Catapult Protocol

Launch Infrastructure for Gamified Trading

Multichain aggregation and launch tools | Provably fair price discovery

Abstract. Catapult is a dual-mode token launch protocol addressing inefficiencies in current on-chain markets: poor liquidity utilization, misaligned incentives, and fee structures that extract rather than recirculate value.

The protocol offers two distinct products. **Catapult Turbo** is a gamified trading environment using algorithmic price generation to create high-volatility markets without liquidity requirements. **Catapult Hyper** is a LayerZero-native launchpad with structured bonding mechanics, automated LP deployment, and multichain token infrastructure.

Each product represents a different approach to token launches. Turbo optimizes for attention and accessibility, removing capital barriers entirely. Hyper optimizes for sustainable on-chain markets through time-windowed bonding and permanent liquidity. Both feed into a unified token economy where fees compound back to participants rather than leaving the system.

1. Introduction

Current token launch infrastructure suffers from inefficient liquidity allocation, misaligned incentives between platforms and users, and fee structures that extract value without returning it to participants. Catapult addresses these issues through two complementary but independent products.

Catapult Turbo replaces traditional market mechanics with **algorithmic price generation**. Tokens trade against a mathematical engine rather than an order book, eliminating liquidity requirements and the associated risks of rugpulls, sniping, and early seller extraction. The result is a pure attention market where volatility itself becomes the product.

Catapult Hyper restructures on-chain launches through **time-windowed bonding phases** and automated liquidity deployment. Projects that clear their bonding thresholds receive permanent, non-extractable LP. Fee revenue is directed back to creators, and the protocol's buyback mechanism rather than disappearing into platform margins.

The two products serve different use cases but share a common economic layer built around the **$PULT** token. Together they form a launch ecosystem where value generated

by activity stays within the system.

2. Catapult Turbo

2.1 Thesis

Trading has entered its dopamine era. Attention spans are measured in seconds, volatility is the product, and traditional market infrastructure hasn't adapted. Turbo is built for this reality.

The core innovation is removing liquidity from the equation entirely. Instead of an order book backed by pooled capital, Turbo uses a mathematical engine to generate price action. Trades execute instantly at the current engine price with **zero slippage**, regardless of size. There's no pool to drain because there's no pool.

This makes token launches radically accessible. Creators don't need capital to start. Traders don't face snipers or insider allocations. Price doesn't die no matter the volume.

2.2 Token Creation and Trading

Launching a Turbo token takes seconds. A creator pays a flat listing fee, selects a volatility mode, and the chart goes live.

Once live, the engine streams an interactive chart. Traders buy and sell exactly as they would on a spot exchange, but every trade settles against the protocol vault rather than counterparties. When the time window expires, or when a trader exits early, positions are settled based on P/L against the engine's price path.

Public tokens appear in the discovery feed and earn creators 0.5% of all trade volume. To maintain volume density and prevent fragmentation across too many concurrent charts, the protocol caps active public sessions. **Private tokens** don't appear in feeds, carry no creator fee, and function as isolated environments for personal trading or strategy testing.

2.3 On-Chain Graduation

Turbo charts exist in simulation, but tokens that generate sufficient traction can transition to real on-chain markets. This graduation path is optional—most Turbo activity lives and settles entirely within the simulation layer.

Tokens that reach $50,000 in cumulative volume become eligible for deployment. The process is automated:

- The contract address is published immediately upon qualification.
- A 15-minute cooldown follows, during which the creator can update token metadata, socials, and imagery.
- At the end of this window, the protocol seeds the LP on Meteora using fees accumulated during the Turbo phase and enables live trading on Solana.

The supply split allocates 98% to the liquidity pool and 2% directly to the creator as a performance incentive. Initial market cap roughly equals the liquidity size, ensuring the token launches with sustainable depth rather than an inflated valuation vulnerable to immediate dumps.

To prevent bot extraction, buyers attempting to enter in the first block of LP deployment face a penalty fee. This **anti-sniping mechanism** protects manual traders who built the volume that earned graduation in the first place.

2.4 Price Engine

Turbo uses a discrete-time **Geometric Brownian Motion** model to generate price paths. GBM is a random walk process that ensures prices stay positive and follow a log-normal distribution, producing realistic volatility while remaining mathematically verifiable. The pricing algorithm is provably fair and has been audited by Hashlock.

The recursive pricing formula:

$$P_{t+1} = P_t \cdot \exp\left[\left(\mu - \frac{1}{2}\sigma^2\right)\Delta t + \sigma\sqrt{\Delta t} \cdot \varepsilon_t\right] \tag{1}$$

where $\varepsilon_t \sim \mathcal{N}(0,1)$, μ is the daily drift coefficient, σ is the daily volatility coefficient, and Δt is the time step rescaled for the session's compressed duration.

The drift μ is set to zero, creating a **martingale** environment with no inherent directional bias. The volatility σ controls the magnitude of price swings.

A property of GBM: the term $-\frac{1}{2}\sigma^2$ creates variance drag, meaning median price paths drift downward over time even with neutral drift. However, the system remains mathematically fair because the magnitude of winning paths compensates for their lower frequency.

2.5 Volatility Modes

Mode	Speed	Lifetime	Daily σ	Per-Tick Volatility
Slow	6×	4 hours	0.50	0.42%
Fast	24×	1 hour	0.75	1.25%
Flash	96×	15 min	1.00	3.33%
Crack	480×	3 min	1.25	9.32%
Mayhem	1440×	1 min	0.75	9.68%

Table 1: Turbo volatility configurations. Parameters may be adjusted based on observed market dynamics.

2.6 Fee Structure

Every trade incurs a 1% fee on notional value, split evenly between the protocol and the token creator (for public tokens). At settlement, winning positions pay an additional 4% fee on gross profit. Losing positions are exempt.

The underlying engine has neutral expected value, but fees introduce localized drag. Even so, the engine is calibrated for extreme volatility where 10x or 100x moves remain reachable.

2.7 Provable Fairness

Turbo implements a **hash-commitment scheme** ensuring every price tick is fixed before trading begins.

When a token initializes, the engine pre-computes the complete price sequence using GBM. It generates a secret salt and records the tick speed. Before the chart goes live, these elements are hashed:

```
fairHash = hashMessage(ticksString + fairSalt + speedTicksInSecond)
```

This hash is published immediately as an immutable anchor. During trading, the salt and price array remain hidden, but because the hash is public, any attempt to alter ticks would cause verification to fail.

Upon session expiration, the system discloses the salt and provides the raw price string. Anyone can verify by recalculating the hash and comparing it to the published value. Due to Keccak-256 properties, changing even a single character produces a completely different hash.

3. Catapult Hyper

3.1 Thesis

Hyper is on-chain launch infrastructure designed around two principles: liquidity should be **permanent**, and fees should **recirculate** to participants.

Built on LayerZero's messaging protocol, Hyper enables tokens to launch as OFTs (Omnichain Fungible Tokens) with unified supply across supported chains. This eliminates the fragmentation and security risks associated with traditional bridges and wrapped assets.

The core mechanism is **structured bonding**. Rather than immediate LP deployment or static fundraising, Hyper uses time-windowed phases that filter for projects with genuine community support. Liquidity that enters the system stays in the system.

3.2 Bonding Lifecycle

Hyper launches follow a strict sequence governed by 48-hour windows.

Initial Phase. A project opens with 48 hours to meet its primary bonding goal of 120 SOL. Supply is sold along a convex curve, with 87.5% of the target required for graduation.

Graduation. Projects that clear the threshold pay a graduation fee (5 SOL) and receive an automatically minted LP holding the remaining 12.5% of supply. The LP token is burned immediately, making liquidity permanent and non-extractable.

Reactivation. Projects that miss their initial goal can attempt a second 48-hour window. This requires paying a reactivation fee (2 SOL) and meeting increased contribution requirements. The penalty filters for sustained community conviction.

Retirement. Failure to clear the second round results in permanent archival. The campaign ends and cannot be relaunched, keeping the terminal focused on active markets.

3.3 Multichain Architecture

Tokens launched through Hyper deploy as **LayerZero OFTs**, maintaining unified supply across all integrated chains. There are no wrapped versions, no bridge risks, and no fragmented liquidity.

The Hyper terminal serves as the discovery and trading interface for these multichain

assets. The initial deployment targets Solana, with architecture designed for expansion to additional networks.

3.4 Fee Structure

Hyper implements distinct fee categories.

Bonding Fees. The Dynamic Volatility Curve applies a variable fee between 0.25% and 10% based on market conditions during the bonding phase. Additional fees apply to reactivation and graduation events. Bonding revenue splits: 50% to the creator, 25% to treasury, 25% to $PULT buyback and burn.

Protocol Fees. Ongoing trading incurs a 0.5% swap fee and 0.1% bridge fee. Protocol revenue splits: 75% to treasury, 25% to $PULT buyback and burn.

LP Fees. All LP pairs deploy against $PULT with a 0.25% fee. LP revenue splits: 50% to the creator, 50% to $PULT buyback and burn.

Referrals. A referral program allocates 7.5% to 22.5% of treasury protocol fees to participants who bring new activity to the platform.

Token holders are not entitled to revenue sharing. For the avoidance of doubt, only creators and the treasury are entitled to revenue.

4. Token Economy

$PULT is the native token of the Catapult ecosystem, functioning as both the base trading pair and the primary value capture mechanism.

4.1 LP Denomination

All Hyper liquidity pools deploy against $PULT rather than stablecoins or network tokens. When a project graduates, its LP is a PULT pair. When traders swap on graduated tokens, they route through PULT.

This creates **structural demand**. Every new launch requires PULT for the LP. Every trade generates PULT volume. The token becomes infrastructure.

4.2 Buyback and Burn

Revenue from across the protocol flows into systematic $PULT buybacks. For the avoidance of doubt, token holders are not entitled to any revenue.

From bonding fees: 25% of all revenue from the Dynamic Volatility Curve, reactivation fees, and graduation fees purchases PULT from the open market.

From protocol fees: 25% of swap and bridge fee revenue purchases PULT.

From LP fees: 50% of all LP trading fees across graduated pairs purchases PULT.

All purchased tokens are **permanently burned**. This creates a direct relationship between platform activity and token deflation. As Catapult usage grows, buy pressure increases while circulating supply decreases.

4.3 Revenue Distribution

The remaining fee revenue distributes across three categories.

Creators receive 50% of bonding fees and 50% of LP fees on their tokens. This aligns creator incentives with long-term token performance rather than launch-and-exit dynamics.

Treasury receives 25% of bonding fees and 75% of protocol fees, funding ongoing development, security, and ecosystem growth.

4.4 Fee Summary

Source	Creator	Treasury	Buyback
Bonding Fees	50%	25%	25%
Protocol Fees	—	75%	25%
LP Fees	50%	—	50%

Table 2: Revenue distribution across fee categories.

5. Conclusion

Catapult provides two distinct approaches to token launch infrastructure, unified by a common economic layer.

Turbo removes liquidity requirements entirely, replacing order books with algorithmic price generation. The result is accessible, high-volatility markets where creators can launch without capital and traders can participate without facing snipers or insider extraction.

Hyper restructures on-chain launches through time-windowed bonding, permanent liquidity, and systematic fee recirculation. Projects that graduate earn committed markets.

The $PULT token connects both products through LP denomination and buyback mechanics, ensuring that value generated across the ecosystem flows back to holders rather than extracting outward.

Whether optimizing for attention markets or sustainable on-chain infrastructure, Catapult aims to demonstrate that launch mechanics can align incentives rather than exploit them.