An (in)complete guide to zkSync 2.0

The zkSync 2.0 release is in alpha preview. Below are the new features. See our troubleshooting page for issues.

Feature	Description
Smart contracts	Now compiled from Zinc or Solidity.
zkPorter protocol support	A sub-protocol for zkSync 2.0 powered by zero-knowledge proofs. Similar to zkRollup. Includes a proof of stake consensus mechanism for data access.
zkSync 2.0 natively supports ECDSA signature (EIP712)	With zkSync 2.0, the `ChangePubKey` operation is no longer required. Accounts are managed in L2 with the same private key used for L1.
Operations	zkSync 2.0 operations are called from both L1 and L2 to request withdrawal of funds.
Smart contracts	Now compiled from Zinc or Solidity. Access with a Web3-compatible client. The zkSync SDK is required to encode/decode the ABI.
Priority mode	Exodus mode now replaces priority mode in zkSync 2.0. Priority mode is where blocks are generated in L2, but only consist of requests initiated from L1. Priority mode is not eternal.
Tokens	Valid ERC20 tokens are added to zkSync 2.0 as a first class citizen token. There's no limit on tokens amounts.

Protocol details

The main part of zkSync 2.0 is the state tree.

- The state tree is a Merkle tree with depth 417 and holds account states.
- Each account is identified by the Ethereum address (160 bits of path) and each account has the key-value storage with `uint256` keys (256 bits).
- The remaining bit chooses the part of protocol in which account exists: zkRollup or zkPorter.

zkSync 2.0 migrations

Feature	Description
`Deposit`	Moves funds from L1 to the L2 account.
`Transfer`	Moves funds from L2 to another L2 account.
`Withdraw`	Moves funds from L2 to another L1 account.

New transactions in zkSync 2.0 only:

Feature	Description
`AddToken`	Adds valid ERC-20 token to L2.
`DeployContract`	Stores bytecode contract in the zkSync network.
`Execute`	Executes a smart contract method.
`MigrateToPorter`	Every account is created in zkRollup.

Feature	Description
`ChangePubKey`	Mandatory in zkSync 1.0. Not supported in zkSync 2.0. Use `_optional_` operation for CREATE2 accounts in zkSync 2.0.

SDK details

SDKs supported by zkSync 2.0:

- Legacy JS SDK
- Web3 JS SDK
- Rust SDK

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