Opinion Editorial

London Fork and its Impact on the Scaling Solutions

I write still in the skepticism of the ethereum London fork. The 5th of August, alongside the ethereum community, watched it become a reality.

It is not surprising that this upgrade is much awaited. Ethereum is not just any altcoin; it is the second-largest blockchain network, the flagship of decentralized finance, and the home of smart contracts.

According to a post published on defiprime.com, 222 out of 245 listed DeFi are on the ethereum network. This shows how important ethereum is to decentralization and how much we should care. With 165 million unique addresses as of 4th August 2021, as depicted on etherscan.io, it is obvious that the same number of persons are waiting patiently for this milestone.

Ethereum's reputation has flourished on being decentralized and secure. However, the public blockchain network has a long-standing battle with the scalability edge of the blockchain trilemma.

As with tradition, the ethereum developers introduce an upgrade each year to better the network's performance. This year's upgrade known as the London fork claims to bring, among other things, scalability to the chain.

Is the battle over? Who won? Perhaps, these questions are popping in the minds of millions of ethereum faithful and enthusiasts.

Before the plunge goes deeper, it will be good to dissect the London fork a bit.

The London Fork
The London fork itself came with 5 Ethereum Improvement Proposals- EIPs. Improvement proposals are somewhat like agendas for each upgrade implemented towards making the network more efficient and sustainable.

EIP-1559: The aim of this proposal is aptly captured in the voice of Coindesk's Christine Kim and published in coindesk.com- 1559 will relieve "Ethereum's auction-style fee market with an algorithm that automatically sets the gas price." This upgrade checkmate sudden spikes in gas fees. Among others, this proposal also counterbalances ether's infinite supply and makes gas fees predictable.

EIP-3198: This proposal is concerned with the betterment of the user experience of smart contracts. It adds an operation code, or opcode, that gives Ethereum Virtual Machine, EVM permission to the block's base fee.

EIP-3529: It reduces the cost of gas refunds for smart contract operations in the ethereum network. It put an end to extortion via the refund mechanism.

EIP-3541: This improvement will make future upgrades easier. It prevents EVM from executing transactions that start with the code '0xEF Byte'. It creates room for additional smart contracts, allows clients to check for protocol changes, and gives developers a clear guide regarding breaking changes.

EIP-3554: 3554 defuses the difficulty bomb. This is essential as ethereum aims to migrate from Proof-of-work to Proof-of-stake protocol. It provides enough time for developers to brace up for Eth 2.0, hoped to be due by December 2021.

The just-concluded hard fork consists of 5 EIPs, but the one that piqued the most interest in the community goes with the number fifteen-fifty-nine. Yes, EIP-1559 is the crux of the matter here.

As captured in the proposal, 1559 claims to make Ether less inflationary, solve gas price issues, increase throughput and make the grounds fertile for scalability.

Ethereum Daily Gas Used Chart

Click and drag in the plot area to zoom in
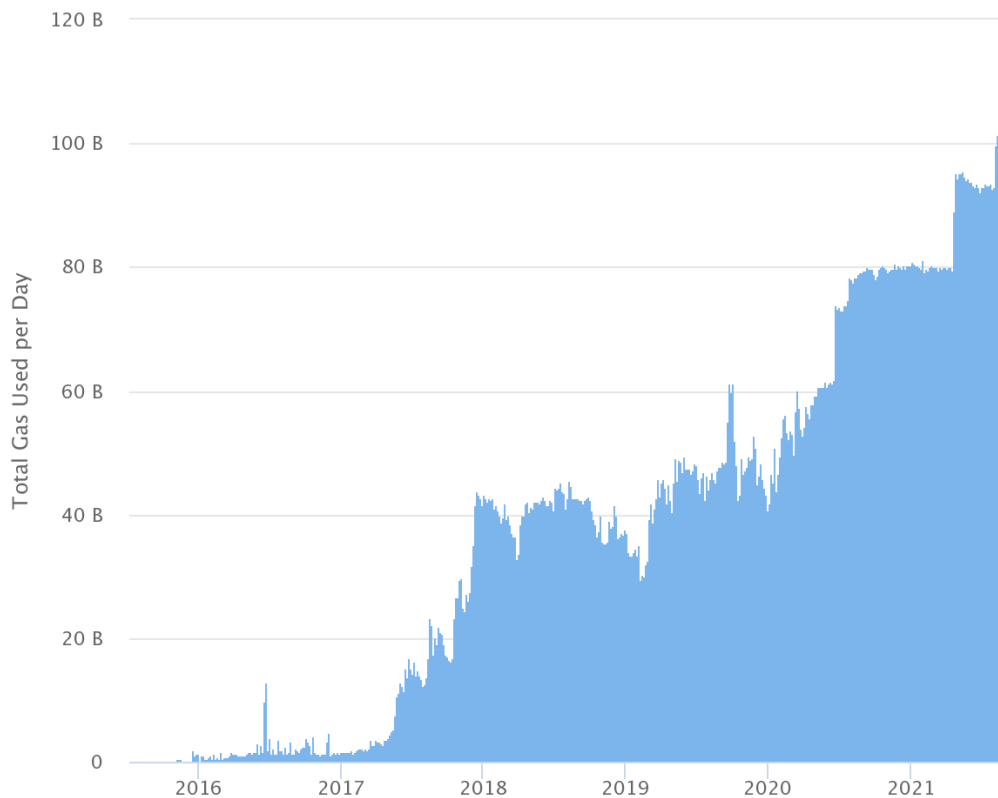
The graph above shows an upward trend in daily gas fees consumed on the ethereum network in the course of 2016 to 2021

Was the problem solved?
Well, we will appreciate the problem better with an insight into what happens on a busy day in the blockchain network.

Transactions on the ethereum network are executed based on a bidding strategy. Users bid on an arbitrary price they feel will make their transactions go through in the next block to be committed in the chain. The bidding price is considered the gas fee.

The shortcoming of this strategy is that it works on a 'highest bidder' protocol. This means that any user who wants to be considered a priority will bid with a gas fee that exceeds the normal price at that instance.

However, the problem begins when more persons are willing to enter the priority list by offering larger bids to the miners. Their transactions go through, but this leads to a gradual and progressive increase in gas fees, and at a point, it becomes exorbitant.

Then the traffic congestion follows as more transactions wait to be put through.

Implication of 1559

Let's consider the supposed rescue from 1559. Upon implementing this proposal, there will no longer be a blind auction to determine the gas fee. The new protocol will algorithmically find a gas fee from the demand at hand.

The protocol also aims to keep the block half full. This new transaction mechanism will go a long way to ease off network congestion and prevent extreme spikes in gas fees. It does not guarantee cheap gas fees in any way.

To a casual observer, the problem seems to have been solved, but there is more. One thing that did not change is tipping the miners to jump the queue. Users can still increase their chances by offering tips to miners.

EIP-1559 will improve the general experience while using the network, a great milestone towards mass adoption, and it makes ethereum a deflationary token by burning base fees.

Can this give us the scalability we are looking for? Definitely not. At least not from this London. There are ready alternatives to explore, and that will urge us into Layer 2 Scaling Solutions.

What are the Layer 2 Scaling Solutions?

Layer-1 blockchains like Bitcoin, Ethereum, Litecoin arrived with a decentralized architecture and an admirable security model. These early arrivals laid the path for the booming cryptocurrency economy, driving unprecedented technological innovation with it.

However, one challenge faced by this type of economic model is scalability. Scalability only becomes an issue when large amounts of data are required to pass through the network instantly. This phenomenon is known as throughput or transaction per second-TPS.

As stated in Coinmarketcap, Bitcoin processes a handful of 3-7 TPS while Visa processes an incomparable sum of 20,000 TPS.

If cryptocurrency should replace the traditional model, it becomes not only a necessity but an indispensable facet of the ecosystem to imbibe the virtue of scalability.
Where do we go from here? Can we take a look at what the layer-2 scaling solution promises?

The rescue from Layer-2

Layer-2 scaling solutions are a set of protocols built on layer-1, in this case- ethereum, to solve scalability. They leverage the decentralized architecture of layer-1 while providing throughput to the ecosystem.

These solutions are especially important because they provide scalability without tampering with the decentralized and secure framework of the main chain, in fact, inheriting them.

The main layer-2 solutions include Rollups, Channels, and Plasma.
These solutions offer high throughput, cost-efficiency, and unrivaled functionality while running applications on the ethereum network.

Rollups are layer-2 solutions that process transactions outside the ethereum mainnet. They increase throughput and reduce fees.

There are two types of rollups, each with its security model.

Zero-knowledge rollups
Zero-knowledge rollups are bundles of data transferred off-chain for processing and computing. They are very efficient with the ability to process 2,000 TPS. It is even more interesting to note that they are not vulnerable to attack and enjoy a good deal of decentralization.

Optimistic rollups
On the other hand, optimistic rollups run parallel with the ethereum mainnet in an optimistic manner, as the name implies. Here the transactions are executed with the assumption that aggregators are not committing fraud. It only becomes necessary to provide proof in the event of fraud.

Layer-2 practicalized
It is pertinent to mention that developers here put in a lot of energy to develop layer-2 scaling solutions, and their products are making the desirable difference.

They include, among others, names like **Lightning Network**, **Polygon**, and **Skale Network.** A quick brief into the trio will offer a stronger grasp of this layer-2 tale.

The first of them, **Lightning Network**, is a thralling layer-2 innovation that processes payments off the Bitcoin main chain at lightning speed. It makes payment instantaneous and low-cost. This layer-2 solution also offers the possibility of cross-chain transactions, provided they have the same cryptographic hash function.

Polygon, formerly Matic, enjoys a good share of popularity because of its throughput and impressing cost efficiency in handling transactions. It also prides itself on having 5-6 times more gaming and NFT Dapps as much as any other chain outside the ethereum network.

Another interesting thing to note about Polygon, aptly captioned ethereum's network of blockchains, is its aggregation of ethereum-compatible blockchains creating a full-fledged sovereign and multi-cross chain ecosystem.

Polygon's shot, if it is not spot-on, hits closest to the bull's eye. What else could be expected from developers that leveraged ethereum without sharing her problems?

Finally, at **Skale Lab**, we were advised to forget the limitations of the traditional blockchain ecosystem. It's coming from a community that took part in the benefits of traditional blockchain but refused to compromise in computation, storage, and security.

Perhaps we can hold them dearly, especially now that London is gone and true scalability is nowhere to be found.

Conclusion
Is the bird at hand worth more than the one in the fork of London?

 At this point, it becomes a no-brainer to say yes. While London's 1559 is faltering in the safe shores hoping for wind, Layer-2 solutions are a total, courageous uphaul and upgrade.

At least we can see the difference when Lightning processes millions of transactions in milliseconds without making a fuss. For the same reason, Polygon was able to seduce developers like Sushiswap, Aave, Kyber to live in her network.