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DIGITAL ASSET CONSULTING

Fundstrat
150 East 52nd St., 3rd Floor
New York, NY 10022

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Avalanche (AVAX)

Digital Assets Research

David Grider, CFAAC
212-293-7144 | @David_Grid
David.Grider@fundstrat.com

Sean Farrell
212-293-7135 | @SeanMFarrell
Sean.Farrell@fundstrat.com

AVALANCHE TL;DR

- Web 3.0 next–gen crypto internet application platform
- Novel tech approach targeting decentralized applications that require scale, security & speed
- Ecosystem of DeFi & Web 3.0 dApps seeing rapid growth
- **Risks:** Competing networks, tech challenges, adoption

Key Statistics

Token Price	$15.15
Range (52W)	$2.79 / $59.94
Market Cap	$2.6B
Circulating Supply	172.4M
Volume (24H)	$105.4M

Source: Coinbase (6/17/2021)

Avalanche: A Novel dApp Protocol for the Internet of Finance

Avalanche (AVAX) is a next-generation smart contracts platform that's structured as a publicly-owned crypto network protocol. Ava Labs supports the Avalanche protocol in its mission to build a high-performing, secure, and energy-efficient cryptonetwork for decentralized applications ("dApps"), novel financial primitives, and new interoperable blockchains. Using its innovative technology approach, the Avalanche protocol is creating a new 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.

- **Next wave of the Web.** Crypto networks like Avalanche are next-generation internet application platforms. The internet continues to evolve. Web 1.0 PC networks connected us online and gave us 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 community-owned protocols like Avalanche that give users back control of their data and privacy with natively embedded DeFi applications (Slide 6).

- **Third era of crypto innovation.** Early crypto networks enabled globally decentralized digital money. The second wave of platforms built upon this core technology to enable the creation of programmable dApps, enabling DeFi products, NFTs, and other yield-generating apps. However, due to high transaction fees and slow processing speed, these platforms have served a limited set of use cases. A third wave of cryptonetworks aims to support a wider range of dApps on cheaper and faster blockchains, and usher in a multi-chain world in which there exist several ecosystems that compete on speed, security, and customization (Slide 7).

- **Novel technology architecture.** Avalanche leverages its novel consensus mechanism and unique architecture to deliver a fast and scalable solution. Avalanche is a proof-of-stake ("PoS") network that uses a probabilistic consensus to validate transactions in a secure manner without sacrificing throughput and scalability (Slide 10). Avalanche's unique multi-chain framework enables Avalanche to become a platform for blockchains, with separate "subnets" serving very different user needs. This structure allows for core functions native to different subnets to interoperate seamlessly, without performance degradation as witnessed in networks that pile all activity onto one chain (Slide 11).

- **Competitive network performance.** Base-layer distributed network technology protocols seeking to host a wide range of applications and build a robust digital economy are aiming to deliver an ideal mix of decentralization, security, and scalability with low transaction fees. Avalanche's mainnet offers a transaction settlement layer with characteristics that are highly competitive with the leading proof of work and proof of stake crypto networks across various metrics (Slide 18).

- **Rapid early adoption is promising.** Avalanche's features have made the platform ideal for many third-party developers who are rapidly deploying new DeFi products on the Avalanche C-Chain. dApps already span decentralized exchanges, liquidity mining, lending, synthetic assets, and more. As a result, the network is seeing rapid growth of assets, applications, and custom implementations on subnets tailored to enterprises and institutions being launched in a short period of time since mainnet went live (Slide 22). This growing usage has been driving a steady rise in transaction fee revenue to the network, which helps underpin the tokens' economic value (Slide 27).

- **What are the risks?** Failure to execute on its product roadmap, slow distribution of network governance, slowing of developer interest, dApps don't gain material demand, competing crypto networks take share, usage and transaction fee revenue doesn't materialize, crypto volatility, regulatory risks (Slide 30).

Bottom line: Avalanche offers a completely new method of consensus and a level of customization that other existing layer 1 protocols don't currently provide. While the network is young, its level of adoption is a promising indicator that developers are taking notice of its benefits and are hoping that Avalanche can deliver on its promise of a scalable and interoperable digital economy.

Project Overview

Headquarters:	Singapore
Founded:	2018

Summary

- **Avalanche** is an open-source platform for launching decentralized applications and enterprise blockchain deployments in one interoperable, highly scalable ecosystem.
- **Ava Labs** is a New York-based technology company supporting the development of the Avalanche consensus protocol and platform. The company was founded in 2018.

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 project is well capitalized, having **raised $54 million over two token sales**
- Ava Labs has raised **$6 million in a Series A financing round with** backing from leading investment firms including **a16z, Initialized Capital & Polychain Capital**

Ava Labs Spun Out Of Cornell And IC3, Tech & Finance Expertise
## A diverse team bringing a scientific mindset to the blockchain

Figure: Key Team Members

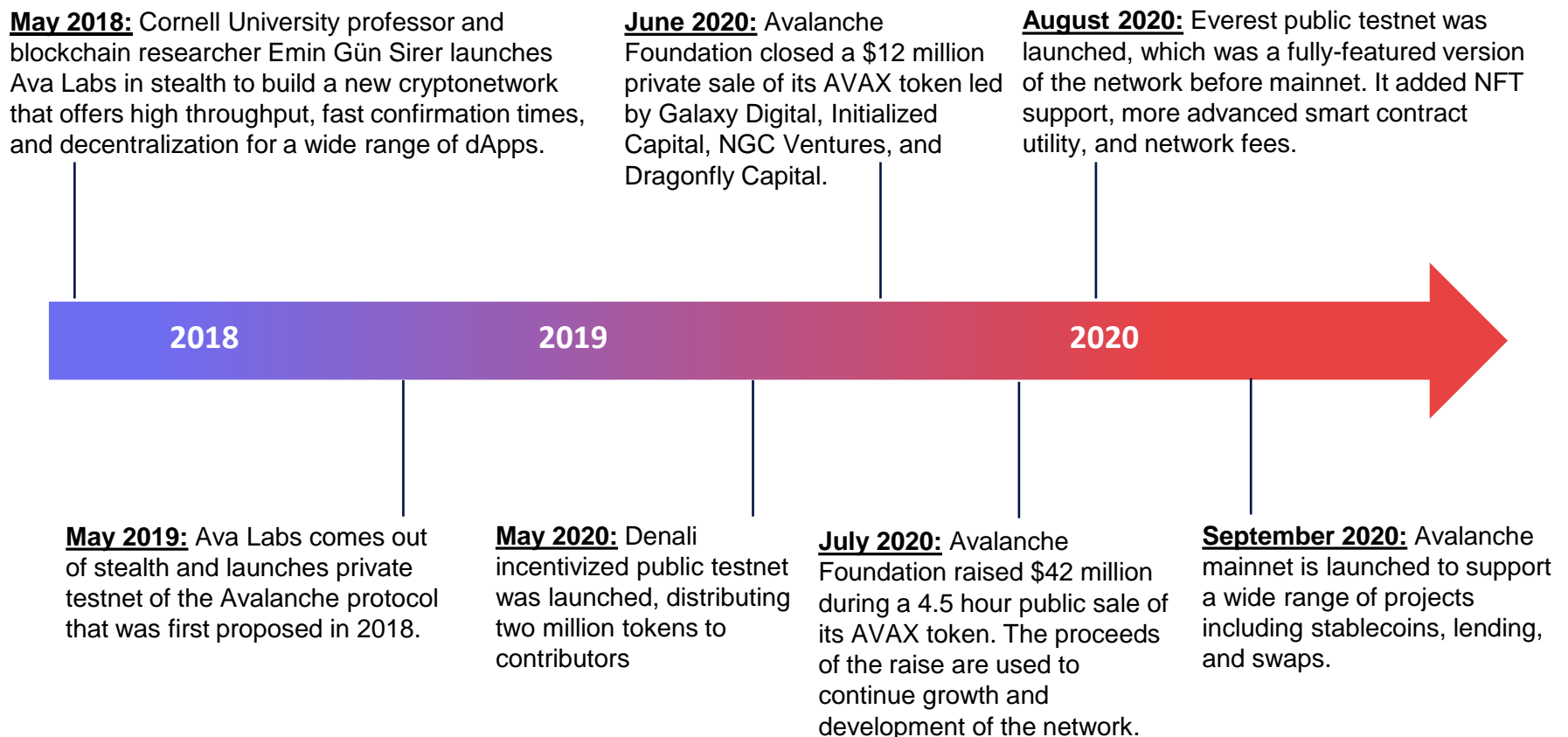| Dr. Emin Gün Sirer	John Wu	Kevin Sekniqi	Ted Yin	Lee Schneider
CEO & Founder	*President*	*COO*	*Chief Protocol Architect*	*General Counsel*
• Associate Professor (on leave) from Cornell University • Creator of first PoW based currency Karma, Bitcoin-NG, Bitcoin Covenants • Author of seminal Bitcoin 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	• Former General Counsel at Block.One, where he played a key role in that company's token sale • Former Counsel at Debevoise & Plimpton • Co-founded Global Blockchain Convergence
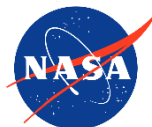
Ava Labs History And Avalanche Protocol Development
In its short history, Avalanche achieved significant historic milestones

- **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, the project has raised $60 million, launched three testnets and the public mainnet of the protocol.**

Figure: Avalanche Historic Milestones

May 2018: Cornell University professor and blockchain researcher Emin Gün Sirer launches Ava Labs in stealth to build a new cryptonetwork that offers high throughput, fast confirmation times, and decentralization for a wide range of dApps.

June 2020: Avalanche Foundation closed a $12 million private sale of its AVAX token led by Galaxy Digital, Initialized Capital, NGC Ventures, and Dragonfly Capital.

August 2020: Everest public testnet was launched, which was a fully-featured version of the network before mainnet. It added NFT support, more advanced smart contract utility, and network fees.

2018　　**2019**　　**2020**

May 2019: Ava Labs comes out of stealth and launches private testnet of the Avalanche protocol that was first proposed in 2018.

May 2020: Denali incentivized public testnet was launched, distributing two million tokens to contributors

July 2020: Avalanche Foundation raised $42 million during a 4.5 hour public sale of its AVAX token. The proceeds of the raise are used to continue growth and development of the network.

September 2020: Avalanche mainnet is launched to support a wide range of projects including stablecoins, lending, and swaps.
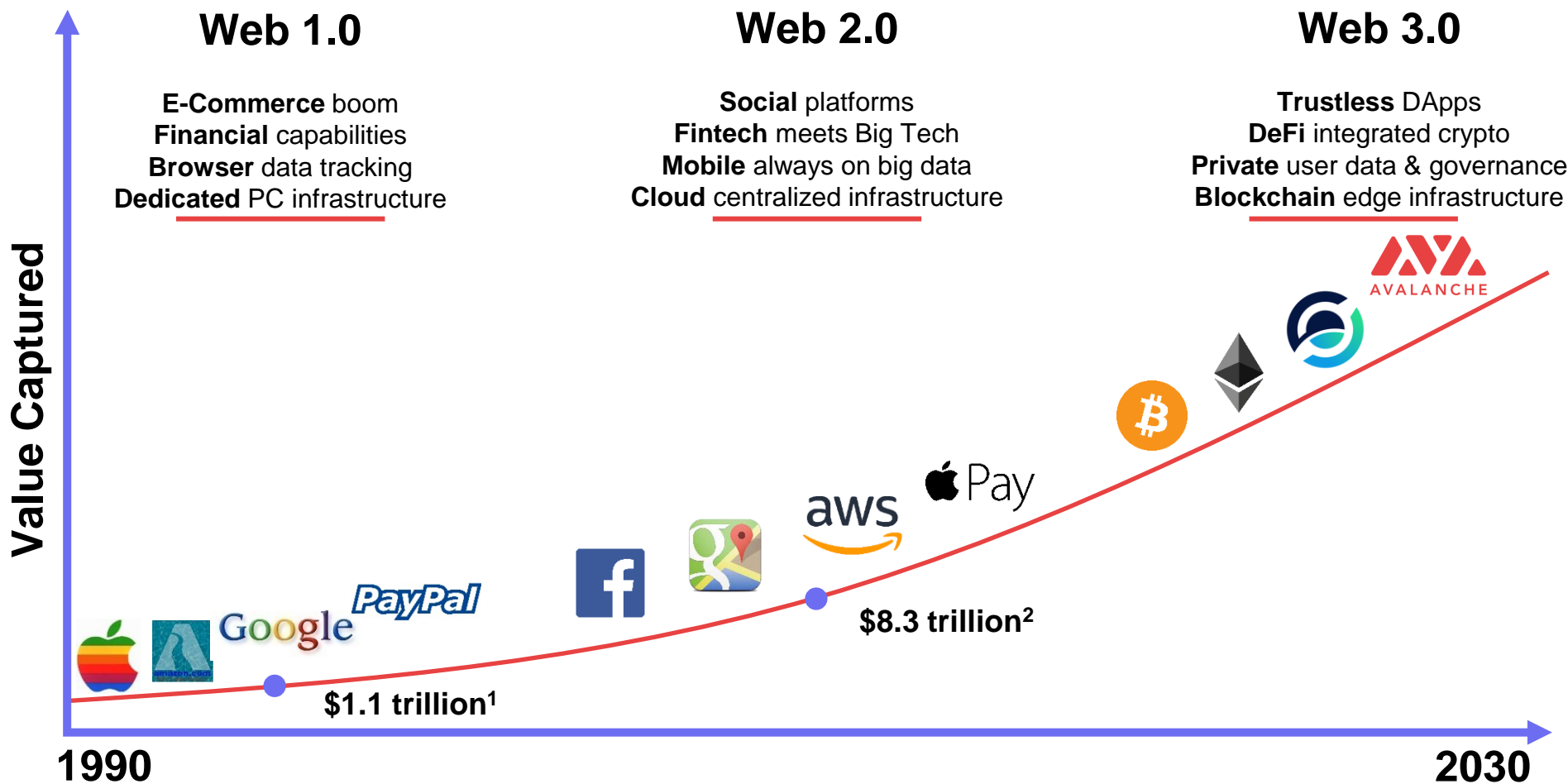
Cryptonetworks Are Platforms For The Next Era Of The Web
Web 3.0 promises to give users back control of their data & privacy

- 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

Web 1.0	Web 2.0	Web 3.0
E-Commerce boom	**Social** platforms	**Trustless** DApps
Financial capabilities	**Fintech** meets Big Tech	**DeFi** integrated crypto
Browser data tracking	**Mobile** always on big data	**Private** user data & governance
Dedicated PC infrastructure	**Cloud** centralized infrastructure	**Blockchain** edge infrastructure

Value Captured

$1.1 trillion[1]

$8.3 trillion[2]

1990

2030

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

Internet Native Economy

Internet Native Applications

Internet Native Money

**Low Fees & High Scalability
Protocol Interoperability
Fully Digital Economy**

Wave 3

**Open & Permission-less
Programmable dApps
Layer-2 DeFi Protocols**

Wave 2

**Global
Decentralized
Digital Money**

Wave 1
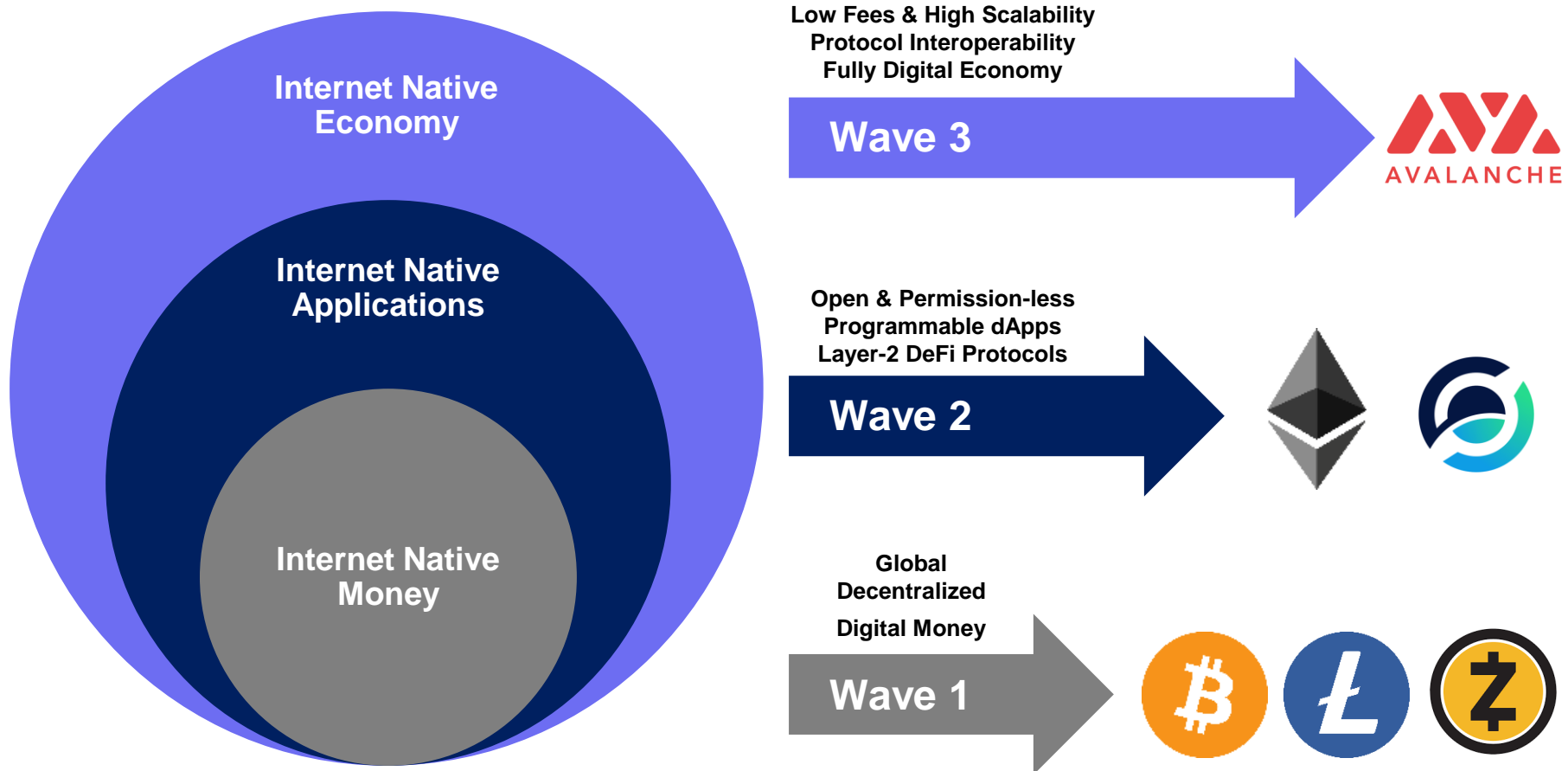
Avalanche May Offer A Solution To Network Congestion
Avalanche consensus is built to be fast, secure, and scalable

- **Avalanche consensus does not require proof-of-work (PoW) but instead, uses proof-of-stake (PoS). Avalanche PoS is designed to offer strong probabilistic safety guarantees against adversarial actors without sacrificing throughput and scalability while being more energy efficient and green vs. PoW networks.**

Figure: Avalanche Consensus Overview
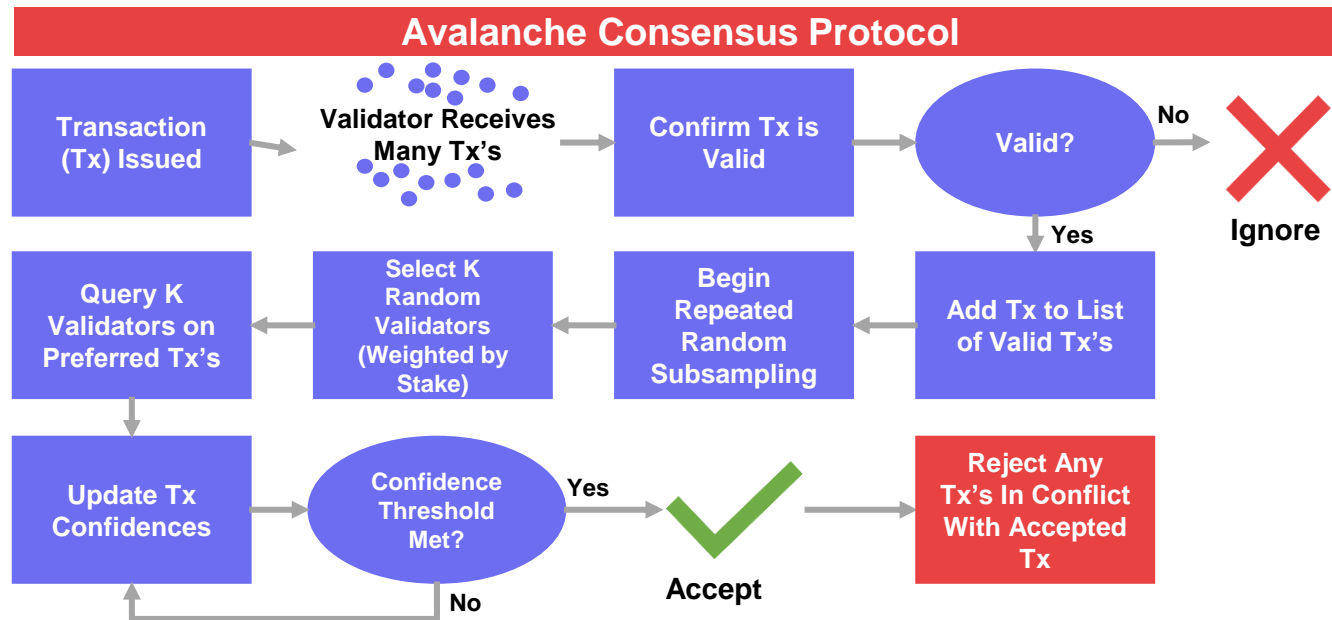
Avalanche Consensus Protocol

Avalanche offers a unique consensus protocol that combines classical consensus mechanisms with Nakamoto consensus methods to create an infrastructure layer that is both **secure** and **scalable**. In simple terms, the validator nodes on the main Avalanche network communicate their respective findings about the state of the network with each other to achieve a probabilistically-driven consensus. This dynamic facilitates transactions at speeds that are favorable compared to other layer 1 protocols.

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

Source: Fundstrat, Ava Labs, Avalanche Foundation, 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

Primary Avalanche Network

The Primary Network is a special subnet, and the members of all custom subnets must be a member of the Primary Network by staking at least 2,000 AVAX. The Primary Network validates the three built-in blockchains.

Exchange Chain (X)

The X-Chain is the default asset chain on Avalanche and enables the creation of new assets, exchanging between assets, and cross-subnet transfers.

Platform Chain (P)

The P-Chain is the metadata chain on Avalanche and coordinates validators, keeps track of active subnets, and allows for the creation of new subnets.

Contracts Chain (C)

The Contract Chain is the default smart contract chain on Avalanche and enables the creation of any Ethereum-compatible smart contracts.

High-speed Payments Network

NYC Commercial Property

Long Term Corporate Bond

Special Metal Proxy Token

Validation

Staking

Subnets

DAPP

DAPP

DAPP

ERC20

ERC20

ERC20

NFT

NFT

NFT

X-Chain use cases can also occur on C-Chain

Avalanche-Ethereum Bridge (AEB) Overview
The AEB brings interoperability to the network

- **The goal of the AEB is to increase liquidity on the Avalanche platform and increase portability of projects across disparate blockchain ecosystems.**

- **Since the AEB was launched, the price of AVAX has performed well, commensurate with the post-bridge-integration performance of several other tokens.**

Figure: Avalanche-Ethereum Bridge Overview

"Bridges will play an increasingly important role in the evolution of DeFi, and the emergence of the first wave of DeFi applications and assets that function across chains….With this bridge so close to launch, we'll soon see many new and familiar assets moving between these two ecosystems, providing users with more choice and opportunities for yield." **– Kevin Sekniqi, COO of Ava Labs.**
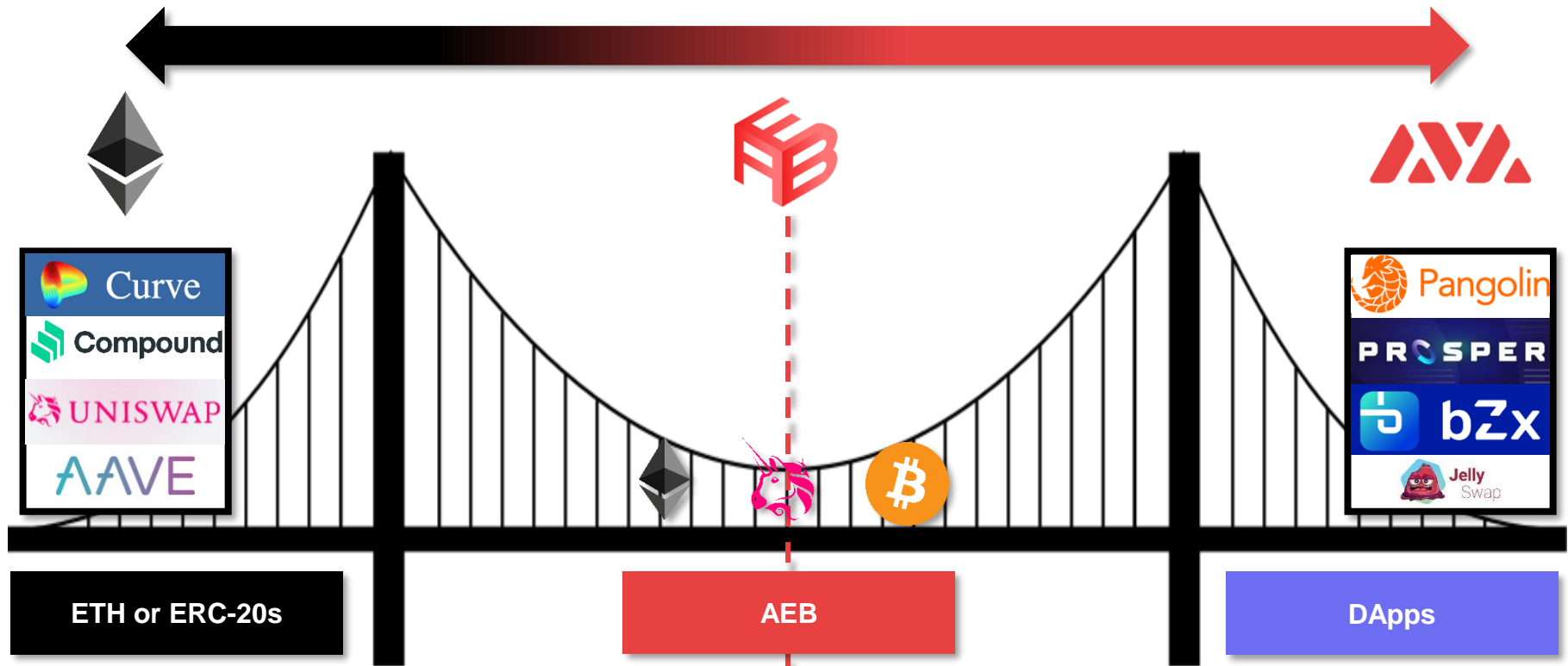
ETH or ERC-20s

AEB

DApps

Avalanche-Ethereum Bridge (AEB) Overview
The AEB brings interoperability to the network

- **The AEB offers users of decentralized apps an alternative to the Ethereum blockchain using ChainSafe's ChainBridge technology. Users can transfer ERC-20 and ERC-721 tokens from the Avalanche C-Chain to Ethereum, and back, creating an open channel between the two chains.**

Figure: Avalanche-Ethereum Bridge Overview

The Bridge is secured by Avalanche partners: **Protofire, Hasquark, POA Network, and Avascan.** Relayers approve and reject transfers based on a vote. If the vote passes a majority, the token transfer is approved.

Steps to Transfer Assets From One Blockchain to Another:

1. An event is emitted from a watched contract on the source chain

2. A handler function parses the event into a general bridge message, including destination chain ID

3. The message is passed to the router which forward it to the destination chain's writer

4. The writer parses the message into a valid transaction and submits it to the chain

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: 5/16/2020 – 5/16/2021

Average Transaction Fee
7-day Rolling Average

Avg Txn Fee (USD)   Avg Txn Fee (ETH)
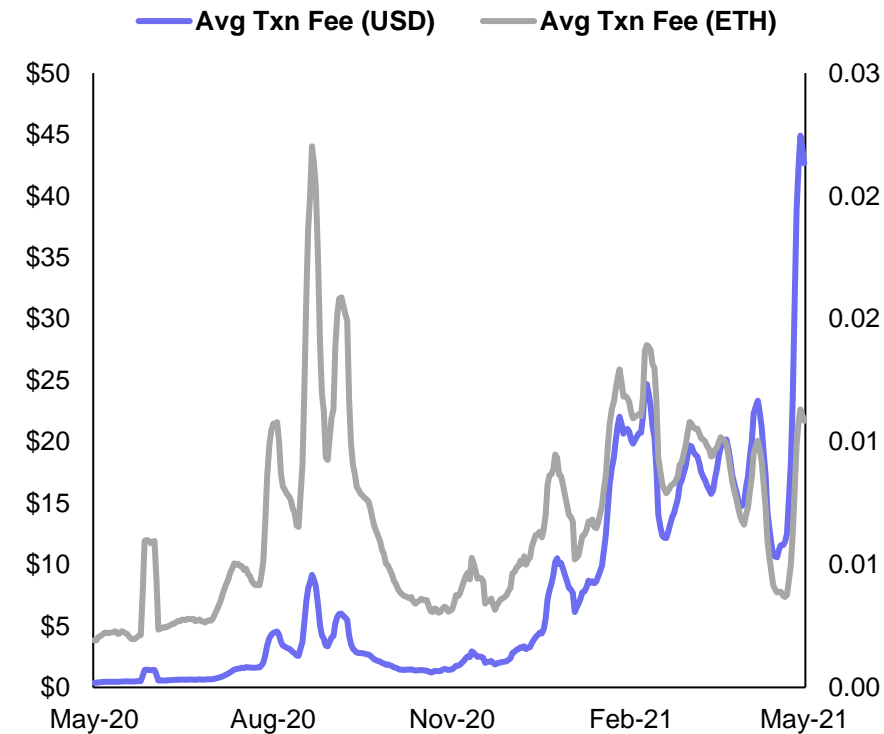
Median Transfer Value
7-day Rolling Average

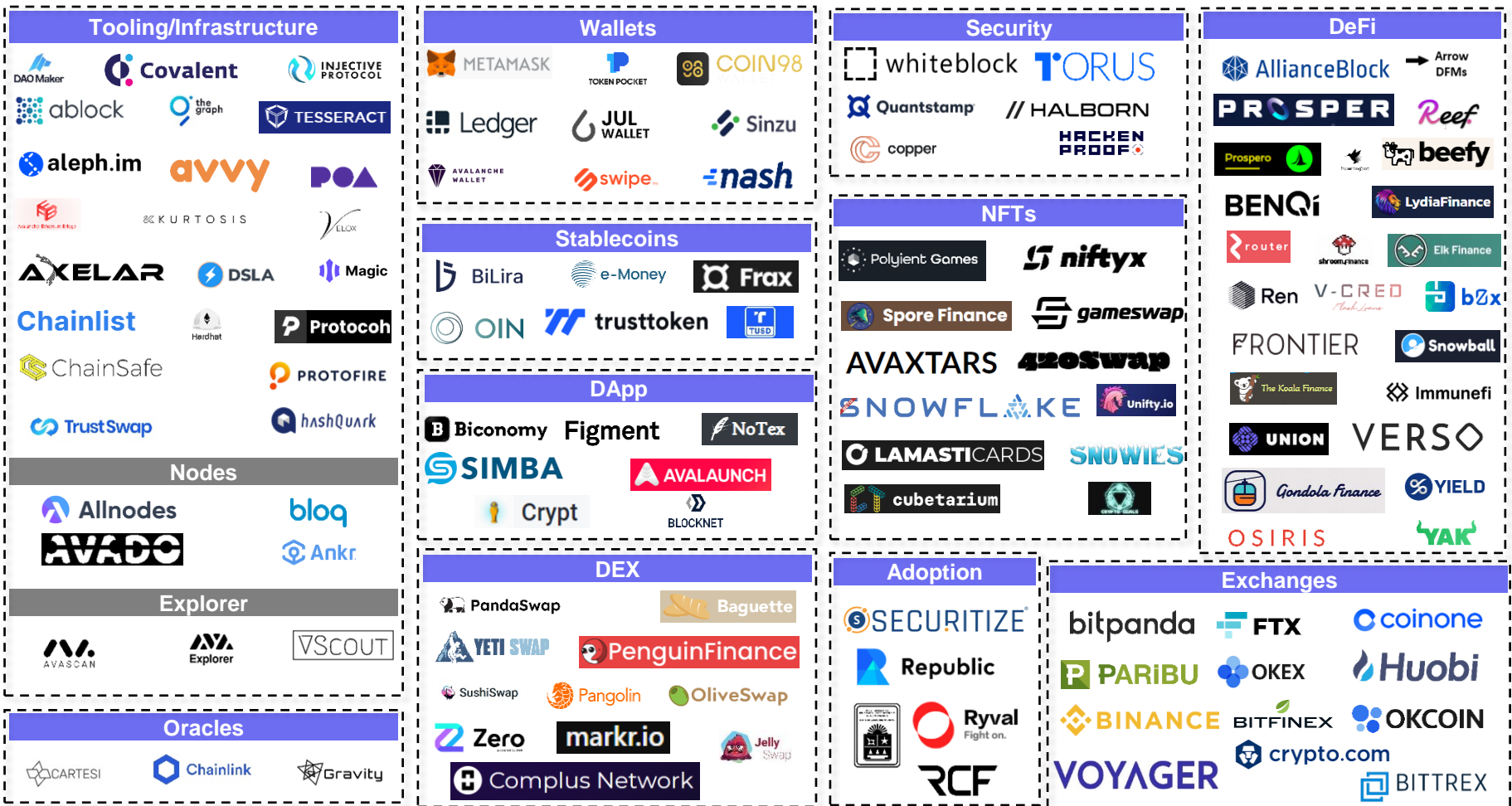Median Txn Size (USD)   Median Txn Size (ETH)
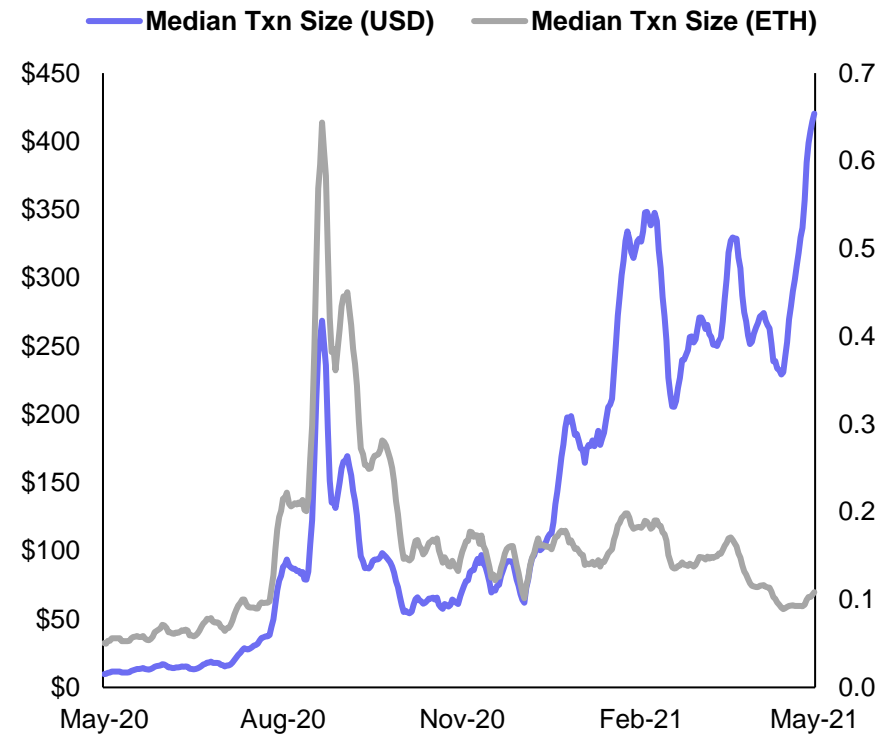
Source: Fundstrat, CoinMetrics

Building Ecosystem In Fastest Growing Crypto Segments
New partnerships support efforts for rapid adoption and growth

- **Since the platform's inception, the Avalanche ecosystem has grown at a rapid pace. In all, 168 projects have been developed on, or integrated with, Avalanche in the past 7 months. The Avalanche Foundation continues to invite applicants developing DeFi products to participate in its grant program.**

- **In May 2021, A&T Capital, OKEx Blockdream Ventures, Blockwater, IOSG, Kernel Ventures, SNZ, SevenX Ventures, Tripara, and NGC Ventures announced a $20 million independent fund named AVATAR, launched with the mission to grow Avalanche's presence in DeFi, NFTs, infrastructure, and tooling.**

Figure: Avalanche Ecosystem Historical Growth & Future Growth Drivers

Open Grants

- Decentralized Exchange
- Stablecoin
- Lending
- Synthetics & Derivatives
- Volatility Index (VIX)

AVATAR
$20M Ecosystem Venture Fund

Avalanche Ecosystem Growth

Legend: Total Projects, Projects Added
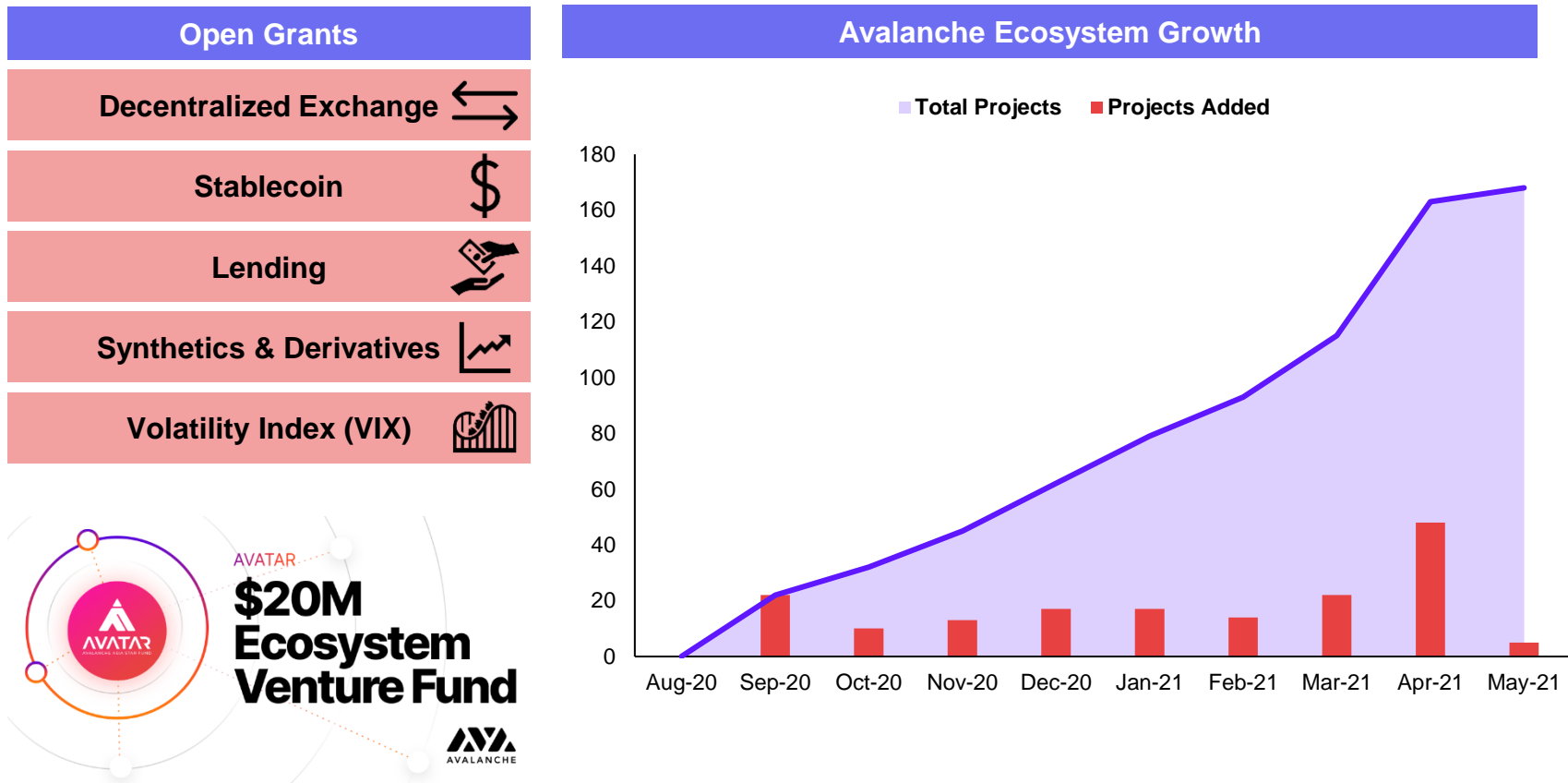
Avalanche-X Grant Program Bootstraps Ecosystem Growth
Inviting developers to build critical infrastructure and products

- **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
The Avalanche Foundation 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

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 (As of 5/14/2021)

Polyient Games: Decentralized NFT Exchange for Avalanche
A non-custodial DEX with NFT capabilities

Figure: Polyient Games Overview

Project Overview

Project:	Polyient Games
Website:	polyient.games
Company:	Polyient, Inc.
Token:	PGT
Primary Purpose:	Native Governance Token
Price:	$173.98
52 Wk Range (High/Low):	$74.09 / $2,087.67
Market Cap:	$3.5M
Founder & CEO:	Brad Robertson
Industry Segment:	Decentralized Exchange, NFTs
Project Description:	Polyient Games, the industry's first investment firm focused on non-fungible tokens (NFTs) and blockchain gaming, has partnered with Ava Labs to build a dedicated NFT decentralized exchange (DEX) on Avalanche

Project Features

Polyient Games Marketplace

The Polyient Games DEX will be featured in the Polyient Games Marketplace, which features unique offerings ranging from exclusive NFT auctions and a peer-to-peer NFT exchange system, as well as more liquid NFT trading products.

Token

The DEX is powered by a utility token (PGT) representing a 1:1000 fraction of PGFKs, the membership and rewards NFT for the Polyient Games Ecosystem. PGT functions as a transactional unit and will act as the main trading pair for all fungible tokens on the Polyient Games DEX.

Initial Litigation Offerings: Tokenizing a New Asset Class
Avalanche is bringing an emerging asset class to the blockchain

Figure: ILO Overview

Project Overview		Project Features

Project Overview

Project: Initial Litigation Offerings

Website: ryval.market

Company: Ryval Market, Republic, Roche Cyrulnik Freedman, LLP

Founded: 2020

Industry Segment: Securitization

Project Description: Ava Labs, Roche Cyrulnik Freedman LLP and Republic Advisory Services are bringing the Initial Litigation Offering ("ILO") token into existence. Purchasers of the ILO token will fund civil cases in which a claimant requires additional resources, and the token holder will retain a legal claim on any potential financial recovery from the resulting decision of the legal proceedings. The ILO tokens will be issued on Avalanche.

Project Features

Industry
Avalanche is bringing the estimated $10.0 billion litigation financing industry to the blockchain. Litigation financing arises from the need for certain plaintiffs in civil cases to obtain economic resources in a civil case.

How it Works
Avalanche will offer tokens to the public to raise capital for a plaintiff. The plaintiff will use this capital to litigate their civil case. Each token will represent a claim on any monetary remedy once the case has been fully litigated.

First Case
The first ILO scheduled to take place on Avalanche will be Apothio, LLC vs, the Kern County Sheriff's Office ("KSCO"). The plaintiff in the case, Apothio, LLC, is a California-based industrial hemp research, development, and commercialization company focused on hemp derivatives such as CBD. Apothio alleges that KSCO deliberately and wrongfully destroyed 500 acres of the plaintiff's hemp farm, estimated to be valued at over $1.0 billion. The ILO is expected to be issued in 2021 and will allow investors to participate in any windfall from a victory in the case.

Source: Fundstrat, Ava Labs, Avalanche Foundation, Avax Projects

Relevant Performance Metrics
Capital-staked and fees-generated show early promise

- **Since launching its Mainnet in September 2020, Avalanche has experienced rapid adoption and user growth as evidenced by the daily fees transacted on the network.**

Figure: Performance Metrics Overview (As of 5/15/2021)

Assessing Performance

Capital Staked
In any proof-of-stake environment, it is important to assess the amount of capital invested on the platform in the form of staked assets. Per the statistics displayed on slide 18, the amount of Avalanche staked as a percent of total market capitalization is greater than any other competing Layer 1 protocol.

Fees Generated
The amount of aggregate daily fees generated on the platform is #4 among all layer 1 protocols (See charts to the right). This indicates organically growing demand among developers and users and signifies demand for block space, a finite resource.

Projects
As shown on slide 22, there are already 168 projects built on/integrated with the Avalanche platform with new partnerships being announced daily.

Aggregate Daily Tx Fees
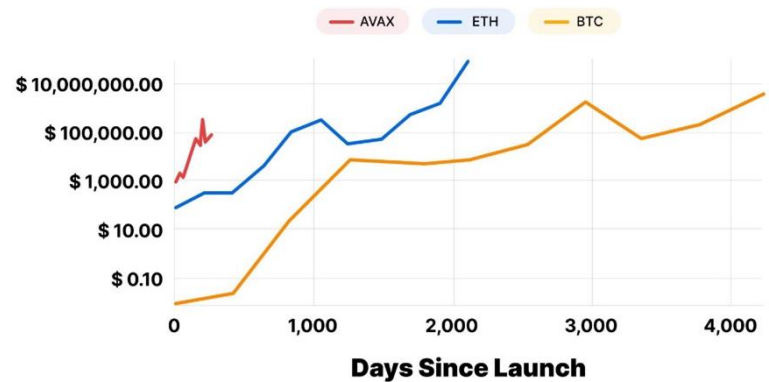
In comparing early network usage of the top Layer 1 Protocols, AVAX outpaces both BTC and ETH

Name		1 Day Fees	7 Day Avg. Fees
1.	Ethereum	$60,761,293.14	$70,674,003.32
2.	Bitcoin	$3,532,286.03	$4,700,515.34
3.	Dogecoin	$73,450.45	$119,115.53
4.	Avalanche	$46,146.10	$52,751.29
5.	Cardano	$26,558.51	$19,405.81

Only 7 months old, Avalanche is the fourth highest usage Layer-1 by aggregate daily fees.

Source: Fundstrat, Ava Labs, Avalanche Foundation, Cryptofees.info

Disclosures