



Cryptocurrencies Post Merge

Cryptocurrencies as we know them today began with the introduction of Bitcoin in its white paper in 2008 and the idea of securing the history of all transactions using Proof-of-Work (PoW). In brief, miners maintaining Bitcoin's ledger must prove that they put in enough computational work (via repetitive hashing) in order to add transactions to the history of Bitcoin (and be paid for that work and expended resources). Users of the system then follow the history which has the most PoW behind it. For someone to alter the history of Bitcoin, they would be required to produce as much computation as the rest of the network (which has been compared to the electricity use of small countries) for as long as they wanted to rewrite history. Thus proof of computation secures the system, and in Bitcoin's history, there has been an arms race for the fastest and cheapest hardware to do this computation at the highest profit margins, with mining today happening solely using specialized hardware called ASICs.

Ethereum, the 2nd largest cryptocurrency by market cap behind Bitcoin, started with a similar PoW mechanism to secure the system. One main difference of Ethereum's PoW mechanism is that the computation (or hashing) function used for the PoW was designed to be resistant to the creation of specialized hardware, so mining historically was predominantly GPU-based. In September 2022, the network switched to another type of protocol to secure the ledger, Proof-of-Stake (PoS), where instead of requiring to enough computation get a chance to add transactions to the ledger, miners instead lock up enough funds (or stake) to get a chance to add transactions. The event that switched Ethereum from PoW to PoS was termed The Merge.



Leading up to The Merge, all the miners of Ethereum who had amassed large amounts of GPUs to make a profit mining, found themselves in a position where they would soon not be able to profit off their hardware in Ethereum. In this thesis we are interested in studying what happened to those miners leading up to and post merge. Did they move to other currencies, since GPUs are general purpose and could be used to mine some other currencies at a profit? Did they leave the cryptocurrency ecosystem all together? What were the contributing factors in these decisions leading up to, and following The Merge?

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