

Sharding

To address the scalability problem the Ethereum team is working on a solution called Sharding. The idea of sharding is to split the space of possible accounts into subspaces, for example, based on first digits of their numerical addresses.

Each shard gets its own set of validators, and these validators will not normally need to validate all the shards. Transactions between the accounts within the same shard would work in the same way as they work today.

Contracts wishing to communicate across multiple shards will need to employ some special techniques, based on the concept of transaction receipts. The crucial difference between calling a contract directly and verifying the receipts is that for direct call one needs to run the code of the contract you're calling, but for verifying a receipt you only need to be sure that receipt cannot be produced by anything else than the transaction you want.

For example, if you want to accept a payment in tokens managed by a different shard, you would generate the payment ID, give it to the payer, ask the payer to pay in the remote shard (with payment ID), and 'bring you back' the receipt.

Sharding allows scaling Ethereum further, because not all nodes of the network will have to execute all of the transactions.