



## Is Avalanche Ethereum's contender?

### Introduction: The Genesis of Avalanche

At its core, Avalanche is an open-source platform engineered to support decentralized applications (dApps) and enterprise blockchain solutions within a singular, interoperable, and scalable ecosystem. Its inception was motivated by the desire to overcome certain challenges inherent in Ethereum, particularly the slower transaction times and the one-size-fits-all nature of its blockchain structure. Avalanche's founder envisioned a platform that could cater to diverse needs through modular design, leading to the development of subnets. These innovations have attracted a range of diverse companies such as Visa, Amazon, JPMorgan and CitiGroup to consider and explore implementing Avalanche's technology.

### Ethereum's Limitations

Ethereum, despite its pioneering role in popularizing dApps and smart contracts, has encountered issues with network congestion and limited customization options. Indeed, no-one can customize any layer of the Ethereum blockchain, you can only add stacks on top of it, like Layer 2's. Furthermore, the amount of transactions the network can process within a certain time frame is finite, leading to congestion when demand is high. On top of that, there is an inherent auction mechanism, thus validators prioritize transactions with higher fees for inclusion in a block, which can drive up the cost of transactions during peak times.

In short, Ethereum is slow, expensive and non-customizable. These challenges have prompted users and developers to explore alternatives like Avalanche, which promises faster transaction throughput, quicker finality, and greater flexibility in blockchain design.

### Innovations Unleashed by Avalanche

Perhaps Avalanche's most significant innovation is its consensus mechanism, which drastically accelerates transaction finality. This mechanism ensures transactions on the Avalanche network achieve finality in under two seconds, setting a new standard for speed and efficiency in the blockchain space. Furthermore, this novel consensus also increases throughput and transactions per second, which is one of the reasons why Ethereum has been lagging behind in institutional adoption. This has allowed Avalanche to also be more scalable than Ethereum. Indeed, on Ethereum, transactions can take up to seven minutes to finalize.

For reference, throughput is defined by how many transactions are finalized per second and is measured in transactions per second (TPS). On the other hand, time to finality is defined by how long it takes for a transaction to go from being submitted to validators to being unchangeable.





*Image 1: The table compares TPS and finality on three main blockchains: Bitcoin, Ethereum and Avalanche*

## Throughput and Finality of Popular Blockchain Networks

Network	Throughput	Time to Finality
Bitcoin	7 TPS	60 min
Ethereum	30 TPS	6.4 min
Avalanche	2500 TPS per Subnet	~0.8 seconds

Source: *Avalanche Academy*

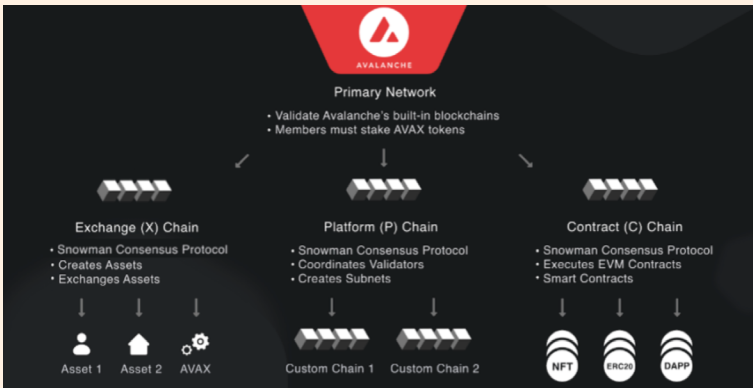
Beyond its scalable architecture, Avalanche stands out for allowing a high degree of customization. This feature enables the creation of application-specific blockchains tailored to specific requirements, whether for private enterprises or public applications, all while maintaining compatibility with the broader Avalanche ecosystem.

As you may know, each blockchain has three main layers on top of the other: the consensus layer on top, followed by the execution and the application layer. The consensus layer is used to guarantee that all nodes on the network agree on the current state of the network and on the authenticity of transactions. The execution layer is used to execute the transactions on a Virtual Machine, and the application layer is used to develop applications on the blockchain with a certain programming language. Avalanche's first innovation is a novel consensus layer that improves scalability. Its second innovation is to let developers customize the execution and application layer.

Customization is done thanks to the concept of Subnets, or subnetworks, which are essentially clusters of validators working together to achieve consensus on the state of a set of blockchains. Each Subnet can define its unique set of rules, from token economics to execution and application layers, offering unparalleled flexibility and control to its creators.

To enable all of these customizations and subnet creations, Avalanche has created multiple chains. First of all, the Contract (C)-Chain, is a high-throughput, EVM-compatible smart contract platform. But the long-term plan for network scalability has always centered around Subnetworks (Subnets), which enable projects to build applications and use cases within their own custom, sovereign blockchain environment networks (Subnets) -- all administered by the primary network's Platform (P) Chain. The three overarching benefits of Subnets is that they isolate performance and enable customization, but most importantly allow for native message passing and interoperability.





Source: Avalanche Docs

## Expanding the Frontier: Financial Applications and Partnerships

Avalanche's adaptability enables it to support diverse applications, spanning from finance to digital identity, thanks to its efficient network. Its collaboration with major players like Citi and J.P. Morgan highlights its transformative potential in reshaping the conventional financial landscape, hindered by costly intermediation fees, long settlement times, and closed, siloed, opaque networks.

The introduction of Avalanche Evergreen Subnets provides financial institutions with ready-to-deploy blockchains and tools, facilitating the creation of custom blockchains with the features they need while maintaining connectivity to other networks, use cases, and institutions. Since its launch, Evergreen has attracted asset managers overseeing a cumulative \$3 trillion under management and significant projects in tokenized assets.

In a pioneering project, Citi has chosen the Avalanche blockchain to test the tokenization of private markets via the "Spruce" subnet. This collaboration highlights Avalanche's robustness, efficiency and scalability, ideal for managing the complexities of private asset transactions. The initiative aims to improve automation, increase transparency and standardize processes. Citi's tests focused on private assets, given the collective \$10T AUM markets remain riddled with manual operations, lack of transparency, and limited standardization.





Onyx by J.P Morgan, Apollo Global, and WisdomTree collaborated under the Monetary Authority of Singapore's (MAS) and Finma's Project Guardian, showcasing a proof-of-concept (PoC) that marked a pivotal step toward revolutionizing the asset and wealth management industry. The PoC demonstrated the possibility of including tokenized alternative investments ("alts") alongside liquid assets in discretionary client portfolios and leveraged a variety of protocols and infrastructure partners, including an Avalanche Evergreen Subnet. The results of this collaboration were quite astonishing: Onyx's solution demonstrated how a wealth management firm with 100,000 client portfolios could automate its monthly rebalancing process from 3,000+ operational steps to a few clicks and savings of ~24bps per annum. Finally, it showed that tokenizing private alternative funds represents a \$400 billion annual revenue opportunity for fund managers and distributors.

### Conclusion

In conclusion, Avalanche represents a dynamic and evolving blockchain platform that addresses some of the critical challenges faced by Ethereum, offering solutions that are fast, flexible, and forward-thinking. Its commitment to innovation, demonstrated through its unique consensus mechanism and supportive partnerships, positions Avalanche as a key player in the blockchain ecosystem, capable of transforming not just the financial industry but a multitude of sectors worldwide.

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Sources:

<https://docs.avax.network/learn/avalanche/avalanche-platform>

<https://www.avax.network/blog/citi-tests-benefits-of-private-markets-tokenization-with-avalanche-evergreen-subnet-spruce>

<https://www.avax.network/blog/onyx-j-p-morgan-leverages-avalanche-for-portfolio-management>

