**Ethereum’s Blockchain**

-Ethereum’s speed will improve from 24 TPS to speeds potentially as high as 100,000 TPS

-Eth 2.0 staking rewards vary and depend on total amount of eth staked

-When there is more ETH staked, rewards are reduced and vice versa

-Staking Eth also gives participants network rewards, which are a portion of daily transaction fees

-Current annual percentage rate (APR) for staking Eth 2.0 is around 4.7%

* + **The Beacon Chain Stats**
    - **Total ETH staked 10,798,949**
    - **Total Validators 321,712**
    - **Current APR 4.7%**
    - **Average Eth Balance: 33.51 Eth**
  + Started as Proof of Work (Ethereum 1.0)
  + Transition to Proof of Stake (Ethereum 2.0/Beacon Chain); December 2020, new blockchain named “Beacon Chain” was setup, that uses Proof of Stake
  + Beacon-chain runs alongside the original blockchain, Ethereum 1.0
  + **Ethereum Validators:**  In order to become a validator for Ethereum 2.0, you need to lockup 32 Ethereum as collateral, 32 ETH on node as your stake, this in turn will earn you staking rewards
  + No way to lockup more than 32 Eth on a single node, you can just set up multiple nodes, with 32 Eth on each
  + In a few years Ethereum 2.0 will deploy in full and will merge with Etheruem 1.0
  + **The Docking,** when Ethereum 1.0 and Ethereum 2.0 merge sometime in 2022, Ethereum will become purely a Proof-of-Stake
    - Only after the docking occurs you will be able to withdraw your staked Ether and rewards, meaning staking is mainly beneficial for longterm Ethereum holders
    - In Ethereum 2.0 each validator that participates in the forging of the block gets a percentage of the newly minted Ether when it’s created
    - More Validators = Lower percent reward
    - More validators you have, smaller each slice will be
    - Each day only 900 validators/node are allowed on board
    - Validator: As a validator, you’re responsible for securing the network and receive continuous payouts for actions that help the network reach consensus
    - **Consensus:** An agreement has been reached, if there is not a disagreement on a proposed choice of film, then consensus is achieved, in the extreme case the group will eventually split. In blockchain, Process is formalized, and reaching consensus means that at least 51% of the nodes on the network agree on the next global state of the network.
    - **Consensus Mechanism (also known as consensus protocols or consensus algorithms)** allow distributed systems (networks of computers) to work together and stay secure, the mechanisms allow cryptoeconomic systems, such as Ethereum, to agree on the state of the Network. Consensus mechanism in cyptoeconomic system also helps prevent certain kinds of economic attacks.
      * **In theory, an attacker can compromise consensus by controlling 51% of the network, Consensus mechanisms are designed to make this “51% attack” unfeasible.**
    - You will be subject to penalties if you don’t set up your validator properly, problems like it going offline. These penalties are referred to as ***Slashing, built in mechanism made to deter mishaps/bad actors in the staking process,*** 
      * ***Slashing results in:*** destruction of portions of your stake and even removal from the network
  + **Ethereum Staking reward Examples:**
    - 1 million ETH Staked – 18.1% max annual reward for each staker
    - 3 million ETH staked – 10.45% annual reward rate

**Eth Staking Continued:**

Offers substantial staking returns because it remains one of the most popular altcoins in the market today. The average rate of return for staking Ethereum is at 5-17% annually.

* Currently two types of Ethereum Validators Present: ***Miners validate transactions on the execution layer (formerly called Eth1), while stakers verify blocks on the consensus layer (formerly called Eth2)***
  + **Miners**: The miners validate transaction on the execution layer (formerly Eth1)
  + **Stakers**: Stakes verify blocks on the consensus layer (formerly called Eth2)
* This means Ethereum stakers will initially need to transfer their ETH from the execution layer to the consensus layer in order to stake. Your ETH cannot be withdrawn until the Ethereum mainnet ultimately merges with Beacon Chain.
* In order to run validator node you need 32 Eth, fast enough computer with large storage space that is connected to the internet 24/7. If you still want to be an Ethereum validator, head to Etthereum Lauchpad
* Transition of Ethereum’s consensus algorithm from PoW to PoS
* Benefits of network upgrade include: faster transaction speeds, Ethereum 2.0 will make mining available to ETH hodlers.
  + **Etheruem Staking Requirements:**
    - Validator needs to lock up a minimum of 32 ETH into the official deposit contract address
    - While Ethereum staking pools exist to give you the opportunity to stake without 32 ETH, Ethereum 2.0 doesn’t permit delegation, in addition to the minimum ETH requirement, Ethereum staking requires you to run specific software to access the network known as node client to verify transactions on the blockchain
    - Move to PoS protocol, Ethereum 2.0 will have a much lower barrier to entry for mining
    - Prior to update, significant upfront investments in hardware were required to participate in mining, switch from PoW, prospective miners will no longer need to purchase graphics cards and run up a high energy bill
  + **Ethereum Blockchain Breakdown:**
    - New upgrade, no longer called Ethereum 2.0, will see improvements to the blockchain and its validation time in addition to its switch to PoS.
    - Ethereum’s speed will improve from 24 TPS to speeds potentially as high as 100,000 TPS
    - This massive increase in speed will be made possible as Ethereum introduces sharding, or breakingup of the blockchain into several (64 in this case Ethereum) different shards
    - Validators can run their own shards, spreading out the requests for validation and improving the workload for validator’s devices
  + **Ethereum Staking Profitability**
    - Eth 2.0 staking rewards vary and depend on total amount of eth staked
    - When there is more ETH staked, rewards are reduced and vice versa
    - Staking Eth also gives participants network rewards, which are a portion of daily transaction fees
    - Current annual percentage rate (APR) for staking Eth 2.0 is around 4.7%