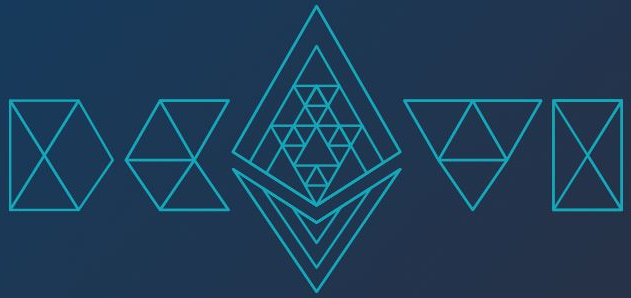

An Overview and Wishlist for Rollup Escape Hatches

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Quantstamp™

Section 1

Rollup Escape Hatches

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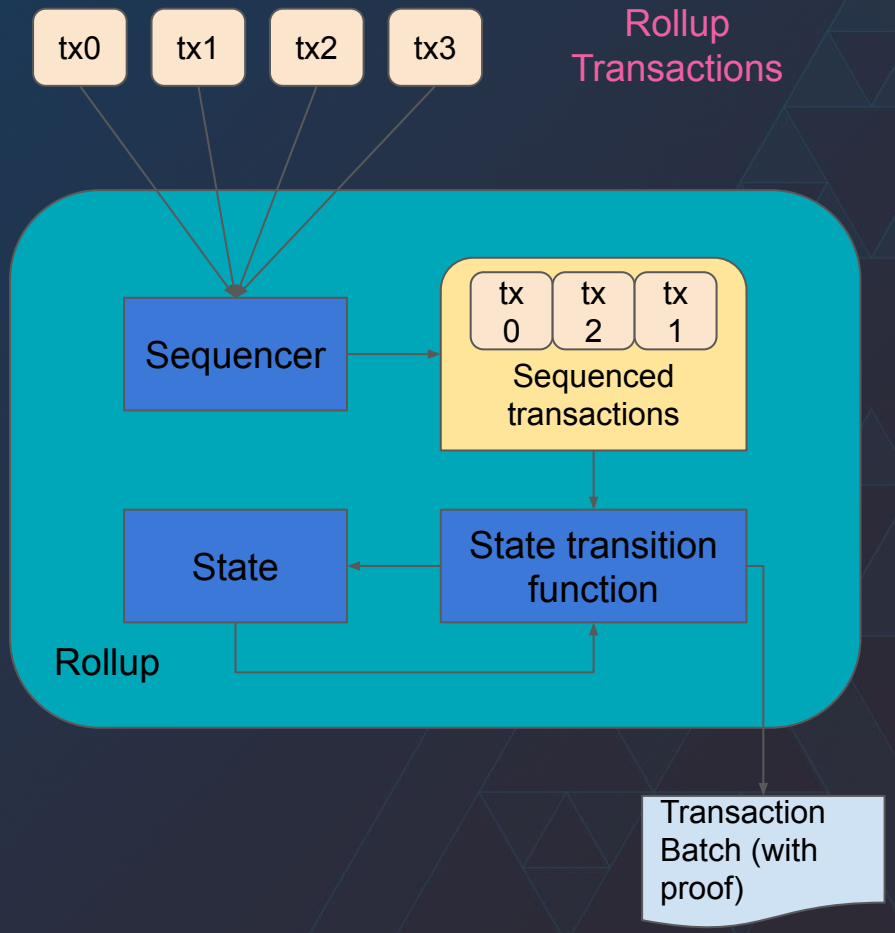
Rollups

“Layer 2(+)” scaling solution.

- Compute state transitions off-chain
- Aggregate state updates
- Publish data and aggregated data to underlying layer for efficiency



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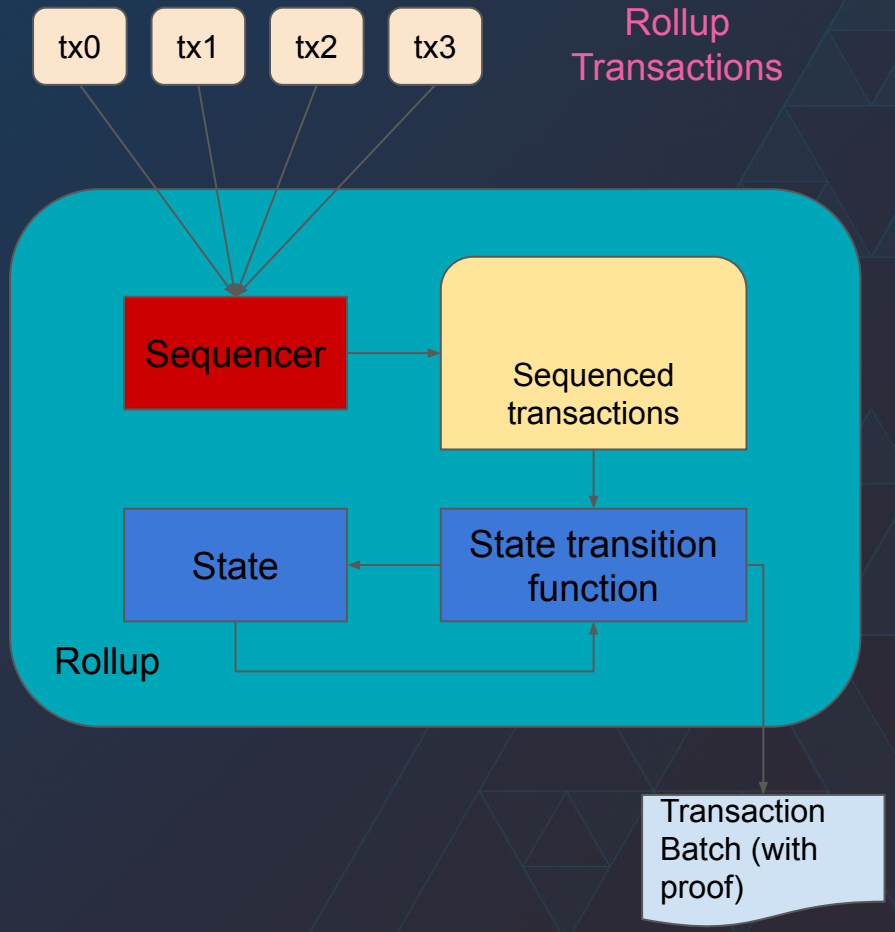
Escape Hatches

An **escape hatch** is method by which users of a rollup can recover digital assets or program state from a rollup when the operators (sequencers) are **offline**.



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Current Approaches

List from, and with thanks to,

L2BEAT

Quantstamp™

Rollup	Escape Hatch Mechanism
Arbitrum Nova [23]/One [24]	Transact Using L1
Aztec [25] (Connect [26])	Propose Blocks* (ZK)
Boba Network [11]	Transact Using L1
dYdX [27]	Force Exit to L1
Fuel (v1) [28]	Propose Blocks
ImmutableX [29]	Force Exit to L1
Layer2.Finance [30]	*None*
Layer2.Finance-zk [31]	Force Exit to L1
Loopring [32]	Force Exit to L1
Metis Andromeda [33]	Transact Using L1
Optimism [15]	Transact Using L1
Polygon Hermez [34]	Force Exit to L1*
rhino.fi [35]	Force Exit to L1
Sorare [36]	Force Exit to L1
StarkNet [12]	*None*
ZKSpace (ZKSwap) [37]	Force Exit to L1
zkSync (v1) [21]	Force Exit to L1

Table 1: Escape hatches for various layer two solutions according to L2Beat.com [38] as of August 2022. We do not distinguish between so-called *Validium* solutions and ZK rollups, as they are similar except that the former is not required to store data on-chain along with their validity proofs.

Section 2

The Menu

Basic Properties

Modular. They should clearly delineate features and functionality.

Secure. They should not be vulnerable to exploitation; they may have large attack surfaces.

Correcting. Users shouldn't need to use consecutive escape hatches.

Advanced Properties I

Support Arbitrary State Escape. What is valuable state may not be clear. Can we escape anything, or provide ways to define specific subsets

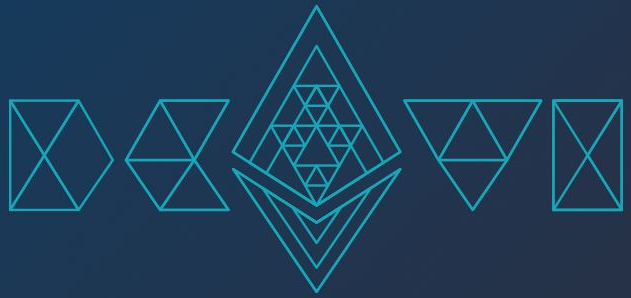
Built-In. dApp developers should need minimal extra work to be supported by an escape hatch, if their state is to be escaped.

(Transaction) Efficient. A gas war on the underlying layer should not clog the escape efforts of the L2 users.

Advanced Properties II

Global. Escape hatches shouldn't be application-specific, for the UX.

Automatic & Live. They should always be available when needed, and they should not need manual intervention to "turn on".



Thank you!

Paper at DICG 2022

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