Scalability

Because scalability challenge due to inherent properties of Ethereum mining that restricts block generation to between 7-15 transactions per second. As a comparison, Visa network processes around 45,000 transactions per second. A key contributing factor for this restriction is the need for every node to process each and every transaction that happens on the network. Unless this challenge is resolved, the transaction congestion can lead to long wait times for Ethereum users. In order to be ready for enterprise-class applications, the Ethereum network needs to improve its transaction processing speed on a mega scale.

There are three potential solutions to resolve the scalability issue. However, each solution comes with its own pros and cons, which need to be taken into consideration before addressing the scalability challenge.

* **Sharding:** Sharding involves dividing a chain state into smaller partitions called shards. Nodes within a shard must process all transactions that originate in that shard. Thus, by reducing the number of nodes that must process each transaction, overall network throughput can be improved.
* **State Channel:**This solution prioritizes the operations it works on while the remaining operations are shifted off the chain (off-chain). Only a proof is submitted to the main chain after the transactions are processed as off-chain.
* **Plasma:**Plasma is another off-chain scaling technique that relies on off-chain transactions (in the child chains) with minimal interactions with the main chain.