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Perps for Everything: The Ultimate RWA Liquidity Solution

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Abstract

This paper systematically examines the market logic, current data, and implementation pathways for the deep integration of Real-World Assets (RWA) with on-chain perpetual contracts (Perps). Against a broader macro backdrop, leading institutions including a16z and Coinbase Ventures have identified "The Perpification of Everything" as a core investment theme for 2026, with the perpetualization of RWA assets transitioning from a fringe hypothesis to industry consensus. From a market data standpoint, as of March 2026, the average daily trading volume of RWA Perps across the market has stabilized above $1 billion, with peak volumes approaching $6 billion during extreme precious metals market conditions. The Perp DEX-to-CEX perpetual contract trading volume ratio rose from 6.3% at the start of 2025 to 18.7% by year-end — tripling from its opening level — confirming that on-chain derivatives infrastructure has matured to a degree capable of accommodating the pricing and execution demands of traditional assets.

Regarding integration pathways, this paper identifies three progressively deeper mechanisms through which RWA enters the Perps market: (1) synthetic exposure at the price layer, wherein oracle feeds map off-chain asset prices for pure cash-difference settlement without requiring underlying assets to be on-chain — the most widely deployed approach today, exemplified by Hyperliquid HIP-3, Ostium, and Bitverse; (2) collateral enhancement at the asset layer, where yield-bearing RWA tokens are incorporated directly into unified margin accounts, enabling simultaneous yield accrual and leveraged trading, as represented by Bitverse's unified account system built on Pharos Network's ecosystem; and (3) structured trading at the yield layer, which disaggregates the interest rate attributes of RWA into independently tradeable instruments, as exemplified by Pendle Finance's PT/YT mechanism and the Boros platform. These three pathways are not mutually exclusive but rather constitute a layered supply structure targeting traders, asset holders, and institutional participants respectively.

On core challenges, this paper identifies three technical thresholds: the cost of acquiring sufficient oracle precision and real-time data delivery; the temporal mismatch between traditional market trading hours and the 24/7 nature of on-chain trading; and the conflict between T+1 settlement cycles and millisecond-level liquidation mechanisms. These challenges collectively point to a single conclusion: general-purpose blockchains face structural bottlenecks in supporting the compound demands of RWA Perps. Purpose-built high-performance Layer 1 chains dedicated to RWA — such as Pharos Network, with its sub-second confirmation capability and protocol-level native compliance architecture — are emerging as critical infrastructure for the scalable operation of this sector.

Keywords: RWA; Perp DEX; Unified Margin; Hyperliquid HIP-3; Bitverse

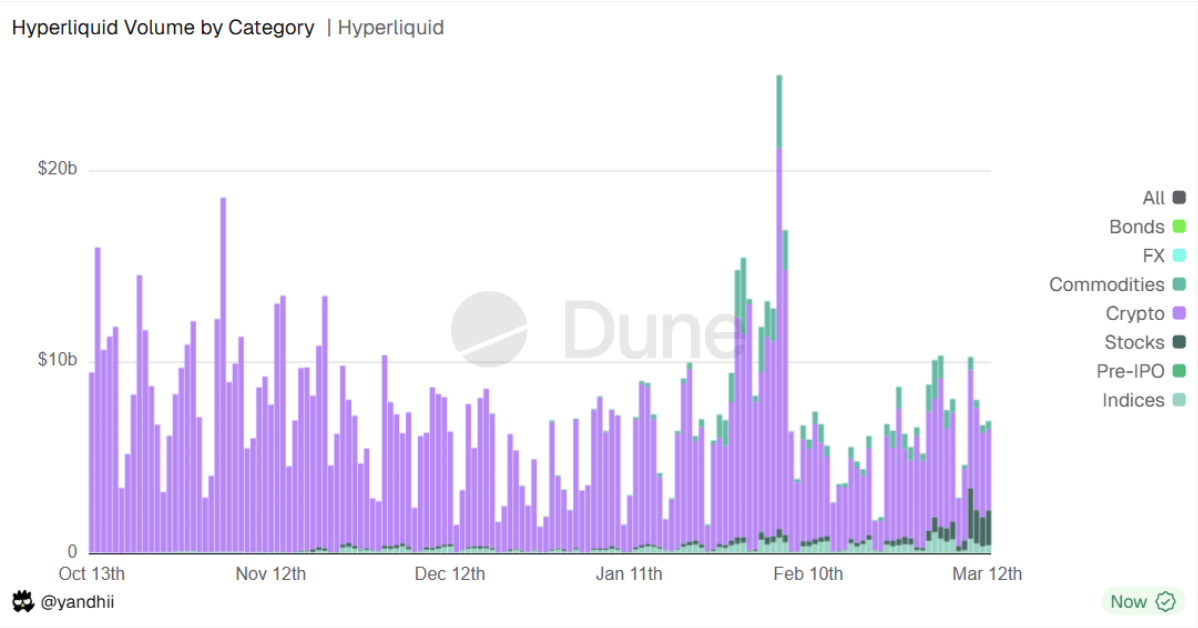
01 / Introduction: The Perpification of Everything — The Inevitable Logic Behind RWA Meets Perps

The development of on-chain crypto products tends to follow a clear evolutionary arc: from "holding" to "trading." Stablecoins solved the problem of on-chain value storage; tokenized U.S. Treasuries solved on-chain risk-free yield. And as the RWA narrative matures, the market inevitably asks the next question: how do you short, hedge, and leverage these assets on-chain? This is precisely where perpetual contracts (Perps) and RWA begin to intersect.

A number of leading crypto research institutions — both domestically and internationally — have already called this convergence. In its 2026 outlook report, a16z placed a directional bet on the development of perpetual contracts in 2026 [1], with a specific focus on the Perpification of RWA assets as an emerging trend. In its 2026 investment report, Coinbase Ventures ranked RWA Perpetuals first among its nine core investment themes, coining the phrase "The Perpification of Everything" with a particular emphasis on the perpetualization of tokenized equity RWAs [2]. Bitget Wallet similarly forecast the convergence of RWA and Perps in its 2026 annual outlook, emphasizing "Everything Perpetualized" as a defining directional theme. This collective institutional conviction reflects both a judgment on market demand and a confirmation of underlying technological readiness — the integration of RWA assets with perpetual contracts has shifted from a fringe hypothesis to a structural industry consensus[3].

From a data perspective, this trend had already begun to take shape in 2025. According to The Block, the on-chain perpetual contract DEX-to-CEX volume ratio jumped from 6.3% at the start of 2025 to 18.7% by year-end — three times the opening figure [4]. At the same time, following the launch of the Hyperliquid HIP-3 protocol, permissionless perpetual contract markets began bringing traditional assets onto the chain in volume — gold, crude oil, the S&P 500 index, the Nasdaq, and more. As of March 2026, among the top 30 markets by trading volume on the Hyperliquid platform, only 7 are crypto-native assets; the remainder are commodities, forex, and equity index RWA contracts [5].

Figure 1: Hyperliquid Trading Volume by Asset Category (Dune Analytics)



Source: Dune

With this backdrop in mind, this paper examines from the ground up the internal logic of combining RWA with Perps, systematically mapping the current market data, driving mechanisms, and specific implementation pathways. It further conducts an in-depth analysis of the necessary infrastructure conditions and potential risks. The paper's core argument is that RWA + Perps is not a simple product combination — it represents a dimensional leap in on-chain finance from "asset holding" to "risk trading." That leap is now determining the competitive landscape for the next wave of on-chain liquidity.

02 / From Holding to Trading: The Bilateral Choice Between RWA Markets and Perp DEXs

2.1 Rapid Expansion and Structural Constraints in the RWA Market

According to RWA.xyz data, as of end of February 2026, the total scale of tokenized RWA on-chain globally had reached approximately $45 billion, representing growth of over 140% compared to the same period in 2025 [6]. Yet behind this headline expansion lies a structural constraint: the overwhelming majority of tokenized assets remain at the "spot holding" layer. Their primary function is to address asset ownership verification and yield distribution — not to provide risk trading tools.

To take tokenized U.S. Treasuries as an example: the primary objective of holders is to capture a risk-free baseline yield of 3.5% to 5%, not to actively trade interest rate movements. In private credit tokens, the secondary market is largely dormant, with subscription and redemption channels serving as the main pathway for asset circulation. This model reduces compliance complexity, but it fundamentally limits the capital efficiency and market depth of RWA assets.

In short, the current RWA market has answered the question of "how to bring high-quality off-chain assets on-chain" but has not yet adequately addressed "how on-chain assets can be efficiently traded, hedged, and recycled." This is precisely where Perp DEXs see their structural opportunity.

2.2 The Perp DEX Explosion: Mature Infrastructure Awaiting New Assets

Perp DEXs underwent a genuine scale breakout in 2025. According to data cited by Stacy Muur on X, on-chain perpetual contract monthly trading volume surpassed $1.2 trillion for the first time in October 2025. DefiLlama data shows that as of mid-March 2026, cross-chain derivatives protocols recorded a 7-day trading volume of approximately $179 billion, open interest of approximately $12.8 billion, and total value locked (TVL) of approximately $3.1 billion. High-performance Perp DEXs led by Hyperliquid now possess the liquidity depth and execution speed to compete head-on with centralized exchanges — its cumulative perpetual contract volume has reached close to $4 trillion, with a processing capacity of 200,000 orders per second at sub-one-second latency.

According to a Grayscale report, by mid-2025, 1 in every 20 global perpetual contract trades was occurring on an on-chain decentralized platform — a ratio that was below 1% just three years earlier [7].

Figure 2: On-Chain Perps Derivatives Overview (DefiLlama)

Source: DefiLlama [8]

Yet the high degree of asset homogeneity among Perp DEX offerings remains the sector's core vulnerability. Across leading platforms such as Hyperliquid, dYdX, and GMX, trading volume remains overwhelmingly concentrated in BTC, ETH, and a handful of major altcoins. During periods of compressed market volatility, on-chain capital lacks sufficient diversity of risk sources to construct differentiated strategies. This is the structural motivation for introducing RWA assets: gold, crude oil, foreign exchange, the S&P 500 index, and even individual U.S. equities all represent exogenous sources of volatility with relatively low correlation to the crypto market. Perp DEXs' mature infrastructure is ready and waiting for a new class of assets — and RWA is the most market-demanded and technically viable candidate.

2.3 The Essence of the Combination: A Dimensional Upgrade of Liquidity

Introducing the perpetual contract trading mechanism into the RWA domain represents on-chain finance's dimensional leap from "asset holding" to "risk trading." The combination is not a simple overlay — it is a mutual amplification of liquidity on both sides.

For RWA, perpetual contracts provide deep liquidity without requiring physical delivery. Investors can gain price exposure without holding the underlying asset, dramatically reducing transaction friction. Take equities: traditionally, tokenized on-chain shares require navigating complex custody,

compliance, and dividend processing. An equity perpetual, by contrast, requires only a reliable price oracle to support 24/7 global trading — releasing liquidity at an order-of-magnitude higher efficiency.

For Perp DEXs, RWA provides a source of volatility anchored to the real economy, expanding the trading frontier of the crypto market. As the volatility of crypto-native assets periodically compresses, on-chain capital urgently needs exogenous variables — commodity prices, foreign exchange rates, equity indices — to construct all-weather portfolios. RWA perpetual contracts fill this demand gap, enabling on-chain traders to manage combined exposure across crypto and traditional assets within a single margin account.

At its core, this combination is a dimensional upgrade of liquidity. Spot RWA answers "how to hold an asset"; RWA + Perps answers "how to trade risk" — using leverage and two-way trading capability to multiply the liquidity of each unit of capital by several to tens of times, fundamentally transforming the capital efficiency of the RWA market.

03 / RWA Perps Market Overview

3.1 The Broader Perp DEX Market Transition

Before examining the convergence of RWA with Perps, it is worth establishing the overall scale of the current on-chain derivatives market.

In 2025, the on-chain derivatives market completed a substantive transition toward mainstream financial infrastructure. As of March 2026, Hyperliquid's cumulative perpetual contract volume has grown to approximately $4 trillion. According to DefiLlama data, Hyperliquid's full-year 2025 cumulative perpetual contract trading volume reached $3.0 trillion — a figure that not only represents a historical peak for decentralized derivatives protocols, but places it in the same competitive tier as top centralized exchanges. For reference, Coinbase's total spot trading volume across the same period was $5.2 trillion (source: Coinbase 2025 Annual Report). In other words, a permissionless, fully on-chain derivatives exchange with no KYC requirements has achieved a derivatives trading volume equivalent to approximately 58% of the entire platform volume of the largest compliant exchange in the United States.

Figure 3: On-Chain Perp DEX/CEX Volume Ratio Trend Throughout 2025

Time Point	Perp DEX/CEX Volume Ratio	Key Drivers
Early 2025	6.30%	—
Mid-2025	~8%	Perp DEX ecosystem led by Hyperliquid matures; DEX execution speed and liquidity depth continue to improve
October 2025	~13%	Hyperliquid HIP-3 protocol launches (October 13), RWA contracts onboarded; monthly on-chain perpetual contract volume breaks $1.2 trillion for the first time
End of 2025	18.70%	Perp DEX trading scale continues to expand; active trading user base doubles

Source: Pharos Research

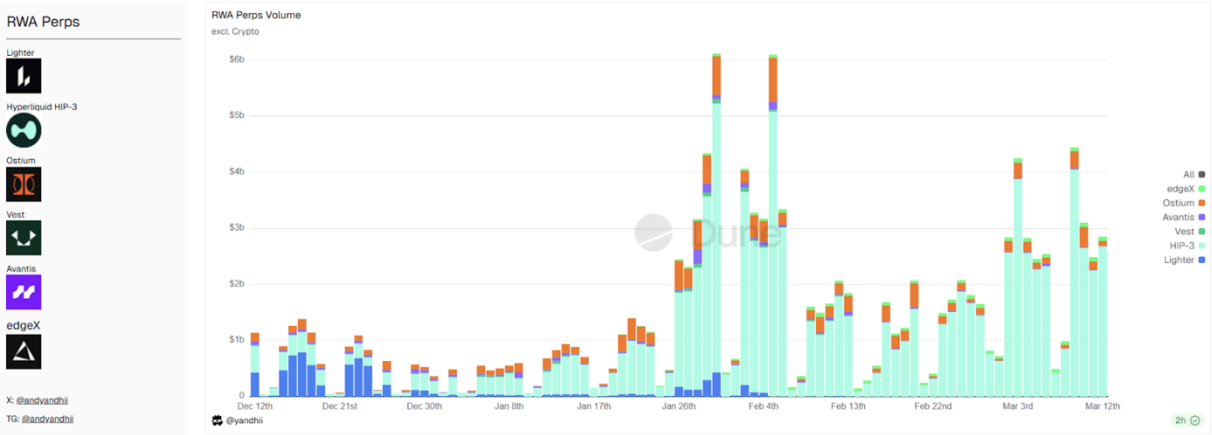
Behind this growth lies the rapid narrowing of the efficiency gap between DEXs and CEXs. Throughout 2025, continued improvements in execution speed, liquidity depth, and user experience across major Perp DEXs enabled them to begin attracting more professionally sophisticated traders. The full-year DEX/CEX perpetual contract volume ratio rose from 6.3% at the start of the year to 18.7% by year-end — a threefold increase over three years and the first instance of such a pronounced structural shift in this ratio. The truly breakout moment came with the October 2025 launch of Hyperliquid HIP-3, which introduced the RWA trading category to the entire Perp DEX ecosystem. The era of RWA Perps had begun.

3.2 Scale of On-Chain RWA Perps: Average Daily Trading Volume Exceeds $1 Billion

As of early 2026, the average daily trading volume of RWA Perps across the entire market stood above $1 billion. This figure is sourced from a Block Scholes article published in early 2026, "2026 — the Year of RWA Perps?", which noted that among DEXs already offering RWA Perps, Hyperliquid, Aster, and Lighter together accounted for approximately $20 billion in combined average daily Perps volume, with RWA Perps representing roughly 5.03% of that total across the three platforms [9].

Based on analysis from the Dune dashboard (@yandhii/rwa-perps), RWA Perps daily trading volume remained in the $1–1.5 billion range in mid-December 2025, surging to a peak of approximately $5–6 billion in late January to early February 2026 driven by precious metals market conditions and geopolitical risk events, with a second peak triggered in early March by oil price spikes following the Iran nuclear crisis.

Figure 4: Daily RWA Perps Trading Volume, 2026 Year-to-Date



Source: Dune

3.3 Category Analysis

3.3.1 Platform Share Evolution: From Ostium's Solo Run to HIP-3 Dominance

The competitive landscape of the on-chain RWA Perps market has undergone a clear three-stage evolution, each phase shaped by different dominant forces.

Ostium was the early pioneer of the sector, officially launching on mainnet in late 2024. Following the launch of its points program in March 2025, the platform's TVL grew to over $50 million and trading volume began accumulating rapidly. By December 2025, its cumulative trading volume had reached $25 billion, with over 95% of open interest concentrated in traditional market assets.

Following the mainnet launch of Hyperliquid HIP-3 in October 2025, the market rapidly fragmented into a multi-polar structure. Lighter entered aggressively with a zero-fee model combined with a

points system. By December 2025, Lighter's on-chain RWA derivatives open interest market share had temporarily approached 50%, while Hyperliquid (including HIP-3) held approximately 30%, and Ostium's share saw a notable decline. It is worth noting that Lighter's volume advantage was more pronounced on an open interest basis, but a significant portion of its trading volume was driven by high-frequency, points-incentivized activity, the quality of which remains questionable.

The genuine reversal came after January 2026. The concentrated eruption of precious metals and crude oil macro market conditions delivered traffic to the HIP-3 ecosystem far exceeding that of any other platform. Trade.xyz, the primary HIP-3 deployer, saw its monthly trading volume surge from approximately $2 billion in November 2025 to over $21 billion in February 2026, commanding approximately 90% of execution share within the HIP-3 ecosystem. On a volume basis, HIP-3 has maintained a dominant lead over Lighter and other platforms' RWA Perps offerings, consistently holding a market share above 80%.

At this point, the on-chain RWA Perps market had completed its full evolutionary cycle: from Ostium's unipolar dominance, through a brief competitive standoff between Lighter and HIP-3, and finally to HIP-3's volume breakout on the back of macro market conditions.

Figure 5: RWA Perps Platform Evolution Summary

Period	Dominant Platform(s)	Explanation
2024 – Mid-2025	Ostium	The pioneer of this sector; the only scaled RWA Perps platform at the time
Q4 2025	Multi-polar; Lighter briefly dominant	Hyperliquid HIP-3 launches in October; Lighter's incentive program activates, briefly capturing ~50% of RWA Perps open interest
December 2025 – Present	Hyperliquid HIP-3	Trading volume share consistently above 80%

Source: Pharos Research

Notably, as sector interest has risen, the roster of RWA Perps participants now extends well beyond the leading platforms named above. Emerging players are taking differentiated positions through divergent infrastructure strategies. Bitverse, for example, has chosen to launch as the first Perp DEX on Pharos Network — a high-performance EVM-compatible Layer 1 purpose-built for RWAfi — offering a zero-gas, zero-slippage, AI-assisted full-asset perpetual contract experience covering crypto assets, U.S. equities, commodities, and RealFi products. This approach contrasts with Ostium's decision to anchor to Arbitrum and Hyperliquid HIP-3's reliance on its own proprietary Layer 1 — new entrants are seeking differentiated ecological positioning through "chain selection" rather than "traffic competition."

3.3.2 Asset Class Distribution: Commodities Lead, Equities Follow

Based on available market data, trading activity in RWA Perps is far from evenly distributed — it exhibits clear patterns of asset rotation and event-driven concentration. Broadly, commodities, equities, indices, and foreign exchange constitute the primary trading categories, with commodities demonstrating a particularly dominant position that shifts across sub-segments in response to geopolitical developments.

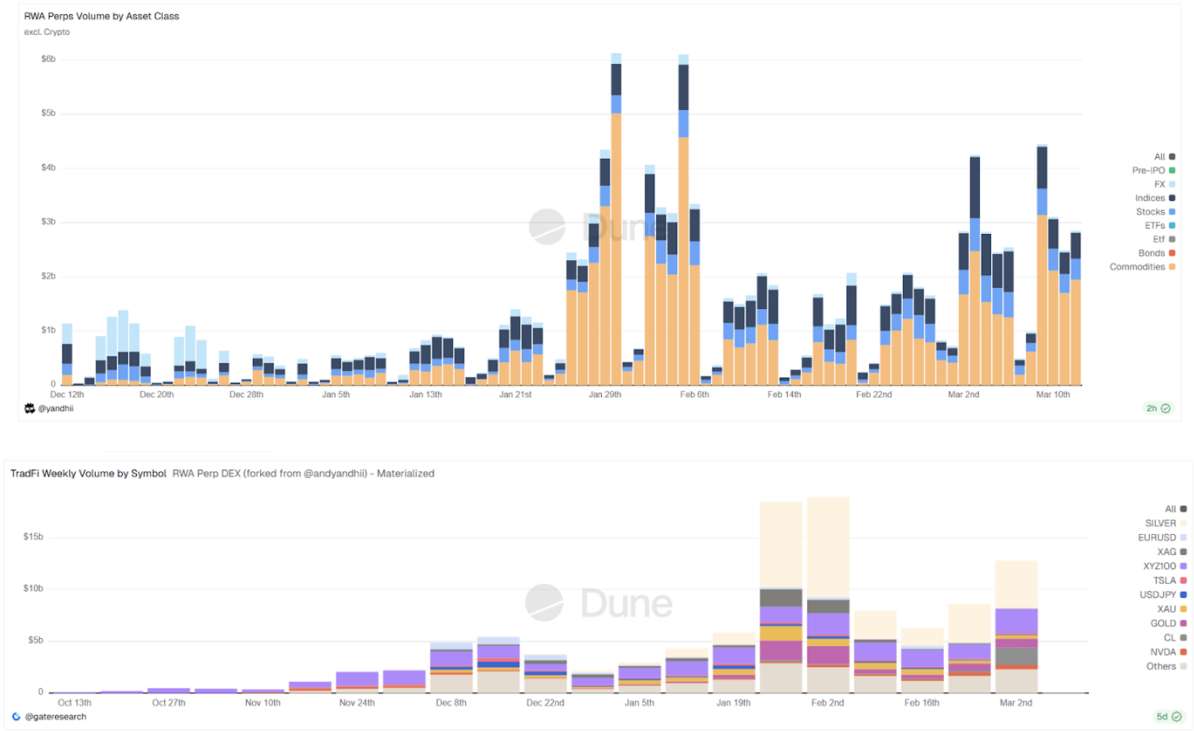
In the early period following HIP-3's launch in October 2025, equity indices first opened up liquidity; thereafter, precious metals took the lead. Against the backdrop of global currency devaluation narratives and rising inflation expectations, gold reached an all-time high of $5,266.37 per ounce on January 28, 2026, with silver hitting a peak of $121.64 per ounce the following day. On the corresponding day, total Hyperliquid precious metals perpetual contract volume reached approximately $1.3 billion, with the silver contract (SILVER-USDC) alone recording $1.138 billion in daily volume — silver vaulting into the platform's top three by volume and briefly surpassing ETH to rank second.

During the same period, Ostium — the RWA Perps-focused platform — saw its on-chain gold contract open interest temporarily account for over 50% of total on-chain gold contract open interest across the entire market, with its cumulative platform trading volume reaching $25 billion.

Entering late February 2026, a clear asset rotation signal emerged — crude oil took over from precious metals as the dominant flow attractor. Following joint U.S.-Israeli strikes on Iran on February 28, Brent crude oil peaked close to $120 per barrel, a cumulative gain of over 30% at its peak. With NYMEX and ICE closed on weekends, Hyperliquid became one of the few venues globally offering real-time crude oil position hedging and price discovery: on March 10, the CL-USDC crude oil contract recorded daily volume of $1.62 billion, surpassing ETH to become the platform's second-largest trading market, with extreme intraday peaks approaching $1.99 billion and a single-day liquidation total of $56 million.

Underpinning both phases was the more stable base provided by equity index contracts: XYZ100 (tracking the Nasdaq 100 Index) saw peak open interest of $213 million, ranking first among all HIP-3 contracts. On the individual stock side, on-chain trading in Tesla, Nvidia, and other tech names was also concentrated on Injective's iAssets platform, where the Magnificent 7 tech stocks contributed 41.6% of the platform's total RWA trading volume for the year.

Figure 6: RWA Perps Trading Volume by Asset Class Since HIP-3 Launch



Source: Dune

04 / Behind the Data: Demand Structure and Driving Mechanisms of RWA Perps

The trading volumes behind RWA Perps are underpinned by fundamental demand drivers. From observable market behavior, demand originates from two directions: the trading side's appetite for exogenous returns, and the asset side's need for on-chain risk management tools. A revolution in capital efficiency mechanisms further amplifies the force from both ends.

4.1 Trading-Side Demand: Seeking Exogenous Returns in a Homogeneous Crypto Market

After more than a decade of development, crypto-native assets have become highly correlated in their price behavior. Whether major altcoins, public chain tokens, or DeFi protocol tokens, the overwhelming majority maintain a strong positive correlation with Bitcoin across most market cycles. This tightly linked structure makes it difficult for quantitative institutions and professional investors to achieve meaningful risk diversification — during systemic drawdowns, crypto assets tend to sell off indiscriminately, severely degrading the effectiveness of internal hedging strategies.

Introducing traditional macro assets — commodities, foreign exchange, equity indices — into on-chain derivatives markets is a structural response to precisely this challenge. The volatility dynamics of such assets exhibit meaningful independence from the crypto market, driven directly by monetary policy direction, geopolitical configurations, supply chain cycles, and corporate earnings. By participating in perpetual contract trading on such assets on-chain, on-chain capital gains the ability to execute cross-market arbitrage, macro event-driven trades, and asset class rotation strategies — maintaining strong capital utilization even when crypto markets enter consolidation or downturn phases.

The events of early 2026 provide a clear illustration: when the joint U.S.-Israeli strike on Iran occurred over the weekend, with traditional markets closed, Hyperliquid briefly became one of the few venues in the world offering real-time crude oil exposure. The crude oil perpetual contract (CL-USDC) saw its single-day volume peak approach $2 billion, overtaking ETH to become the platform's second-largest asset by volume — a vivid demonstration of how exogenous variables activate on-chain trading demand.

4.2 Asset-Side Demand: On-Chain Hedging Tools for Tokenized Asset Holders

Viewed from the asset supply perspective, as tens of billions of dollars in tokenized assets — including U.S. Treasuries, corporate credit bonds, and infrastructure yield rights — complete their migration on-chain, risk management needs inevitably follow. Consider tokenized U.S. Treasuries: against a backdrop of Federal Reserve monetary policy uncertainty, the fair value of bond holdings is under constant repricing pressure from rising interest rates. For institutions holding such assets

that need to hedge duration exposure, the operational pathway within traditional financial infrastructure is cumbersome — from opening OTC accounts and paying intermediary fees to completing cross-border fund transfers, the full process often takes days or even weeks, severely lacking in timeliness.

RWA Perps enable this operation to be executed in real time within a single account. Holders can simultaneously maintain continuous yield accrual on tokenized Treasuries while establishing short positions through on-chain interest rate-related derivatives contracts, constructing a delta-neutral portfolio that effectively isolates interest rate volatility risk from the underlying asset. This closed-loop architecture — integrating asset allocation, yield capture, and risk hedging within a single on-chain environment — is a key foundation for tokenized assets generating genuine institutional appeal.

4.3 Capital Efficiency: The Mechanism Breakthrough of the Unified Margin System

Whether demand from both ends can translate into sustained on-chain scale growth ultimately depends on the quality of capital efficiency mechanism design. Traditional crypto derivatives exchanges almost universally adopt isolated margin or single-currency cross-margin models, requiring users to allocate funds independently for each trading pair and accepting only non-yield-bearing stablecoins such as USDT/USDC as collateral. The true cost of this mechanism is significant: holders of yield-bearing assets must first liquidate them at a market discount and convert them into non-yield-bearing stablecoins before participating in contract trading — an opportunity cost that cannot be ignored.

Taking Bitverse within the Pharos ecosystem as an example: its Unified Trading Account Engine (UTA Engine) enables yield-bearing stablecoins, tokenized Treasuries, major crypto assets, and even tokenized equities to be consolidated into a single comprehensive capital account. The system sets haircut rates based on the historical volatility and market liquidity depth of each asset class, and calculates the account's overall USD-denominated purchasing power in real time. The core value of this mechanism operates on two levels: first, P&L across different positions can offset each other, so when users hold highly correlated long/short positions, the system automatically compresses overall margin utilization and increases available capital; second, collateral assets not deployed in open positions continue to accumulate interest yield within the underlying protocol — genuinely enabling simultaneous yield accrual and leveraged trading from the same capital.

Figure 7: Bitverse Unified Margin System by Asset Class

Asset Category	Max Leverage	Risk Rating	Unified Margin Treatment Logic
Major crypto assets(market cap > $50B)	50×	Low Risk	Deep liquidity and robust price discovery; highest haircut rate applied, supports large position establishment.
Mid-tier crypto assets(market cap > $10B)	30×	Medium Risk	Moderate discount applied to total purchasing power; eligible for cross-asset hedging portfolios.
High-volatility Meme assets	5 – 20×	High Risk	Concentrated supply and frequent extreme volatility; strict collateral limits with dedicated risk isolation.
Tokenized equities and traditional equity assets	10 – 20× (typically 10×)	Medium-Low Risk	Traditional market pricing with controlled volatility; serves as a high-quality anchor asset for hedging portfolios during trading hours.
Non-standard and yield-bearing RWA	5 – 20× (typically 10×)	Complex Risk	Price-stable but secondary market liquidity is limited; while providing margin purchasing power, underlying assets continue to accrue yield, maximizing capital efficiency.

Source: Bitverse Official Website

In terms of asset-tier management, Bitverse applies differentiated leverage ranges calibrated to the risk profile of each asset class: major crypto assets with market caps above $50 billion support up to 50x leverage; tokenized equities and other RWA assets correspond to 10–20x; high-volatility Meme assets are capped at 5–20x. This granular risk stratification design, while safeguarding the protocol's solvency, provides ample flexibility for participants with varying strategic profiles. The unified margin system structurally dismantles the capital separation between spot asset storage and derivatives trading, and stands as one of the core drivers enabling real-world assets to transition from static holding to dynamic circulation.

05 / Three Pathways: Deconstructing the Mechanisms by Which RWA Enters the Perps Market

Based on current market practice, the integration of RWA with perpetual contracts manifests through three distinct mechanisms, progressing from shallow to deep in terms of the degree of RWA participation: synthetic exposure at the price layer, collateral enhancement at the asset layer, and structured trading at the yield layer. The three pathways serve different user needs and risk preferences, and also impose meaningfully different requirements on underlying infrastructure.

5.1 Pathway One: The Price Layer — Synthetic Exposure Without Holding Underlying Assets

This is the most mature and widely deployed integration pathway in the current market. Its core mechanism: the protocol holds no underlying physical assets and does not require custody of any such assets. Instead, it uses oracles to synchronize the real-time prices of off-chain assets — gold, crude oil, foreign exchange rates, individual equities — onto the blockchain. Traders use stablecoins such as USDC as margin, trading the price movement of these assets via perpetual contracts in a cash-difference settlement format. All gains and losses are settled in stablecoins throughout; no physical delivery of any kind occurs.

The pathway's core advantage lies in flexible deployment and broad asset coverage — any asset with a reliable price source can become a tradeable instrument. Following the mainnet launch of Hyperliquid HIP-3 on October 13, 2025, any eligible developer could permissionlessly deploy a perpetual market on the platform. Trade.xyz quickly became the largest HIP-3 deployer, introducing U.S. equities, equity indices, precious metals, and crude oil across the board, with monthly trading volume exceeding $21 billion at the start of 2026. Ostium similarly employs the synthetic pathway, focusing on foreign exchange, commodities, and global equity indices; as noted in its December 3, 2025 fundraising announcement, its cumulative platform trading volume had reached $25 billion, with over 95% of open interest concentrated in traditional assets.

In terms of its own design, Bitverse on this pathway covers a full suite of synthetic perpetual contracts spanning major crypto assets to U.S. equities, commodities, and indices — delivering an integrated trading experience for "crypto-world assets + traditional market assets" within a single platform. Its trading system syncs with market data providers in real time during traditional market hours, and extends tradeable windows through pre-market, after-hours, and overnight pricing during market closures, maintaining basic market activity through limit orders to minimize the liquidity gaps caused by traditional market closures.

Currently, this pathway faces two primary challenges. First is the temporal mismatch between fixed traditional market closing hours and the 24/7 nature of on-chain trading — a particularly acute problem when extreme macro events occur over weekends. Second is the oracle delay attack risk:

attackers can exploit the price gap window at the moment of traditional market open to arbitrage against liquidity providers, causing systematic losses. Both challenges ultimately point to the need for fast on-chain confirmation speeds and robust oracle architecture.

5.2 Pathway Two: The Asset Layer — RWA as Collateral, Yield and Leverage Running in Parallel

Beyond directly trading RWA asset prices, the RWA token itself can also serve as collateral. The core mechanism of this pathway: yield-bearing RWA tokens — such as tokenized U.S. Treasuries or money market fund shares — are used directly as margin to open perpetual contract positions. Users do not need to liquidate their holdings; the underlying asset's yield accrual continues throughout the margin period.

This mechanism delivers a step-change improvement in capital efficiency. Under the traditional model, a user wishing to participate in contract trading must first liquidate yield-bearing assets at a market discount and convert them into non-yield-bearing USDC before entering — a process that generates transaction friction and forcibly interrupts the underlying asset's interest accumulation. Under a unified margin framework, yield-bearing assets serve directly as collateral, and their continuously generated returns operate in parallel with the directional exposure of the contract position. The result is a genuine doubling effect: a single unit of capital simultaneously supports two sources of return.

Figure 8: Traditional Margin Model vs. UTA Engine — Unified Margin Comparison

Comparison Dimension	Traditional Margin Model	UTA Engine — Unified Margin
Accepted Collateral	USDT / USDC only	Tokenized treasuries, yield-bearing stablecoins, crypto assets, tokenized equities — all accepted
Yield-Bearing Capability	Assets must first be liquidated; yield accrual ceases	Underlying assets continue to generate yield throughout the margin period
P&L Netting	Calculated in isolation per position; no cross-netting	Netted at the account level; margin utilization automatically compressed
Capital Efficiency	Margin sits as zero-yield stablecoins	The same capital simultaneously carries yield-bearing returns and trading exposure

Source: Pharos Research

Bitverse has built upon this foundation by integrating the UTA Engine — a unified account architecture derived from the core account technology of leading centralized exchanges, transplanted into a decentralized context. The system allows users to consolidate yield-bearing

stablecoins, tokenized Treasuries, major crypto assets, and tokenized equities into a single comprehensive capital account. It applies differentiated haircut rates based on the historical volatility and liquidity depth of each asset class, and implements tiered leverage management for assets with different risk profiles. P&L across different positions can offset each other at the account level, and when users hold highly correlated long/short positions, the system automatically compresses overall margin utilization to maximize available capital — further improving the account's capital efficiency.

At the infrastructure level, this pathway is considerably more technically demanding than Pathway One. The liquidation processing of yield-bearing RWA tokens requires the underlying blockchain to offer sub-second state confirmation capability, preventing the timing mismatch between traditional RWA redemption cycles (T+1 or longer) and on-chain millisecond-level liquidation mechanisms from escalating into protocol bad debt during extreme market conditions. Pharos Network, as a high-performance EVM-compatible Layer 1 focused on RWAfi, has — according to its May 2025 testnet release materials — already demonstrated a processing capacity of 30,000 transactions per second and a final confirmation time of approximately one second on testnet. Its native programmable compliance layer supports the embedding of KYC/AML logic at the protocol level, creating the technical preconditions for frictionless collateralization of yield-bearing RWA tokens.

5.3 Pathway Three: The Yield Layer — RWA Interest Rate and Yield Attributes Become Tradeable Instruments

This is the highest-order financial engineering approach among the three pathways, and also the direction currently closest to institutional demand. The conceptual shift is this: rather than trading the price movement of the asset itself, the "yield attributes" of the asset — interest rate levels, coupon cash flows, the future trajectory of yield rates — are independently disaggregated, becoming on-chain instruments that can be freely bought, sold, and traded with leverage.

In traditional financial markets, the equivalent instruments are interest rate swaps (IRS), credit default swaps (CDS), and similar tools — core instruments for institutional investors' granular risk management, with notional values far exceeding the corresponding spot markets. The most representative on-chain implementation of this logic comes from Pendle Finance.

Pendle achieves this by splitting yield-bearing assets — including RWA-backed yield-bearing stablecoins, liquid staking tokens, and other yield-generating instruments — into two independently tradeable tokens: PT (Principal Token, representing the principal claim at maturity) and YT (Yield Token, representing the floating yield stream over the holding period). Users holding YT are in effect trading the future interest rate trajectory of the underlying asset, not the asset itself. On August 6, 2025, Pendle further launched the Boros platform on Arbitrum, incorporating perpetual contract funding rates as a tradeable yield instrument. According to Pendle's official 2025 press release, Boros accumulated $5.5 billion in trading volume and $80 million in open interest within four months of its launch. In terms of overall scale, Pendle's peak TVL in 2025 reached $13.4 billion, capturing over 50% market share in the DeFi yield management sector, with subsequent integrations including USDG and other RWA-backed yield stream products.

This pathway places the highest demands on infrastructure among the three: it requires sufficiently precise interest rate oracles providing continuous price feeds, deep liquidity pools supporting the independent circulation of PT and YT, and a high-performance blockchain capable of handling complex multi-leg settlement logic. Compared to Pathways One and Two, Pathway Three's current user base remains predominantly composed of DeFi professional strategy operators. Scaling to institutional-grade markets will take time. Nevertheless, the direction it represents — transforming every dimension of value in an RWA into an independently priceable and tradeable on-chain instrument — is the ultimate form of the RWA financialization process.

Figure 9: Comparison of Three Pathways for RWA to Enter the Perps Market

Pathway	Core Logic	Assets On-Chain?	Key Advantages	Target Users	Core Challenges	Case Examples
Price Layer: Synthetic Exposure	Oracle-mapped pricing; pure cash-difference settlement	No	Broad coverage, flexible deployment	Traders	Market-hours mismatch; oracle delay attacks	HIP-3 / Ostium / Bitverse
Asset Layer: Collateral Enhancement	Yield-bearing RWA as margin; yield accrual continues while holding positions	Yes	Maximum capital efficiency	RWA asset holders	Liquidation timing mismatch; compliance friction	Pharos + Bitverse unified margin system
Yield Layer: Structured Trading	RWA yield attributes disaggregated; interest rate trajectory traded independently	Yes (structured tokens)	Granular risk management; institutional-grade tooling	Institutional participants	Long liquidity build-out cycle; high comprehension barrier	Pendle Finance (PT/YT + Boros)

Source: Pharos Research

06 / Three Technical Thresholds: Core Constraints on the Scalable Deployment of RWA Perps

The market potential of RWA Perps has been validated by data, but the pace of scalable deployment ultimately hinges on breaking through three core technical thresholds: oracle precision and reliability; cross-market temporal mismatches in trading hours; and the conflict between liquidation mechanisms and traditional asset settlement cycles. The three are interrelated and together point to a single conclusion — the infrastructure requirements of this sector far exceed those of building a typical crypto-native Perp DEX.

6.1 Oracle Systems: Three-Way Requirements for Precision, Real-Time Delivery, and Attack Resistance

When handling crypto assets like BTC/ETH, traditional Perp DEXs typically obtain high-frequency price feeds from multiple major centralized exchanges such as Binance and Coinbase, with price feed latency typically at the millisecond level. But this approach is impractical for traditional financial assets: U.S. equity market data is commercially copyrighted content, and real-time access requires paid licensing from data providers such as Bloomberg or Refinitiv. Forex quotes are more dispersed in source, but professional-grade precision feeds still carry significant access costs. Commodities require distinguishing between spot and futures contract prices across different data sources, and managing the roll problem across contracts of different expiration dates.

In response to these challenges, current market participants have adopted varied approaches. Ostium uses Chainlink Data Streams for crypto assets while building a customized oracle system using Stork specifically for RWA assets. Injective's iAsset framework connects to Pyth Network for high-precision, low-latency price data. Bitverse, meanwhile, works with market data service providers to package traditional financial market price feeds for on-chain delivery, and implements circuit-breaker mechanisms — including trading suspension and feature degradation — during extreme market conditions, prioritizing capital safety over price continuity as its governing risk management principle.

6.2 Trading Hours Mismatch: On-Chain 24/7 Markets vs. Traditional Assets with Set Closing Hours

This is a systemic problem for RWA Perps without a perfect solution. On-chain markets operate continuously without interruption, while traditional financial assets — particularly exchange-traded equities and futures — are subject to fixed trading hour restrictions. The systemic risk created by this mismatch is as follows: when major macro events occur during traditional market closure — such as the joint U.S.-Israeli strike on Iran over the weekend of February 28, 2026 — users holding positions in on-chain synthetic assets cannot hedge through spot markets, while on-chain prices exhibit

"artificial stability" due to oracle updates being paused. When traditional markets reopen, the accumulated risk is released all at once through a price gap.

In response, Ostium has adopted a relatively conservative approach: new positions are not permitted during non-trading hours, but existing positions can continue to be managed — avoiding users building positions blindly under conditions of information asymmetry. Bitverse, by contrast, favors extending trading time coverage as much as possible, lengthening tradeable windows through pre-market, after-hours, and overnight pricing data, and permitting limit orders to queue across all hours to reduce the liquidity discontinuities caused by market closures. The two strategies involve different trade-offs: the former exchanges user experience continuity for risk controllability; the latter accepts greater complexity in volatility management in exchange for broader price discovery. No unified optimal solution has emerged yet, but as market-maker mechanisms are introduced and oracle precision improves, the viability of hybrid approaches continues to increase.

6.3 Liquidation Mechanism Certainty: Millisecond Processing vs. T+N Settlement

Perp DEX liquidation mechanisms depend on fast, atomic asset disposition: when a user's margin falls below the maintenance margin level, the protocol must rapidly liquidate the position before prices deteriorate further to prevent bad debt from accumulating. For crypto-native assets, this process can be completed within seconds, as on-chain liquidity is available at any time. But if the margin is an RWA token (Pathway Two), and the underlying RWA requires conversion to cash through a T+1 redemption channel, the liquidation process faces the risk of a "liquidity vacuum": during the redemption period, the protocol holds an asset whose valuation may continue to decline but cannot be immediately converted to cash. The rate at which systemic bad debt accumulates would far exceed the capacity of the liquidation mechanism.

There are two directional approaches to resolving this issue. The first is to solve it at the asset level: prioritize allowing only highly standardized RWA with near-T+0 liquidity characteristics — such as money market fund tokens and short-duration Treasury tokens — to serve as margin, rather than illiquid private credit-type RWA. The second is to solve it at the infrastructure level: leverage high-performance blockchains (such as Pharos, an RWA-dedicated chain) to provide sub-second state confirmation capability, combined with blue-chip oracles tracking RWA token prices in real time, triggering early warnings and position reduction mechanisms as collateral value begins to decline — rather than waiting until the actual threshold is breached before initiating liquidation.

07 / Conclusions and Outlook

7.1 Core Conclusions

The central thesis of this paper is as follows: the integration of RWA with Perps is not a simple overlay of two sectors. Against the backdrop of "The Perpification of Everything," it represents a substantive leap for RWA assets from "asset holding" to "risk trading." The conditions for this leap were substantially in place by 2025 — on the Perp DEX side, infrastructure maturity improved dramatically, with high-performance platforms such as Hyperliquid now possessing the execution capability to accommodate the pricing and trading of traditional assets; on the RWA side, tokenized asset scale surpassed $45 billion, with growing and increasingly explicit demand from institutional holders for hedging and capital efficiency tools. The simultaneous maturation of both ends moved RWA Perps from proof-of-concept to early market validation.

Market data provides the most direct evidence. On the volume dimension: as of March 2026, average daily trading volume for RWA Perps across the market has stabilized above $1 billion, with peak volumes approaching $6 billion during extreme precious metals conditions, and crude oil contracts recording daily volumes of nearly $2 billion at their peak. On the platform landscape dimension: Hyperliquid HIP-3 has progressively dominated the sector since its October 2025 launch, consistently holding a trading volume market share above 80% as of early 2026, with Trade.xyz recording a single-month trading volume high of over $21 billion.

Figure 10: Comprehensive Ecosystem Map of RWA Perps

Source: Pharos Research

Structurally, the three pathways through which RWA enters the Perps market each carry their own internal logic and applicable boundaries:

The synthetic exposure pathway (price layer) — with its flexible deployment and broad asset coverage as core advantages — represents the most mature and widely deployed implementation approach today, but its reliability is highly dependent on the robustness of its oracle architecture.

The yield-bearing margin pathway (asset layer) — by incorporating tokenized Treasuries and other yield-bearing assets into unified margin accounts — translates capital efficiency improvements from theory into an operationally actionable mechanism design. Its defining implementation is the full-asset unified account system represented by Bitverse.

The yield structuring pathway (yield layer) — exemplified by Pendle — transforms the interest rate attributes of RWA themselves into independently priceable on-chain instruments. It represents the highest degree of financial engineering and the product form closest to institutional-grade markets.

The three pathways are not mutually exclusive but constitute a layered supply structure serving distinct user segments: the synthetic pathway attracts traders; the margin pathway improves capital efficiency for asset holders; the yield structuring pathway serves institutional participants requiring granular interest rate risk management.

On the infrastructure front, the paper's conclusion is as follows: general-purpose blockchains face structural bottlenecks in supporting the compound demands of RWA Perps — sub-second liquidation confirmation, protocol-level native compliance, and cross-asset unified settlement together point toward purpose-built high-performance Layer 1 chains. Pharos Network, an RWA-dedicated public chain, with its 30,000 TPS testnet throughput, sub-one-second finality, and native ZK KYC/AML framework, is emerging as the critical infrastructure backbone for the scalable operation of RWA Perps. Bitverse, as the first full-category Perp DEX within the Pharos ecosystem, with its unified margin system and full-asset coverage strategy, directly validates the value proposition of this infrastructure.

7.2 Trend Outlook

The early growth of the RWA Perps sector has been driven primarily by market events — geopolitical conflicts boosting crude oil demand, currency devaluation narratives activating precious metals trading. This type of event-driven catalysis tends to be unsustainable. From a medium-to-long-term perspective, whether the sector can move beyond event-driven dynamics and enter a phase of structural expansion depends on the following dimensions:

First, asset coverage depth will be the primary competitive battleground in the next phase. In the current market, commodities — especially gold and crude oil — have completed the transition from emerging instruments to mainstream categories, while equity RWA Perps penetration remains relatively limited. Scaling individual stock perpetuals requires more refined corporate action handling (dividends, stock splits, trading halts, etc.) and more robust price feed integration — this will be a significant differentiator in platform technical capabilities between 2026 and 2027. Meanwhile, the forex category, benefiting from its inherent 24/7 pricing advantage, is well positioned to serve as a stable traffic base in subsequent market expansion, though its trading structure and style remain subject to market exploration.

Second, the penetration rate of yield-bearing margin will directly determine whether RWA Perps can transition from a niche strategy to a mainstream trading scenario. At the current stage, users willing to actively place tokenized Treasuries into a contract account as margin remain a small minority — partly due to awareness barriers, partly because the product experience is not yet smooth enough. As the compliance pathway for tokenized money market fund products becomes clearer (the closure of Ondo's SEC review is already an important signal) and the scale of on-chain yield-bearing stablecoins continues to expand, the conditions for yield-bearing margin to evolve from an optional feature to a default option are gradually maturing. Once this shift occurs, Perp DEXs' capital

attraction will see a systemic improvement — the opportunity cost of holding yield-bearing assets drops significantly, and the natural migration of capital from stablecoins into Perp accounts will become more organic.

Third, greater regulatory clarity will serve as the critical valve controlling the scale of institutional capital entry. The closure of the SEC's Ondo investigation at the end of 2025 and the shift in the overall regulatory posture following Paul Atkins' appointment as SEC Chair have already sent positive signals to compliant RWA products. However, the regulatory boundaries in the synthetic derivatives space — in particular, the accessibility of U.S. equity CFDs to U.S. users — remain in a grey zone. Within the next 12 to 24 months, if the U.S. or EU articulates a clear regulatory position on on-chain synthetic equity contracts — in whichever direction — it will have a material impact on the user composition and product design of all platforms within the sector. Based on the composite signals from the current regulatory trajectory, the more likely outcome is "differentiated compliance access" rather than an outright ban — i.e., drawing lines via qualified investor classification and geographic access controls, rather than shutting down the market entirely. For infrastructure with native protocol-level compliance capabilities, this direction represents a clear and distinct competitive advantage.

The ultimate form of the on-chain RWA Perps market is a decentralized derivatives system in which any real-world asset with a reliable price source can be traded, hedged, and priced 24/7 on-chain. That destination is still some distance away from where we stand today. But from the market data accumulated from 2025 through early 2026, the path is being carved out — not by concept, but by each crude oil contract, each long gold position, and each user who chooses to stay on-chain and trade through the weekend.

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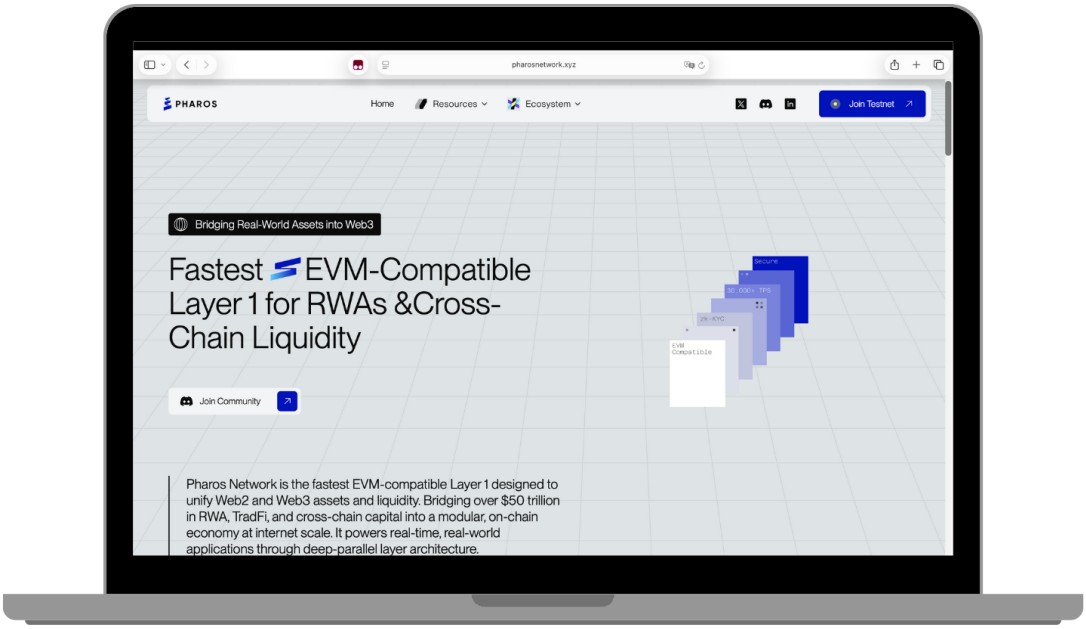
Pharos' Official Website: https://www.pharosnetwork.xyz/



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