

# Building an SVM Rollup for Mantis: Interoperability

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*This article is a part of a series of articles discussing what Mantis believes a rollup on SVM requires. In this series, we explore the different components that we needed to architect for the Mantis rollup.*

## Summary

A core advantage of Mantis over other intent-centric protocols is its cross-chain interoperability. Intents in general help provide users with best execution given that multiple possible solutions can be given for the same intent. Interoperability further broadens the solution space, allowing solutions to intents to consider cross-chain operations. As a result, users have access to even more opportunities with optimized execution via the Mantis framework.

Mantis utilizes the [Inter-Blockchain Communication \(IBC\) Protocol](#) for cross-chain interoperability with credible commitments. More specifically, Mantis uses the IBC connections created by the [Picasso Network](#). State proofs allow Mantis to be natively interoperable with IBC. Thus, Mantis can interoperate in a trust-minimized, seamless manner with all chains connected to the IBC Protocol.

## The Inter-Blockchain Communication Protocol

IBC is a protocol for reliable and authenticated bi-directional messaging between different blockchains. An IBC connection must be established before a blockchain can communicate along this protocol. This is done through a handshake which verifies the identity and status of each chain. Once the connection is established, smart contracts on each chain can begin exchanging packets.

The IBC is comprised of two layers:

- **IBC/TAO:** The transport layer governing packet transmission, authentication, and ordering. This layer consists of light clients, connections, and channels.
- **IBC/APP:** The application layer specifying application handlers (such as token transfer handlers or NFT handlers) for processing packets.

Relayers are also a vital component of IBC messaging. Relayers are off-chain permissionless components that construct packets on one chain and send them to the destination chain.

IBC has a number of advantages over other cross-chain communication mechanisms. Notably, the IBC is trust-minimized and highly secure. This is accomplished via the following characteristics of the IBC:

- **Native Protocol Security:** Light Client verification on both sending and receiving chains ensures that all IBC transactions are secured by the consensus of each of the two chains.
- **Censorship Resistance:** There are no centralized entities that can censor transactions. If one relay decides to not send the packet, there will be other relayers.
- **Permissionlessness:** The decision to connect or not sits at the individual blockchain level and is not governed by any centralized entity.

Thus, IBC trusts only in the consensus of transferring and receiving chains, imposing no new trust assumptions itself. This stands in contrast to traditional permissioned bridges that place trust in third-party intermediaries and actors to play their roles as expected.

Because of these advantages, IBC was selected as the cross-chain bridging mechanism for Mantis.

## The Picasso Network's IBC Connections

The Picasso Network is utilized to connect Mantis to the IBC network. IBC was originally designed for the Interchain ecosystem, which consists of the Cosmos Hub and Cosmos SDK chains. However, the Picasso Network has since expanded the reach of IBC to many more ecosystems.

Now, IBC connects over 110 chains, including:

- Solana
- Ethereum and its Layer 2s
- Polkadot and Kusama relay chains and parachains
- The Cosmos Hub and Cosmos SDK chains

Picasso is also in the process of integrating even more ecosystems to the IBC, with [Bitcoin being their next target ecosystem](#).

## How Mantis is Natively IBC Interoperable

On Mantis, the IBC is used to settle transactions from the Mantis rollup to the destination chain. Mantis taps into Picasso's IBC connections by natively integrating with the IBC. IBC interoperability is natively integrated into Mantis via state proofs generated in the validator client of the Mantis rollup. These state proofs are detailed in [this forum post by Michał Nazarewicz](#).

As a result, Mantis is able to seamlessly and securely interoperate with the 110+ and growing ecosystems connected to IBC.