The Role of Composable's Restaking Layer in Picasso's IBC Solana Connection

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As previously published, [Picasso](#) is gearing up to deploy the[first IBC connection to Solana](#). The Solana ecosystem will thus shortly join Cosmos, Ethereum (soon), Polkadot, and Kusama, in the trust-minimized cross-ecosystem IBC hub that Picasso is building. Meaning, users from Solana will be able to interact with all of the aforementioned ecosystems — without needing to put their trust in third parties — for the first time.

Composable's Restaking Layer will play an exciting and important role in this upcoming connection. In this article, we build on Picasso's earlier announcement of [restaking on Solana](#), and delve deeper into the concept and the pivotal role of Composable's Restaking Layer. Moreover, we present a demo of how our Solana <> IBC connection works.

TL;DR:

Composable's Restaking Layer is a critical element that will achieve:

✅ Trust-minimized Solana <> IBC compatibility for Picasso

✅ Restaking with validators on Solana (introduced via Picasso)

✅ Restaking Layer for the Solana ecosystem (introduced in the future with MANTIS)

Why Solana IBC Hasn't Been Done

IBC represents a great opportunity for advancing cross-chain interoperability. Not only is the IBC protocol cost- and time-efficient compared to many other bridges, but also it is trustless. Most popular bridges like Wormhole are trusted, meaning users must put their faith into a third party to uphold the security of the bridge and facilitate asset transfers. In contrast, IBC is trust-minimized, as it uses cryptographic techniques (instead of a trusted third party) to ensure bridge security and reliability. As a result, users only need to trust in publicly visible code when transferring over IBC.

However, Solana doesn't meet IBC's technical criteria, preventing the ecosystem's integration with the wider IBC network. For example, the IBC [ICS-23 specification](#) states that "…to provide a guarantee of a particular state transition having occurred on one chain which can be verified on another chain, IBC requires an efficient cryptographic construction to prove inclusion or non-inclusion of particular values at particular paths in state." Solana lacks these required state proofs, instead implementing [a more simple payment and state verification system](#) This makes Solana incompatible with the IBC protocol — at least until now.

A Recap of the IBC Solana Connection Architecture

Alongside our research collaborators at[INESC-ID Distributed Systems Group](#) of the University of Lisbon, Composable is pioneering an approach to introduce state proofs via a novel guest blockchain/layer 2 solution.

The connection of Solana with the IBC protocol is facilitated by Composable's novel "guest blockchain" approach, a key component designed to overcome connectivity challenges. As Solana is not natively compatible with IBC, this strategy is essential, as it addresses the inherent incompatibility issues. For a comprehensive understanding of the 'guest blockchain' solution, we invite you to explore the details in our [research blog](#).

In essence, this connection involves a 'guest blockchain' operating as an restaking layer atop Solana, equipped with all necessary features for IBC compatibility. This process works as follows: Validators on the guest blockchain receive messages regarding Solana's transaction activities. Utilizing this data, they construct blocks on the guest blockchain that accurately reflect these transactions from Solana. This process and architecture is depicted below:

The guest blockchain acts as a replication of the Solana blockchain. Its key distinction lies in its ability to interoperate within the IBC network via Picasso and [trustless.zone](#). This positions the guest blockchain as a Restaking Layer for the Solana network.

The inner workings of the Restaking Layer and Picasso's upcoming Solana <> IBC connection can be viewed in our github repo here.

Solana <> IBC Demo

The following is a demonstration of Composable's Solana <> IBC connection:

How Restaking Fits In

The Importance of Restaked Validation

Restaking is a critical part of the guest blockchain mechanism that facilitates the IBC Solana connection. Essentially, Composable's restaking layer (the guest blockchain) serves as a restaking layer for Solana, and this network needs to be validated like any other chain using the proof-of-stake (PoS) model, as Solana does.

Specifically, on the guest blockchain, previously staked assets are restaked with validators to secure the network.

Validator Role & Rewards

The security model involves control by a supermajority of nodes/validators on the guest blockchain. It is the nodes' responsibility to sign corresponding payloads of transfer transactions. To join, a validator must provide a bonded stake. Thus, this model is gated from independent actors joining.

Validators in the guest blockchain will be rewarded with a portion of bridging gas/transaction fees.

User Restaking & Rewards

Assets that have been staked and can be restaked again include liquid staking tokens (LSTs) and receipt tokens (including liquidity provider or LP tokens). These assets are restaked from their native chain. For example, a user restaking stETH into our guest blockchain would do so from Ethereum, while a user staking stATOM into our guest blockchain would do so from Cosmos. Then, the Composable Virtual Machine (CVM) will reroute these assets to a unified staking hub. From here, they are allocated to validators on our guest blockchain on Solana.

Tokens that we will accept for restaking include a number of Solana-native tokens.

In this mechanism, it is critical that we properly determine the value of these restaked tokens. To accomplish this, oracles will need to be utilized to query different token pricing. The oracles can provide price feeds on token pairs, eg. stETH / ETH and provide a reasonable estimate of the current value based on the swap price. We plan to use the following oracles for this purpose:

- Chainlink: for Ethereum-based restaked assets

- Pyth: for Solana-based restaked assets

- Band: for Cosmos-based restaked assets

Rewards for participating in this restaking onto our guest blockchain are 20% of the bridging fees; these will be divided up between users proportionately to their stake amount and time

Looking to the Future: Launch Process

As we plan for the launch of the trust-minimized Solana <> IBC connection, we are looking to onboard validators. If you're a validator and want to participate, please contact us:

- Discord

- Telegram

- Email: info@composable.finance

In the coming weeks, we will be continuing to publish more information on our Solana <> IBC connection, including specific staking and vault opportunities and more.