

Architecture & Design

The Canto network is a sovereign chain built using the [Cosmos SDK](#) and custom modules. Cosmos SDK chains can be scaffolded, built and interacted with using the [Ignite CLI](#).

Canto is EVM-enabled, utilizing a module called [Ethermint](#) which deploys an EVM execution environment enabling Solidity code to be deployed directly from the Ethereum network. Canto enables a native bridge between CosmWasm tokens and ERC-20 standard tokens using the [ERC-20 module](#).

This is it how it works:

1. The `erc20` module maintains a canonical one-to-one mapping of native Cosmos Coin denomination to ERC20 Token contract addresses (i.e. `esdk.Coin`).
2. \longleftrightarrow ERC20), called `TokenPair`.
3. The conversion of the ERC20 tokens \longleftrightarrow Coin of a given pair can be enabled or disabled via governance.
4. A native Cosmos Coin corresponds to `ansdk.Coin` that is native to the [bank module](#) (which controls account balances and token supply in Cosmos SDK). It can be either the native staking/gas denomination (eg: `EVMO`, `ATOM`, etc) or an IBC fungible token voucher (i.e with denom format of `ibc/{hash}`).
5. When a proposal is initiated for an existing native Cosmos Coin, the `erc20` module will deploy a factory ERC20 contract, representing the ERC20 token for the token pair, giving the module ownership of that contract.
6. During the registration of a Cosmos Coin the following `bankMetadata` is used to deploy a ERC20 contract:
7. Holders of native Cosmos coins and IBC vouchers on the Canto chain can convert their Coin into ERC20 Tokens, which can then be used in the ethermint EVM, by creating a [ConvertCoin Tx](#).
8. Vice versa, the [ConvertERC20 Tx](#) allows holders of ERC20 tokens on the Canto chain to convert ERC-20 tokens back to their native Cosmos Coin representation.
9. The [EVM hooks](#) allows users to convert ERC20s to Cosmos Coins by sending an Ethereum tx transfer to the module account address. This enables native conversion of tokens via Metamask and EVM-enabled wallets for both token pairs that have been registered through a native Cosmos coin or an ERC20 token.
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To learn more about the Ethermint module, click [here](#) (Credit to Tharsis).

[Previous Token Economics](#) [Next Onboarding Module](#) Last updated 3 months ago On this page