

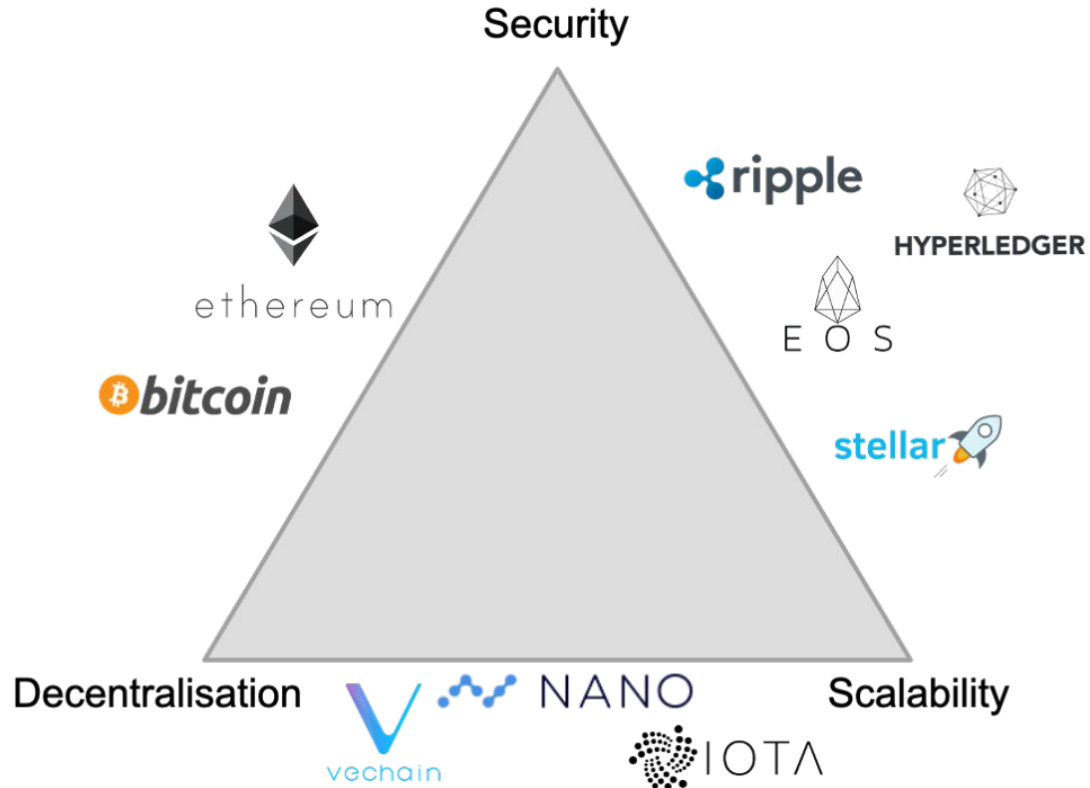
Multivers^x

Case study

Public?

Community

Blockchain Trilemma



Proof of Stake



Validating capacity depends on the stake in the network



Validators do not receive a block reward, instead, they collect transaction fees as reward



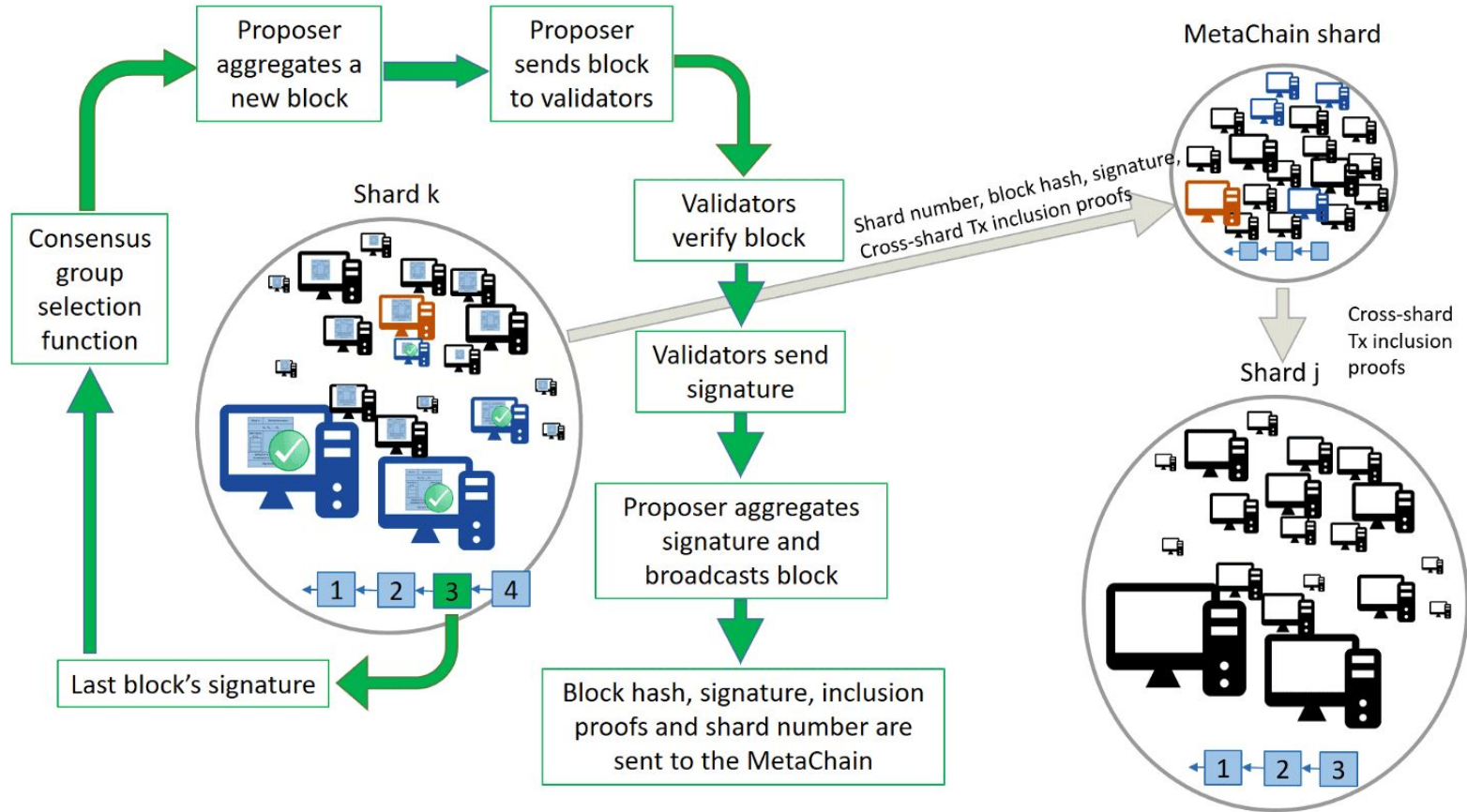
Hacker would need to own 51% of all the cryptocurrency on the network, which is practically impossible and therefore, makes 51% attacks impossible



Requires less energy

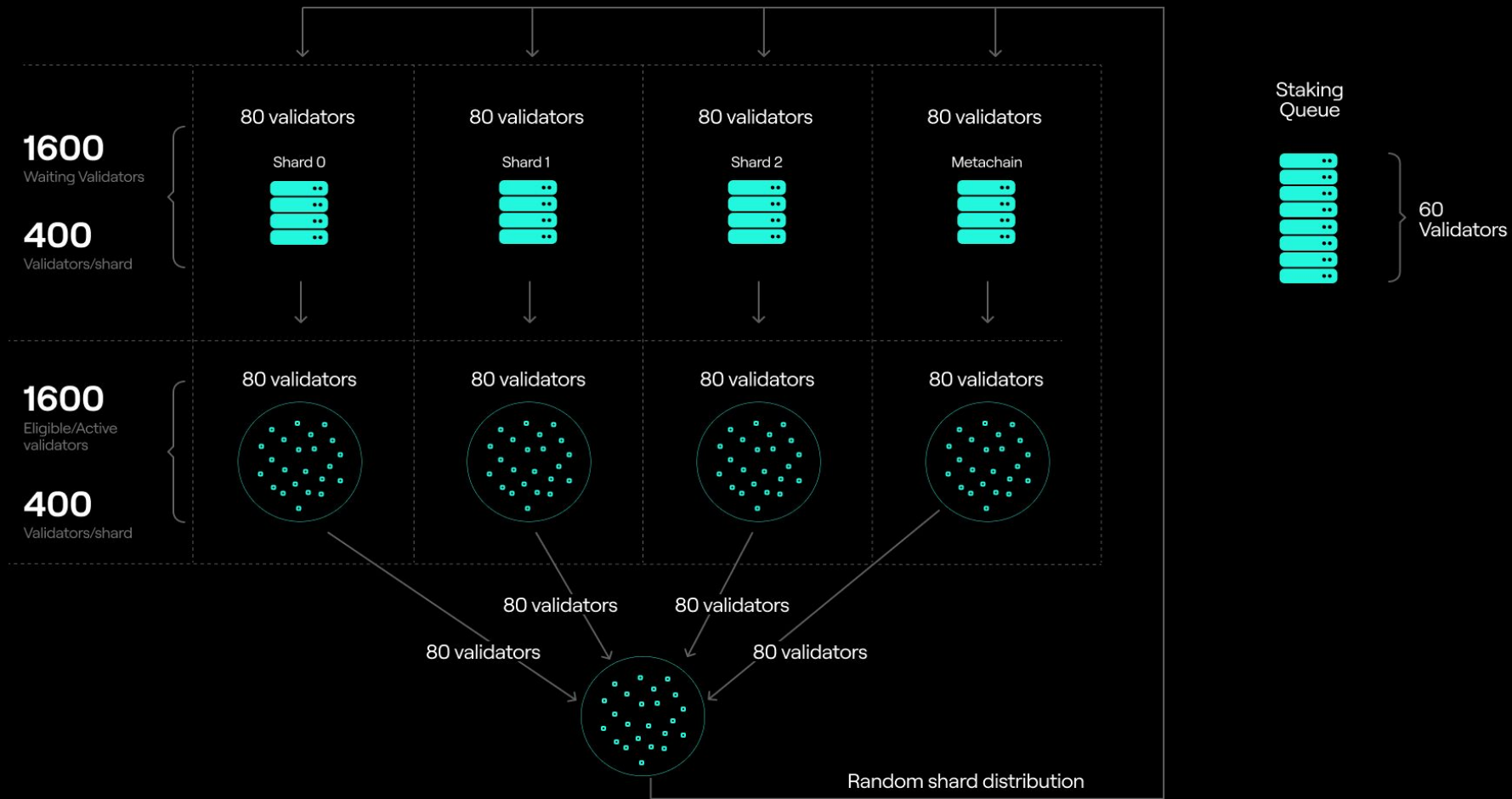
Secure Proof of Stake

Secure Proof of Stake



Network

- Permissionless
- 5000+ nodes (3200+ validator nodes)
- 30,000 current TPS
- 6s block time
- consensus: 63 validators out of 400
- $\frac{2}{3} + 1$ for successful block
- \$0.002 tx cost
- 30% SC gas returned to SC authors



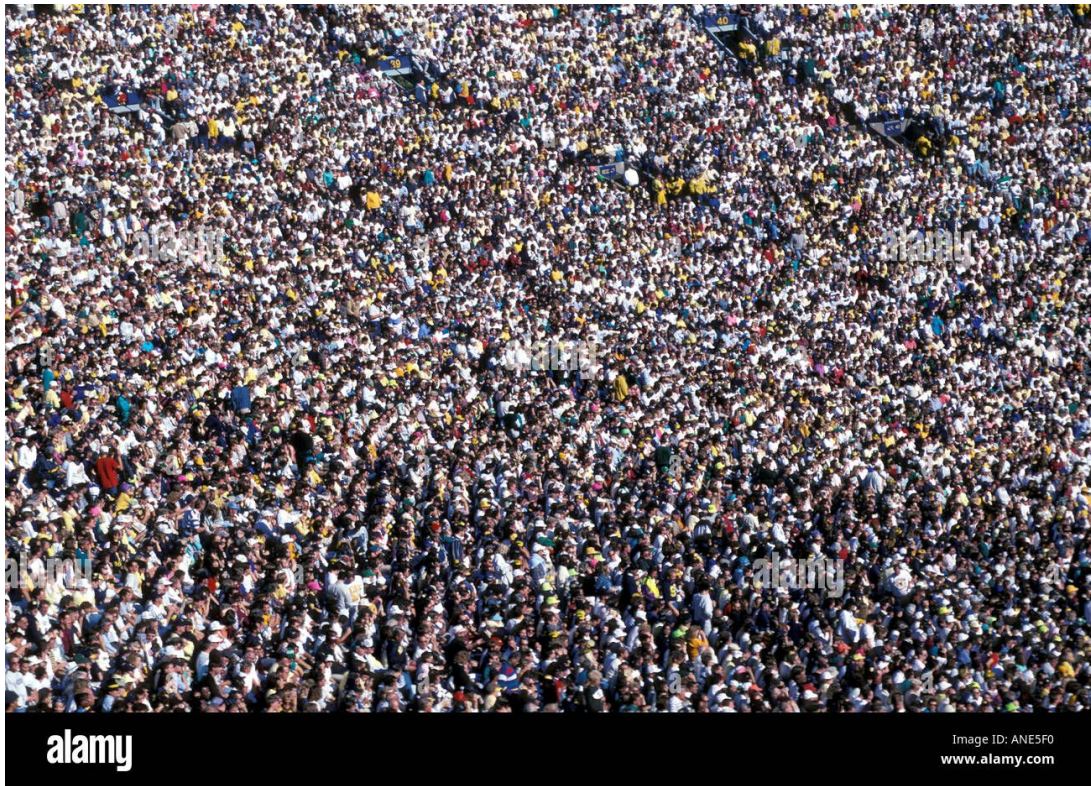
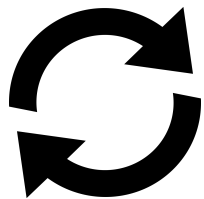
Auction

Waiting

Eligible



Why sharding?



Adaptive State Sharding

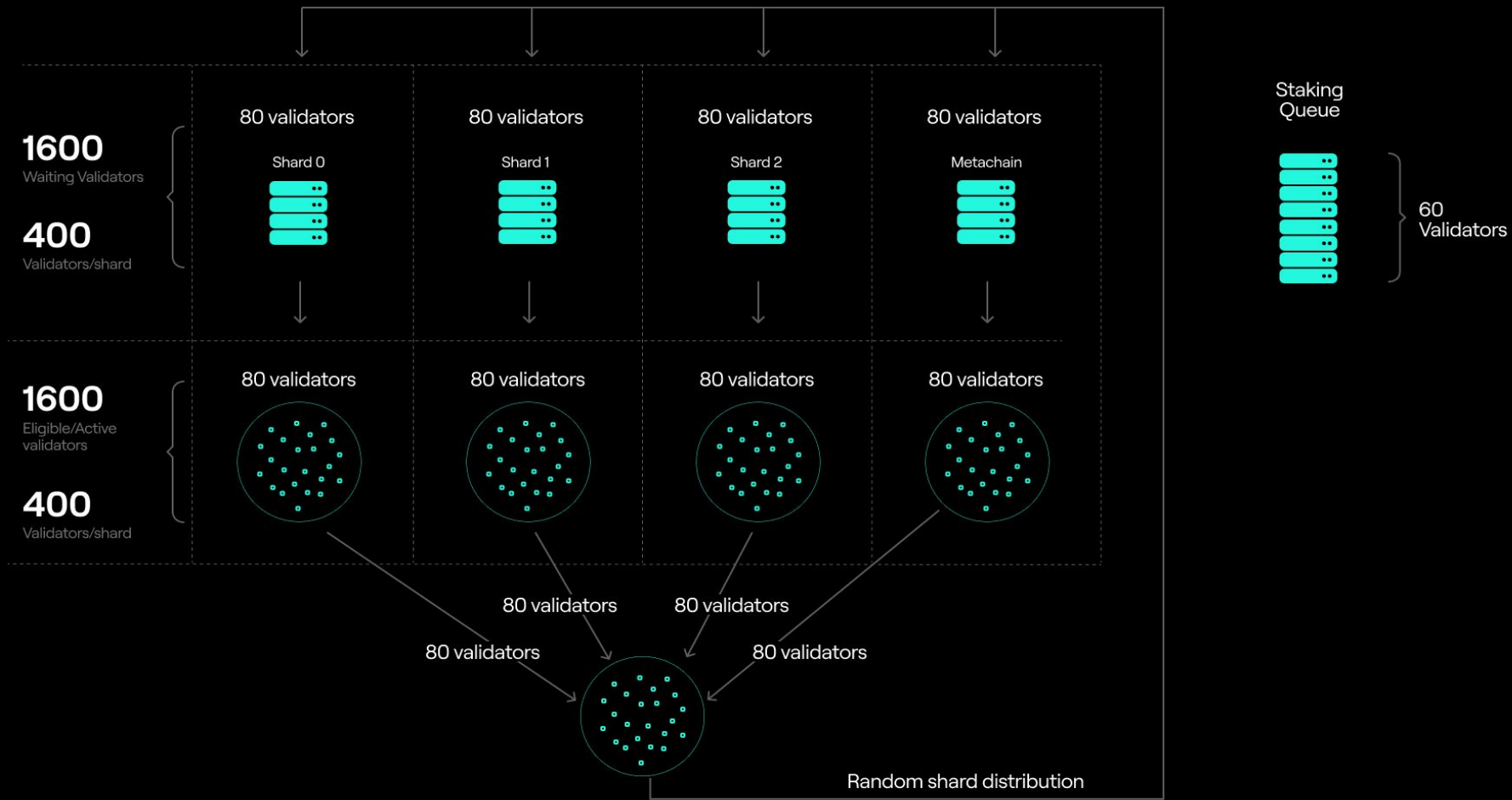
1. Network sharding
2. Transaction sharding
3. State sharding



allows parallel processing

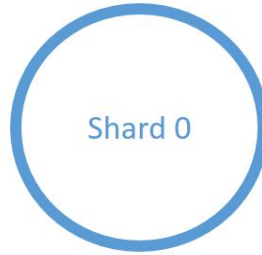


nodes process only a part of
all TXs



Step 1:
Node to shard assignment

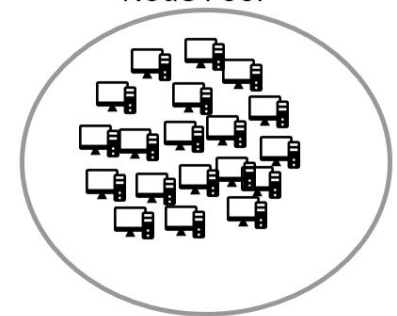
1 Shard



3bit Addresses			Shard
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	0

400 < Total Nodes < 800

Node Pool



Smart Contracts



contracts > examples > crypto-kitties > kitty-auction > src > lib.rs > KittyAuction > create_and_auction_gen_zero_kitty

```
1  #![no_std]
2
3  use multiversx_sc::imports::*;
4
5  pub mod auction;
6  use auction::*;
7  pub mod kitty_owner;
8
9  #[multiversx_sc::contract]
10  2 implementations
11  pub trait KittyAuction {
12      #[init]
13      fn init(
14          &self,
15          gen_zero_kitty: u32,
16          gen_zero_kitty: u32,
17          gen_zero_kitty: u32,
18          opt_kitty_owner: Option<Address>,
19      ) {
20          self.gen_zero_kitty
21              .set(gen_zero_kitty);
22          self.gen_zero_kitty
23              .set(gen_zero_kitty);
24          self.gen_zero_kitty
25              .set(gen_zero_kitty);
26
27          if let OptKittyOwner {
28              owner: owner,
29          } = opt_kitty_owner {
30              self.kitty_owner
31                  .set(owner);
32          }
33
34          // endpoints - owner-only
```



tract_address {

VM overview

Smart contract (Rust/C/C++/...)

Wasmer

SC primitives

Execution contexts

mx-chain-wasm-vm (VM)

mx-chain-vm-common (VM adapter)

mx-chain-go node (the protocol)