Building on the Polygon zkEVM with Avail

Polygon zkEVM, when combined with Avail in a Validium setup, provides a robust solution for scaling Ethereum applications. Here's an overview of this setup:

Transaction Lifecycle

1. Transaction Submission
2.
    - Process
3.
    - : Users initiate transactions by sending them to the Validium Sequencer.
4.
    - Role
5.
    - : The Sequencer temporarily holds these transactions before they are processed.
6. Batch Processing
7.
    - Component
8.
    - :validium-batcher
9.
    - Function
10.
    - : Transactions are grouped into batches to optimize processing efficiency.
11. Data Availability with Avail
12.
    - Component
13.
    - :avail-validator
14.
    - Function
15.
    - : Transaction batches are transmitted to Avail's blockchain, where they are validated and made available for further processing within the Validium environment.
16. Proof Generation
17.
    - Component
18.
    - :zkevm-prover
19.
    - Function
20.
    - : A dedicated prover generates cryptographic proofs for the Validium network, ensuring the validity of transactions and data availability on Ethereum.
21. Transaction Commitment to Ethereum
22.
    - Component
23.
    - :validium-bridge
24.
    - Action
25.
    - : Validity proofs and transaction commitments are submitted to the Ethereum network, anchoring the Validium state on the Ethereum mainnet.
26. Verifier and Rollup Node Integration
27.
    - Component
28.
    - :validium-node
29.
    - Function
30.
    - : The Validium node queries Ethereum for transaction data and commitments, maintaining data availability and enabling users to interact with the Validium chain securely.

Interoperability and Fault Tolerance

The combination of Polygon zkEVM and Avail in the Validium setup is designed to seamlessly integrate with Polygon's fault-tolerant system. This ensures the robustness of the Validium Sequencer while enabling efficient cross-chain communication and interoperability.

Developer Onboarding

Developers interested in leveraging Polygon zkEVM with Avail within the Validium framework can begin by referring to the comprehensive guide provided in theAvail Validium GitHub repository(opens in a new tab). For ongoing support and updates, developers are encouraged to join the Avail community forum or Discord channel.

Polygon zkEVM Avail-Powered zkEVM Validium