About Sanctum

what is sanctum?

sanctum is making all staked SOL liquid to supercharge the SOL economy.

about us

We've been building liquid staking on Solana since February 2021. We helped Solana Labs to build the SPL stake pool program (today, all but two LSTs use a version of the SPL program), and launched the first SPL stake pool, Socean.

Over the years, we've continuously built to improve liquid staking. One critical piece was [unstake.it](#) (now the Sanctum Reserve), which provides instant unstake liquidity for all LSTs on Solana. Now, we're building Sanctum, which unifies liquidity for all LSTs and will usher in a new era of liquid staking on Solana.

the problem

Staked SOL is not easily tradable or transferable. It secures the network and earns staking yields (good!), but you can't do anything with it. That is why none of the SOL on NFT marketplaces like Tensor or MagicEden, or NFT lending platforms like Sharky is currently staked. This SOL *is* participating in the economy, but not securing the network, and not earning staking rewards.

So there is a trade-off here. We want to use our SOL in the economy, to do all sorts of things: DeFi, NFT, payments, what have you. But at the same time we want to earn staking yields and secure the network. If only there was a way to do both..

why liquid staking?

Well, it turns out that there is. Liquid staking gives you the best of both worlds: it lets you secure the network and use your SOL at the same time.

You can think of staking as putting gold in a vault, and liquid staking as issuing a piece of paper money (an IOU) for the gold in that vault. In the same way that a paper IOU can be redeemed at any time for the gold, a liquid staking token can be redeemed at any time for staked SOL.

Unlike staked SOL, this liquid staking token is transferable. It can be used in all of DeFi – borrow-lend, perps, stablecoin issuance, etc.

Liquid staking is also a 10x UX improvement from native staking. Think how involved the process of native staking and unstaking is. First you have to navigate to the staking tab in your wallet and find your preferred validator. Then you have to "activate" your stake and wait two days. Everytime you want to stake more, you have to wait another two days. Even if it's with the same validator, stake accounts with the same validator don't automatically combine, so now your wallet is littered with many stake accounts and you have to "merge" them one by one. Unstaking is even worse. If you want to sell half of your stake, you need to first "split" your stake account into two. Then you have to deactivate your stake, and finally remember to claim it two days later.

All of this results in an incredibly obtuse user experience. I've lost count of the number of times I've seen people ask "I've unstaked my SOL, where is it?"

In contrast, liquid staking with Sanctum is a breeze. You want to stake to Solblaze? Swap SOL to bSOL on [jup.ag](jup.ag). Unstake? Sell as much or as little of your bSOL as you like. No waiting, no merging and splitting, no finagling with a shitty stake account UI.

People already know how to swap, and they love Jupiter's UI. Liquid staking lets us leverage that.

why liquid staking hasn't worked (yet)

Total Stake Solana Stake Over Time (Sourced)
Values are in SOL
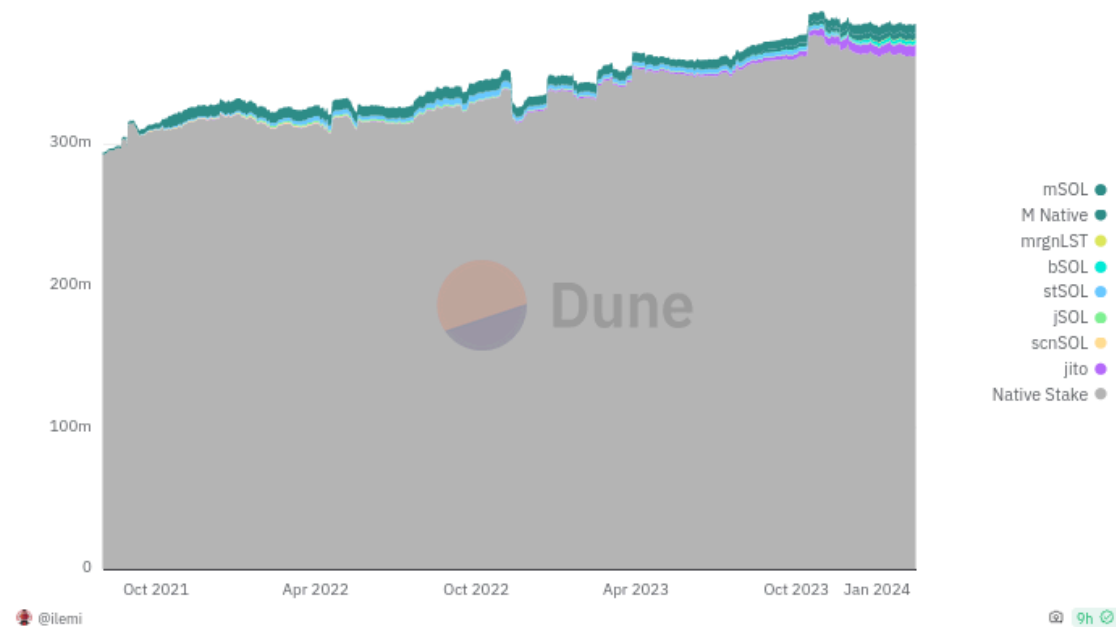
Despite the many advantages of liquid staking, after almost three years less than 5% of staked SOL is liquid staked. This is a travesty. It's like if 95% of all money was still gold bars, kept in vaults under lock and key.

Why? If liquid staking is so great, how come nobody wants it? I think it's because nobody has cracked the secret yet. I think everyone has looked at liquid staking the wrong way – until now.

liquid staking is much more than stake pools

The first (and for a long time, the only) option for liquid staking on Solana was stake pools. Stake pools take your SOL and issue you their LST. They then take your SOL and stake it with a bunch of different validators. The staking returns that these validators accrue go into the pool, causing the LST to gain in value over time. This isn't bad, and is sufficient for many use cases, but the value proposition isn't strong enough, and isn't for everybody (I go into more detail in [a blog post](#)).

In fact, liquid staking can be much more than that. Here's one example. All stake pools split their stake amongst multiple different validators, and also charge an management fee. But many people want to stake to a specific validator, and they don't want to pay

extra fees in order to access liquid staking. So many people choose to stick with native staking instead.

So we have recently launched **validator LSTs,** which combine all the benefits of native staking (zero fees, choose your own validator) *and* the benefits of liquid staking (instant liquidity, use it throughout Solana). They are a strict upgrade over native staking and a compelling alternative to stake pools.

That's just the tip of the iceberg. There are a thousand different possibilities for LSTs. Projects can use LSTs as a delivery mechanism for extra yields (e.g. laine gives block rewards to laineSOL holders, who get double the APY of native staking), for NFT mints (e.g. hold pathSOL to unlock an NFT whitelist slot), or even as a subscription service (hold alphaSOL gain access to a private Discord).

Just like the invention of paper money helped to unlock the gold bars sitting in vaults, and supercharged the world's economy, liquid staking – done right – unlocks staked SOL and supercharges the Solana economy.

why didn't anyone else do this?

Why didn't anyone do this before?

Because it required **a change in mindset from PvP to PvE.** I want to stress that **the new meta of liquid staking on Solana we are pioneering is fundamentally different from what came before, or indeed on any other chain.**

The liquid staking meta on other chains (and in the past on Solana) used to be *winner-take-all*. Before we worked with Jupiter to build the Sanctum Router, liquidity was incredibly fragmented. You had for example a stSOL-SOL pool on Saber, a mSOL-SOL pool on Raydium, and a scnSOL-SOL pool on Orca, and these pools were completely separate. So every stake pool needed to fight for liquidity, and everyone wanted to use liquidity as a moat to extinguish the competition.

This is a super PvP mindset, imported from Ethereum (remember the "Curve wars", "Saber wars"?) I saw this game being played between Marinade and Lido when we were Socean. They were giving out millions in their token every week in order to incentivise deposits into AMMs.

Of course, under these circumstances, there was no way you could have smaller LSTs. You had to come up with millions of dollars of liquidity to even start to play the game, otherwise your LST would easily depeg. So validator LSTs were impossible.

The core mindset shift we made is to think not about "how can we win this liquidity war" but "how can we help liquid staking flourish". And so we started to build for a million-LST future. We realised that our goal is not to destroy each other, but rather to unlock ~95% of native staked SOL, and the ~33% of unstaked SOL.
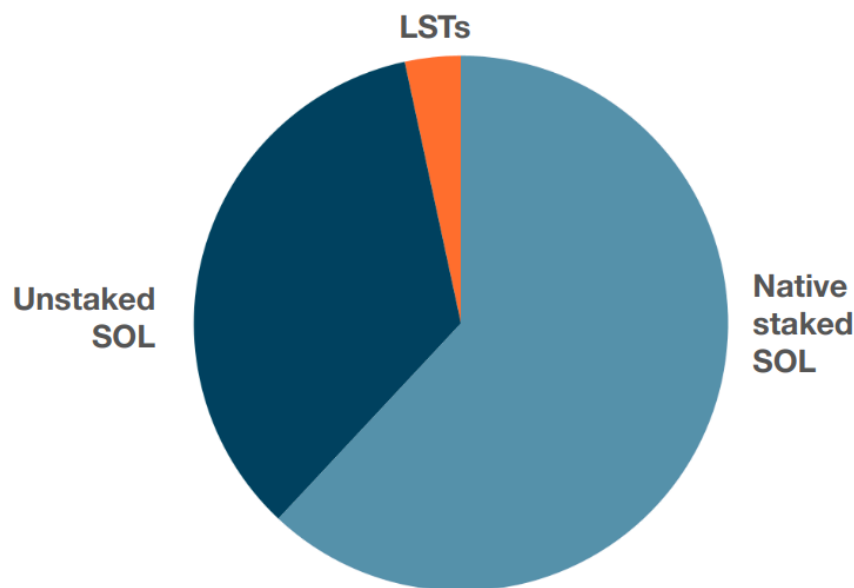
our roadmap

Phase 0: Build a unified liquidity layer

So here is what we have done. First, we built the foundational infrastructure for all LSTs to be interoperable, used throughout DeFi, and traded in size without slippage.
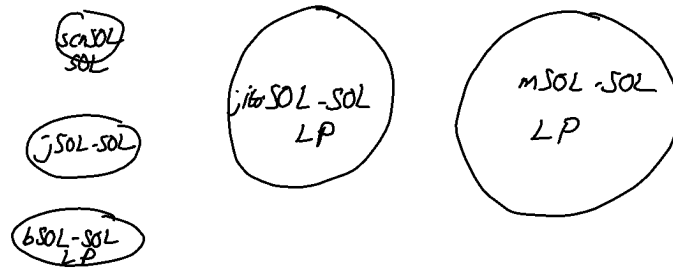
We built unstake.it (now the **Sanctum Reserve**). It is a pool of liquid SOL that is able to service instant unstake for all LSTs. Thus, no matter how big or small an LST is, it will be able to be instant unstaked into SOL right away. This is the backstop of Solana DeFi: DeFi protocols are able to integrate LSTs as collateral because they have a large emergency pool of SOL always available to service instant unstakes.

We built the **Sanctum Router**. This is a router we built together with Jupiter that [might be the most important piece of infrastructure for Solana LSTs](#). It allows people to convert one LST to another *even when there is normally no route between two LSTs*. This unifies LST liquidity by allowing small LSTs to access the liquidity of much larger LSTs.
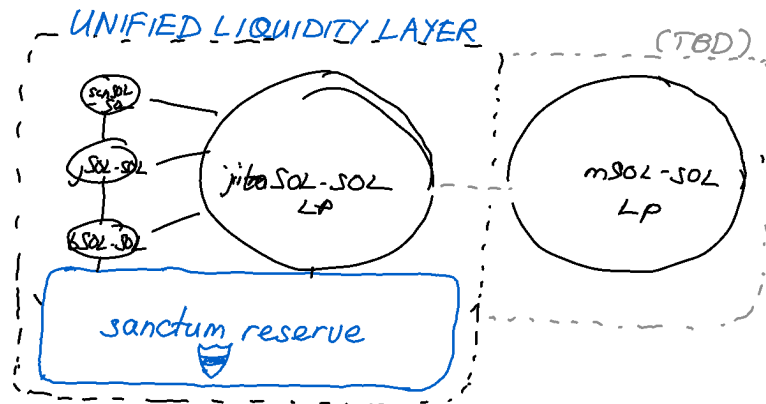
Previously if you had e.g. scnSOL, you could only get SOL back via scnSOL - SOL LPs. And when the liquidity there runs out, the price craters. But with the Sanctum Router, scnSOL can go through not just scnSOL-SOL LPs, but every other LST's LPs: scnSOL -> jitoSOL -> SOL, scnSOL -> mSOL -> SOL, etc.
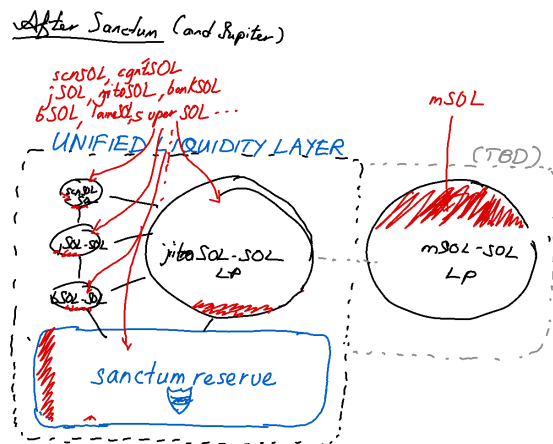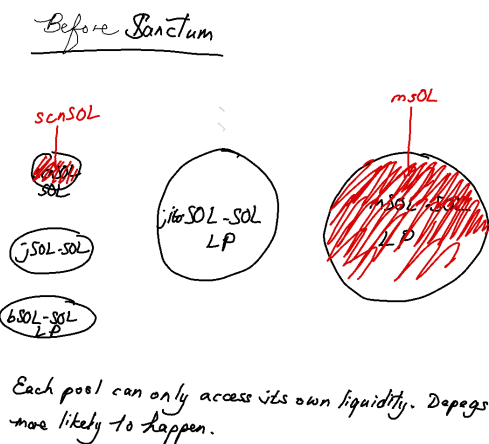
Before Sanctum

Liquidity is fragmented. Small LSTs suffer.

After Sanctum (and Jupiter)

UNIFIED LIQUIDITY LAYER

(TBD)

sanctum reserve

Before Sanctum

scnSOL

scnSOL-SOL

jSOL-SOL

bSOL-SOL LP

mSOL

jitoSOL-SOL LP

mSOL-SOL LP

Each pool can only access its own liquidity. Depegs more likely to happen.

After Sanctum (and Jupiter)

scnSOL, cgntSOL
jSOL, jitoSOL, bonkSOL
bSOL, lanecys upor SOL ...

UNIFIED LIQUIDITY LAYER

mSOL

(TBD)

scnSOL-SOL

jSOL-SOL

bSOL-SOL

jitoSOL-SOL LP

mSOL-SOL LP

sanctum reserve

All LSTs are able to tap into the combined liquidity of all LSTs.

Unified LST liquidity layer.

Only possible on Solana.

The mSOL depeg on December 12th, 2023 showed that even large stake pools on Solana can temporarily depeg when faced with large selling pressure. And it depegged because the Marinade stake pool (at the time) wasn't yet integrated with Sanctum Router – otherwise, they would have been able to draw from the Sanctum Reserve or even tap into liquidity from other LSTs.
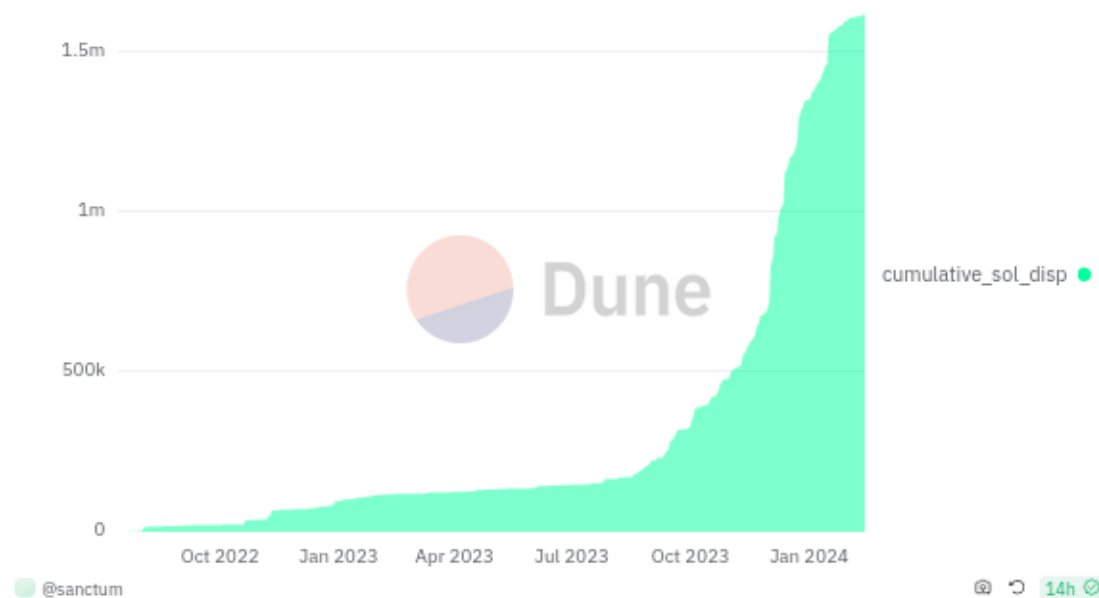
Router and Reserve have collectively serviced over 300M of volume on Jupiter alone and dispensed over 1.5M of SOL in instant unstakes.

Cumulative SOL Dispensed by Day all_daily_unstakes

Before Sanctum, it would be impossible to have thousands of different LSTs. The total liquidity would be fractured across all of these LSTs and depth would be laughably small.

But this unified liquidity layer changes things. There *can* be thousands, millions of LSTs. Each of them can access the full depth of unified liquidity with Sanctum Router and Sanctum Reserve – without having to put up any liquidity of their own.

So the next step: to launch these LSTs.

We've launched with a pioneer batch of six new validator LSTs: **bonkSOL, compassSOL, dSOL, jucySOL, pwrSOL,** and **superSOL.** These validator LSTs have zero deposit stake fee, zero withdrawal fee, and zero management fee. They therefore represent a strict upgrade over native staking.

These projects are all highly motivated and are excitedly trying different things with their LSTs, and we think that this will kickstart a Cambrian explosion of new LSTs on Solana. The goal is to migrate existing native stakers to validator LSTs, and to get SOL holders to hold LSTs instead.

The launch has been a good way to improve our infra so we can scale to run thousands of different LSTs. The initial response has been very promising, with many more projects requesting to be onboarded.

And Sanctum has delivered on its liquidity promise. Here's an example of a brand new LST (bonkSOL) with no native liquidity. Despite that, it supports large 1,000 bonkSOL → USDC and bonkSOL → SOL swaps thanks to Router and Reserve.
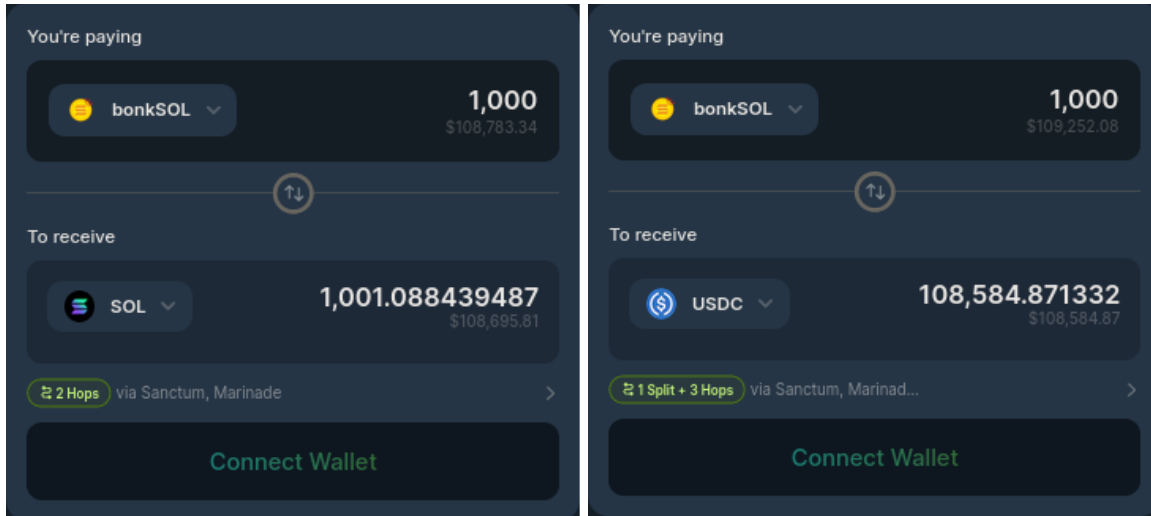
Before   **After**
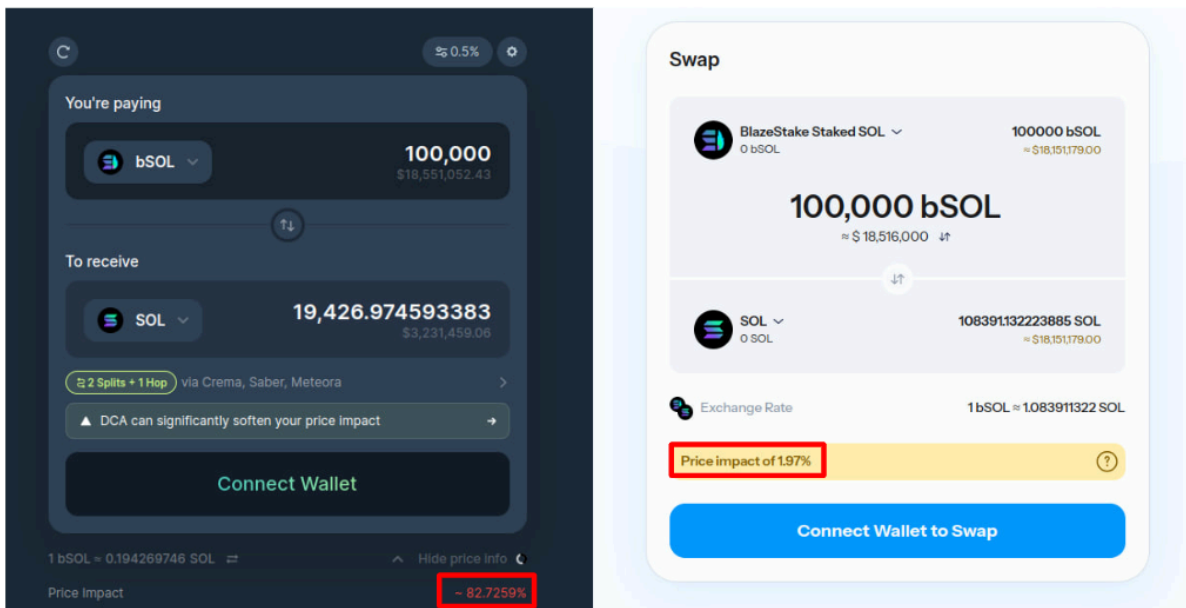
We have built a world where anyone can have their own LST, not just validators. Here are more exciting use cases for LSTs; some already here, some purely hypothetical (for now). Note that the hypothetical ones are purely my ideas and they do not necessarily have the teams' approval.

laineSOL: Laine is one of the best validators in the space, and many people want to support him. Before Sanctum, they would have to give up on the liquidity and UX benefits of liquid staking to do so. Now thanks to Sanctum's unified liquidity layer, there is no tradeoff: anyone can stake in laineSOL and enjoy the benefits of LSTs. Laine

also uses laineSOL as a way to distribute block rewards to stakers. laineSOL holders enjoy extra block rewards, resulting in a net APY of ~20% – more than twice native staking yields.

pathSOL: Fed up with the many rug NFT projects, [Pathfinders](#) decided to run an "unruggable mint". Unlike most other NFTs, these ones come with a money-back-guarantee. You pay 10 SOL to mint a Pathfinder – but if you ever change your mind, you can burn the Pathfinder and get your SOL back. The SOL is staked into pathSOL and does not give staking returns to its stakers; instead, staking yields are given to the team to support the development of the Pathfinders universe. This incentivises building in public, maintains a floor price, and ensures that the team continues to deliver on their roadmap.

tensorSOL: Tensor is the largest Solana NFT marketplace. There is a lot of SOL sitting around in unfilled orders. By allowing people to place bids with tensorSOL instead of SOL, Tensor earns yield on open orders. Tensor gives extra points to tensorSOL users, and runs a jackpot of sorts: every time someone pays in tensorSOL, they have a chance to win part of the accumulated staking rewards.

waifuSOL: [Raiba AI](#) is building Mika, the first Solana AI waifu. They accept credit card subscriptions, but also waifuSOL: you automatically get access to Mika for as long as you hold 50 waifuSOL. Membership is tiered: waifuSOL whales get early access to preview builds of Mika and new waifus.

These stories – and many like it – make up the infinite-LST promise. Sanctum's promise is to empower all these usecases and kickstart a Cambrian explosion of new LSTs.

Phase 2: Infinity

Next, we launch **[Infinity](#)**. Infinity is a multi-LST LP that supports swaps between all LSTs in the pool. Most pools support only two assets (e.g. jitoSOL-bSOL); we support thousands. This allows our pool to be much more capital-efficient than normal pools. In fact, we believe it's the most capital-efficient LST AMM design possible; **the optimal liquidity solution for an infinite-LST future.**

How does it work? The key insight is that there is an infallible on-chain oracle that tells us the floor price of every LST. The price of every LST can simply be read off the account itself. This lets Infinity support swaps between any two LSTs of any size without having to rely on any constant-product or stableswap invariant.

Users can join Infinity by depositing any (whitelisted) LST into Infinity. In return, they will receive the **INF** token, which accrues both staking rewards and trading fees from the pool. Of course, all the LSTs that we launch in phase 1 will be eligible to enter Infinity.

INF is itself an LST and so can be directly composed upon by DeFi protocols. All LSTs will be able to share the liquidity of **INF-USDC and INF-SOL**, or route via **INF** to access the liquidity from any other LST pair. We plan to make **INF** one of the most liquid LSTs on Solana, to further deepen liquidity available to LSTs.

Phase 3: LFG

We don't have all the answers, and there are many things that I'd love the wisdom of the community on.

We absolutely want to reward early adopters of Solana's new staking meta, and we want to do it in a fair and equitable way. I have seen a lot of discussion over point systems and mechanism design. A linear mechanism is fair and guaranteed sybil-resistant, but perpetuates rich-get-richer. if i have put in a million dollars and i get a 100k airdrop and you put in 10k and you get a 1k airdrop, it might be linear and "fair", but at the same time now I have gotten 99k more than you.

A lot of the joy and promise of crypto for me is that we're building a new economic system that can make all of us rich. What outcomes are we trying to achieve here? Who are we trying to reward? 10k to a whale isn't anything at all, but it can be life-changing for a poor. And we'd love to use this project that we've been working on for years to change as many lives as possible. I'd love to hear the community's thoughts re: these questions as we move towards decentralising Sanctum as a public good. There are also many other questions: How should our token be used to govern the Sanctum DAO and steward this public good far into the future? How should our token accrue value?

Sanctum – more than any other protocol – belongs to Solana's users. We are here to build the new staking meta, but we need buy-in from everyone. We need evangelists to spread the word. We need native stakers to convert to LSTs. We need DeFi protocols–existing and new–to integrate Infinity and the new wave of validator LSTs. We need projects to launch innovative new kinds of LSTs: personal LSTs, NFT LSTs, subscription-based LSTs. We need to build the LST economy together, and we need your help.