ethereum foundation

Fast Confirmation Rule for Interoperability

The Fast Confirmation Rule (FCR) is a new Ethereum feature that provides a very strong assurance a block will not be reorged within 13 seconds, a 98% reduction from the approximately 13-minute time to finality. Bridges or solvers who rely on finality or a different confirmation heuristic today may use FCR to decrease reorg risk. Faster deposits directly lead to better user experience, but also decrease capital lockup and improve market efficiency.

FCR works by counting attestations in real-time. If there is overwhelming support for a block and robustness checks are passed, the block is fast-confirmed. Ethereum nodes run the rule locally, which means FCR does not require a hardfork. The first consensus clients are expected to be production-ready around the end of Q1. **In Q2, bridges and solvers can already use FCR.**

FCR comes with two core assumptions. First, it assumes the network is synchronous, meaning attestations are delivered within about 8 seconds. Second, it assumes there is no adversary with more than 25% stake, slightly less than the 33% maximum adversarial stake that finality can withstand. **If these assumptions hold, any fast-confirmed block will, with certainty, be finalized.**

These assumptions are reasonable and usually hold. In the rare case that they do not, it can cause either a liveness or a safety failure. A liveness failure means it may take longer than 13 seconds to fast-confirm a block. Eventually, the rule automatically falls back to finality. This is a feature, not a bug: FCR falls back to a more secure confirmation rule when needed. A safety failure means that a fast-confirmed block is reorged. Most exchanges face this risk today as well, if they do not wait for finality. With FCR, reorg risk is extremely small.

Using FCR for interoperability is extremely easy. Currently a consensus client's JSON-RPC has a `safe` block tag which returns the latest justified block. When the client implements FCR, it repurposes `safe` to return the latest fast-confirmed block. **Bridges and solvers should be aware of the change, but no implementation is required.**

We encourage interoperability solvers to start testing FCR once live on testnets. For support, contact fastconfirm@ethereum.org.