Jupiter Overview Report

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Introduction

Jupiter is a decentralized exchange (DEX) aggregator on the Solana blockchain, designed to provide users with the best token swap rates by aggregating liquidity from multiple DEXs and automated market makers (AMMs) like Raydium, Serum, and Orca. Launched in 2021, Jupiter has become a key player in Solana's DeFi ecosystem, optimizing swaps and offering advanced trading features.

Jupiter's governance token, JUP, is central to its ecosystem, empowering holders to influence platform developments and participate in governance decisions. Jupiter plays a critical role in the Solana DeFi landscape, combining liquidity aggregation with a comprehensive suite of trading tools to provide an efficient, accessible, and innovative platform for decentralised trading.

Below is an overview of Jupiter's core products that we will explore further in this report

Jupiter Products Overview

Source: station.jup.ag

Product	Function/Description	Notable Features
Jupiter Swap	An evolved solution initially created to navigate the variety of AMMs in Solana DeFi. It helps users find the best prices across multiple AMMs with minimal friction..	Aggregation of multiple AMMs for best prices, reduced friction, wide token support
Jupiter Limit Order	A user-friendly platform to place limit orders on Solana. It leverages the full liquidity of the Solana ecosystem, allowing users to buy or sell any token pair at a specified price.	Widest token pair selection, full ecosystem liquidity leverage, precise buy/sell at specified price
Jupiter DCA	A dollar-cost averaging tool enabling automated, scheduled purchases or sales of SPL tokens over a set period.	Automated recurring orders, flexible scheduling, supports all SPL tokens
Value Averaging (VA)	A strategy similar to DCA, but contributions vary based on portfolio growth targets rather than fixed investments. It aims to achieve equal growth increments rather than consistent investment amounts.	Adjusted contributions based on market conditions, buys more when prices are low and less when prices are high
Jupiter Perpetuals	A. decentralised exchange for leveraged trading (up to 100x), enabling traders to go long or short on various assets.	High leverage (up to 100x), long/short positions, decentralised trading
JupSOL	A liquid staking token representing staked SOL with Jupiter's validator. Users eam validator rewards and 100% MEV while maintaining liquidity.	Liquid staking of SOL, automatic distribution of validator rewards and MEV, issued through Sanctum
Onboard	A seamless asset onboarding solution designed to streamline bringing assets into the Solana ecosystem.	User-friendly asset onboarding, reduces friction for new users
ApePro	A memecoin trading terminal on Solana, providing professional performance and superior mobile optimisation for traders.	Memecoin-focused, optimised mobile experience, professional trading features
Jupiter Lock	An open-sourced, audited, and free solution for locking and distributing tokens over time.	Secure token locking, time-based distribution, fully open-sourced and audited

Spot Overview

Jupiter Spot is a platform for token trading on the Solana network. It utilises a universal routing algorithm, Jupiter Routing, which interacts with over 22 AMMs to identify favorable pricing for trades across the Solana ecosystem.

Jupiter Spot supports four primary methods for executing spot trades:

1. **Swap:**
   The Swap function enables users to exchange any token on Solana at competitive prices with no additional platform fees. It automatically adjusts settings to reduce slippage, applies suitable priority fees, and provides warnings when necessary. Users can define their acceptable slippage limits and priority fee thresholds prior to executing a swap.

2. **Limit Order (LO):**
   Limit Orders allow users to set a specific price at which a trade will be executed. Once this target price is reached, the system attempts to fill the order at the exact specified rate. The user interface provides guidance on setting appropriate order parameters.

3. **Dollar-Cost Averaging (DCA):**
   DCA schedules regular, automated trades at user-defined intervals (e.g., weekly or monthly), with a 0.1% fee per transaction. The system also includes features to retry failed orders and aims to reduce priority fees and slippage automatically.

4. **Value Averaging (VA):**
   VA is similar to DCA but varies the investment amount based on price movements. When prices are low, it increases the purchase amount; when prices are high, it reduces the amount. This approach focuses on maintaining targeted portfolio growth rather than a fixed transaction size at each interval.

Jupiter's core objective as an everyday exchange is to improve user access to favorable pricing in the dynamic and fast-moving landscape of token trading.

Central to this goal is its routing engine, Metis, which plays a key role in identifying competitive token prices by rapidly incorporating newly launched tokens and markets into its routing logic. This engine is designed to secure advantageous trade execution by evaluating multiple liquidity sources and selecting routes that offer the best available pricing. Jupiter distinguishes itself by avoiding protocol-level fees, enabling users to capture the full value of each trade, even in volatile or illiquid markets. Metis does not simply perform price checks but also incorporates real-time network conditions, ensuring execution remains both timely and cost-efficient.

Token safety and transparency are another major priority. Jupiter has implemented an interface that surfaces detailed token-level data, including metadata, verification status, and controlling authorities. This information helps users identify legitimate assets and steer clear of fraudulent or malicious tokens. The platform refines its token search experience by removing duplicates and impersonators, and by incorporating community feedback and live data feeds. In doing so, Jupiter not only reduces the risk of interacting with spoofed tokens but also helps foster a more reliable and trustworthy trading environment, especially for newer users unfamiliar with Solana's token ecosystem.

The platform also provides a high level of customization for trade execution. Traders can define slippage thresholds, transaction fees, and other operational parameters that determine how and when a trade is completed. This flexibility is available through two primary settings modes. Auto mode is aimed at typical users who prefer to rely on Jupiter's default configurations, which are dynamically adjusted based on current market conditions and network congestion. Manual mode, in contrast, caters to advanced users who want precise control. It allows for detailed modifications of slippage levels, broadcast settings, and fee structures. Manual mode also includes options for MEV protection and for limiting the number and type of intermediaries used in trade routes, enhancing control over privacy, latency, and cost.

The platform's swap settings reflect its broader philosophy of striking a balance between user autonomy and intelligent automation. Transaction fees on Solana are typically low; however, users can opt to pay priority fees to expedite confirmation times during periods of congestion. This is particularly useful for trades that require time-sensitive execution or when trading large volumes. Slippage, a common concern in decentralized exchanges, is managed through threshold settings that ensure trades only execute within a user-defined price range. If market movement causes the quoted price to slip beyond this range, the trade is automatically canceled, preventing unintended losses. Through these features, Jupiter has established itself as a practical and responsive trading platform tailored for daily use. It combines a strong emphasis on pricing efficiency and token safety with user-centric controls that suit a range of trader profiles. By integrating real-time data, community input, and customizable settings, it addresses many of the pitfalls found in other decentralized exchanges. Jupiter's approach reflects a broader trend toward making crypto trading more secure, intuitive, and aligned with the needs of both retail and experienced participants.

How to Trade Safely on Jupiter

Jupiter balances ease of use with informational safeguards. It highlights potential risks (e.g., large price impact, token verification status), displays relevant token details, and provides transaction summaries (e.g., minimum received, transaction fees, price differences).

MEV Protection:

Enabling MEV Protect sends transactions directly to Jito block engines, aiming to reduce front-running and sandwich attacks. Users should be aware that such protection may occasionally slow or fail transactions, as not all validators run Jito engines.

Swap Summary and ExactOut:

Jupiter displays a comprehensive summary of each trade, including minimum received and fee information. The "ExactOut" feature is also highlighted, which ensures receiving a set number of tokens while noting that this may result in less favorable pricing than the standard "ExactIn" method.

Jupiter Swap initially addressed the fragmentation of AMMs in Solana DeFi, offering a way to discover optimal prices across multiple sources. As Solana's ecosystem expanded and more markets emerged, Jupiter adapted its infrastructure for greater scalability and to maintain user safeguards.

High-Level Process:

- New tokens and AMM markets are continuously indexed and become tradable immediately.
- After 14 days, each market undergoes periodic checks (every 30 minutes) to assess liquidity. Markets not meeting certain criteria are removed.
- Jupiter's routing engine calculates the best possible quotes and applies user-defined settings and safeguards during execution.

Metis: The Routing Engine

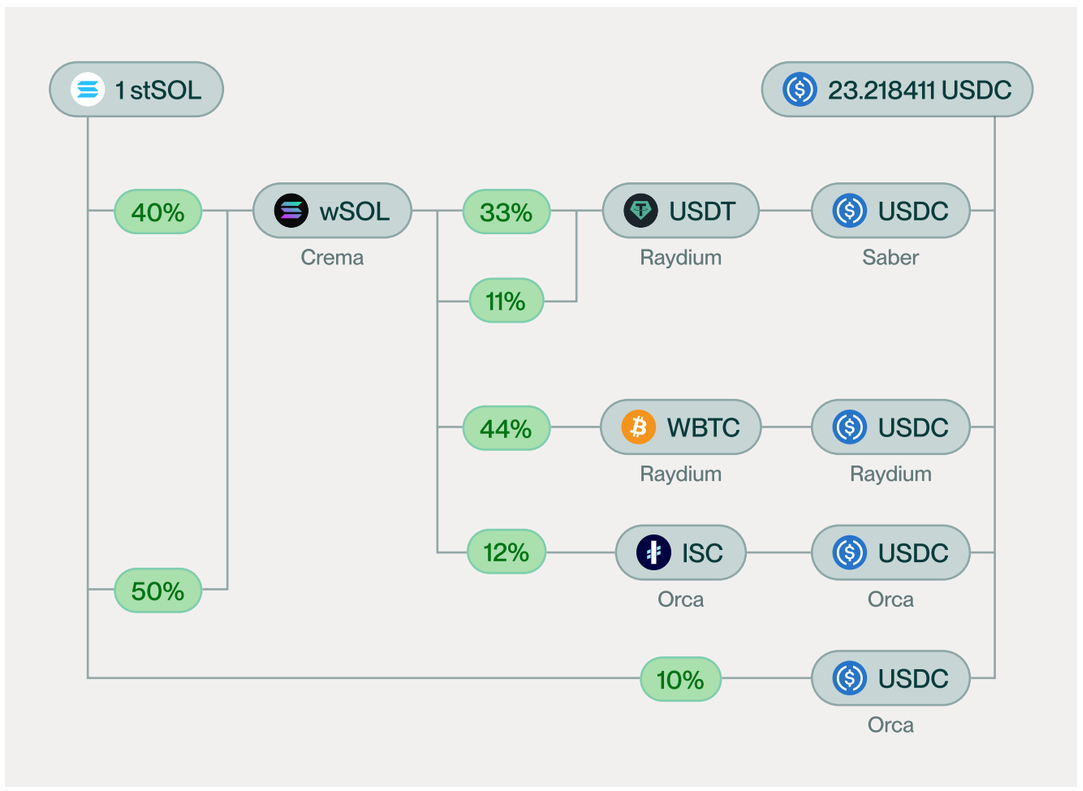
Metis is Jupiter's customised solution based on a variant of the Bellman-Ford algorithm. The Bellman-Ford algorithm begins by significantly underestimating the distance from the starting vertex to all other vertices. It then gradually refines these estimates through iterations, identifying shorter paths that improve upon the initially overestimated distances. It is optimised for Solana's high-speed environment and is designed to identify optimal routes efficiently, even under dynamic network conditions.

Key Innovations in Metis:

- **Incremental Route Building:**
  Routes are constructed incrementally, allowing the integration of multiple DEXs and intermediary tokens in complex trades to achieve improved prices.

- **Route Generation and Quoting Combined:**
  By merging these steps, Metis avoids inefficient paths and increases the likelihood of identifying better-priced routes.

- **Future-Ready Scalability:**
  Metis is prepared for upcoming Solana upgrades that may allow more than four DEXs per transaction and handle an expanding number of DeFi protocols.



Performance Improvements:
Metis refreshes quotes in parallel and real time. Compared to previous versions, it generally provides more favorable prices, with improvements becoming more pronounced as trade sizes increase.

How Limit Orders Work

Jupiter's limit orders execute trades at a user-defined price by tapping into on-chain liquidity on Solana. Once an order is placed, a keeper monitors token prices and, when the specified price target is reached, attempts to fill the order. If liquidity is limited, the keeper can complete the order in smaller portions to minimise price impact. Fulfilled orders—whether full or partial—are delivered directly to the user's wallet.

Unlike traditional order-book models, Jupiter's system does not aggregate all orders centrally. Instead, it relies on active monitoring of decentralised liquidity sources.

Key Advantages:

- Provides a centralised exchange-like experience with broad access to Solana's liquidity.
- Users can set an expiry time for orders, automatically cancelling unfilled portions and refunding tokens at the end of the period.
- Ensures that the received amount matches the quoted price, eliminating slippage-related failures.
- Offers access to a wide range of token pairs, dependent on available liquidity.
- Protects users from MEV front-running.

Comparison with Central Limit Order Books (CLOBs):
CLOBs rely on active market makers to ensure efficient operations. In contrast, Jupiter's limit orders utilise a wide range of DEXs and AMMs on Solana. Rather than depending on market-makers, Jupiter's execution is triggered by the price meeting user-defined targets, drawing on liquidity from over 20 different DEXs and AMMs.

How Jupiter VA Works

VA is similar to DCA but adjusts the investment amount in response to price changes. Instead of investing a fixed amount at regular intervals, VA sets target portfolio values for each interval. When prices fall below the target, more capital is invested; when they rise above it, less is committed. This approach aims to enhance long-term outcomes by increasing exposure in lower-priced conditions and reducing it when prices are elevated.

VA Execution Mechanics:

- Users deposit the total intended investment amount into a dedicated VA vault.
- The first transaction occurs immediately after setup, with subsequent trades taking place at user-selected intervals.
- If prices dip, VA purchases more to reach the target value; if prices are high, the strategy invests less or not at all.

A 0.1% platform fee applies at each transaction. Tokens purchased are transferred automatically to the user's wallet if the associated token account remains open. VA also includes timing variability in order placement and sets minimum acceptable output levels to reduce the likelihood of front-running and other adversarial tactics.

ApePro Overview

ApePro functions as a specialist terminal for trading memecoins on Solana, offering advanced performance and mobile-friendly features. It integrates key components such as:

- **Ape Account Program:**
  Utilises Multiparty Computation and account abstraction technology, allowing users to log in via social accounts or traditional Web3 methods without seed phrases. It operates through a dedicated Solana program rather than a standard externally owned account . Users can activate an Ape Vault by depositing 0.1 SOL, and currently, only SOL withdrawals are supported.

- **Discovering New Tokens:**
  Displays tokens launched within the past 24 hours, enabling users to buy or sell quickly without repeatedly signing transactions. Users can filter tokens by criteria such as those created via Pump.fun, developer mint counts, token authorities, and social links.

- **Hunt Gems Feed:**
  Provides a real-time listing of new and emerging tokens. Categories include newly created tokens, Pump.fun tokens nearing migration, and tokens that have migrated liquidity to Raydium. Users can perform rapid trades without signing each transaction.

- **Signless MEV-Protected Swaps:**
  Allows rapid, automated swaps without manual approvals, safeguarded against MEV attacks through Jito's infrastructure. Intelligent fee adjustments and integration with Jupiter's router ensure cost-effective, market-competitive trades.

- **Portfolio and Trading Tools:**
  Offers position tracking, PnL monitoring, and historical transaction summaries. Users can access real-time charts, compare token prices or market caps in SOL or USD, and view developer trade activity. Transaction histories and related data are also accessible.

- **Token Checklist:**
  Summarises key token risk indicators (e.g., whether liquidity pools are locked or burned, top 10 holders' distribution, developer minting capabilities, and authorities to freeze or mint tokens).

JLP Overview (Jupiter Liquidity Provider Pool)

The JLP pool underpins liquidity provision for Jupiter Perpetuals. It functions as a counterparty to traders, holding a basket of assets (SOL, ETH, WBTC, USDC, and USDT) and earning from a portion of the generated trading fees.

- **JLP Tokens:**
  Purchasing JLP tokens provides users with a proportional share of the pool's value, which reflects asset appreciation and fee generation. Contributors receive embedded yield, updated hourly, without manual staking or harvesting. JLP tokens can be freely traded as SPL tokens.

- **Becoming a Liquidity Provider:**
  Anyone can acquire JLP tokens through Jupiter Swap, which will locate optimal routes to mint or buy these tokens. Fees apply based on the pool's current asset weightings and market conditions.

- **Fee Revenue and APY:**
  The pool retains 75% of trading fees (from opening/closing positions, price impact, borrowing, and swaps), which are compounded back into the pool. The JLP APR is recalculated weekly based on the realised fees. Contributors can estimate their share of these fees proportionally to their contribution.

- **Mechanics of the Liquidity Pool:**
  Traders borrow from JLP assets to take leveraged positions. Instead of periodic funding payments, traders pay hourly borrow fees. This structure compensates LPs for providing liquidity.

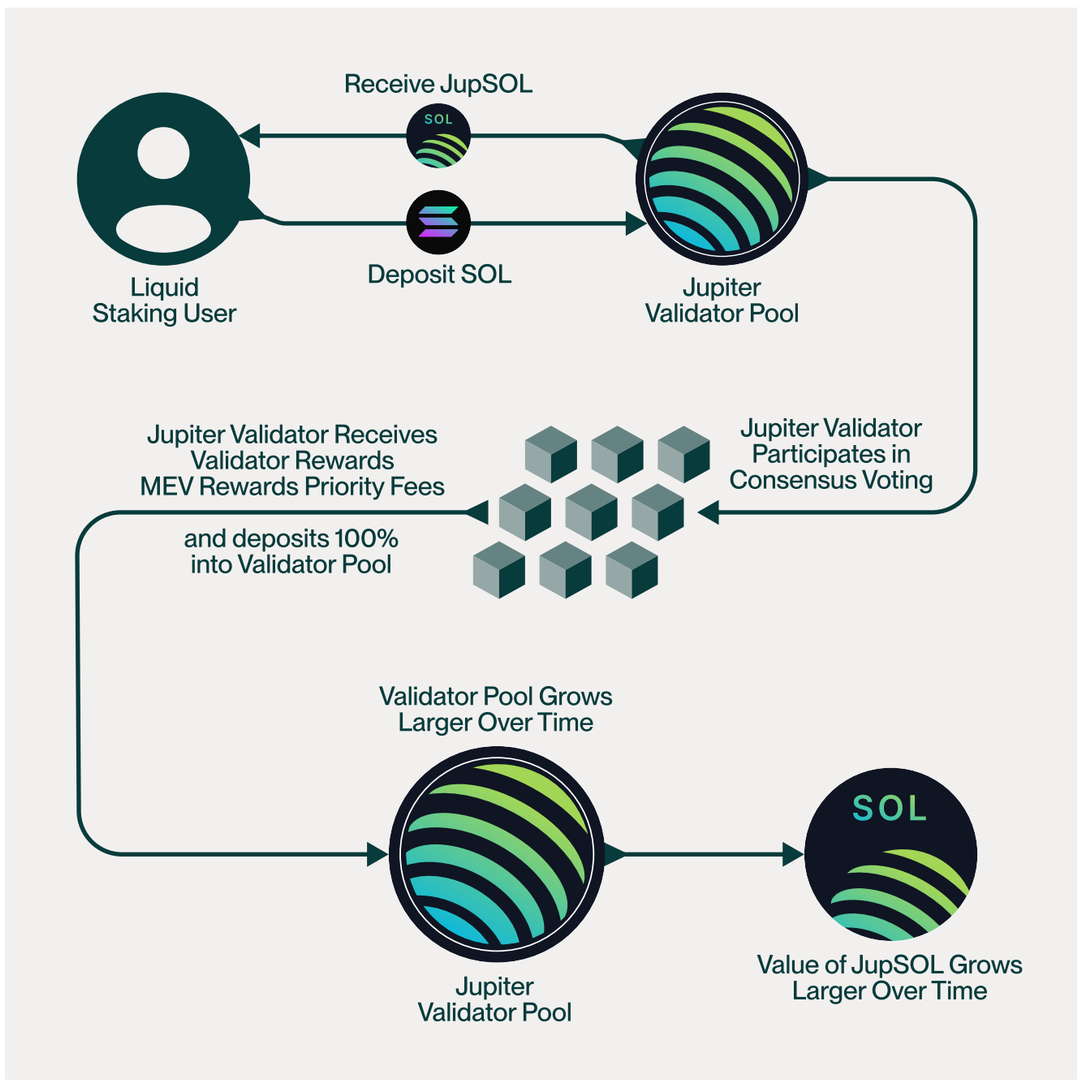
- **Risks and Market Dynamics:**
  The JLP pool holds both stable and volatile assets. Market movements, trader profits/losses, and token price fluctuations influence the pool's value. Short traders' profits reduce stablecoin reserves, while long traders' profits reduce volatile assets, affecting pool composition and potential returns. Asset weight targets are maintained through dynamic fee adjustments. In extreme cases (e.g., asset depegs), the pool's design limits how far weightings can diverge from targets.

- **Target Weight and Rebalancing:**
  Each asset in the pool has a predefined target weight. When asset proportions shift, fees for depositing or withdrawing that asset adjust to encourage rebalancing. If an asset surpasses set bounds, depositing or withdrawing that asset may be restricted until it returns to a permissible range.

ApePro and Jupiter's liquidity solutions provide a wide range of functionalities for traders and liquidity providers in the Solana ecosystem. ApePro focuses on user-friendly access to new and established tokens with MEV-protected, signless swaps and flexible order options, while JLP offers a mechanism for LPs to earn fees from perpetual trading activity. Both systems incorporate dynamic risk management measures, fee structures, and performance tracking, reflecting an evolving approach to decentralised trading and liquidity provision.

JupSOL Overview

JupSOL is a liquid staking token (LST) representing staked SOL within Jupiter's validator infrastructure, managed by Triton. Issued through Sanctum, JupSOL allows holders to benefit from staking rewards, including 100% of MEV returns, without incurring typical fees such as management, commission, or withdrawal charges.



Core Mechanism

Users deposit SOL, which is then staked to the Jupiter validator. In return, they receive JupSOL tokens at an initial 1:1 ratio with SOL. Over time, as validator rewards accrue, the value of JupSOL gradually increases relative to SOL. By simply holding JupSOL, users earn staking rewards, effectively gaining exposure to the "risk-free" rate of return on SOL. Although JupSOL's ratio to SOL continually rises, its absolute value in dollar terms may still fluctuate with the market price of SOL.

Source of Yield

JupSOL's yield is derived from validator staking rewards, MEV kickbacks (returned entirely to JupSOL holders), and the Jupiter team's initial SOL delegation, which is used to enhance the annual percentage yield. As a result, JupSOL may offer higher than average returns compared to other LSTs.

Fees and Security

JupSOL applies zero management, validator commission, or withdrawal fees. It does, however, impose a 0.1% SOL deposit fee intended to deter arbitrage attacks. The token is built on the SPL stake pool program, an audited and widely used system that has managed substantial amounts of staked SOL securely. A multisig authority, including representatives from Sanctum, Jupiter, Mango, marginfi, and Jito, oversees any changes, ensuring no single entity can unilaterally alter the program.

Benefits of Holding JupSOL

Holding JupSOL helps users earn staking-based returns while also receiving MEV-derived benefits. This positions JupSOL as a potentially more profitable alternative to standard staking. Additionally, by holding JupSOL, users contribute to Jupiter's transaction inclusion rate, which may aid in maintaining efficient swapping and other DeFi operations during periods of network congestion.

This data highlights Jupiter's significant footprint within the Solana ecosystem. The volume figure illustrates the platform's role in facilitating a substantial amount of capital flow, while the number of swaps indicates high-frequency token exchange activity. The large number of traders underscores the platform's widespread reach and accessibility, indicating that Jupiter has attracted a substantial and diverse user base.

Between September 2022 and December 2022, Jupiter's swap activity remained relatively low, consistently below five million swaps per period. Throughout the first half of 2023, these figures began to climb, ultimately reaching a few million swaps per period. By late 2023, volumes had surpassed ten million swaps per period, reflecting a noticeable escalation in platform usage. This upward momentum continued into 2024-25, with regular intervals exceeding twenty million swaps, culminating in a peak phase during the latter half of the year when volumes approached or reached approximately forty million swaps per period. Overall, this progression illustrates a sustained and significant increase in the frequency of swaps executed on the Jupiter platform over the observed time frame.

Valour's JUP ETP

Valour JUP (JUP) SEK is an exchange-traded product (ETP) tracking JUP, the native token of the Jupiter ecosystem. Valour's Certificate product line offers compliant Exchange Traded Products, each fully hedged by their respective digital assets. To ensure secure cold storage, Valour partners with tier one licensed custodians such as Copper. Traded on regulated exchanges and MTFs, these certificates provide transparent pricing and liquidity, reinforcing investor confidence in secure digital asset investments. Valour's Base Prospectuses are approved by the Swedish Financial Supervisory Authority, meeting EU requirements for completeness, clarity, and consistency.

Conclusion

Jupiter has established itself as a central component in Solana's DeFi infrastructure, providing users and liquidity providers with a broad range of tools, strategies, and safeguards designed to enhance the trading experience. By integrating multiple DEXs and AMMs, Jupiter's routing engine enables efficient, competitive pricing, while flexible configurations for swaps, limit orders, DCA, and VA solutions cater to different trading styles and investment goals. ApePro extends this functionality to memecoin markets, and JLP pools offer opportunities for liquidity providers to participate in fee-generated yields. Meanwhile, JupSOL illustrates how liquid staking can unlock additional value and flexibility for SOL holders. Taken together, these products and features highlight Jupiter's ongoing commitment to delivering a secure, user-friendly, and innovative environment that continues to evolve alongside the growth of Solana's DeFi ecosystem.

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