What is Arcology

Arcology is an L1 blockchain with capability to process transitions in full parallel. Conceptional, you can think Arcology as APTOS with EVM compatibility. In fact, Arcology has a very different parallel execution design and can do more than APTOS.

Parallel Processing

Conventional, blockchains process transactions in sequential order. Transaction only be processed one by one. The deterministic nature of blockchains makes most common synchronization mechanisms unusable. This is a major scalability bottleneck.

How we did it

In Arcology, transactions are processed in full parallel. VMs are wrapped into transaction execution units called EUs, which basically take in transactions and spit out some state transitions (or delta writes in APTOS terminology). Below is the whole process:

- All the EUs are running in full isolation and aren't aware of each other
- Different EUs are running in different threads
- All the EUs are executing against the latest clear states
- State changes generated during the execution will be temporarily cached
- A module called Arbitrator will be responsible for detecting potential conflicts among these state transitions.
- Only the nonconflicting transitions will be committed to the StateDB. The transactions calling state conflicts will be reverted.

Arcology can take full use of the processing power of the hosting server. The more threads available, the faster it can run.

Cluster Computation

In case you are running out all the threads on a single machine.

Arcology can further expand the parallel processing power to multiple machines. For example, you can connect two machines with 64 cores on each and they will work just like one with 128 cores.

Scalability

There is no theoretical limit on how fast Arcology can go, it scales up pretty linearly with the number of processors available. As a rule of thumb,250~300TPS / core running complex smart contracts is reasonable in a real-life scenario with all the bells and whistles attached.

An execution-only test (what APTOS does) can be 10 times faster.

www.arcology.network