

AIM¹-006: Including Nonce Tracker In The State

liayoo 2020-02-16

Problem Description

- Nonced transactions (transactions that have nonce $\neq -1$) get dropped from the tx pool since the committedNonceTracker in TransactionPool does not get updated for unfinalized but notarized blocks in the BlockPool. The behavior is intended, however, we're lacking nonce trackers for unfinalized blocks. When processing transactions in the TransactionPool and gathering those with valid nonces and/or timestamps, it only checks with the committedNonceTracker, the nonces after the last finalized block.
- Coupled with the missing "uncommitted" nonce trackers, we also don't update the node's nonce when a transaction is dropped.

Proposed Changes

AS-IS

- TransactionPool only has committedNonceTracker and pendingNonceTracker
- No nonce trackers for blocks in the BlockPool (may be notarized but not yet finalized blocks)
- There's a nonce field in BlockchainNode that gets incremented every time createSingleTransaction() is called without a nonce in the txBody

TO-BE

- Keep track of the nonces and timestamps in the global state at paths such as **/accounts/{address}/nonce** and **/accounts/{address}/timestamp**
- Replace the committedNonceTracker and pendingNonceTracker with the finalized state and the BlockchainNode.db, respectively
- Deprecate the nonce in BlockchainNode and use a nonce from a specific version of state

¹ AI Network Improvement Memo. Visit <https://docs.ainetwork.ai> for the full list.

Document History

Date	Who	Change	Notes
2021-02-16	liayoo	Initial draft	
2021-02-23	liayoo, platfowner, minsulee2, cshcomcom, shyun-comcom	Internal review	
2021-05-13	platfowner	Published	