



Deep Dive: Solana On-Chain Activity

// April 2025



Part I

Network Capacity & Compute Efficiency

What is compute? What are compute units (CU)?

When you execute an on-chain transaction, it uses up computational resources or compute. Compute is measured in compute units (CU).



Block Compute Budget

- Each block: limit of 48M CU (raised to 50M CU on April 10)
- Blocks consist of multiple transactions
- Each transaction deducts CU from block budget



CU Limits

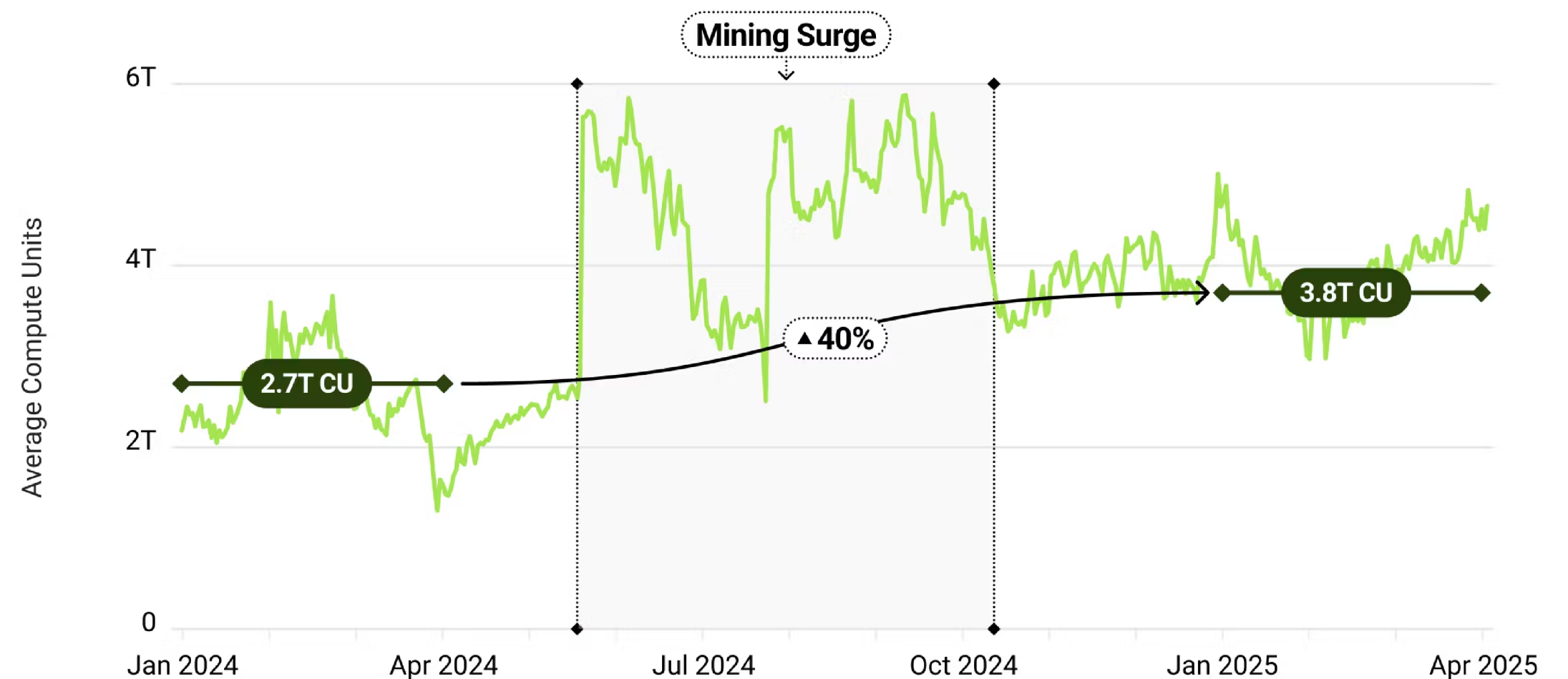
- Maximum: 1.4M CU per transaction
- Transactions are split into instructions
- Instruction Limits:
 - Default Limit: 200k CU
 - Custom Limit: users can request a specific limit on compute units

Compute usage has grown by over 40% in a year.

Solana's daily compute units surged 40%, from 2.7T daily CU in Jan-Apr 2024 to 3.8T in the same period of 2025.

Mining drove summer 2024 peaks near 6T CU, with usage now stable above last year's levels.

Average Compute Usage By Day



Solana's utilization rate dipped slightly since 2024.

Programs request compute units upfront when executing transactions.

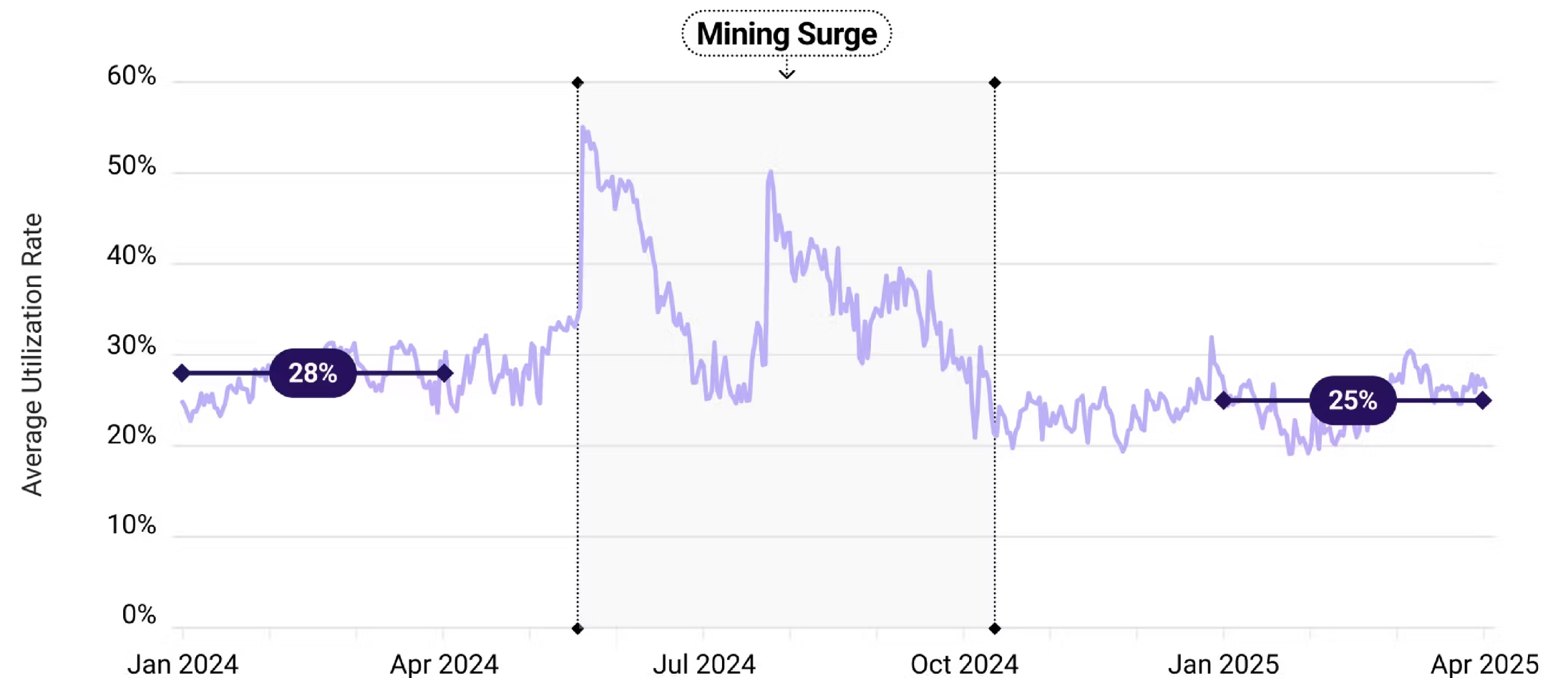
Utilization rate measures efficiency—compute used divided by compute requested.

Solana's program efficiency dropped from 28% in Jan-Apr 2024 to 25% in Jan-Apr 2025.

Mining programs drove peaks of over 50% in the summer of 2024.

Average Program Utilization Rate

By Day



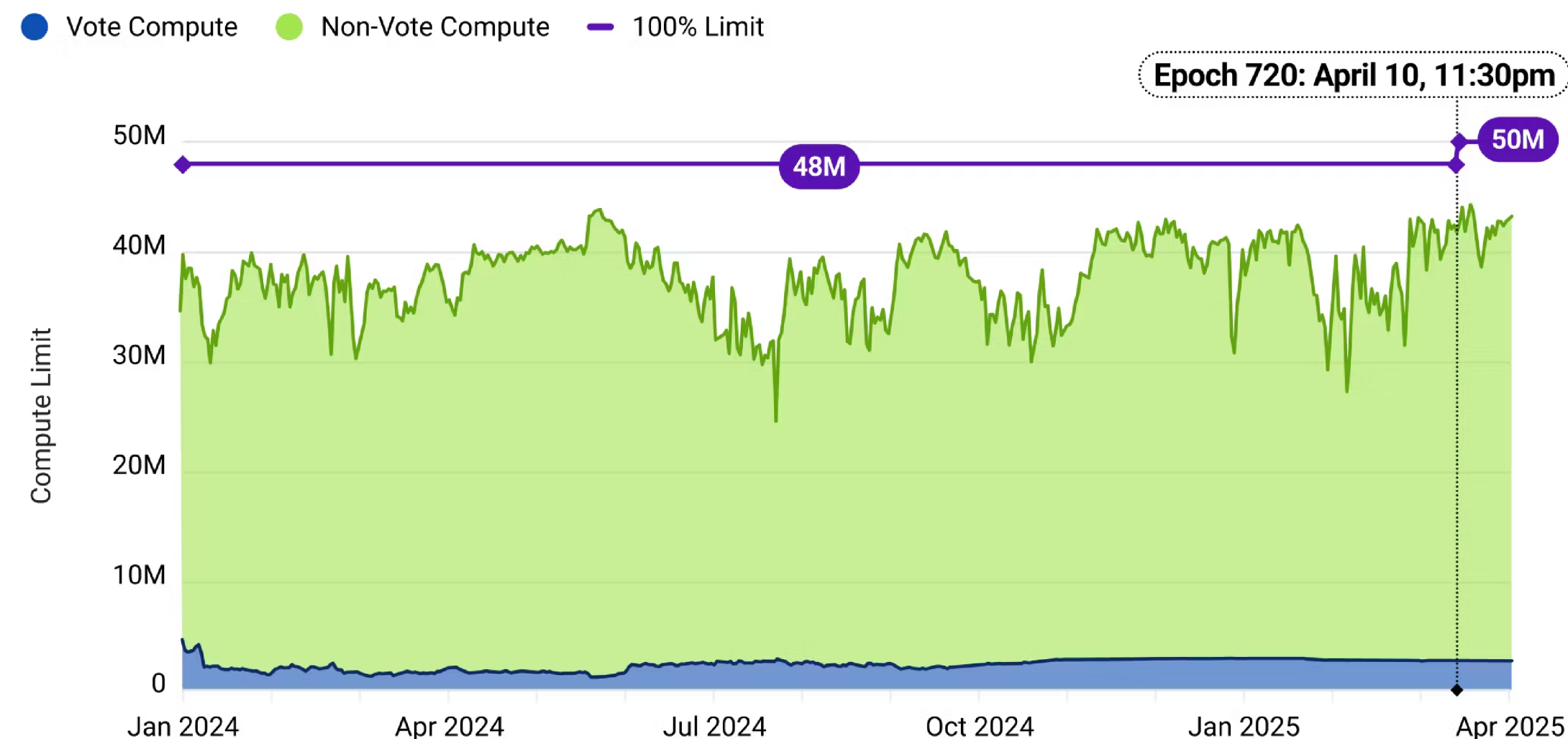
Solana blocks show room for growth.

Solana's blocks use 79% of the compute limit. 74% of compute comes from non-vote transactions and 5% from vote transactions.

On Epoch 720 (April 10), the compute limit was raised from 48M to 50M, but block usage stayed similar.

Blocks averaged 42M CU from April 1 to April 10, and 41.5M for the rest of April after the limit was raised.

Compute Usage per Block: Vote vs Non-Vote By Day

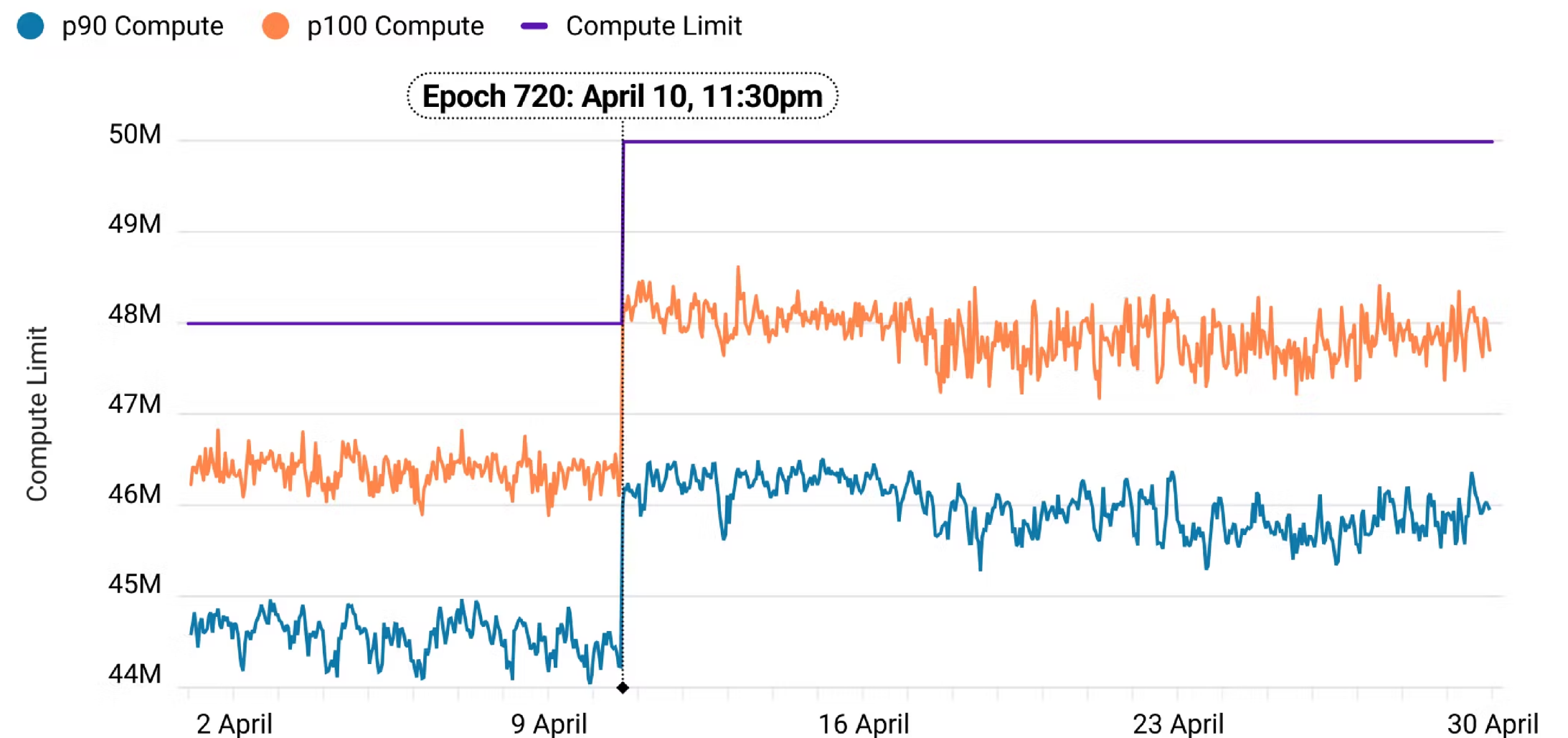


The busiest blocks used more compute after the limit increase.

The compute usage for top 10% of blocks (P90) grew from 44.5M to 46M after the limit increase. P100 grew from 46.4M CU to 47.9M CU, and at times surpassed the previous limit of 48M CU.

This suggests the compute limit increase was effective, boosting network throughput by allowing more compute-heavy transactions per block.

Compute Usage per Block: Percentiles By Hour



Solana activity has grown year-over-year, even during quiet periods.

Solana's median non-vote TPS rose from 800 in Jan-Apr 2024 to 1100 in Jan-Apr 2025.

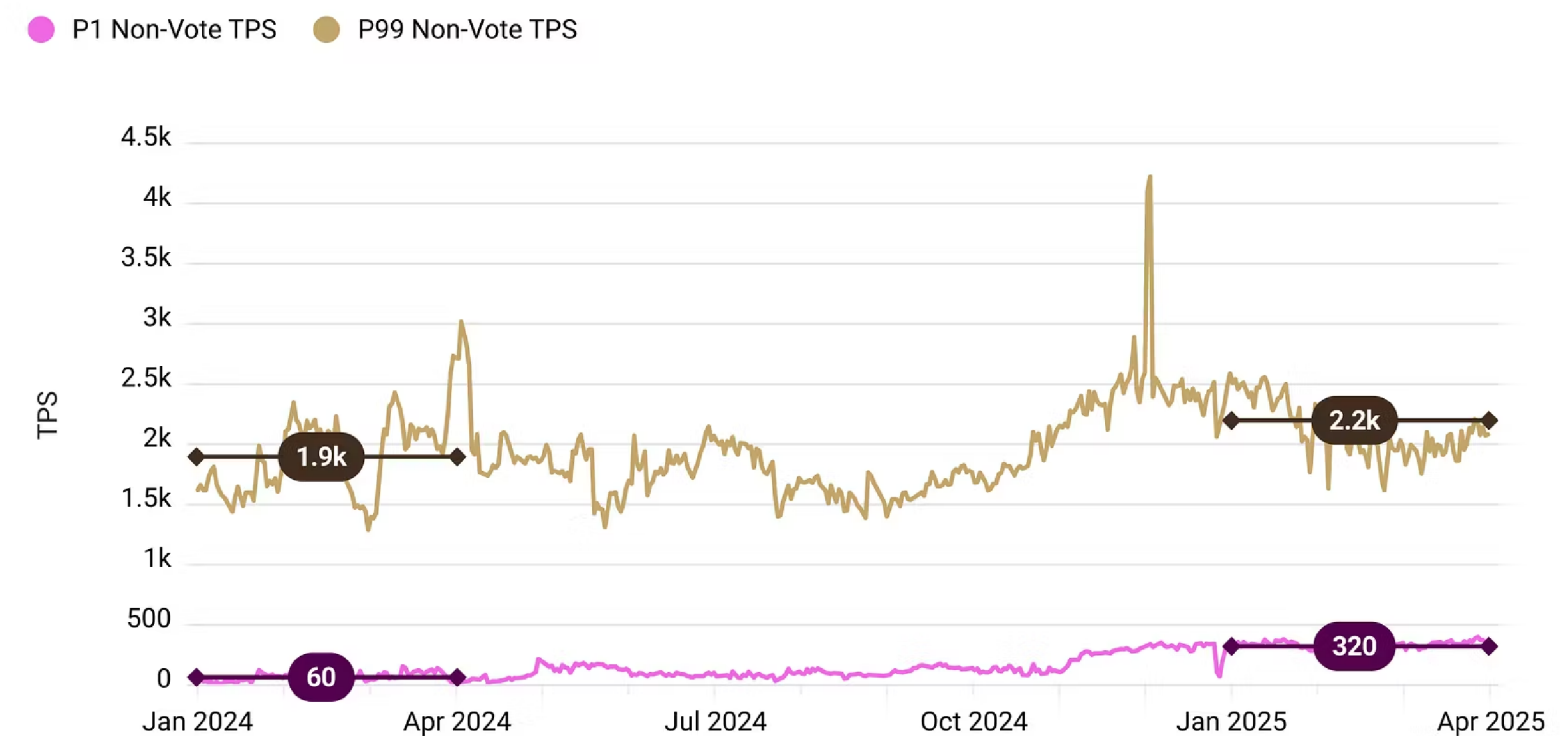
The P99 percentile (top 1% of periods by activity) increased slightly from 1900 to 2200.

The P1 percentile (lowest 1%) jumped from 60 to 320, a 5x increase in "baseline" activity.

Median Non-Vote TPS Over Time By Week



P1 vs P99 Non-Vote TPS Over Time By Week



Part II

Program Activity:

Who's Using Solana?

DeFi is king of Solana compute.

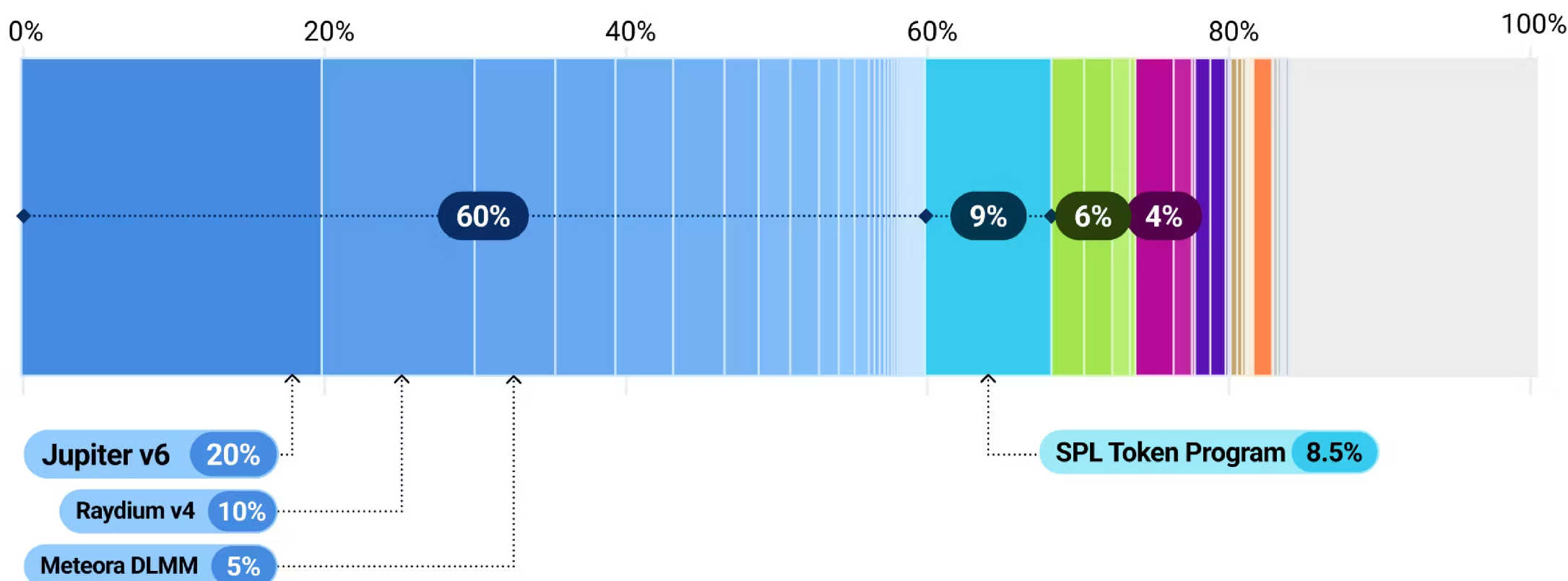
Across Solana's full history, DeFi leads compute usage at 60% with top projects Jupiter (20%), Raydium (10%), and Meteora (5%).

Solana Program Library (SPL) programs follow at 9%, driven by the SPL Token Program. Oracles take around 6%, and Mining 4%.

Compute Usage by Block

By Project, 2021-2025

DeFi Solana Program Library Oracle On-chain PoW NFT MEV/Arbitrage Bots Gaming Other



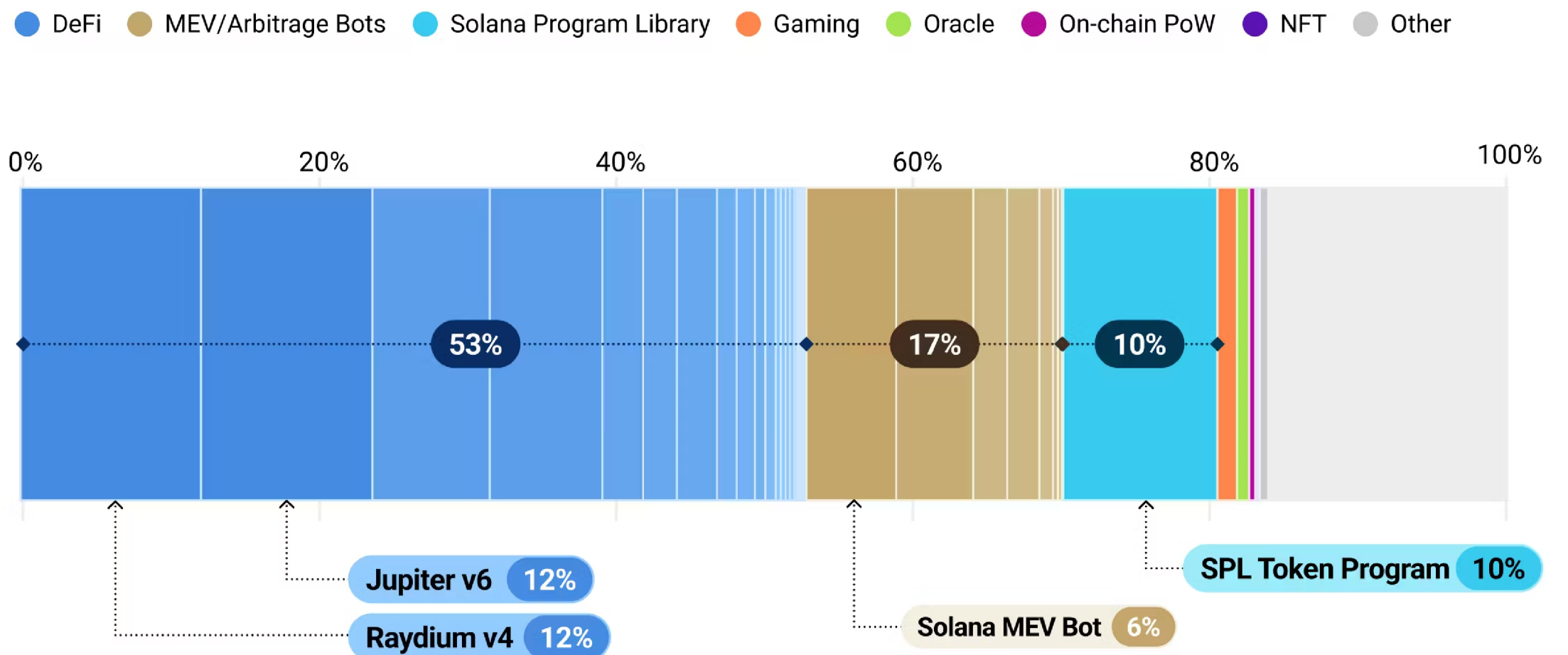
Raydium dominated DeFi, and MEV/Arbitrage bots surged.

DeFi held 53% of Solana's compute in April, with Raydium (12%) overtaking Jupiter (11.50%). Meteora and pump.fun both sit around 8%.

MEV/Arbitrage bots emerged as the second category by compute at 17%, with Solana MEV Bot leading at 6%.

Compute Usage by Block

By Program, April 2025

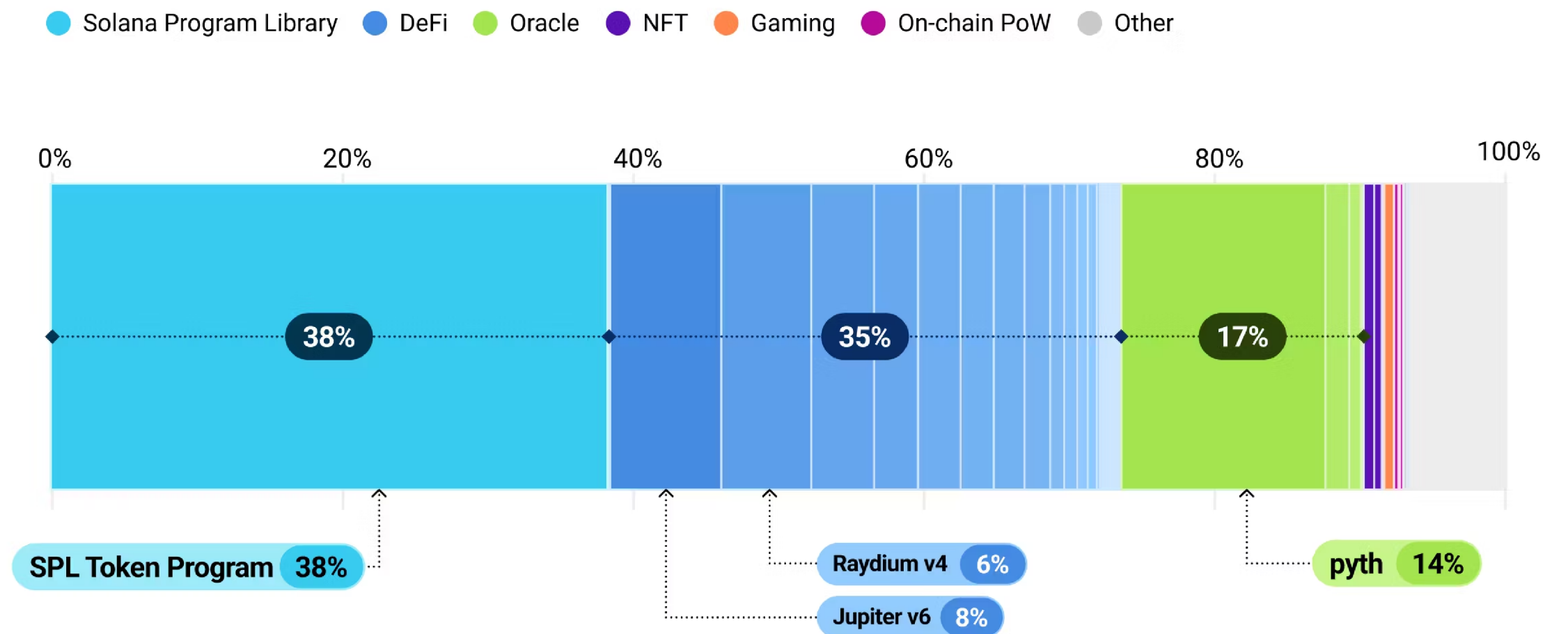


Over Solana's full history, invocations have been driven by System programs and DeFi.

SPL programs account for 38% of invocations led by the SPL Token Program.

DeFi contributes 35%, with Jupiter (8%) and Raydium (6%) as the top protocols. Oracles add 17%, with Pyth (14%) as the top protocol.

Invocations per Block By Project, 2021-2025



Year-over-year, DeFi and SPL increased in invocations.

From Q1 2024 to Q1 2025, DeFi's share of invocations stayed steady at around 40% with Jupiter (12%) Raydium (7%) and Meteora (7%) leading.

SPL programs grew from 46% to 51%, dominated by SPL Token Program.

Note: For this slide we are consolidating all programs associated with Jupiter, including various iterations of the aggregator program, Jupiter DCA, and the programs related to Jupiter perpetual, among others.

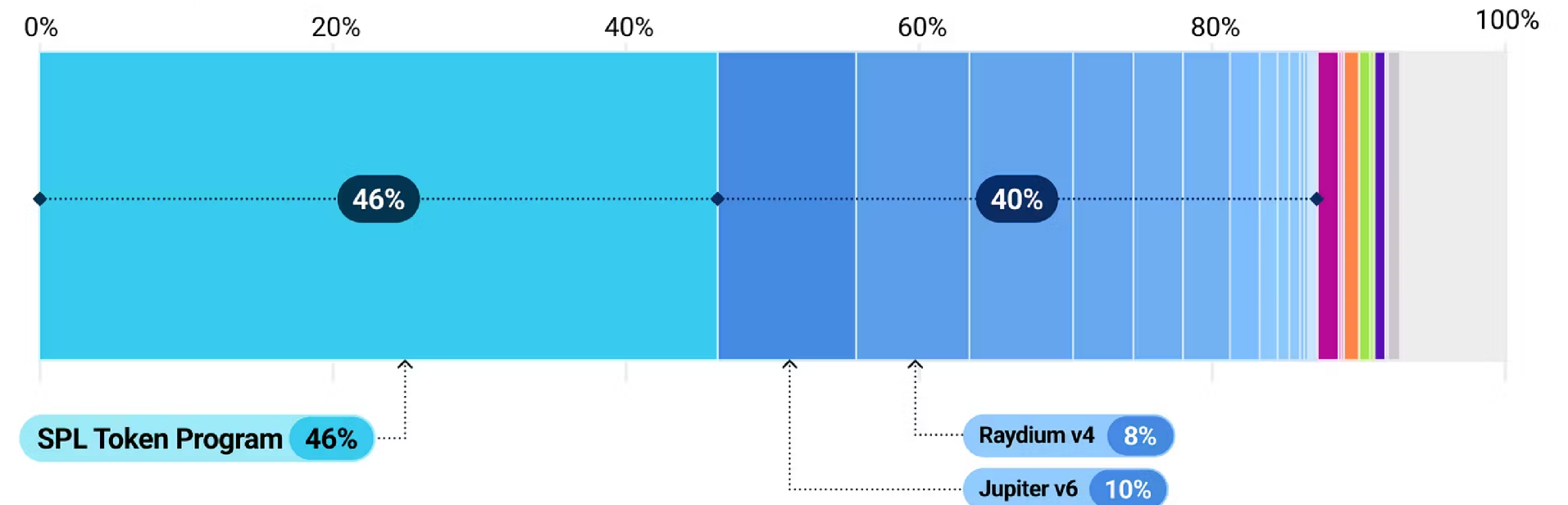
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Top 100 Block Invocations

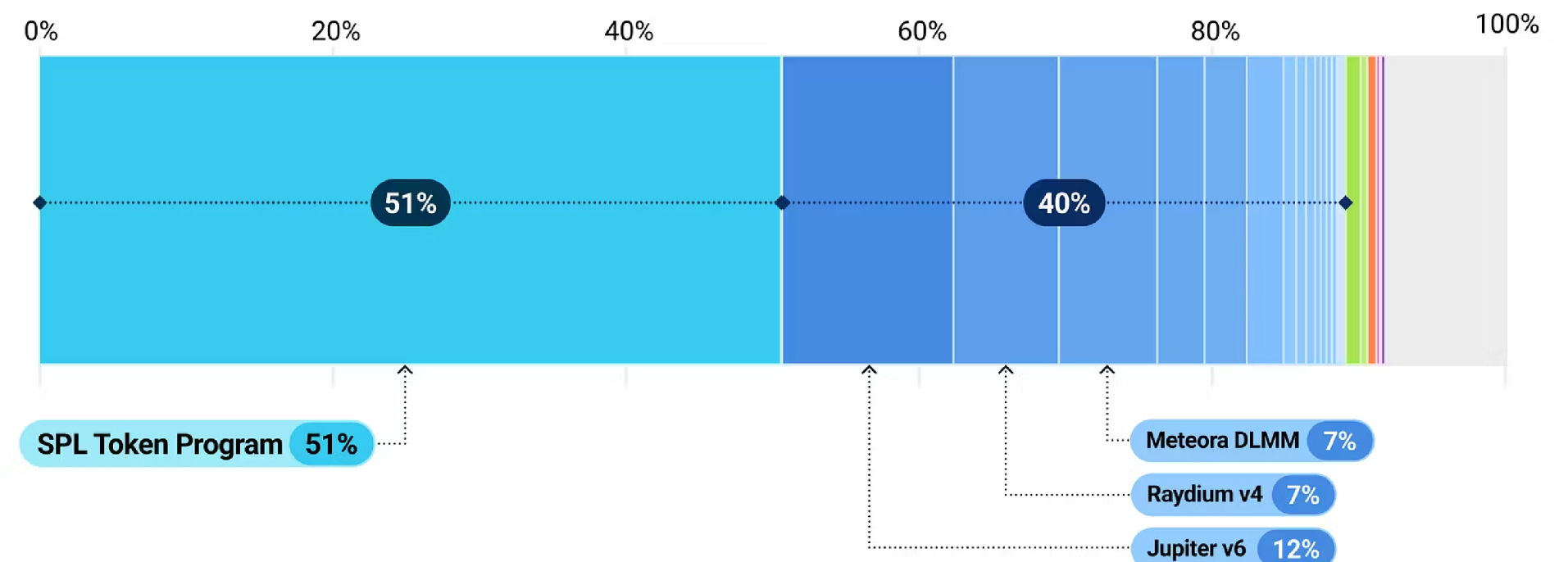
By Program Type, January-April 2024 vs January-April 2025

● Solana Program Library ● DeFi ● On-chain PoW ● Gaming ● Oracle ● NFT ● Other

January-April 2024



January-April 2025



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Spot DEXes and aggregators lead DEX compute share.

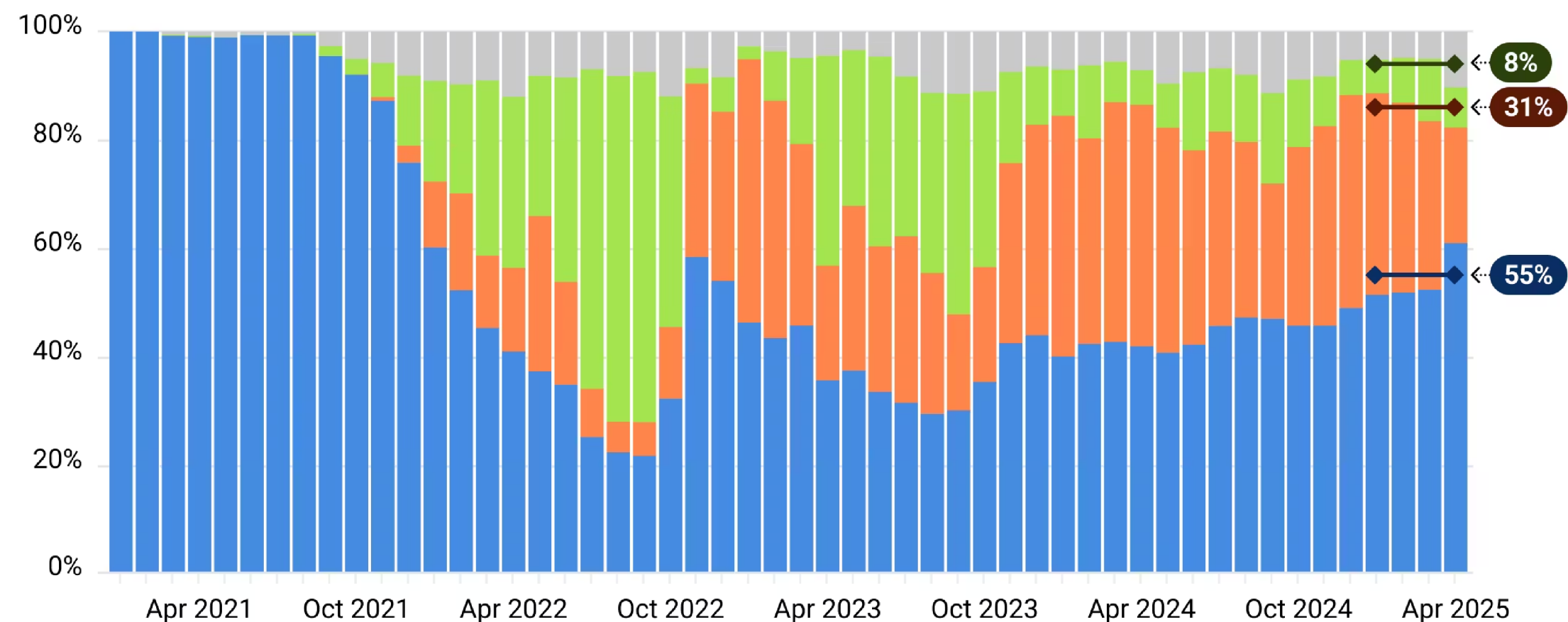
Spot DEXs like Raydium (or Serum initially) dominated Solana's DEX compute share.

Perpetual DEXs like Mango or Drift surged in late 2022, briefly taking the lion's share of compute.

Into 2025, aggregators grew to 31% of compute, spot to 55%, and perpetual's share dropped to 8%.

DEX Compute Share By Month

Spot Spot Aggregator Perpetuals Others



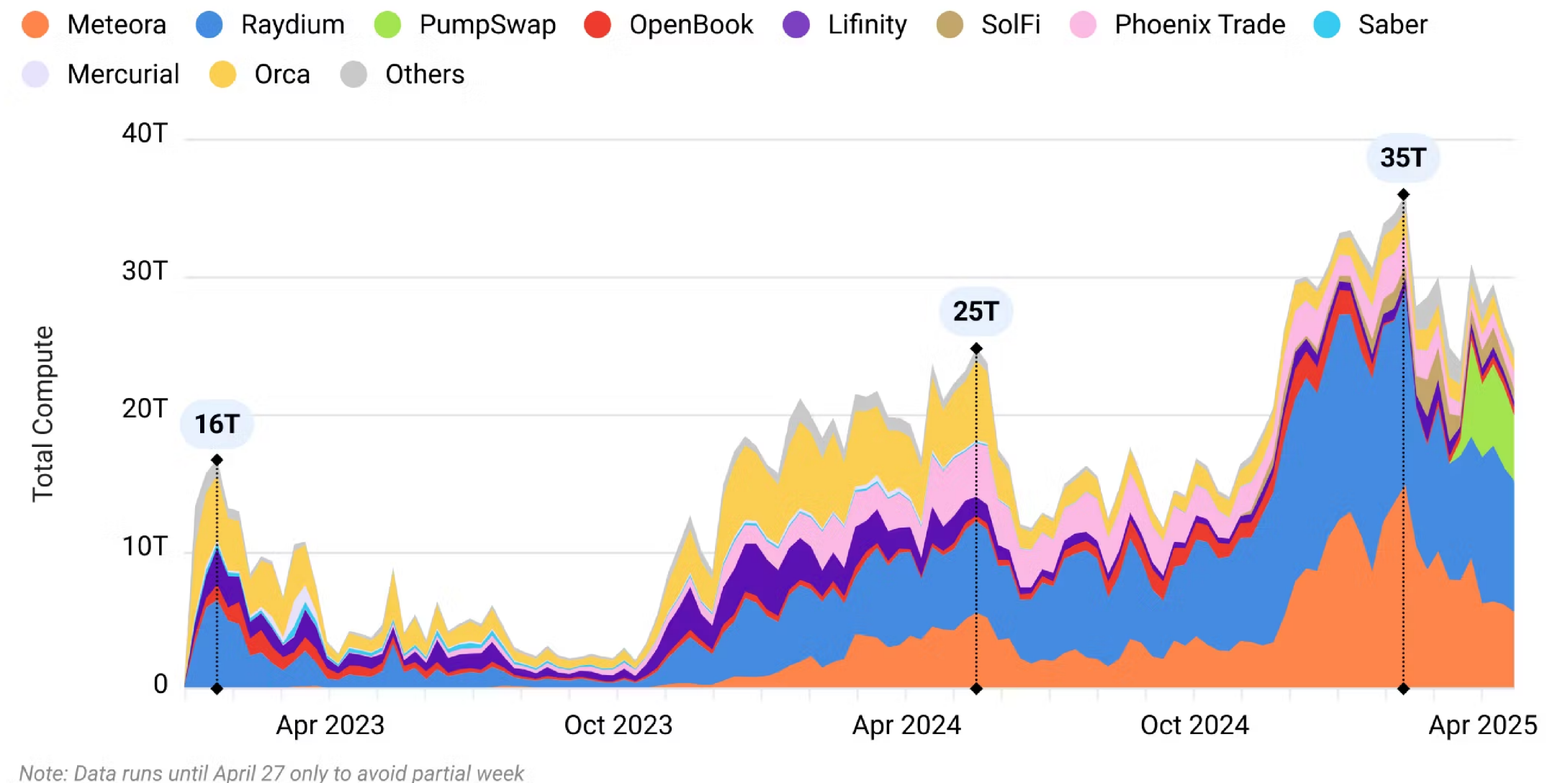
DEX spot compute has grown in rising waves.

DEX spot compute on Solana peaked at 16, 25, and 35 trillion CU weekly across three waves since January 2023, with floors rising after each dip.

Orca and Raydium dominated in 2023, followed by Lifinity and Ellipsis Labs' rise and fall, while Meteora gained share from mid-2024.

Ellipsis Labs' SolFi and PumpSwap (pump.fun's DEX) have started to gain share in 2025.

DEX Spot Compute By Week



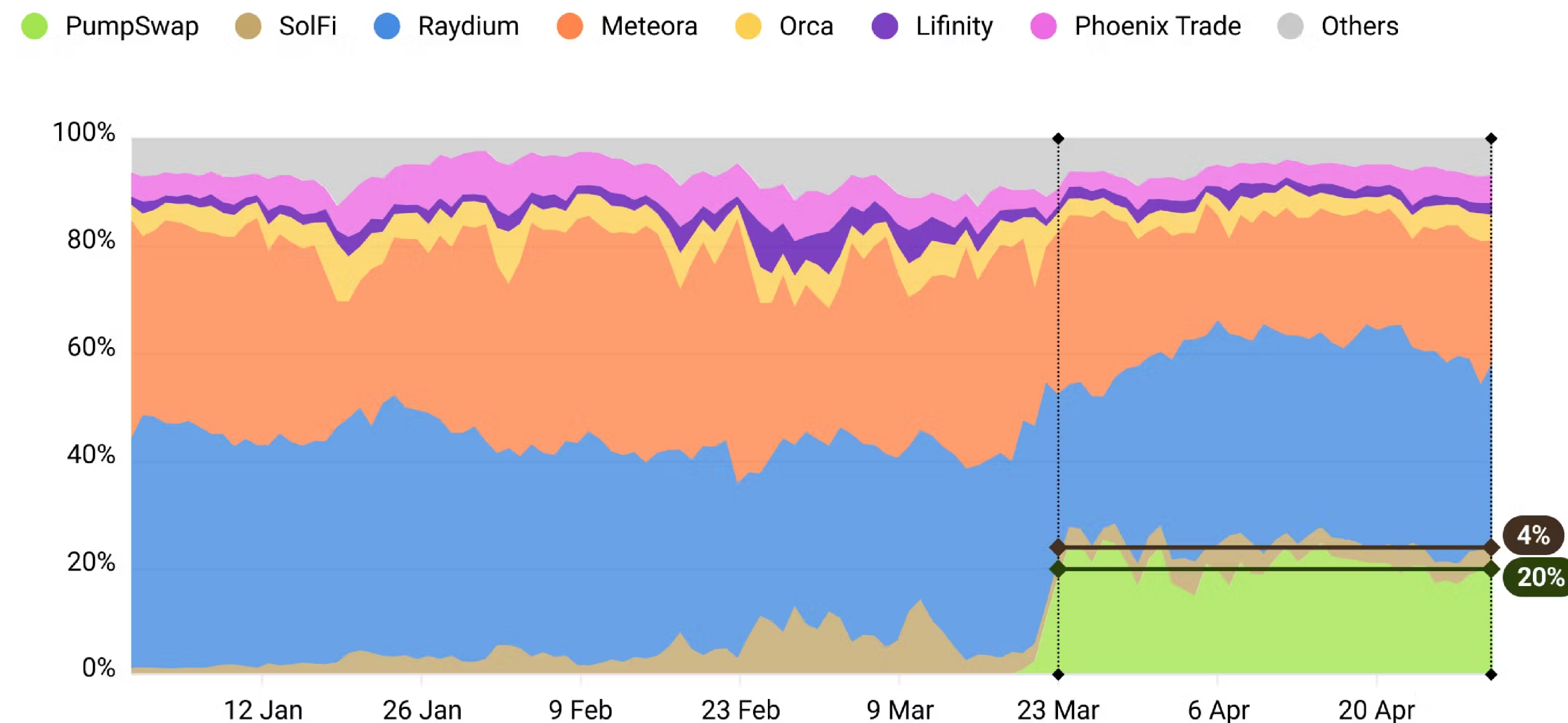
Beginning in March, PumpSwap surged in DEX spot compute.

PumpSwap, launched on March 21, quickly captured around 20% of Solana's DEX spot compute.

SolFi rose to as much as 10% in February and has stabilized around 4% since then.

DEX Spot Compute: Share by Project

By Day

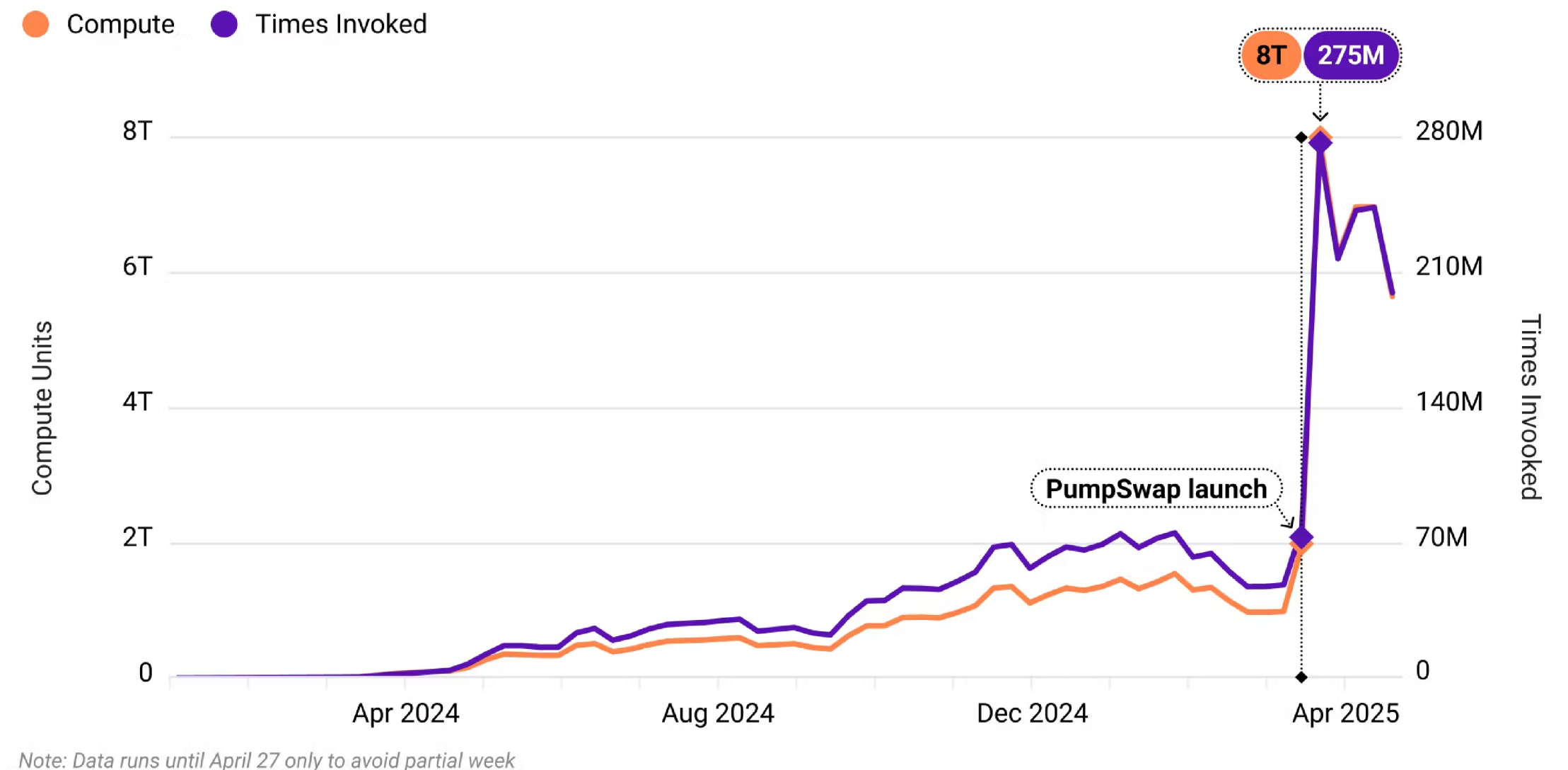


PumpSwap has driven the pump.fun surge.

Pump.fun's compute and invocations grew steadily until PumpSwap's release, after which both went parabolic.

The last week of March saw pump.fun hit 275 million weekly invocations and 8 trillion CU.

Compute and Times Invoked for Pump.fun By Week



Jupiter dominates perps volume share with minimal compute usage.

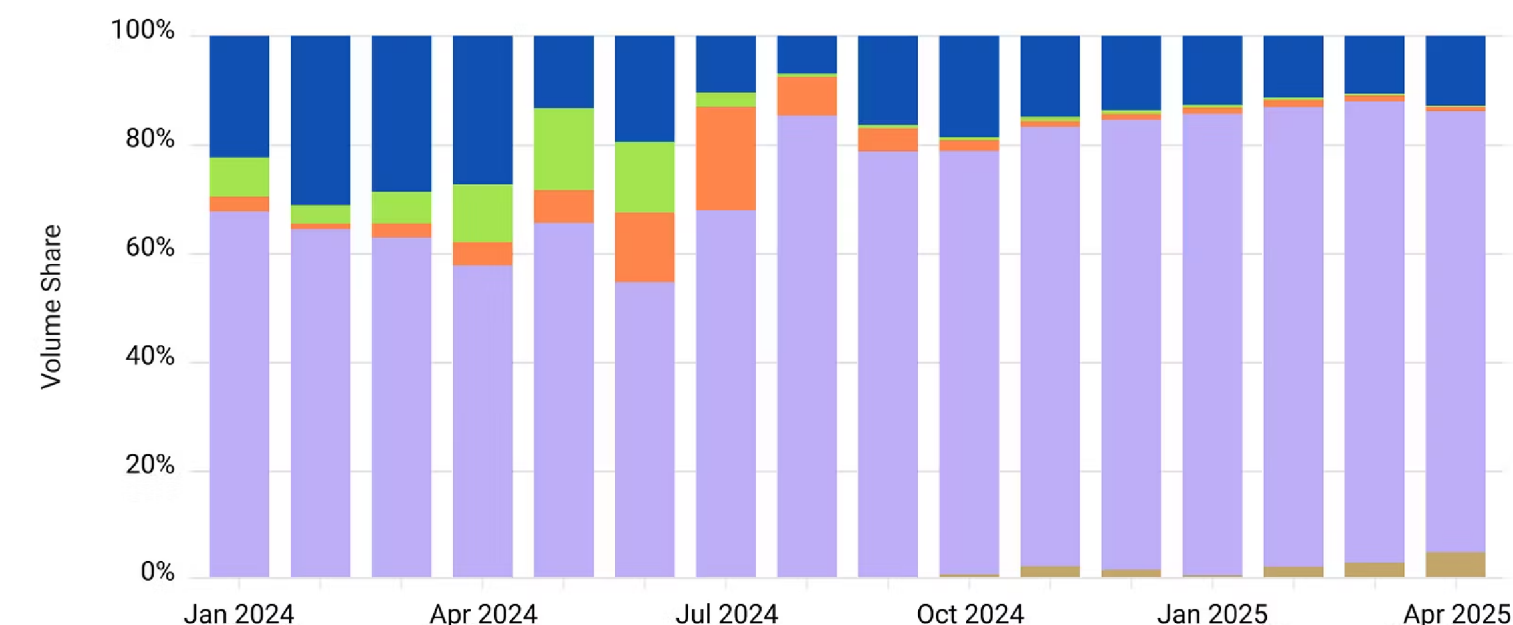
Jupiter leads Solana perp DEX volume in 2025 with 84%, but uses only 4% of compute. With 0.3% volume, Zeta spends the most compute among perp DEXs at 70%.

This disparity arises from design choices. Zeta's on-chain orderbook and matching engine drive high compute usage.

In contrast, Jupiter's liquidity pools and running part of the computations off-chain matching minimize compute spent on Solana.

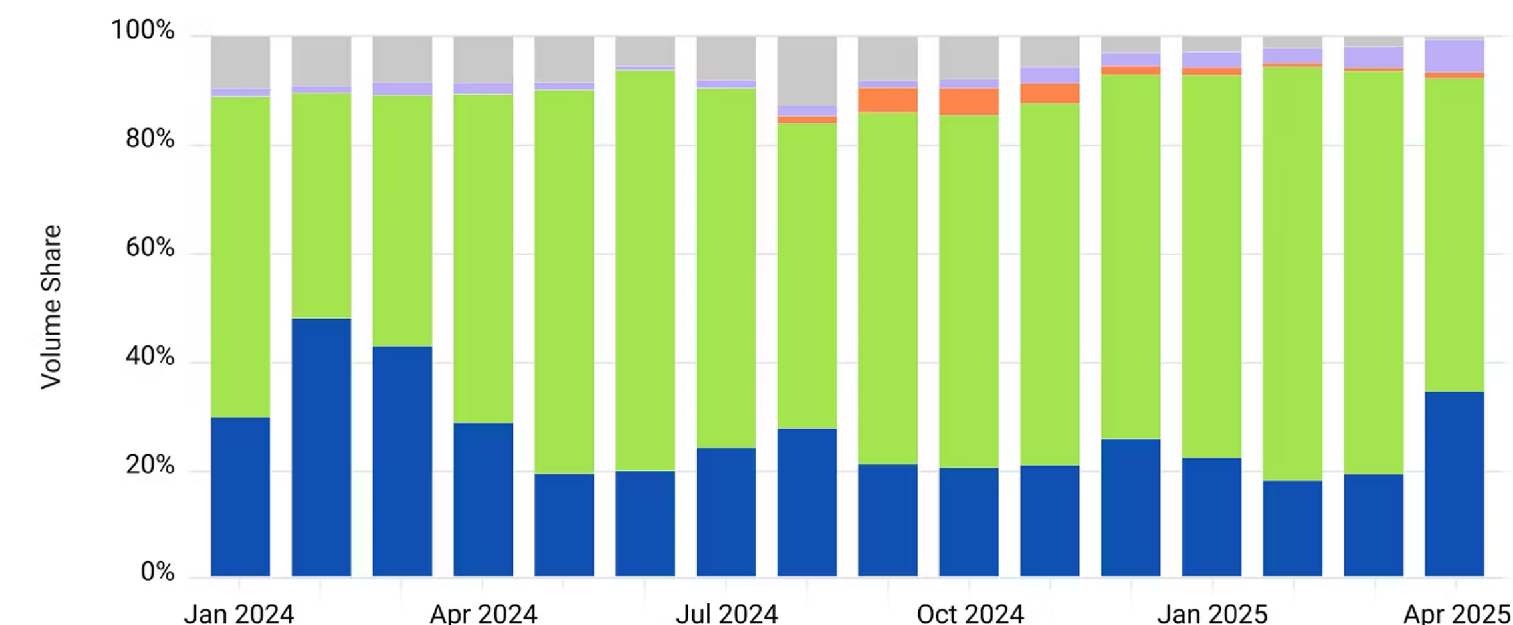
Perps Volume Share by Platform By Month

Drift Protocol Adrena Flash Trade Zeta Markets Jupiter Perps



Perps Total Compute Share by Platform By Month

Drift Protocol Zeta Markets Flash Trade Jupiter Perps Adrena Others



Token Extensions has lagged in invocations.

Token Extensions tokens grew to 25% of Solana's newly created fungible tokens in 2025, reaching a peak of over 40% in January.

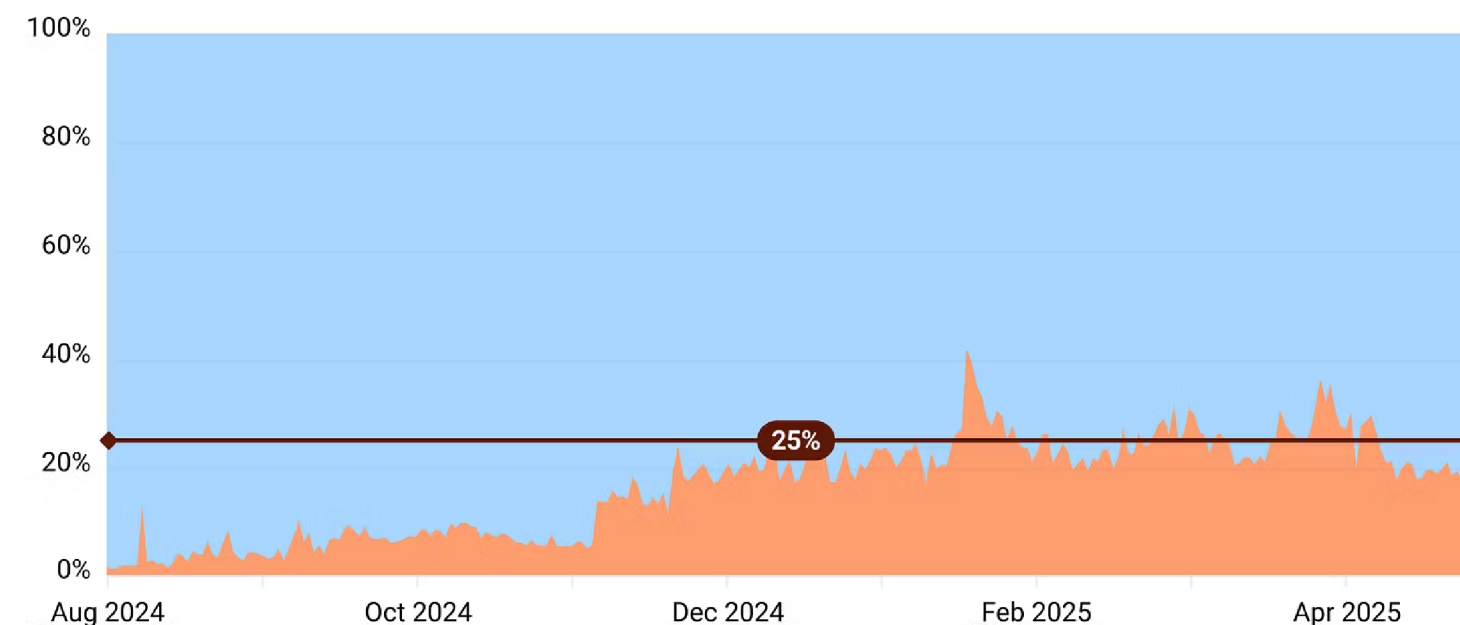
However, invocations for Token Extensions averaged only around 1% in 2025 compared to the original SPL Token Program at 99%.

This discrepancy stems from SPL Token Program's dominant role in DeFi and token swaps, which drive most activity on Solana.

Share of Tokens: Token Extensions vs SPL Token Program

By Day

Token Extensions SPL Token Program



Share of Invocations: Token Extensions vs SPL Token Program

By Day

Token Extensions SPL Token Program

