a unified engine in which each layer directly fuels and secures the next.

2.3.1 Trust Layer

The Trust Layer establishes the foundation of integrity. For each short position user (who claims to provide future liquid assets), the Trust Layer collects a security deposit from them and runs a decentralized mechanism with the other two layers to manage the deposit. Such decentralized management of the deposit builds the trustless asset tokenization infrastructure.

2.3.2 Liquidity Layer

The Liquidity Layer acts as the market engine, transforming this verified participant base into a dynamic marketplace. It thrives on the capital and activity generated by the Trust Layer, utilizing security deposits and proceeds to fuel liquidity. The core of this layer is a Dual-Key Equilibrium Model. This model

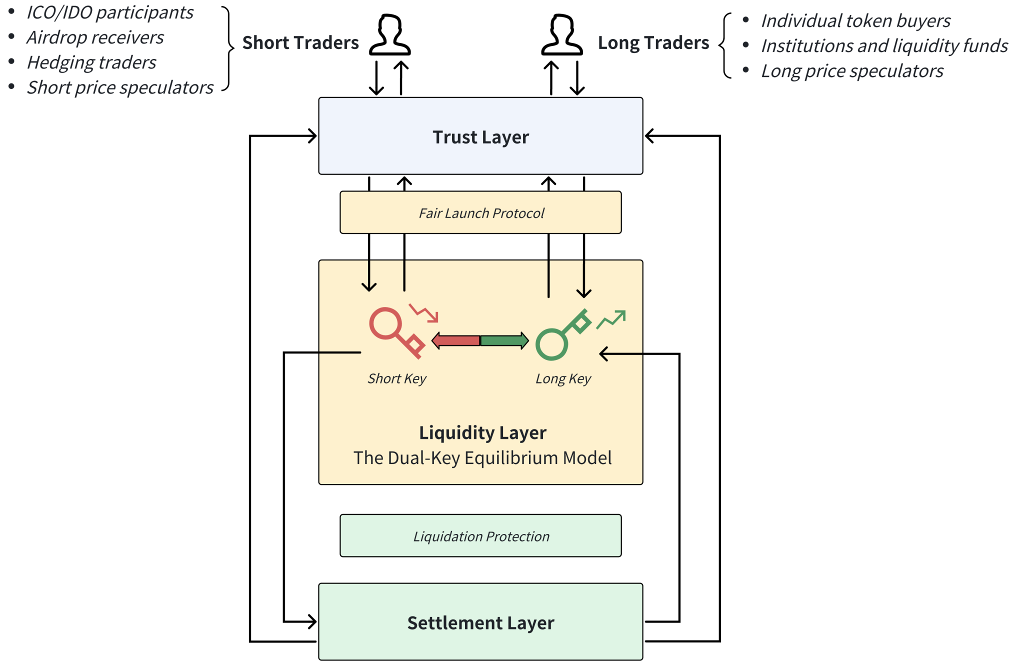

Figure 2: The architecture of Aspecta Atom Upgrade.

enables native short exposure without relying on external liquidity pools or oracle dependencies, establishing a dynamically balanced, self-regulating market for pre-liquidity assets.

On the other hand, the Liquidity Layer also includes a Fair Launch Protocol that actively eliminating bots and Sybil attacks through fair launch and sniper tax mechanisms.

2.3.3 Settlement Layer

The Settlement Layer functions as the system's self-enforcing resolution mechanism, automatically executing outcomes based on prior actions. It directly links to the Trust Layer to release or penalize deposits, while redistributing value according to the final state of the Equilibrium System. This creates a virtuous cycle that returns value to compliant participants, ensuring the long-term sustainability of the entire ecosystem.

2.4 Technology

In this section, we will introduce the **Dual-Key Equilibrium Model** and other key techniques in each layer.

2.4.1 Core Architecture: The Dual-Key Equilibrium Model

Current illiquid asset platforms exhibit a structural bias toward long positions, creating information asymmetry and limiting price discovery. The Aspecta Atom Upgrade introduces a novel primitive: the Dual-Key Bonding Curve. This mechanism enables native short exposure without relying on external liquidity pools or oracle dependencies, establishing a dynamically balanced, self-regulating market for pre-liquidity assets.

- Long Key (LK): A synthetic asset representing a claim on a fixed percentage (e.g., 0.00001%) of a project's future token supply. Purchases interact directly with the bonding curve, driving price appreciation deterministically.
- Short Key (SK): A novel synthetic debt position minted upon collateral deposit. Each SK minted effectively creates and sells a corresponding LK into the market, applying downward pressure on the bonding curve. The P&L of an SK holder is inversely correlated with the LK price.

2.4.2 Market Equilibrium Through Algorithmic Design

The system forms a closed-loop economic environment where long and short activities create a continuous price discovery feedback loop. The buying pressure from LK holders and the selling pressure generated through SK minting maintain a dynamic equilibrium, theoretically driving the key price toward a community-validated fair value.

2.4.3 Non-Custodial Short Engine & Risk Engineering

The short mechanism is a cornerstone of our architectural innovation.

- **Position Initiation**: Users open a short position by locking collateral (e.g., in BNB). The protocol then algorithmically mints a Short Key (SK) and simultaneously executes a synthetic sale of a Long Key (LK), instantly realizing downward price impact.

- **Profit Locking & Collateral Management**: The potential profit from a short position, along with the initial collateral, is programmatically locked in a non-custodial smart contract vault. All release conditions are strictly predicate-based.

- **Safe Liquidation Engine**: Positions are bound to a deterministic "Safe Liquidation" point. This is triggered when the locked collateral becomes insufficient to repurchase the minted LK—effectively, a price doubling event. This design minimizes systemic risk and protects the integrity of the long-side pool. However, different from a pre-market perp, when the price reaches the liquidation point, the SK position will not be forcibly liquidated. Instead, it will be safely locked and can still be closed after the project TGE. This mechanism significantly reduces the unreasonable liquidation risk for short users in the pre-market.

2.4.4 Settlement Logic: A Two-Phase Deterministic Process

Asset settlement of liquidity events (e.g., TGE) are triggered by immutable smart contract logic. Taking TGE events as an example:

- **Settlement for Short Positions (TGE to TGE+2h)**

  SK holders must deliver the predefined quantity of project tokens to the contract to unlock their collateral and realize profits. The pre-defined exchange rate (e.g., 1 SK = 0.00001% of token supply) is immutable, pegging the key price directly to the project's FDV. Failure to deliver results in the forfeiture of locked assets, which are reallocated to the long-side pool as compensation.

- **Settlement for Long Positions (TGE+2h onwards)**

  LK holders can redeem their keys for a pro-rata share of:

  1. Tokens from all settled short positions,
  2. Forfeited BNB from all unsettled short positions,
  3. All remaining BNB liquidity in the pool.

  This design ensures long traders become the ultimate beneficiaries of any short-side failures.

2.4.5 Fair-Launch mechanism

BuildKey V2 includes several mechanism designs to provide fair and transparent participation.

- **Share/Raffle-Based Key Allocation Mechanism**

  The system begins with a deposit phase, where user deposits are used to bootstrap the initial liquidity of the bonding curve. A deterministic function allocates Long Keys to depositors in proportion to their deposit amount by either direct sharing or random raffle, establishing a fair and permissionless initial distribution.

- **Hard Cap per Address: An Anti-Monopoly Provision**

  To explicitly prevent wealth concentration and mitigate Sybil attacks, the protocol enforces a strict and non-bypassable upper limit on the number of Long Keys a single address can acquire at the beginning of the trading phase. This hard cap is a foundational parameter that ensures a decentralized holder base from inception, structurally reducing the risk of price manipulation by any single entity.

- **Dynamic Decay Sniper Tax & Self-Adaptive Pricing**

  To counter post-launch volatility, BuildKey V2 also implements a time-variable transaction tax. For the first five minutes after pool activation, all buy transactions are subject to an additional fee. This tax follows a deterministic linear decay model, starting at a predefined maximum and decreasing to zero by the end of the five-minute window.

  This model does not prohibit early trading but introduces a calculable cost-benefit analysis, requiring participants to weigh the advantage of early entry against the economic disincentive of the tax.

  From another perspective, this approach allows users to negotiate the initial prices of different assets in a fair and democratic manner, thereby achieving self-adaptive pricing for different assets.

2.5 Comparison & Benchmark

In this section, we compare BuildKey V1 and V2 with existing trading platforms, and demonstrate the significant advantages brought by BuildKey V2.

<table>
<tr><th></th><th>Description</th><th>BuildKey V1</th><th>BuildKey V2</th></tr>
<tr><td>ICO / IDO Platforms</td><td>ICO/IDO platforms offer allocations at a fixed price.
Participants' shares can not be traded and remain locked until the TGE.</td><td>Allows users to initially purchase allocations at a fixed price and subsequently trade them freely on a bonding curve.
Enables free pre-market price discovery and organic attention building.</td><td>Seamlessly integrates with existing ICO/IDO platforms, enabling participants to sell their allocations or hedge their positions.
Supports opening or closing short positions to profit on the pre-market.
All features from BuildKey V1 are fully preserved, allowing users outside initial sales to acquire pre-listing allocations from others through BuildKey's open market.</td></tr>
<tr><td>CEX / DEX Spot & Perp</td><td>Primarily focus on trading liquid tokens.
Illiquid assets cannot be traded directly on these platforms due to counterparty risks and their non-standardized nature.</td><td rowspan="2">BuildKey V1 builds
A standardized trading and asset settlement procedure for all kinds of illiquid assets.
An AMM-based trading mechanism, bringing in memecoin-level trading smoothness and liquidity.</td><td rowspan="2">BuildKey V2 provides 100x potential liquidity growth for the illiquid asset market by delivering:
Permissionless trading for all asset holders and stakeholders
Spot + Derivative + DeFi: Efficient Liquidity and Smooth Trading Experience
Trustless and Decentralized Asset Settlement
Safe Hedging & No Liquidation Risk</td></tr>
<tr><td>Pre-market</td><td>Counterparty risk
Reliance on centralized verification and authorization.
Incompatibility with advanced liquidity mechanisms, resulting in low trading efficiency.</td></tr>
<tr><td>Pre-market Perp</td><td>Existing pre-market perp is only available for a select few projects
Order book-based trading experience may suffer from low liquidity
Pre-market price volatility poses an excessively high liquidation risk for hedging users.
Hedging execution requires multiple steps to complete</td><td colspan="2">Support ANY pre-market: BuildKey V1 and V2 together form a decentralized, permissionless, and trustless infrastructure that supports all types of illiquid assets—including pre-market trading for any asset type.
Spot + Derivatives + DeFi. Smooth Trading & Hedging: BuildKey V2 provides unified liquidity across spot and derivative markets. This allows users to execute integrated spot and perpetual hedging strategies in a single step directly within BuildKey, eliminating the need for multi-platform operations.
Liquidation Protection: BuildKey V2 has a special Liquidation Protection & Safe Hedging mechanism. The short position will not be forcibly liquidated even if the pre-market price experiences short-term sharp volatility. Instead, the position will be safely locked and short users can still close it by finishing asset</td></tr>
</table>

Figure 3: The comparison of BuildKey V1 and V2 with existing trading platforms.

3 Aspecta 1.0 Review: BuildKey, Asset Infra, and Build Attestation

3.1 Overview

Aspecta 1.0 has built a universal price discovery infrastructure, systematically addressing the pricing challenges of illiquid assets.

- **BuildKey**: A universal framework that standardizes illiquid assets into ERC-20 credentials with programmed trust.
- **Programmable Asset Infra**: For projects/stakeholders to launch & grow diverse assets with flexible pricing models, gated distribution, and customized utilities to support lifecycle development.
- **Build Attestation (Aspecta ID) & Build Matrix**:
  - **Aspecta ID**: One of the largest reputation systems for developers and early-stage projects. Use AI (LLM & Graph Learning) to transform billions of GitHub commits, on-chain data, and multidimensional work histories into intuitive reputation.
  - **Builder Matrix & Builder Economy:** Rooted on Aspecta ID, in partnership with ecosystems (e.g., L1 & L2 blockchains) to identify and support attested developers & early-stage projects. Follow up with BuildKey open price discovery to facilitate community building & market awareness.

3.2 Traction

The BuildKey model and the Programmable Asset Infra have brought over 30 illiquid/Pre-market assets to the open on-chain world, including Solayer, Sign Protocol, and many others. The open price discovery mechanism generated average returns of 3573%, with 8 assets delivering 10x+ gains and a total trading volume of hundreds of millions USD.

Aspecta ID boasts 619,000+ registered users (with some overlap of BuildKey users), including 54,000+ GitHub-verified developers/projects and 19,000+ highly skilled developers/projects. Builder Matrix has partnered with over 10 major ecosystems across Web2 & Web3 — such as Google Developer Group, Consensys, BNB Chain, and more.

3.3 Case Study: River BuildKey in Collaboration with Binance Wallet

On September 18th, 2025, Aspecta collaborates with Binance Wallet to introduce the BuildKey-based exclusive TGE model, bringing the BuildKey standard to a broader audience.

2% of the total $RIVER total supply was allocated for BuildKey trading. In total 100,301.86 BNB ($100,301,860 equivalent) was deposited during the Fair Launch stage, which was 99329.94% oversubscribed. During the Trading Stage, the BuildKey price surged 800% in a few minutes. The asset brings participants 6000% returns after TGE.

4 Conclusion

Aspecta 1.0 has established a comprehensive infrastructure for illiquid assets, covering attestation, price discovery, and trading—facilitating hundreds of millions of USD in trading volume.

Driven by substantial market demand, Aspecta has launched the Atom Upgrade, introducing a novel blockchain architecture that enables AMM-based, unified spot and derivatives trading in a fully trustless environment. This architecture delivers Trustless Asset Tokenization and Unified Liquidity, laying the foundation for potential 100x growth in the illiquid assets market.

Aspecta will continue to enhance its illiquid asset trading infrastructure, aiming to deliver an experience rivaling that of top-tier CEXs and DEXs. This will empower the trillion-dollar illiquid assets with liquidity and trading efficiency comparable to major digital assets like BTC, ETH, and BNB.