**What is Maximal Extractable Value(MEV)?**

Including, removing, or rearranging transactions in every block they mine has allowed miners and validators to make money off of pending transactions.

The underlying technology of cryptocurrencies is blockchain, which enables parties to transact with each other without the need for a middleman. The processing time for bitcoin transactions can range from a few minutes to many hours, depending on the blockchain and consensus technique employed.

Pending transactions are kept in the network's "mempool," which is a publicly accessible waiting area, in both proof-of-stake and proof-of-work consensus procedures. There, they will remain until a miner or validator chooses them, arranges them, and builds a block out of the data. After being verified by network nodes, that block is added to the official chain.

However, miners and validators have discovered ways to make money by adding, removing, or rearranging transactions in a block while a pending transaction is sitting in a mempool. Maximal (formerly miner) extractable value, or MEV, is the focus of this tactic.

MEV is still a relatively new issue, and organizations dedicated to research and development, such as Flashbots, are trying to reduce the risks that come with it. The Ethereum Foundation claims that whereas some MEV extraction techniques are harmful and worsen user experiences, other techniques can aid in addressing network inefficiencies.

Since Ethereum is the second-largest blockchain, MEV is most frequently linked to it, however it's crucial to understand that this is not an Ethereum-specific problem. Because Ethereum and other similar blockchains have smart contracts, which are a key component of MEV-extraction, MEV techniques are less profitable on Bitcoin, the largest blockchain.

**History of MEV?**

MEV, which is effectively the maximum value a miner may extract from rearranging transactions when creating a block on a blockchain network, is also referred to as a "invisible tax" that miners can collect from users.

Under the pseudonym Pmcgoohan, an algorithmic trader initially predicted the activity in 2014. He cautioned that miners could covertly reorganize transactions in a mempool for their own benefit.

The merchant stated in a Reddit thread, "Miners can see all the contract code they run (obviously), and the order in which transactions run is up to individual miners." "What is to stop a miner from front running in any Ethereum marketplace implementation?"

In a 2019 study titled "Flash Boys 2.0," smart contract researcher Phil Daian and his colleagues developed this concept further and introduced the term "miner extractable value" (MEV), which stands for "the total amount of ETH miners can extract from manipulation of transactions within a given time frame." Researchers Dan Robinson and Georgios Konstantopoulos described Ethereum's mempool as a “dark forest” due to the intense competition and dubious means employed to obtain MEV in a blog post they published in August 2020, which helped to popularize the problem.

**How does extracting MEV work?**

On a network like as Ethereum, MEV can be derived from block generation in a variety of methods.

In proof-of-work systems, where miners regulate the sequence and inclusion of transactions in a block, MEV was initially applied. Therefore, "miner extractable value" was the original meaning of the abbreviation.

Value extraction techniques will continue after the Ethereum blockchain experienced a transition to proof-of-stake in late 2022 (a step known as "The Merge"). This led to the more encompassing term "maximal extractable value" that is widely used today.

Since they are the only ones who can ensure a successful MEV extraction, network miners or validators should theoretically receive the full MEV amount, according to the Ethereum Foundation. It does point out, though, that a significant amount of MEV is recovered by independent network users known as "searchers," who employ bots to automate the process and run sophisticated algorithms to find lucrative MEV chances.