POLYGON Blockchain

Steps involved in Mining of ethereum transactions:

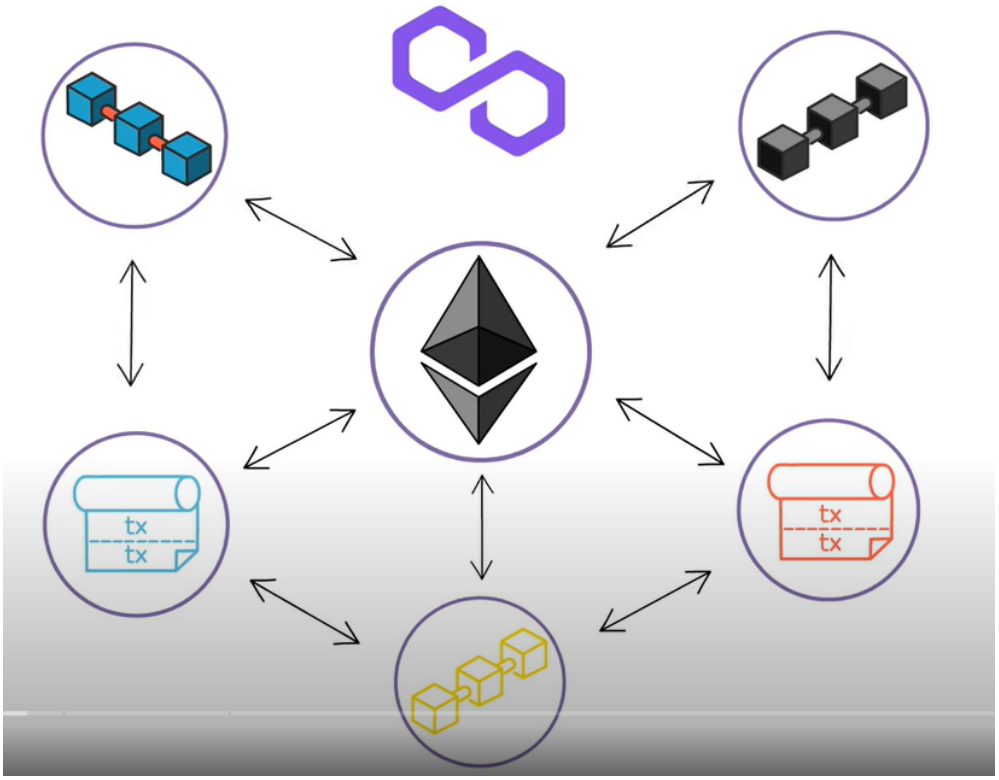
1. A user sends a transaction request which is sent to the entire ethereum network.
2. Each node in the network adds these transactions into a memory pool.
3. Memory pool consists of those valid transactions which are not yet assigned to a block.
4. A mining node then combines several of these transactions into a block such that
   -> Transaction fee is maximum
   -> Total gas in the block does not exceed the gas limit.
5. Miner then validates each of those transactions and executes the code of the request.
6. A “proof of work” certificate is produced by the miner once all the transactions in a block are verified and executed.
7. Miner then broadcasts the block to all the nodes in the network.
8. Each node verifies the checksum of their new EVM state and compares it with the state of the block claimed by the miner.
9. Once verified, all nodes add this block to the tail of the blockchain.
10. All the nodes remove the transactions of the added block from their mempool.

Drawbacks of ethereum:

1. Low throughput : Can only process 15-25 transactions per second.
2. Not user friendly : The transaction requests corresponding to users who are willing to pay more transaction fees will be preferred.

Polygon blockchain:

1. Polygon is a “layer two” or “sidechain” scaling solution that consists of a series of blockchains.
2. It provides faster transactions and lower costs for users as it uses POS consensus.
3. It acts as a speedy parallel blockchain running alongside the main Ethereum blockchain.
4. Its currency is MATIC and is an ERC-20 token.
5. It aims to improve upon Ethereum as a blockchain development network.



Polygon - Connection of multiple blockchains

Ethereum vs Polygon

Parameter	Ethereum	Polygon
transactions	15-25 transactions per second	65,000 transactions per second
Gas fees	Transactions are handled individually. Thus, high gas fees.	Transactions are handled in bulk. Thus, low gas fees.
consensus	Proof of work (POW)	Proof of stake (POS)

Proof of work vs Proof of stake

Parameter	Ethereum	Polygon
Selection of miner	The probability of mining a block is determined by how much computational work is done by the miner.	The probability of validating a new block is determined by how large of a stake a miner holds.
Competition between miners	To add each block to chain, miners must compete to solve difficult puzzles using their computer process power	There is no competition as block creator is chosen by an algorithm based on user stake.
Malicious attacks	Hackers would need to have 51% of computation power to add malicious blocks.	Hackers would need to own 51% of all cryptocurrency on the network, which is practically impossible.
Reward	A reward is given to the first miner who solves the cryptographic puzzle of each block.	The validators do not receive a block reward instead they collect network fee as their reward.
Investment	Initial investment to buy hardware.	Initial investment to buy stake and build reputation.
Efficiency	They are less energy and cost efficient	They are highly cost and energy efficient