Tiered-Finality

Blockchains typically only differentiate between blocks that have been finalized and blocks that have not. AltLayer on the other hand, uses a tiered methodology for block finalization. The tiered methodology allows an end user to decide on the finality status of a transaction give her security budget . Finalization consists of three different tiers: Execution-level (for low security budget, Verification-level (for medium security budget) and Rollup-level (for high security budget). As the block progresses through the different tiers of finalization, there is an increasing level of confidence on the finality of the block. The level of confidence is lowest at the execution-level and is the highest at the rollup-level. Execution-level Finalization: As discussed earlier, transactions get collected from the transaction pool and packed into blocks by block producers. Block are then accepted by the consensus protocol that the block producers participate in. Blocks and transactions therein that have been accepted by the consensus protocol are said to be finalized at the execution-level . Verification-level Finalization : After blocks have been produced by block producers and have undergone the consensus protocol, they are then verified by the verifiers. Blocks that have been verified via this verification process are considered to be finalized at the verification-level . A stronger finalization is also achieved when additional verifiers can proceed to either affirm or reject the update committed by another verfier. The more affirmations a block has, the more likely it is to be correct. Note that consensus on verified blocks via a quourm of verifiers is an optional feature in AltLayer. Rollup-Level Finalization: Blocks that have passed the quorum consensus will go through a period of time open for challenges. This allows anyone to run their own verifier and participate in the verification process if they so wish to. In the event that a discrepancy is found between the challenger and the proposal on chain, the challenger may choose to make a challenge on the block. If the challenge is successful, any block found after the point of challenge will be deemed invalid. AltLayer would also have to perform a state revert up till the point of the last valid block. In the case where the challenge is unsuccessful, the stake provided by the challenger will be slashed.

Last modified10mo ago