Title: Addressing common rollup misconceptions
Author: disoriented_llama
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Awareness about rollups is increasing exponentially, but there are still too many bad takes. Here, I'll address some of these myths and misconceptions to the best of my knowledge. Feel free to ask more questions, I'll edit them in. Also, please correct me if I get something wrong.

I believe a lot of misconceptions are because people are stuck with the old monolithic blockchain ways where it is assumed that there's only one way to do things, and that is that one blockchain will do everything. So, let's begin with that, and also, thanks to r/ethfinance users for contributing these misconceptions.

Addendum: Now that this post is pinned, I'm adding a couple of links so you can learn what rollups are. This is how Ethereum & the wider blockchain industry will scale.

[An Incomplete Guide to Rollups (vitalik.ca)](https://vitalik.ca/general/2021/01/05/rollup.html)

[https://www.youtube.com/watch?v=7pWxCklcNsU](https://www.youtube.com/watch?v=7pWxCklcNsU&t;=1s)

Updated on 14th October 2021.

# Rollups are a temporary band aid fix - X, Y, Z blockchain can do it on L1 so they don't need rollups

(by u/hehechibby, u/ec265)

Rollups are the present and future of the blockchain industry.

But first, a brief perspective shift is required to understand why rollups are essential. Until now, blockchains have had to do it all - execution, consensus/security and data availability. This has led to significant bottlenecks and inefficiencies, reflected in the blockchain trilemma. Rollups are blockchains that are laser focused on one thing, and one thing exclusively: executing transactions as fast as possible, while "outsourcing" the hard work of security and data availability to a different L1 chain that is better at it. It's simple division of labour or specialization in action. Just like it led exponential growth in the industrial revolution, so will it lead exponential increase in scalability for the blockchain industry.

Now, X, Y, Z blockchain may have compromised significant amounts of decentralization and security to get high scalability, and Ethereum and Bitcoin may have compromised scalability to get high security and decentralization. Rollups are simply constructions that can get the best of all worlds - with high scalability, security, *and* decentralization.

The important point is that it doesn't matter if it's an L1 or a rollup - to the user they are just interacting with an execution layer. **Execution layers - L1s and rollups - should be directly compared with each other.** Solana and Avalanche are not competing with Ethereum - they are competing with Arbitrum One and StarkNet. \[Unless they pivot to a rollup-centric roadmap focusing on security and data availability, rather than execution - like Ethereum and Tezos have.\]

Tl;dr: Whatever any L1 execution layer can do, a rollup can do it better.

# X, Y, Z blockchain is still faster than rollups

[No.](https://www.reddit.com/r/ethfinance/comments/pk57n7/why_rollups_data_shards_are_the_only_sustainable/) Once again, whatever any L1 can do, a rollup can do it better long term. I'll point out that there's a wide-open design space with rollups, and some rollups will opt to have conservative rate limits - especially optimistic rollups. But with zkRs, they don't *have* to - they can push past the limits of L1s as described in the article linked above.

# Lack of composability is bad

(by u/Whovillage)

This is a common argument about rollups but it actually makes very little sense. As mentioned twice already, whatever any L1 can do, a rollup can do it better. I don't see anyone complaining about lack of composability between L1s?

A rollup remains fully composable, even if it's settled across multiple data shards or external data availability sources.

Like L1s are not composable with each other, so are rollups not composable with each other. But there are many interoperability solutions live like Hop, Connext, cBridge and Biconomy, and many more in the works. Indeed, there's amazing innovations [like dAMM that lets multiple zkRollups share liquidity](https://medium.com/starkware/damm-decentralized-amm-59b329fb4cc3)! In addition, eventually we can have internally sharded zk rollups which retain full synchronous composability - a feat nigh impossible on L1s.

Tl;dr: Rollup composability is superior to L1s.

# Fragmentation of liquidity is bad

(by u/Beef_Lamborghinion)

See above, all of the same applies. Rollups may not share liquidity, but neither do L1s. Except, unlike L1s, they actually can with innovations like dAMM!

Tl;dr: Rollup liquidity fragmentation is less than L1 fragmentation.

# Rollups are centralized

(by u/Whovillage)

All transaction data (in compressed form) and proofs are published on L1, which enable exiting a rollup directly from L1 even if the rollup itself is compromised. So, security and decentralization of rollups = security and decentralization of L1. Now, it's certainly true that rollups [may have centralized controls in the early days](https://www.reddit.com/r/ethfinance/comments/nl9cum/early_rollup_training_wheels/), but most if not all rollup projects are committed to progressive decentralization. The final form of rollups: zk rollups with decentralized sequencers, decentralized provers, decentralized L1 smart contracts and light unassisted exits - **you have security and decentralization that's practically identical to the most secure and decentralized security layer (currently Ethereum), except with the massive scalability**.

# Casual users will never be able to execute the CEX - Ethereum mainnet - rollup journey / it's too expensive

(by u/Whovillage, u/stevieraykatz)

Top CEXs like OKEx, Huobi and Coinbase have committed to support withdrawals directly to (and deposits from) Arbitrum One and other rollups with very low fees. Bitfinex already supports withdrawals to Hermez.

Meanwhile, going through Ethereum is not the only way into rollups. cBridge, for example, lets you enter Arbitrum One through Optimism, Polygon PoS, Binance Smart Chain, xDai, Avalanche or Fantom. So, there are plenty of options already, and there'll be many more over time as CEXs and fiat ramps integrate, and liquidity builds up for these various solutions. Argent is releasing with direct fiat on-ramps to zkSync and other rollups soon. With account abstraction, innovative fee models, and meta-transactions - the user experience can actually be better. We can already see this on dYdX - all gas is abstracted from the user. All the user sees is instant transactions without ever having to worry about gas - a UX better than any L1.

Tl;dr: The UX is better than any L1.

# It takes too long to withdraw from rollups

This is true for optimistic rollups - take 7 days to withdraw from rollup to L1 using the default bridge. However, as mentioned above, there are multiple options available that let you make a fast withdrawal for fungible assets. Of course, zkRollups don't have this limitation. For NFTs, zkRs are thus a preferred solution.

# Rollups will be obsolete after "Eth 2.0"

Firstly, ["Eth2" is deprecated nomenclature](https://notes.ethereum.org/@timbeiko/great-renaming). The two major upgrades coming to Ethereum next are The Merge which merges the consensus layer (previously eth2) with the execution layer (previously eth1) - so we're all one Ethereum again! The next major upgrade after that is data sharding on the consensus layer side. Data sharding is actually focused on accelerating rollups. So, Ethereum L1 scalability will be limited for the foreseeable future, while rollups will scale through the roof!

Tl;dr: Ethereum's roadmap is rollup-centric and designed to accelerate and empower rollups.

# Rollups are still too expensive

This is true, in the short term. Optimistic rollups like Arbitrum One and Optimistic Ethereum are reducing fees by 90%-95% currently, which while a huge improvement over Ethereum is still too expensive. With some optimizations like signature aggregation, better batching and calldata compression, this can be reduced to 99%. Indeed, zkRollups are already seeing 99% reductions getting fees down to the $0.10-$1 range even when L1 fees are high. dYdX is already doing transaction fees in the \~$0.10 for complex DeFi derivative trades - although this is abstracted away from the end users to be gas-free.

But it doesn't stop here! When Ethereum releases data shards, rollup costs will absolutely plummet, with over a magnitude greater capacity unlocked overnight, scaling up to several orders of magnitude long term.

You can get a preview of that with validiums like Immutable X, where it costs less than a cent to mint an NFT. Indeed, it's so cheap that Immutable X is subsidizing it, so it currently costs $0.00 to mint an NFT with your Ethereum wallet! [Try it out for yourself on SwiftMint](https://swiftmint.io/). I'll note that validiums are not as secure as rollups, but they are more secure than sidechains and other L1s. Volitions further extend this by giving users the choice between rollup and validium - best of all worlds!

Tl;dr: In the long term, rollups + data shards will offer the greatest scale and lowest fees possible for given demand.

# Rollup finality is slow

Rollup sequencers give you "soft confirmations" nearly instantly - for me this is \~0.3 seconds on average for a Uniswap trade on Arbitrum or Optimism. For most people, this soft confirmation is fine. But it's true that L1 finality is often delayed, especially in the case of zkRs. StarkNet has a great solution [with checkpoints achieving effective finality](https://ethresear.ch/t/checkpoints-for-faster-finality-in-starknet/9633) on the rollup side very quickly, at which point the finality is as fast as the L1 can finalize. As zk tech improves, Ethereum implements single-slot finality and data shards are staggered, we will see finality drop to a few seconds. You can also have a consensus mechanism on a rollup that finalizes fast - just like any L1 would - so you get the same experience, but additional security. But this gives up efficiencies gained from being a rollup.

All that said, there may be some niche usecases where settling directly on L1 still makes sense without bolstering security - but this is a very small niche.

# Rollups are an Ethereum thing and bound by EVM and Solidity

Rollups are definitely not just an Ethereum thing. Indeed, [Tezos is embracing](https://www.youtube.com/watch?v=oqBSs0DSuzQ) a rollup-centric roadmap. Arthur Breitman, founder of Tezos, actually makes one of the best arguments for why rollups are the ultimate scalability solution, in tandem with data shards. [NEAR is also designing for sharded data availability](https://twitter.com/ilblackdragon/status/1437323779420696578). Celestia is building a security & DA layer exclusively for rollups.

Further, rollups have a wide open design space. They can experiment with VMs, fee models, coordination mechanisms, governance etc. Indeed, the room for innovation is much wider than L1s - given they always have a fallback on the most secure L1. Want a quantum-resistant VM? Use StarkNet. Like your UTXOs? Use Fuel V2. Like LLVM and Rust? Use zkSync 2.0. Just want a chain optimized for one specific application? Sure, use Immutable X for NFTs. Want a fully private chain: use Aztec. WASM? Arbitrum. Any VM, any programming language, any data model - a rollup can do it all. Indeed, it can innovate beyond any L1 with clever fee & tokenomics models (see: Immutable X's IMX token), governance structures, etc.

Tl;dr: Rollups have a wide-open design space, and anything any L1 can do, so can rollups, and then some.

# Why is Ethereum special, if you can deploy rollups elsewhere?

Rollups will leverage whatever is the most secure and decentralized L1 with the highest data availability that can support it.

It's clear Ethereum is orders of magnitude more secure and decentralized than any smart contract platform. Realistically, Bitcoin is the only other chain that's comparable, but of course, they lack the ability to host rollups.

Ethereum doesn't currently have the highest data availability, but it will, with data sharding. Meanwhile, we have validiums offering ample data availability with security that's still superior to other L1s. Data sharding inverts the trilemma - the more decentralized your network is, the more data shards you can deploy, and the more scalable your rollups will be. This is how rollups that deploy on Ethereum will scale to millions of TPS over the years, [speculatively up to 15 million TPS by 2030](https://www.reddit.com/r/ethfinance/comments/ojafms/conjecture_how_far_can_rollups_data_shards_scale/). The only area where Ethereum can be improved is the execution layer - to make it more friendly for verifying zk-SN(T)ARKs. I'm sure it will, once The Merge, data shards and statelessness are done.

It's clear, then, that Ethereum is uniquely positioned to be the best host for rollups. But this is not to say that there can't be other contenders. If Ethereum's data shards are saturated, we'll see data availability chains like Celestia or Avail potentially taking up the slack. Other L1s who are embracing a rollup-centric model, like Tezos, may also benefit if there's an overflow of demand from Ethereum-based rollups. And of course, the elephant in the room is an unexpected new competitor, though realistically, the only real competitor is if Bitcoin somehow adds the functionality to verify zk-SNARKs and implements data sharding.

For the rollups, it doesn't really matter. They'll just leverage whatever L1 offers them the best security, decentralization, network effect and data availability.

Tl;dr: Ethereum is uniquely positioned to offer the highest security, decentralization, and data availability - making it the defacto standard host for rollups.

# Rollups are stealing traffic from Ethereum

Ethereum execution is fully saturated, and has had full blocks for years now. All activity on rollups is net additive. Now, some may argue sharding would have expanded Ethereum's capacity - but rollups + data shards in tandem increase the overall capacity of the Ethereum ecosystem by several orders of magnitude more than the previous sharding solution.

# Rollups are too complicated, no one will understand it

Might I just point out I'm writing this on the day that Arbitrum One has proven to be the fastest growing smart contract platform in history? In reality, the UX for using a rollup is identical to that of using an L1, as covered before. Users need not care about the underlying architecture - to them it's just another smart contract platform. Do YouTube users care about what programming language it was written in, what OS the servers run on, what hardware the servers implement, what internet connection they use etc.? Of course not. Indeed, [I expect things will improve significantly with smart contract wallets and centralized frontends](https://polynya.medium.com/a-vision-of-ethereum-2025-bb92a0d4dc4f).

# When rollups get big enough they will just abandon the base chain and create their own blockchain

(by u/Whovillage)

Technically, this is possible. However, what makes a rollup special is that it's backed by the most secure and decentralized L1. This is the hardest bit, evidently so as only Bitcoin and Ethereum have managed to achieve it. Arbitrum One has already demonstrated that there's exponentially more demand for a chain backed by Ethereum's security than a more centralized consensus mechanism. On a related note, as alluded to earlier, if there's a competitor that offers better security and data availability than Ethereum, then rollups will be well incentivized to migrate. Which is fine, and will keep Ethereum core researchers and developers honest.

# There are no rollup tokens, so people won't be invested in the ecosystems

This is not quite true. While there are many rollup projects in their early stage and do not yet have a token, I expect most rollups to eventually release a token. Many rollup projects do have tokens, and are using them in innovative ways - like Immutable X. Just another advantage for rollups over L1s - you can have unique and clever token and fee models.

# It's too expensive to compute a zero-knowledge proof

True, but by amortizing this over many transactions, the costs become negligible relative to gas paid for transaction calldata. Of course, we're still in the early days of zero-knowledge tech, and we'll see costs and time for computing zk proofs plummet over time. Software optimizations, GPU/FPGAs/ASICs, Moore's Law, and growing adoption with more transactions means things will only get better for zkRollups, which have already proved to be sustainable.

# Can NFTs transfer easily between L1 and rollups and between rollups?

(by u/Datacruncha)

This is a great question that I had overlooked. While there are multiple bridges for fungible tokens, as mentioned above, NFTs are more complicated because you can't have liquidity bridges. Currently, yes, you can transfer NFTs between L1s and rollups, but the solutions are definitely early workarounds. For example, on zkSync 1.x, you can mint an NFT there, and when you withdraw to L1, it's simply burned on zkSync 1.x and minted as an ERC-721 on L1. Cross-rollup is definitely an unresolved problem. Fortunately, this is being actively researched, and there's a lot of discussion on a [recent wrapped NFTs proposal by Vitalik](https://ethresear.ch/t/cross-rollup-nft-wrapper-and-migration-ideas/10507) to make NFTs easily transferable cross rollups. Jordi Baylina from Polygon Hermez [further expands upon it](https://ethresear.ch/t/cross-rollup-nft-wrapper-and-migration-ideas/10507/28) but really there are many insightful comments in that thread (and some low-quality trolling too!).

# You're talking about the future, execution risks remain

This is absolutely true. Rollups are nascent technology, and [it'll take a couple of years to mature](https://www.reddit.com/r/ethfinance/comments/paipgj/why_the_transition_to_rollupcentric_ethereum_is_a/) and live up to their potential. Things can go wrong. Fair enough, but I do make it very clear what the current shortcomings are and how they will be fixed in the future.