Avalanche (AVAX)

Digital Assets Research

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AVALANCHE

TL;DR

- Implementing novel consensus that aims to achieve scale, security & speed with unprecedented decentralization
- Impressive ecosystem growth with DeFi & Web 3.0 dApps
- **Risks:** Competing L1s or L2s overcome technical & regulatory challenges

Key Statistics

Token Price	$28.13
Range (52W)	$2.79 / $59.94
Market Cap	$3.6B
Circulating Supply	128.0M
Volume (24H)	$210.9M

Source: Coinbase (3/31/2021)

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Avalanche: Building a Novel dApp Protocol for the Internet of Finance

Ava Labs is building the Avalanche protocol which expects to deliver the highest performance, most secure, and most energy efficient general-purpose cryptonetwork for highly decentralized applications, novel financial primitives, and new interoperable blockchains. Using its innovative Avalanche consensus mechanism, the protocol hopes to create a new digital crypto-native economy for frictionless real-world and digital asset exchange, composable financial application primitives and derivatives, Web 3.0 privacy-focused data and social applications, and more. Avalanche expects to scale these use cases for global userbases.

- **The Avalanche core team consists of seasoned professionals and distributed systems researchers.** As the CEO and Founder of Ava Labs, Dr. Emin Gün Sirer is a former professor of computer science and networking systems at Cornell University. He developed Bitcoin-NG, a bitcoin scaling solution, and Bitcoin Covenants, a security solution. To develop the Avalanche protocol, he successfully built a team with experience in institutional finance, private markets, and technology (Slide 3).
- **Avalanche aims to build on earlier breakthroughs to develop a fully internet-native economy.** Early cryptocurrencies offered global, decentralized, non-sovereign, digital money. The second wave of crypto platforms built on the core technology and enabled the creation of ecosystems of programmable dApps. These dApps included DeFi products, NFT collectibles, and other yield-generating apps and use cases. However, these platforms haven't proven themselves to be designed for every use case. Now, a third wave of cryptonetworks are aiming to support a wider range of dApps on cheaper and faster blockchains. By offering a dApp platform with low fees, high scalability, and network interoperability, Avalanche believes it will enable the creation of a fully digital economy on a global scale (Slide 6).
- **Avalanche is organically growing a comprehensive DeFi & Web 3.0 ecosystem.** Third-party developers are rapidly deploying new DeFi products on the Avalanche (Contracts) C-Chain. These decentralized applications span decentralized exchange, liquidity mining, lending, synthetic assets, and more (Slide 7). Avalanche's unique, multi-chain framework enables core functions to interoperate seamlessly, without causing performance degradation as we see in networks that pile all activity into one chain. This is leading to rapid, precipitous growth of assets, applications, and custom implementations on subnets tailored to enterprises and institutions (Slide 9).
- **Network metrics are competitive with top protocols in terms of scalability, security & speed.** In order to host a wide range of decentralized applications and build a robust digital economy, the blockchain base-layer must offer decentralization, security, and scalability with low transaction fees. Avalanche's mainnet already offers a transaction settlement layer with characteristics that are highly competitive with the leading staking networks and proof-of-work cryptocurrencies across these metrics (Slide 11). Additionally, AVAX's proof-of-stake consensus incentivizes token lockups with high staking rewards (Slide 13).
- **Partnerships may help bootstrap network adoption and growth.** The Avalanche protocol is a young network that initially launched its mainnet in September 2020, yet it already boasts an impressive ecosystem of partners, integrations, and third-party applications. Beyond DeFi and Web 3.0, the Avalanche Foundation and Ava Labs are building out tooling and infrastructure to support a wide range of crypto products and use cases. Integrations with the leading crypto exchanges, wallets, stablecoins, and asset tokenization projects could fast track adoption and incentivize users to engage with the Avalanche network (Slide 14).
- **What could go wrong?** Avalanche fails to execute on its roadmap, competing layer-one protocols or second-layer solutions iterate faster and deliver scalable cryptonetworks, Avalanche fails to attract significant developer mindshare and adoption.

Bottom line: Although the network is young in its growth and development, Avalanche implements an interesting consensus mechanism that may successfully deliver a scalable and interoperable cryptonetwork to enable a global and fully digital economy of decentralized financial applications and Web 3.0 personal data sovereignty.

Project Overview

Ava Labs.

Founder and CEO:	**Emin Gün Sirer**
Headquarters:	**New York, NY**
Founded:	**2018**

Summary

- **Ava Labs** is the New York-based technology company developing the Avalanche consensus protocol and network. Avalanche is an open-source platform for launching **highly decentralized applications**, new **financial primitives**, and new **interoperable blockchains**.

- The project was founded in 2018 by Emin Gün Sirer, Maofan Yin, and Kevin Sekniqi who were all researchers at Cornell University. Sirer is renowned for his contributions to peer-to-peer systems, operating systems and computer networking.

Project Objectives

- **Democratize financial markets and bridge all blockchain platforms** together into one interoperable ecosystem
- Create the **highest performance**, **most secure**, and **most energy efficient** decentralized protocol
- Next generation blockchain platform enabling anyone to **digitize, create, and exchange assets**

Value Proposition

- Developers who build on Avalanche can easily create **powerful, reliable, and secure applications and custom blockchain networks** with complex rulesets or build on existing private or public subnets
- Avalanche gives developers complete control on both the network and application layers–**enabling them to build anything they can imagine**

Financing History

- The firm is well capitalized having **raised $6 million in a Series A financing round and $54 million over two token sales**
- Ava Labs has backing from leading investment firms including **a16z, Bitmain, Dragonfly Capital Partners, Galaxy Digital, Initialized Capital & NGC Ventures**

Dragonfly Capital · GALAXY DIGITAL · a16z ANDREESSEN HOROWITZ · initialized()

Source: FSInsight, Ava Labs

Founding Team Spun Out Of Cornell And IC3, Tech & Finance Expertise

Dr. Emin Gün Sirer

CEO and Founder

John Wu

President

Kevin Sekniqi

COO and Co-Founder

Ted Yin

Chief Protocol Architect and Co-Founder

Previous Experience

- Associate Professor (on leave) from Cornell University
- Creator of first PoW based currency Karma, Bitcoin-NG, Bitcoin Covenants
- Author of seminal Bitcoin Selfish Mining Paper
- In 2003, published the first cryptocurrency that uses distributed mint based on PoW

- Former CEO of the Digital Assets Group at SharesPost
- Founder of $500 million hedge fund, Sureview Capital
- Former portfolio manager at Kingdon Capital and analyst at Tiger Management
- Received MBA from Harvard Business School and BS from Cornell University

- Cornell PhD Candidate 2021 (currently on leave)
- Former researcher and software engineer at Microsoft
- Former researcher and software engineer at NASA Jet Propulsion Laboratory

- Cornell PhD Candidate 2021
- First author of Hotstuff Consensus Protocol Paper, used by Facebook Libra Blockchain
- Former research assistant at Vmware, SpeechLab of Shanghai Jiao Tong University, and the Institute for Infocomm Research

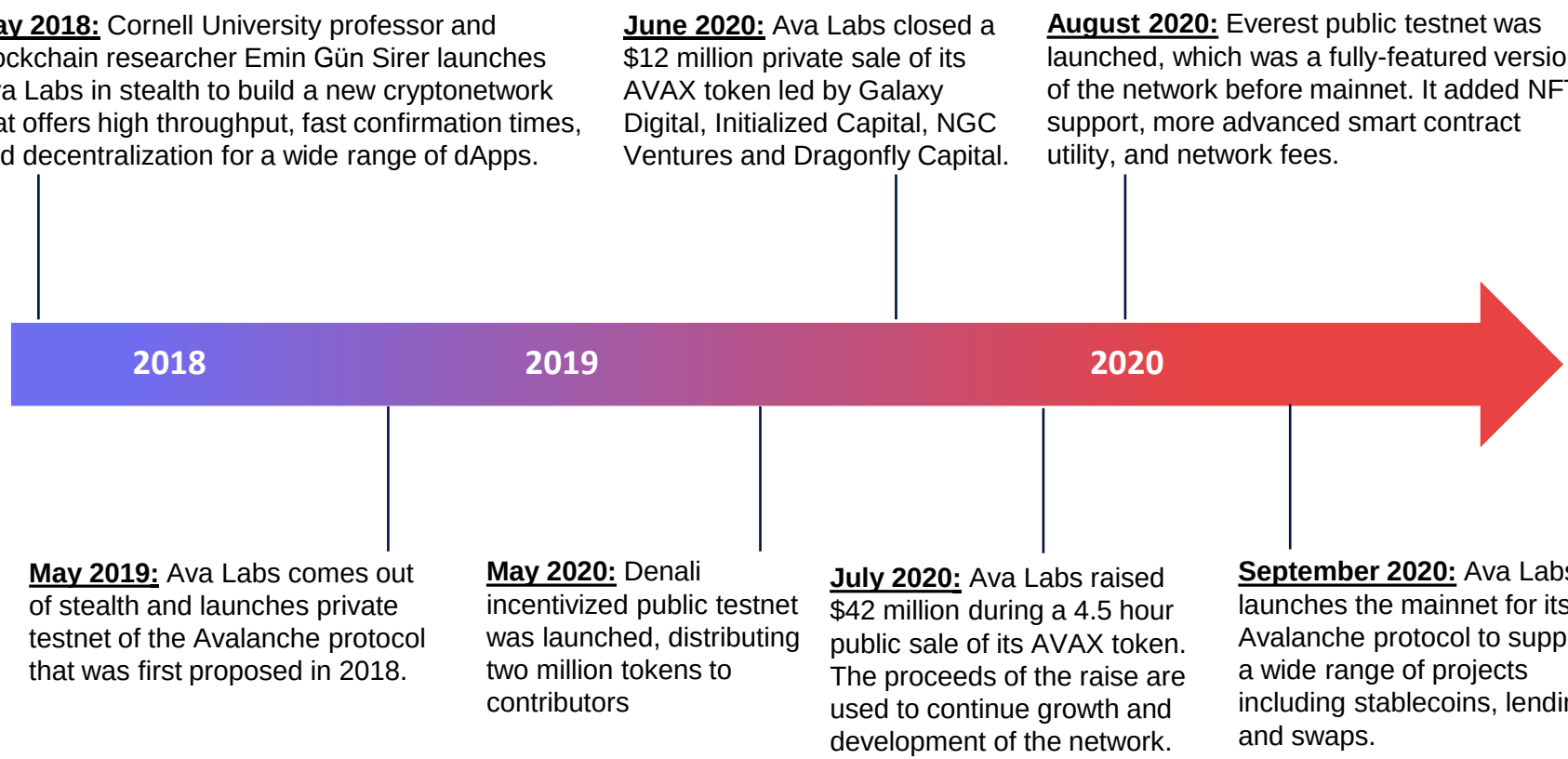
Source: FSInsight, Ava Labs

Ava Labs History And Avalanche Protocol Development

In its short history, Ava Labs achieved significant historic milestones

- **Avalanche Consensus was initially outlined in a whitepaper by a pseudonymous group called Team Rocket in 2018, an idea Sirer and his colleagues were also pursuing. With those proofs, Sirer, Sekniqi, and Yin began Ava Labs to develop a novel layer-one blockchain based on the proposed breakthroughs.**
- **Since its founding, Ava Labs raised $60 million and launched three testnets and the public mainnet of the protocol.**

Figure: Ava Labs Historic Milestones



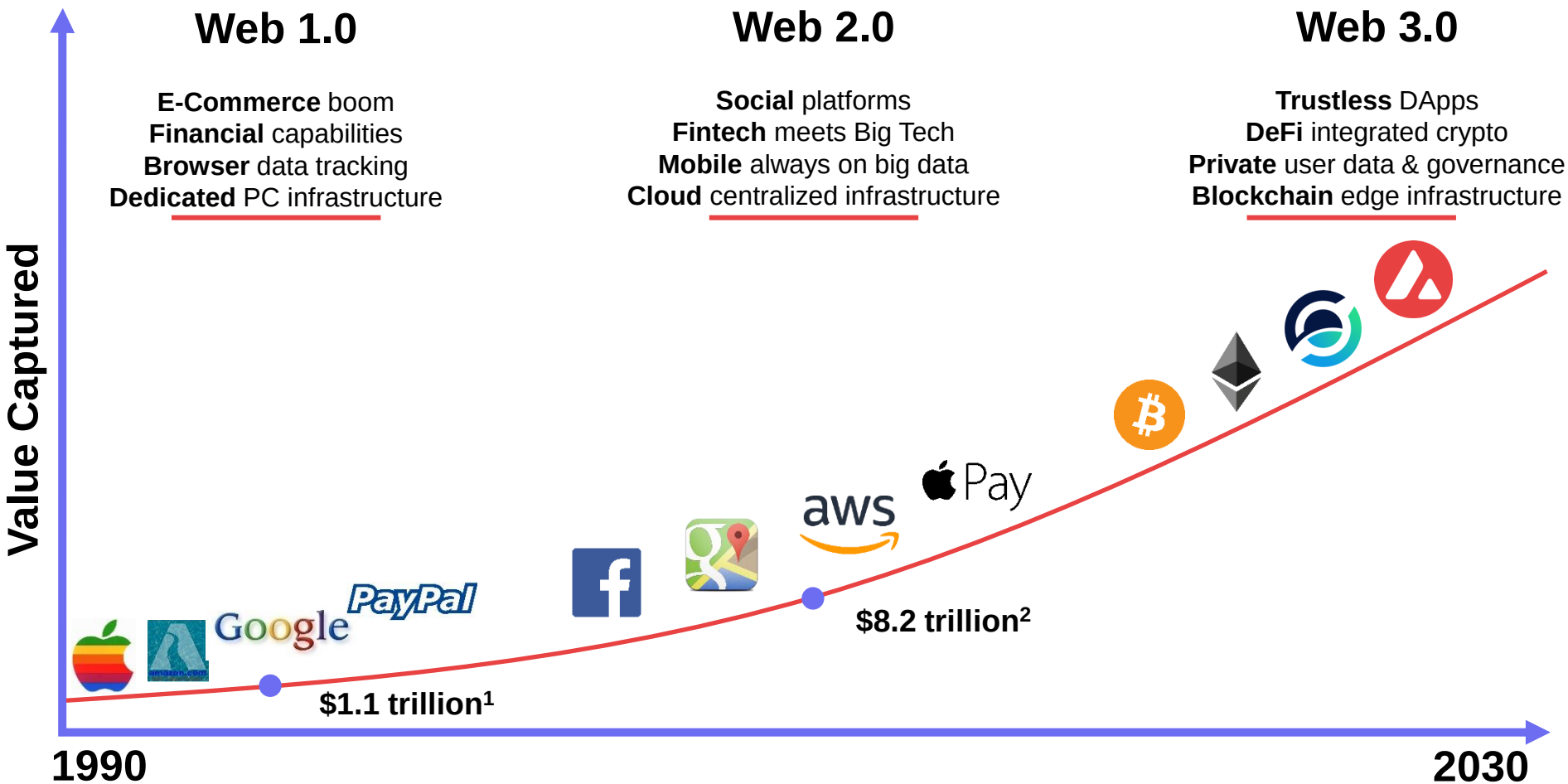
Source: FSInsight, CoinDesk, TheBlock

Cryptonetworks Are Platforms For The Next Era Of The Web

Web 3.0 promises to give users back control of their data & privacy

- **The internet continues to evolve. Web 1.0 PC networks connected us online and gave as access to information and e-commerce payment gateways. Web 2.0 mobile-first social networks connected us to online communities while algorithms used our data to optimize user experience. Web 3.0 cryptonetworks consist of trustless protocols giving users back control of their data and privacy with DeFi applications natively embedded.**

Figure: Evolution of the Web



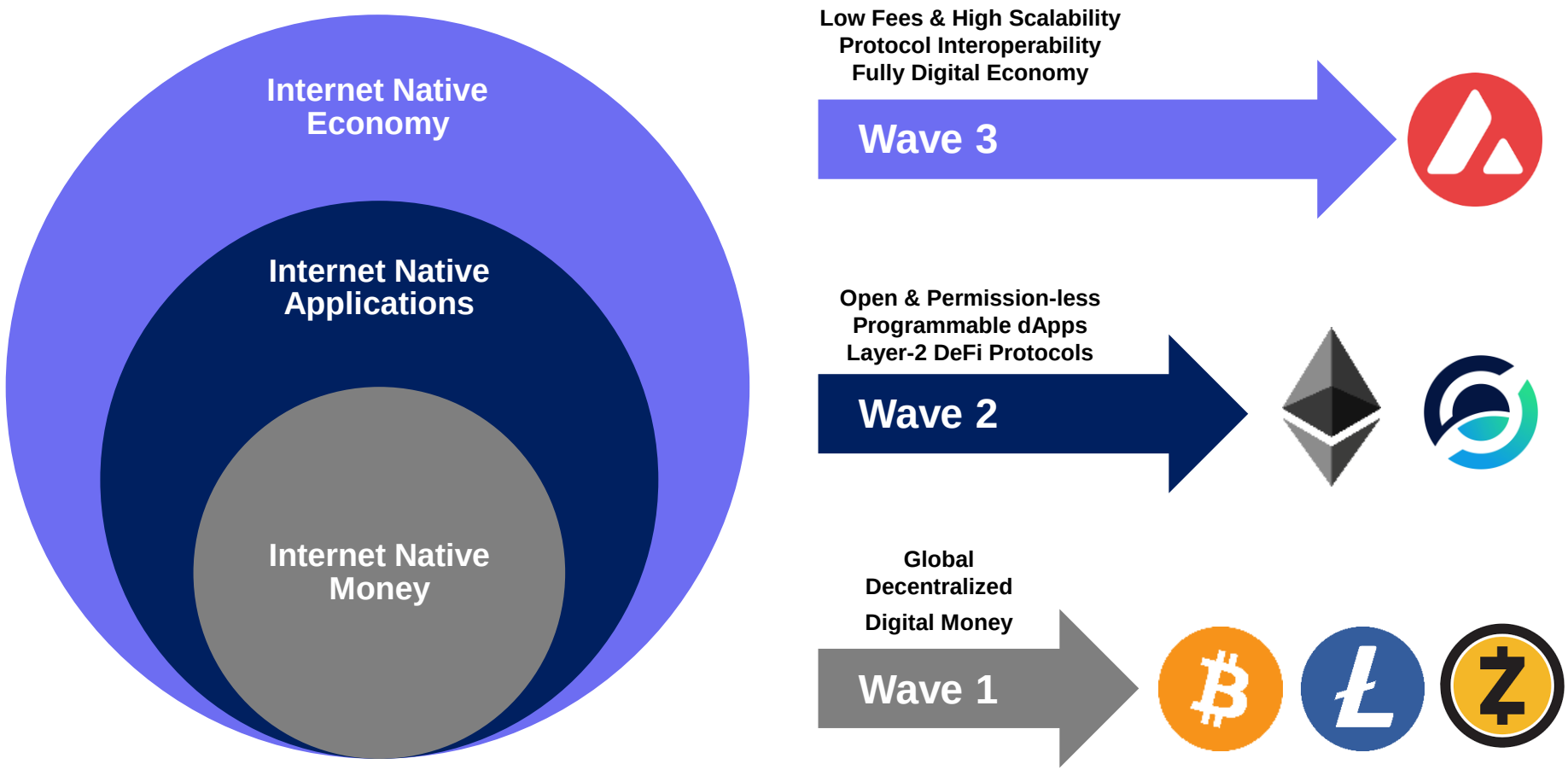
Source: FSInsight, Fabric Ventures Inspired, (1) Internet companies market cap as of 2000, (2) Big Tech market cap as of 2/9/2021

Avalanche Aims To Develop A Fully Internet-Native Economy

Avalanche may solve technical issues to support full range of dApps

- **Early cryptocurrencies offered global, decentralized, non-sovereign, digital money. The second wave of crypto platforms built on the core technology and enabled the creation of ecosystems of programmable dApps. These dApps included DeFi products, NFT collectibles, and other yield-generating apps and use cases. However, these platforms proved to be slow and expensive, ushering in the third wave of cryptonetworks supporting a wider range of dApps.**

Figure: Cryptonetwork Progression & Attributes



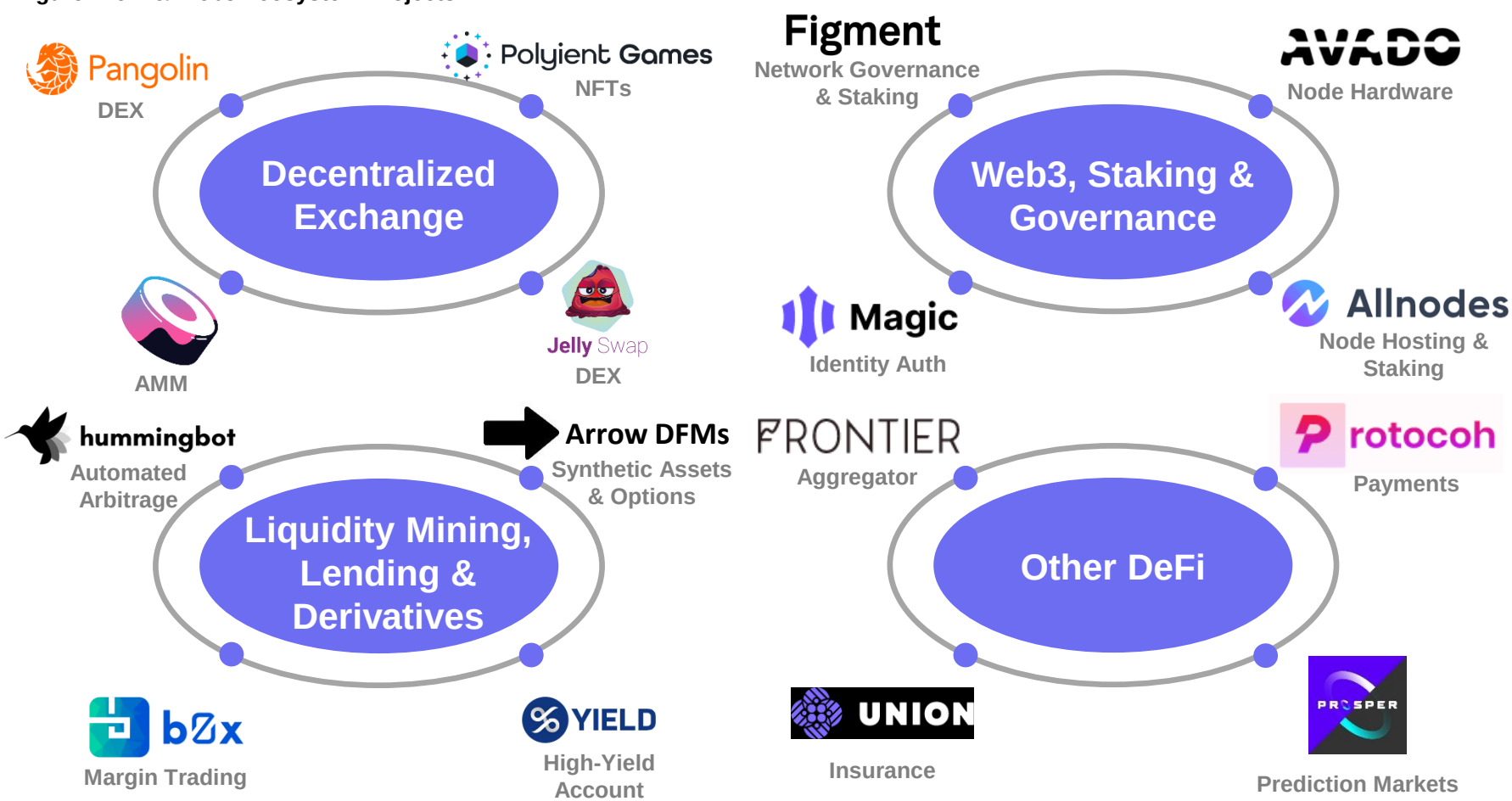
Source: FSInsight

Focused On Building Comprehensive DeFi & Web3 Ecosystem

Avalanche is making progress within leading DeFi use cases & apps

- **Third-party developers are rapidly deploying new DeFi products on the Avalanche (Contracts) C-Chain. These decentralized applications span decentralized exchange, liquidity mining, lending, synthetic assets, and more.**
- **Since its launch February 9th, Pangolin Exchange had $855M+ in total trading volume and $250M+ total liquidity. As tooling and DeFi primitives continue to be built, we expect more developers will flock to the Avalanche platform.**

Figure: DeFi & Web3 Ecosystem Projects



Source: FSInsight, Ava Labs, Pangolin Exchange

Avalanche Consensus Is Competitive With Leading Protocols

AVAX token accrues value as usage of the network increases

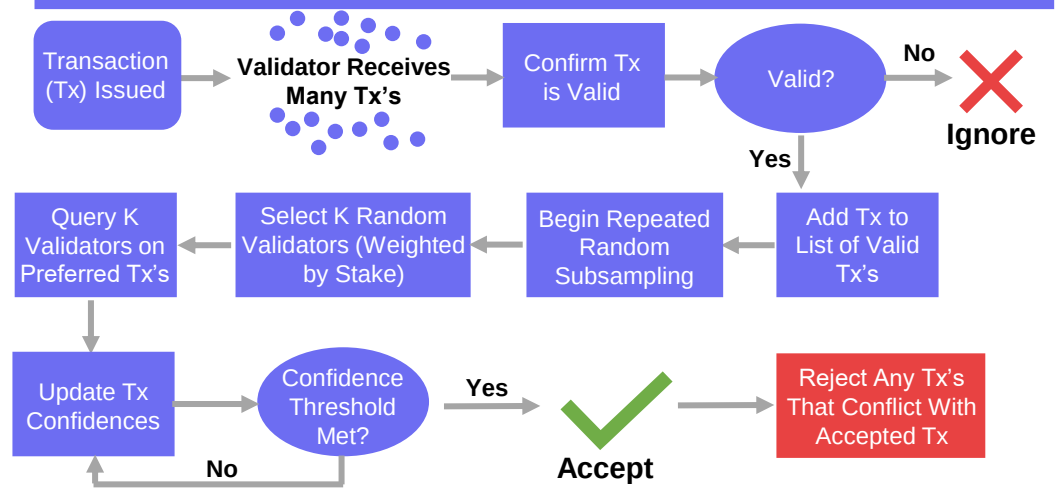
- **AVAX is the native token of the network and is expected to accrue value as it secures the network, pays for transaction fees, and provides the basic unit of account between the multiple blockchains deployed on the network.**
- **Avalanche consensus does not require proof-of-work, it is energy efficient and green. It is expected to offer a strong probabilistic safety guarantee in the presence of adversarial actors without sacrificing throughput and scalability.**

Figure: AVAX Token & Avalanche Consensus Overview

AVAX Token Overview

Symbol	AVAX
Native Platform	Avalanche
Primary Purpose	Platform's Native Asset
Price	$28.13
52 Wk Range (High/Low)	$59.94 / $2.79
Market Cap ($M)	$3.6B
24H Volume	$210.9M
Circulating Supply	128.0M
Initial Supply (Locked & Unlocked) / Fully Diluted Supply	360M / 720M
Supply Staked ($M) / % Initial Supply Staked	$297.4M / 82.6%
Supported Exchanges	OKCOIN, BINANCE, BITFINEX, Huobi, FTX
Node / Staking Services	ALLNODES, bloq, Ankr

Avalanche Consensus



Consensus: Classical vs Nakamoto vs Avalanche

	Classical	Nakamoto	Avalanche
Scalable	-	✓	✓
Highly Decentralized	-	✓	✓
Low Latency	✓	-	✓
High Throughput	✓	-	✓
Lightweight	✓	-	✓
Green, Sustainable	✓	-	✓

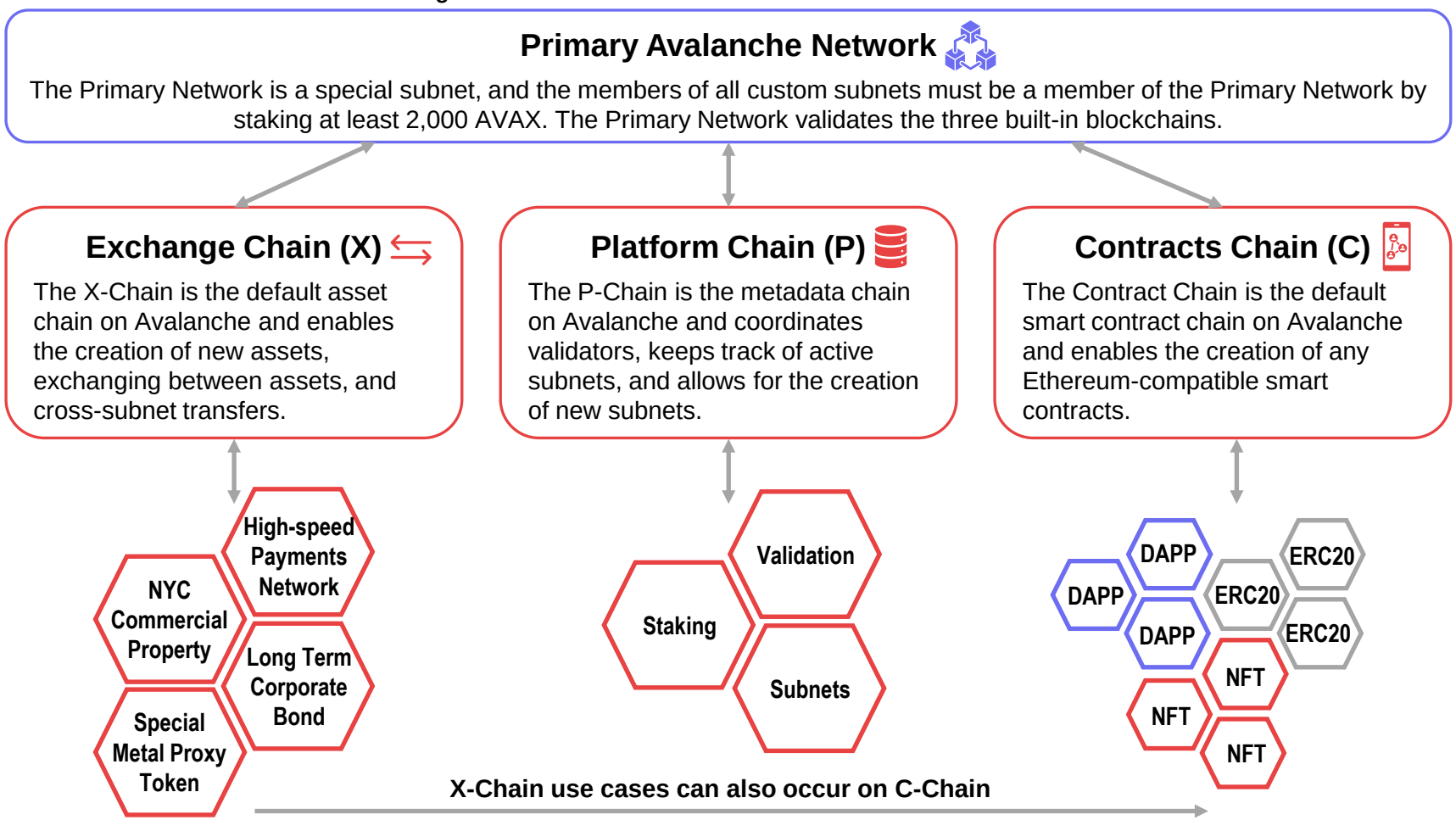
Source: FSInsight, Ava Labs, Coinbase

Avalanche Architecture Enables Platform To Scale With Usage

Subnets can be launched to optimize for specific use cases

- **Avalanche features three built-in blockchains (subnets) which are all validated and secured by the Primary Network. A subnet is a dynamic set of validators working together to achieve consensus on the state of a set of blockchains.**
- **Subnets are highly customizable blockchains, allowing for the creation of networks with unique properties and predefined rules such as type of virtual machine, governance, membership parameters, and regulatory compliance.**

Figure: Avalanche Network Architecture Diagram



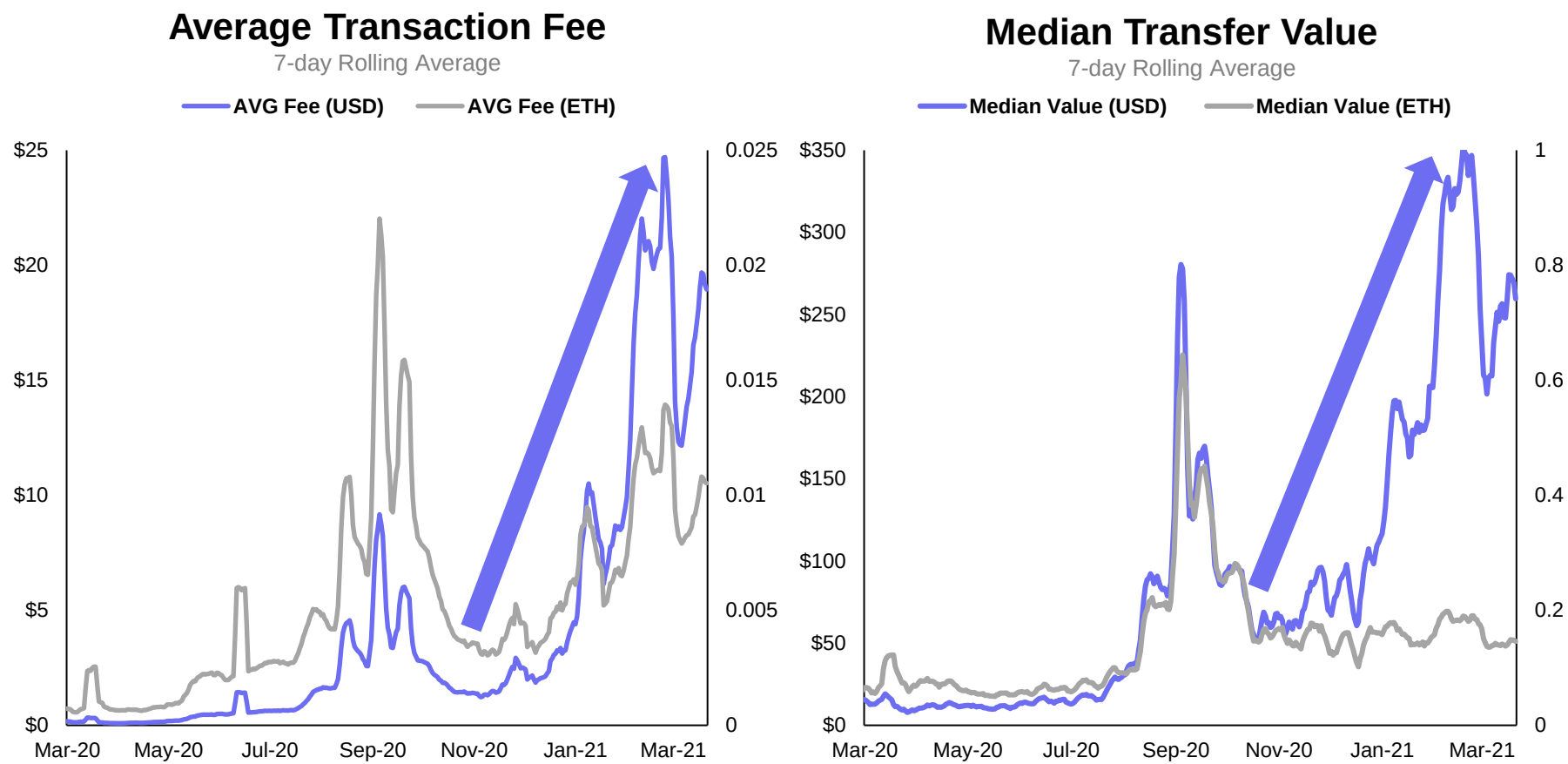
Source: FSInsight, Ava Labs

Ethereum Bottleneck Is Pricing Out Users & Transactions

New protocols may enable products requiring cheaper transactions

- **As users dive into new DeFi products, transaction fees on the Ethereum blockchain have skyrocketed. High transaction fees can limit certain use cases and price out smaller users/transactions from the network.**
- **Ethereum has shown it is useful and has established significant network effects. However, new layer-one protocols focused on scalability and low fees could grow complementary ecosystems and enable novel use cases.**

Figure: Ethereum Network 7-day Rolling Average Transaction Fee and Median Transfer Value
Date: 3/1/2020 – 3/21/2021



Source: FSInsight, CoinMetrics

AVAX Is Competitive In Terms of Scalability, Security & Speed

Avalanche Consensus aims to deliver performance without tradeoffs

- **In order to host a wide range of decentralized applications and build a robust digital economy, the blockchain base-layer must offer decentralization, security, and scalability with low transaction fees.**
- **Avalanche's mainnet already offers a transaction settlement layer with characteristics that are highly competitive with the leading staking networks and proof-of-work cryptocurrencies across these metrics.**

Figure: Comparative Key Network Metrics
Date: 3/31/2021

Source: FSInsight, Avascan, StakingRewards

AVAX Token Supply Issuance Schedule

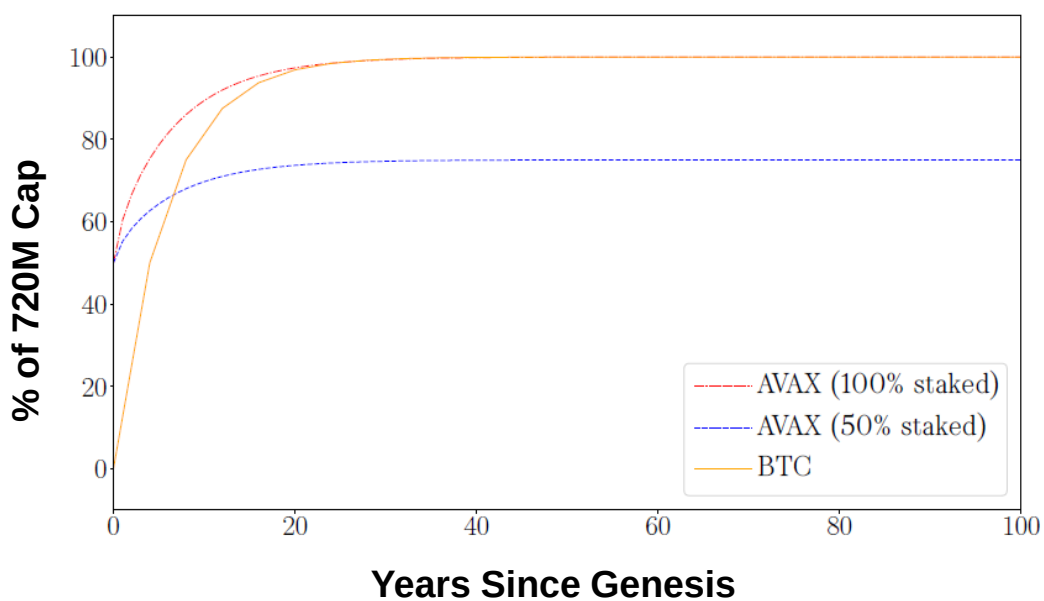
Supply cap of 720M with initial mainnet supply of 360M at launch

- **Approximately 50% of the token distribution is allocated as staking rewards and the remaining 50% is split between public and private sale investors, the Avalanche Foundation, the Ava Labs team, grant program, and token airdrop.**
- **AVAX has a burn and mint model in which user transaction fees are burned and newly minted tokens are rewarded to validators. In the long run, token burns may cause the network to be deflationary as tokens are removed from circulating supply.**

Figure: AVAX Issuance Schedule and Initial Token Distribution

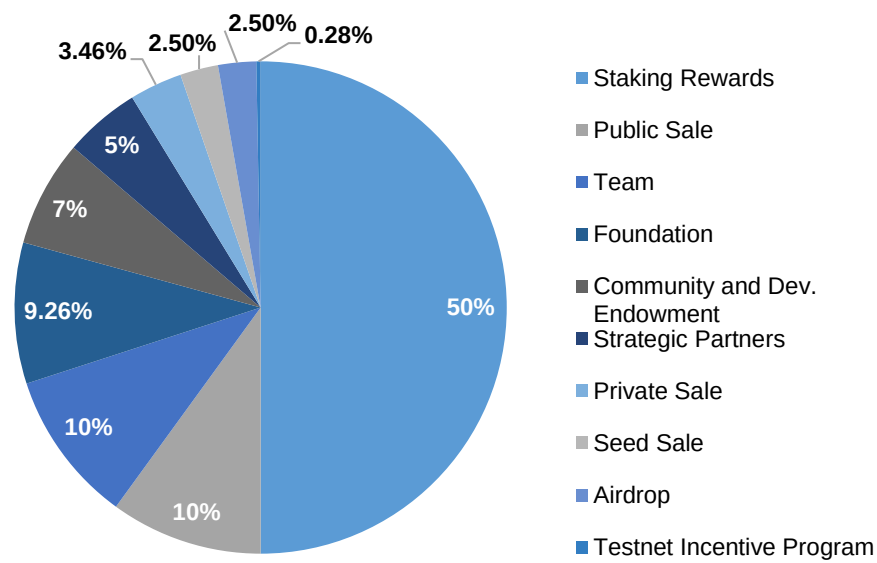
AVAX Token Issuance Schedule

Projected supply from mainnet launch



AVAX Token Distribution

Allocations to various stakeholders



Source: FSInsight, Ava Labs

AVAX Incentivizes Token Lockup With High Staking Rewards

Staking reduces circulating supply & allows the network to function

- **Validators play a crucial role in processing transaction and securing the network. They must stake at least 2,000 AVAX to participate and receive token rewards based on proof-of-uptime and proof-of-correctness.**
- **AVAX also has governance properties and network nodes can vote on certain protocol parameters by staking. These may include specific protocol developments and the inflation/reward rate within pre-established boundaries.**

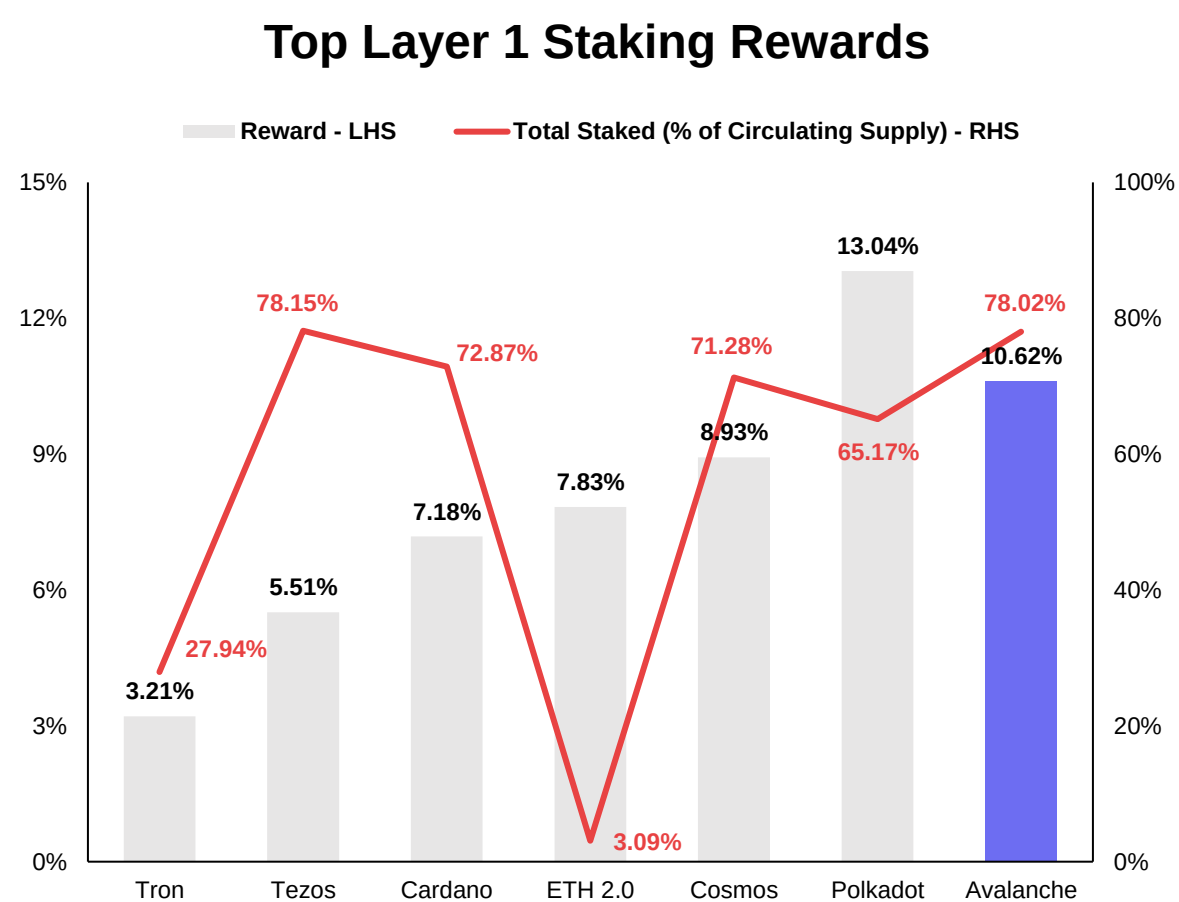
Figure: Competing Layer 1 Staking Rewards and % of Supply Staked
Date: 3/31/2021

Total AVAX Staked / Value Staked ($USD)
297,369,844 / $8.37B

Staking Rewards (annualized)
10.62%

Staking Ratio (% of Supply)
78.02%

Total Active Validators / Delegators
890 / 6,302



Source: FSInsight, Avascan, Ava Explorer, StakingRewards

Building Ecosystem In Fastest Growing Crypto Segments

New partnerships support efforts for rapid adoption and growth

- **Beyond DeFi and Web 3.0, the Avalanche Foundation and Ava Labs are building out tooling and infrastructure to support a wide range of crypto products and use cases.**
- **Integrations with the leading crypto exchanges, wallets, stablecoins, and asset tokenization projects could fast track adoption and incentivize users to engage with the Avalanche network.**

Figure: Avalanche Ecosystem Partnerships & Projects

DeFi

hummingbot, FRONTIER, YIELD, Arrow DFMs, bZx, Reef, UNION, PROSPER

Exchanges

BINANCE, FTX, OKCOIN, OKEX, BITFINEX, Huobi, VOYAGER

Wallets

Ledger, METAMASK, AVALANCHE WALLET, COIN98 WALLET

NFT / Gaming / DEX

Polyient Games, sushiswap, DEXTER, YETI SWAP, Pangolin, Complus Network, Jelly Swap

Stablecoins

BiLira, e-Money, trusttoken

Integrations / Infrastructure

Republic, aleph.im, SECURITIZE, bloq, ALLNODES, Magic, Ankr, hashQuark, AVASCAN

Source: FSInsight, Ava Labs

Avalanche-X Grant Program Bootstraps Ecosystem Growth

Inviting developers to build critical infrastructure and products

- **The grant program is designed to kickstart growth and provide resources for developers and other participants to grow the Avalanche ecosystem. 7% of the total token supply (~50 million AVAX) will be allocated to the Community & Developer Endowment, of which the Avalanche-X program is part.**
- **To date, the program has funded critical infrastructure and applications including block explorers, payment and trading products, an educational platform, and node and wallet infrastructure, amongst other tooling.**

Figure: Avalanche-X Grant Program

Eligibility

Ava Labs will consider all applications, whether the applicant is new to the space or a seasoned developer, as long as they want to help grow the Avalanche ecosystem.

Project Requirements

All projects must contribute to the growth of Avalanche, as a fully open-source and decentralized ecosystem.

Grant Size

The grant amount depends on the complexity and scope of the project. The maximum limit is $250,000 unless otherwise stated for specific grants.

Cohort 1

May 19, 2020

Applications	Blockchain Academy Chile, NoTex
Financial Products	Protocoh, Jelly Swap
Tooling / Infra	Avado, Figment, Kurtosis

Cohort 2

October 6, 2020

User Services	ablock, Magic
Block Explorers	VScout, Avascan
Tooling / Infra	Tesseract, Halborn

Source: FSInsight, Ava Labs

Appendix - Comparison of network stats, category descriptions and sources

	Scalability (TPS)	# of Validators (Consensus Nodes)	Security (Settlement Sec)	Transaction Fees ($)
Avalanche	4,500	890	2	$0.04
Bitcoin	7	14	3600	$11.07
Ethereum	15	56	120	$8.70
Algorand	1,000	100	22	$0.001
Cosmos	1,000	125	7	$0.04
Polkadot	1,000	297	60	$0.00003
Ripple	1,500	40	4	$0.001
Stellar Lumens	1,000	40	5	$0.004

	Description	Sources
Scalability	Throughput (transactions per second) capacity of the network	Ava Labs https://ripple.com/xrp/ https://www.theblockcrypto.com/linked/77349/centres-usdc-coin-is-now-supported-by-algorand-in-addition-to-ethereum
Consensus Nodes	Number of nodes/miner entities primary affecting technical network consensus (issuing ledger changes) in the last 24 hours	https://avascan.info/staking/validators https://polkadot.subscan.io/validator https://www.etherchain.org/charts/topMiners https://www.blockchain.com/charts/pools https://stellarbeat.io/
Finality	Number of seconds before a transaction is expected to be considered secure against double spend attempts based on historical precedent of reversed transactions	Ava Labs https://ripple.com/xrp/ https://investorplace.com/2021/01/stellar-lumens-should-increase-in-value/
Transaction Fees	Average transaction fee on the network	https://polkadot.subscan.io/tools/charts https://ethgasstation.info/ https://bitinfocharts.com/comparison/bitcoin-transactionfees.html https://atom.tokenview.com/en/charts

Source: FSInsight, Ava Labs, Avascan, Ethernodes, Bitnodes, Subscan, Ripple, TheBlock

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Positive (+): The analyst expects the performance of his industry/sector coverage universe over the next 6-18 months to be attractive vs. the relevant broad market benchmark, being the S&P 500 for North America.

Neutral (N): The analyst expects the performance of his or her industry/sector coverage universe over the next 6-18 months to be in line with the relevant broad market benchmark, being the S&P 500 for North America.

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