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Hedera (HBAR)

Digital Assets Research

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- Enterprise-grade distributed ledger technology network
- Patented Hashgraph technology is energy efficient and provides high throughput
- Early use cases show meaningful impact and traction
- **Risks:** Adoption, centralization, token distribution

Key Statistics

Token Price	$0.23
Range (52W)	$0.03 / $0.57
Market Cap	$4.2B
Circulating Supply	18.1B
Volume (24H)	$70.4M

Source: Coinbase (12/14/2021)

Hedera: Emerging dApp Ecosystem Powered By Next-Gen Consensus

Hedera (HBAR) is a public Distributed Ledger Technology (DLT) network designed for the creation of secure decentralized applications (dApps) with near real-time consensus. Due to its enterprise focus, the network was constructed with an emphasis on regulatory compliance across jurisdictions and includes tools that allow dApps to run KYC/AML checks and identity verification.

- **Scalable transaction fee design.** Hedera leverages its native cryptocurrency, HBAR, to fuel and secure the network while incentivizing nodes to contribute computational resources. Transaction fees are fixed depending on the type of transaction but average $0.0001 and are paid in HBAR tokens (Slide 2). The total transaction fee comprises a node fee that compensates the specific node that processes the transaction, a network fee that pays all participating nodes for consensus, and a service fee corresponding to the type of service. This fixed fee model makes the platform appealing as a scalable enterprise solution relative to other Layer-1 blockchains (Slide 5).

- **Built on Hashgraph technology.** The main distinction between Hedera and most other smart contract platforms is that it licenses Swirlds' patented Hashgraph technology. Hashgraph is more energy-efficient than its blockchain counterparts as there are no 'stale' blocks that miners waste energy on – each node adds a hash last created by itself and a second hash received from another node. This translates to a potential transaction bandwidth of 10,000 TPS and a 3-7 second finality competitive with other major Layer-1 blockchains (Slide 11).

- **Notable Governing Council additions.** Hedera has adopted a governing council framework that was modeled after Visa. Since its open access launch, Hedera has added 18 new members by invitation who vote on governance structures, proposed code updates, node policies, and processes. Some notable additions include Chainlink Labs, London School of Economics, and Boeing. As all members of the Hedera Governing Council have been invited to join as network operators, Hedera Council members are not only governing the network but also actively participating in it (Slide 6).

- **Material progress towards decentralization.** Hedera is currently a public network, allowing developers and users to create accounts, transact, and deploy decentralized applications. However, its Mainnet consensus nodes are permissioned and operated by Hedera Council members. As the security, stability, and incentives of Hedera matures, the network will transition from a public permissioned to a public permissionless model by first opening node operations to more permissioned ecosystem partners, then to any person or organization with sufficient compute capabilities. (Slide 8)

- **Early use cases show promise.** Hedera's enterprise focus has garnered adoption from Everyware, a solutions provider for real-time asset tracking and monitoring across different sectors. One of Everyware's most critical applications is tracking storage and transportation of temperature-sensitive COVID-19 vaccines for the United Kingdom's National Health Service. Other developers include Calaxy, a social media app created by NBA player Spencer Dinwiddie allowing creators to monetize content via their fan base, and GOMint, a digital content tokenization platform, which enables content creators to tokenize their digital content and monetize via partnerships with content platforms (Slide 13).

- **What are the risks?** Dollar-denominated fees may lack necessary incentives for early adopters, investors, and developers to migrate to the platform. Public permissioned model may fail to successfully transition to public permissionless model. Seats on the Hedera Governing Council may remain unfilled and iterative approach to token distribution may impact decentralization (Slide 19).

Bottom line: Hedera is still a permissioned network and has several vacant governing council seats. But it leverages a patented DLT technology to offer secure and near real-time consensus that potentially exceeds the performance of other existing DLT networks today. While there are challenges to overcome as a nascent network, early enterprise use cases offer a glimpse into the potential adoption once fully scaled and decentralized.

Introduction to Hedera
An enterprise-grade public network

Figure: Overview of the Hedera Hashgraph Platform

Description

Hedera Hashgraph is a public Distributed Ledger Technology (DLT) project which supports decentralized applications (dApps), primarily for enterprise usage. Hedera intends to be regulatory-compliant across jurisdictions and includes tools that allow dApps to do KYC/AML checks and identity verification

Key Features

- Unique architecture and consensus method allows for high transaction speeds (3-7 second finality) at scale
- Transaction fees are fixed at $0.0001 but paid in HBAR tokens, which allows for low fees regardless of platform size
- Serves as the interoperability layer between existing and emerging enterprise deployments
- Visa-style governing council with 39 term-limited members (25 added thus far include Google Cloud and IBM)

Services

Primary Network Services
- *Consensus service* – transparent, reliable timestamps, and transaction ordering to facilitate transactions between parties
- *Token service (HTS)* – configure, mint, and manage native fungible and non-fungible tokens
- *Smart contract service* – leverage HTS for fast, low-fee, and industry-standard Solidity smart contracts

Highlighted Capabilities
- *Scheduled Transactions* – enables parties to inexpensively and natively schedule and execute Hedera transactions
- *Multi-Signature Transactions* – execute transactions in real-time when multiple key signature requirements are met
- *Atomic Swaps* – swap native tokens using HTS with another (or with hbars) between two accounts
- *Account-level KYC* – HTS allows issuers to optionally require KYC for any accounts which receive or send their token
- *File Service* – distributes files to each node on the network
- *Smart Contract* – build and deploy Solidity smart contracts on the network

Value Proposition

- Enterprises can achieve cost savings on existing payments and other business processes
- Potential roadmap allows for new business model creation (such as micropayments)
- Enterprises can use Hedera to enhance supply chain efficiencies and access to trade finance

Source: Fundstrat, Hedera Hashgraph

Introduction to Hedera (Cont.)
An enterprise-grade public network

Figure: Overview of the Hedera Hashgraph Platform

Performance
- Compared to blockchains, a Hashgraph can process a larger quantity of transactions per second ("TPS")
- Able to achieve a TPS of 10,000 at Mainnet launch[1], and is expected to scale to even higher TPS capabilities to enable micropayments
- Currently, Hedera is a public network with permissioned nodes run by the Governing Council. However, the plan is for the network to grow to include permissionless nodes in the future
- Consensus latency is measured in seconds

Stability
- Technical and legal safeguards prevent developers from forking the network
- All services code, SDK code, mirror node code and integration code are open source with on-going community contribution. The platform code is open-review.
- Council controls any changes to code to better facilitate enterprise adoption of the network

Security
- Proof of Stake consensus process + Asynchronous Byzantine Fault Tolerance requiring a 2/3 vote to approve transactions
- Governing council will run nodes, staking both their own tokens (HBARs) as well as a proportionate amount of Hedera Hashgraph treasury HBARs. Nodes cast one vote per HBAR staked, giving the initially permissioned (governing council) nodes dominant share as the network ramps.
- The underlying hashgraph algorithm is natively DDoS resistant through its "leaderless" system, which is a unique security capability versus competition

Regulatory Compliance
- The Hedera platform includes tools that enable dApps the ability to comply with applicable regulations such as KYC and AML requirements (See previous slide)

Governance
- Initial term-limited governing council of 39 global leaders in various fields, of which 25 council members have already been publicly announced, with recent additions that include companies such as Chainlink Labs and Google Cloud
- Governance Council will elect Board of Managers to oversee operations
- The Council will enact permissioned governance to ensure adoption as the platform develops

Milestones
- In November 2021, Hedera surpassed 1.8 billion total transactions since inception
- Total accounts grew 515% YoY, reaching 590,000 as of November 2021
- The Governance Council has added 18 reputable firms since the open access launched with 7 founding members, growing to 25 companies in total as of November 2021
- Hedera Token Service (HTS) went live on Mainnet with over 60 initial ecosystem partners in February 2021

(1) We note that a TPS of 10,000 has only been achieved in controlled settings and has not, to our knowledge been observed in the Hedera network.
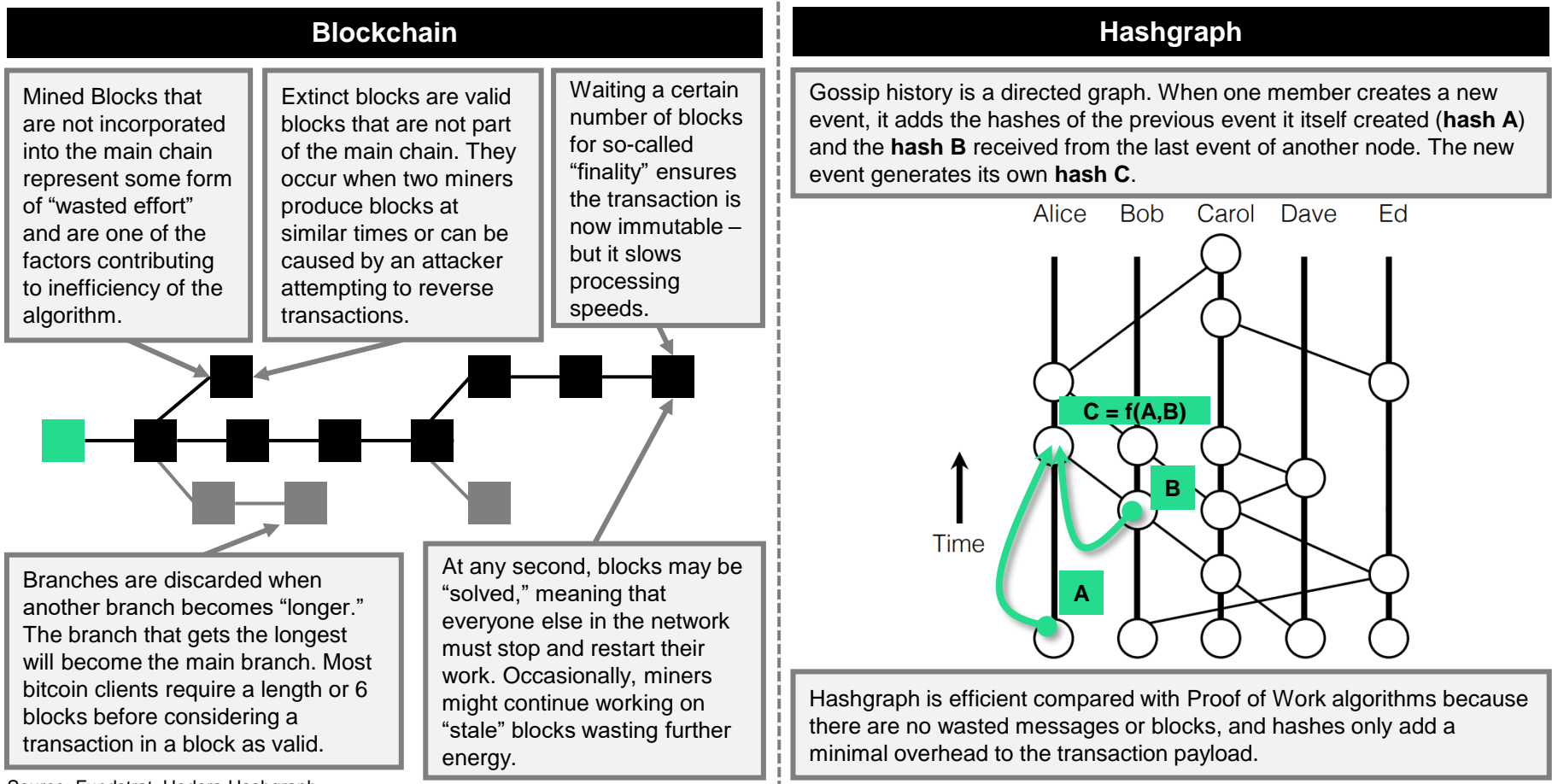Source: Fundstrat, Hedera Hashgraph

Hashgraph vs Blockchain Technology
Low processing overhead improves efficiency

- **Distributed consensus mechanisms allow for a group of users to agree on the order, details and value of a series of transactions in the absence of a single / centralized trusted entity.**

- **Blockchain is one way of achieving distributed consensus, using one of several algorithms such as Proof of Work (Bitcoin), Casper FFG (Ethereum), dBFT (Neo) and others. Iota's Tangle is an example of a non-blockchain distributed consensus mechanism; Hashgraph is another.**

Figure: A comparison of Hedera Hashgraph and Blockchain technology

Blockchain	Hashgraph

Mined Blocks that are not incorporated into the main chain represent some form of "wasted effort" and are one of the factors contributing to inefficiency of the algorithm.

Extinct blocks are valid blocks that are not part of the main chain. They occur when two miners produce blocks at similar times or can be caused by an attacker attempting to reverse transactions.

Waiting a certain number of blocks for so-called "finality" ensures the transaction is now immutable – but it slows processing speeds.

Gossip history is a directed graph. When one member creates a new event, it adds the hashes of the previous event it itself created (**hash A**) and the **hash B** received from the last event of another node. The new event generates its own **hash C**.

Branches are discarded when another branch becomes "longer." The branch that gets the longest will become the main branch. Most bitcoin clients require a length or 6 blocks before considering a transaction in a block as valid.

At any second, blocks may be "solved," meaning that everyone else in the network must stop and restart their work. Occasionally, miners might continue working on "stale" blocks wasting further energy.

Hashgraph is efficient compared with Proof of Work algorithms because there are no wasted messages or blocks, and hashes only add a minimal overhead to the transaction payload.

Alice Bob Carol Dave Ed

$C = f(A,B)$

B

A

Time
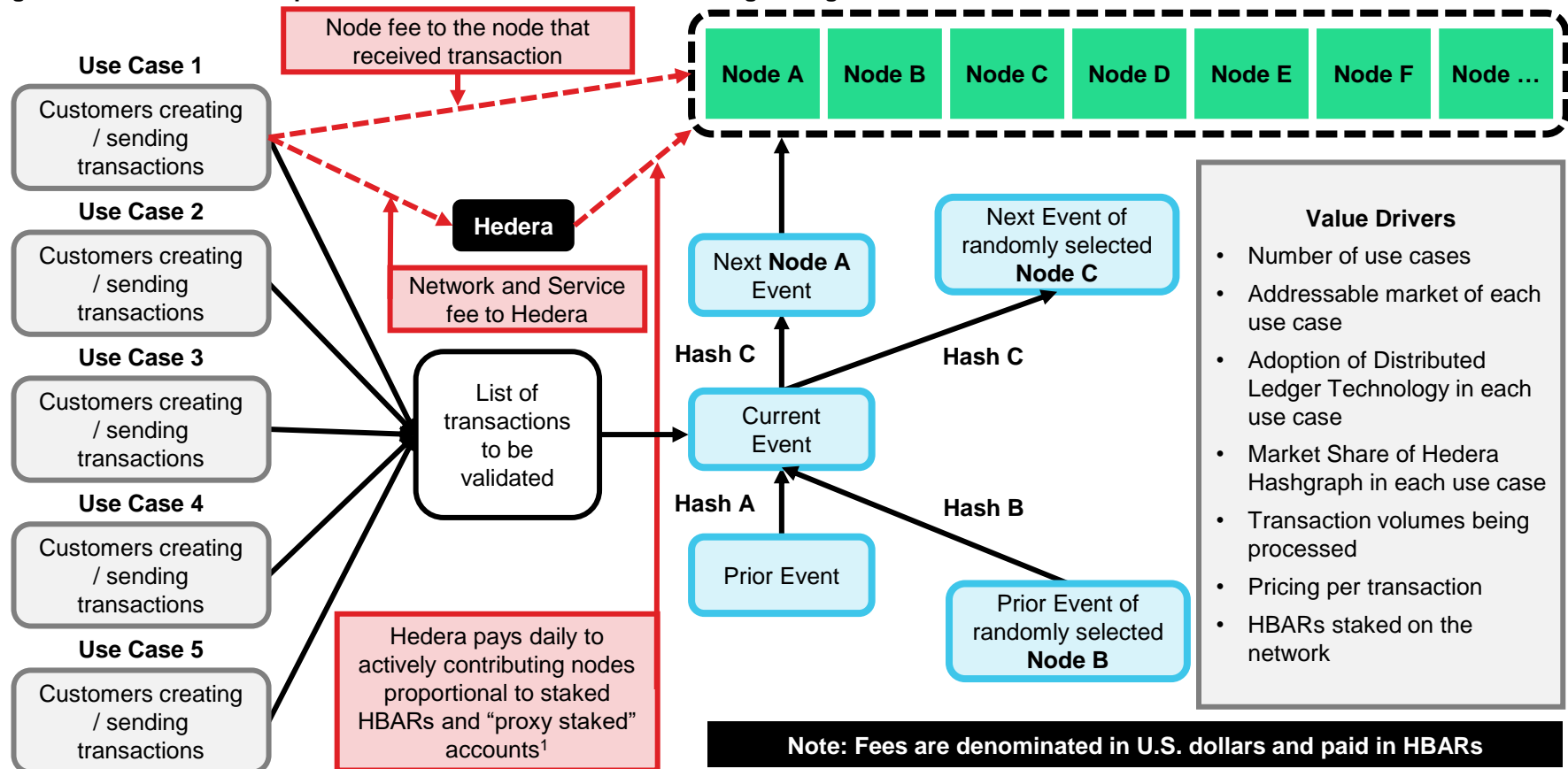
Source: Fundstrat, Hedera Hashgraph

Hedera Balances Low Fees with Strong Node Incentives
Transaction Fees are comprised of three separate parts

- **Node Fees are paid by users to compensate nodes for resources and energy expended and to incentivize nodes to service users. Initially, the Node Fee amount will be set by Hedera, but eventually will be determined by each node.**

- **After a transaction is submitted, the client pays a Network Fee to compensate all nodes for reaching consensus. Network Fees are paid into a Hedera account for Network Fees and Service Fees (the "Fee Deposit Account").**

- **Service Fees compensate the network for executing the transaction and the ongoing job of maintaining or supporting the transaction.**

Figure: Hedera network map and drivers that affect the value flowing through the network

Governing Council Modeled After Visa Could Aid Adoption
Since its Mainnet launch, Hedera has added 18 new members

- Membership is by invitation, and members vote on governance structures, proposed changes to code and node policies and processes.

- Members operate nodes to validate transactions and stake an equal share of the treasury tokens on behalf of Hedera as part of the governance and security framework.

- Council members typically would join the council to help contribute their technology (e.g. IBM) and participate in and help grow the ecosystem, where they see use cases that can either enable new business models or save cost. For example, legal firm DLA Piper could use contract law and real estate transactions stored and executed on the distributed ledger.

Figure: Hedera's Governance Council

New to council since last report

Governance Structure	Technical Controls	Legal Controls	Network Decisions
• Owners of Hedera Hashgraph LLC • 25 members (Fortune 500 and Web 3.0, Universities) • Up to 39 members, max of two consecutive 3-year terms • 11 unique industries in 6 different continents	• No forks of the Hedera code are permitted (patented) • The Council ensures simultaneous software upgrade across entire network	• Maintains patents & IP protections on code • No license is required to use network • The code is not open source, but it is open review	• Feature decisions ("what") • Product roadmap ("when") • Fee model • Node incentives • Manage treasury

Source: Fundstrat, Hedera Hashgraph

Governing Council Allocates Towards Ecosystem Initiatives
10.7 billion hbars approved in July governing council meeting

- **20% of total supply will be allocated across several key verticals, in order to compete with incentive structures of other Layer 1 networks focusing on retail and institutional adoption.**

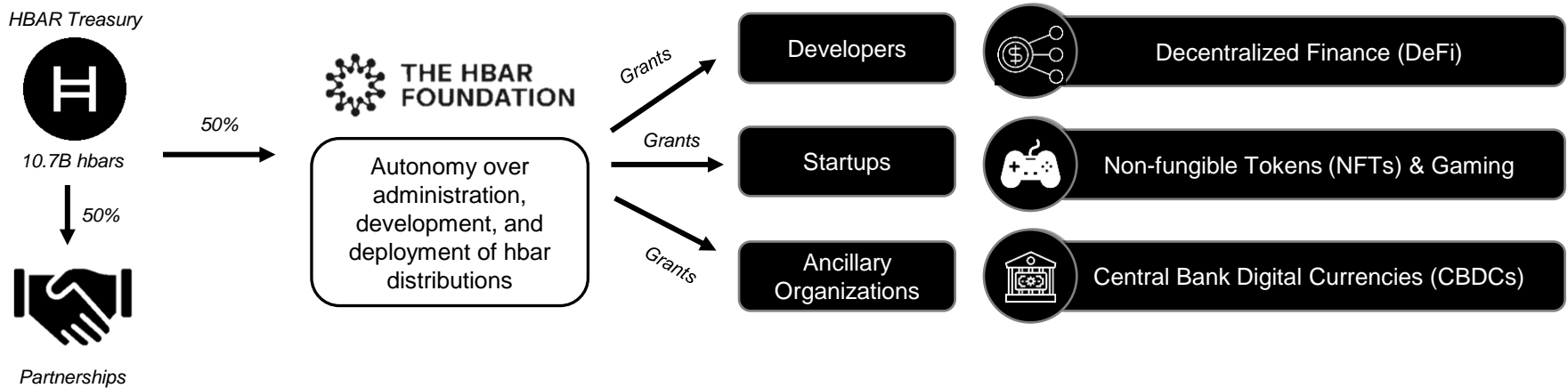**Figure: Ecosystem Development Initiatives**

HBAR Treasury

10.7B hbars

50% → THE HBAR FOUNDATION

Autonomy over administration, development, and deployment of hbar distributions

50% ↓ Partnerships

Grants → Developers → Decentralized Finance (DeFi)

Grants → Startups → Non-fungible Tokens (NFTs) & Gaming

Grants → Ancillary Organizations → Central Bank Digital Currencies (CBDCs)

Figure: HBAR Foundation Leadership

Shayne Higdon
CEO
• Previously Member of the Board at Code Notary, SVP of Enterprise Strategy and Operations at BMC Software
• Led 40+ M&A and corporate venture transactions across SaaS, multi-cloud, application performance, and identity management

"Our mission is to fund a future where entrepreneurs form digitally-native economies and ecosystems, controlling their own assets, identities, data, marketplaces, and more. We are excited to engage with and support organizations and teams that share this vision."
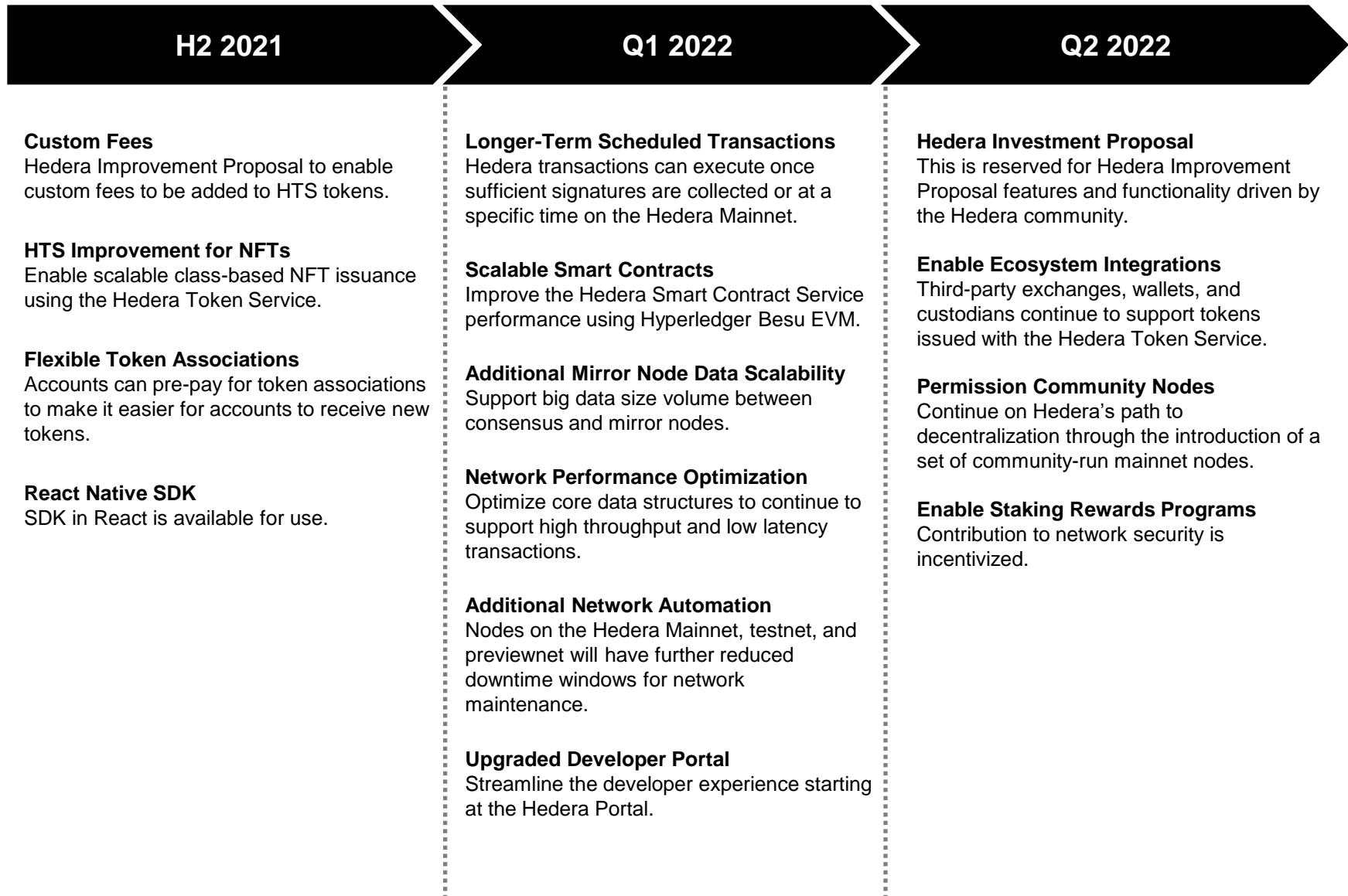
- Shayne Higdon

Source: Fundstrat, Hedera Hashgraph

Near-Term Development Roadmap
Continued optimization for performance and third-party integrations

Figure: Development Roadmap

H2 2021	Q1 2022	Q2 2022

H2 2021

Custom Fees
Hedera Improvement Proposal to enable custom fees to be added to HTS tokens.

HTS Improvement for NFTs
Enable scalable class-based NFT issuance using the Hedera Token Service.

Flexible Token Associations
Accounts can pre-pay for token associations to make it easier for accounts to receive new tokens.

React Native SDK
SDK in React is available for use.

Q1 2022

Longer-Term Scheduled Transactions
Hedera transactions can execute once sufficient signatures are collected or at a specific time on the Hedera Mainnet.

Scalable Smart Contracts
Improve the Hedera Smart Contract Service performance using Hyperledger Besu EVM.

Additional Mirror Node Data Scalability
Support big data size volume between consensus and mirror nodes.

Network Performance Optimization
Optimize core data structures to continue to support high throughput and low latency transactions.

Additional Network Automation
Nodes on the Hedera Mainnet, testnet, and previewnet will have further reduced downtime windows for network maintenance.

Upgraded Developer Portal
Streamline the developer experience starting at the Hedera Portal.

Q2 2022

Hedera Investment Proposal
This is reserved for Hedera Improvement Proposal features and functionality driven by the Hedera community.

Enable Ecosystem Integrations
Third-party exchanges, wallets, and custodians continue to support tokens issued with the Hedera Token Service.

Permission Community Nodes
Continue on Hedera's path to decentralization through the introduction of a set of community-run mainnet nodes.

Enable Staking Rewards Programs
Contribution to network security is incentivized.

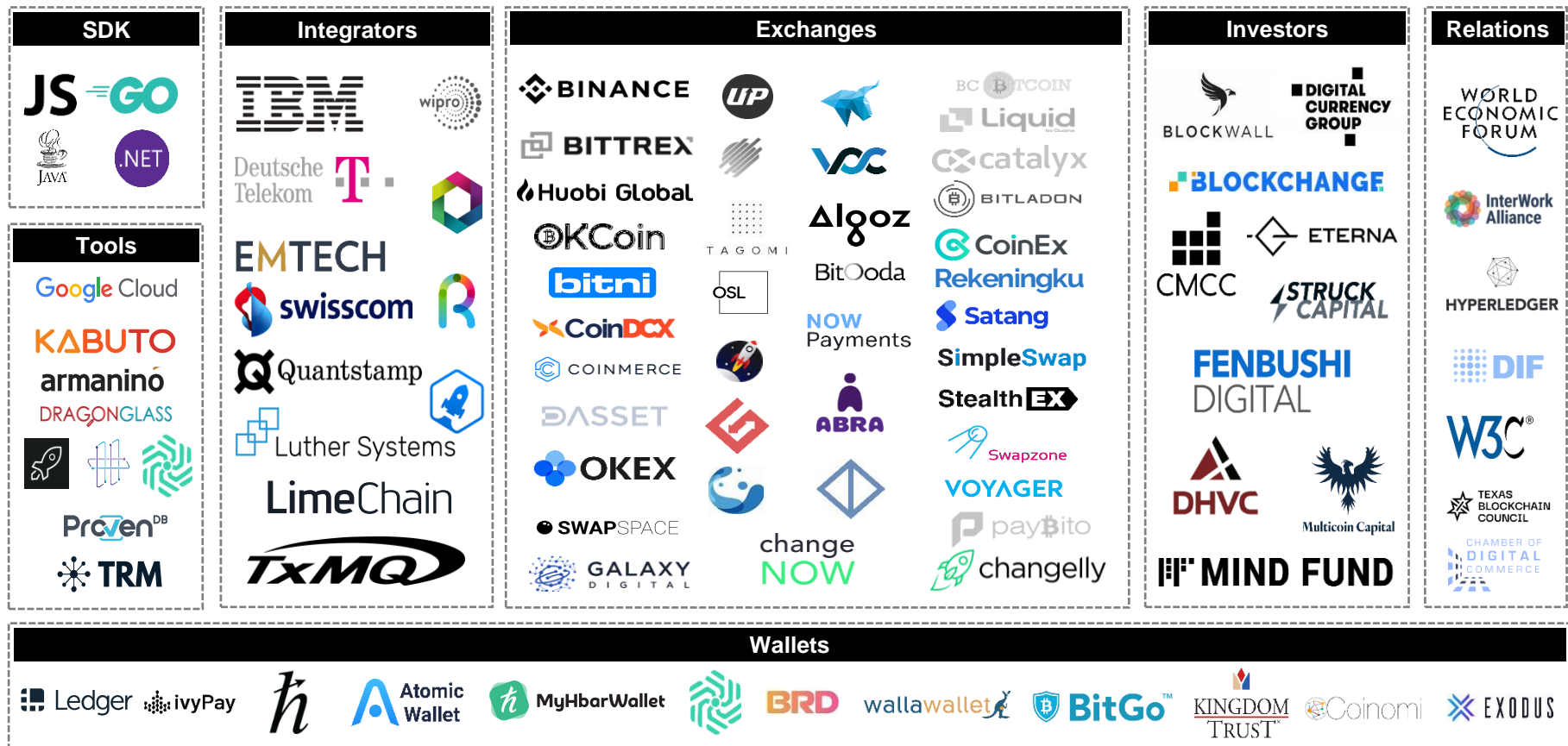Source: Fundstrat, Hedera Hashgraph

The Hedera Token Service (HTS) Ecosystem
A collection of partners helps Hedera in its next phase of development

- The HTS ecosystem is comprised of over 60 partners across the categories of token issuers, wallet/custody providers, network explorers, exchanges, systems integrators, and more.
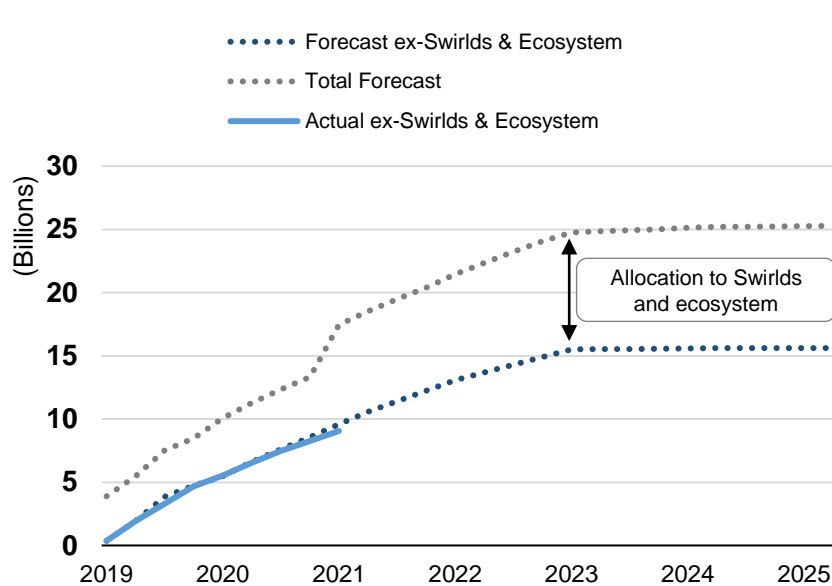
Figure: The HTS Ecosystem

Future Token Distribution Planned to Match Network Growth
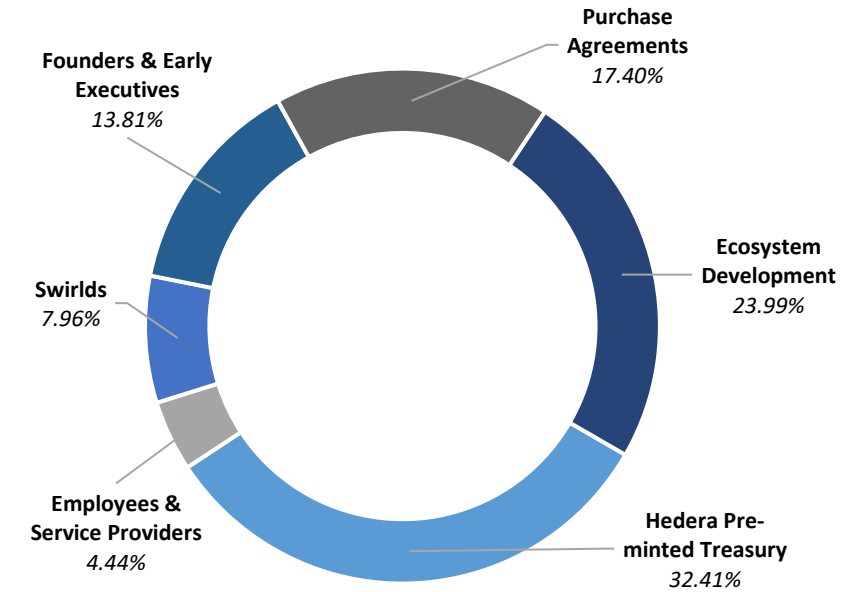## Hedera updates supply tokenomics with 2021 Treasury Report

- Hedera's hbar token powers and secures the network as its payment mechanism for fees. To date these fees are largely transaction-based and paid by users to network nodes for completing transactions. Developers also have the option to monetize their apps by implementing fees on user interaction.

- In 2020, Hedera released an estimated hbar distribution schedule which outlines releasing 50% of supply by the end of 2025 – the majority being to SAFTs. Looking further out, Hedera expects to match token release to network growth, in part by implementing node reward payments and staking rewards.

Figures: Hbar allocation and distribution from Hedera Treasury Management Report

Forecast ex-Swirlds & Ecosystem
Total Forecast
Actual ex-Swirlds & Ecosystem

Allocation to Swirlds and ecosystem

Forecast w/ Swirlds & Ecosystem:
- *Swirlds is Hedera's founding development team*
- *Swirlds received one-time allocation which remains illiquid*
- *Swirlds is owed a revenue share as stated in the MLA*
- *Ecosystem incentives launched in Q3' 2021*

Purchase Agreements *17.40%*
Founders & Early Executives *13.81%*
Ecosystem Development *23.99%*
Swirlds *7.96%*
Hedera Pre-minted Treasury *32.41%*
Employees & Service Providers *4.44%*

Hard Token Cap: *50 Billion*

Source: Fundstrat, Hedera Treasury Management Report

Transaction Bandwidth Remains Ranged Well Below Potential
Expect gradual increase to 10,000 TPS as network scales

- **Over the course of 2021 transaction bandwidth has generally been range-bound between 35 - 80 transactions per second while reaching 100 TPS on one occasion in March.**

- **It is likely this will increase in relation to network activity as the demand for transaction processing increases. One leading indicator for network activity is app development which nearly doubled in 2021. With Hedera dedicating $378 million* towards future developer incentives we expect total apps on the platform to grow significantly.**

Figures: Hedera vs Ethereum TPS, Actual and Expected Total Apps on Hedera (1H2021)
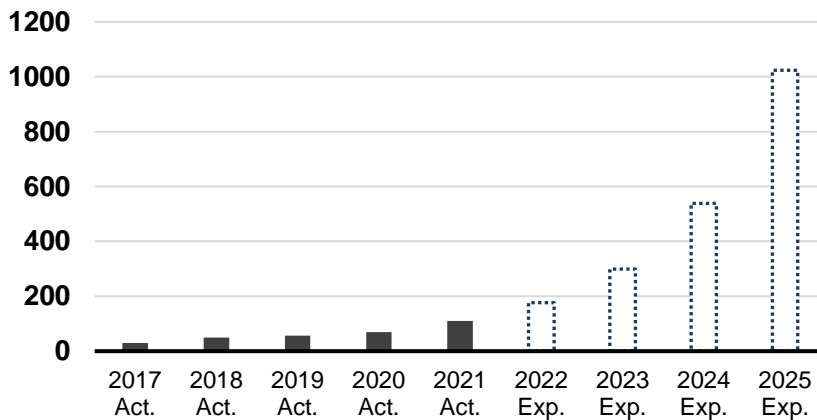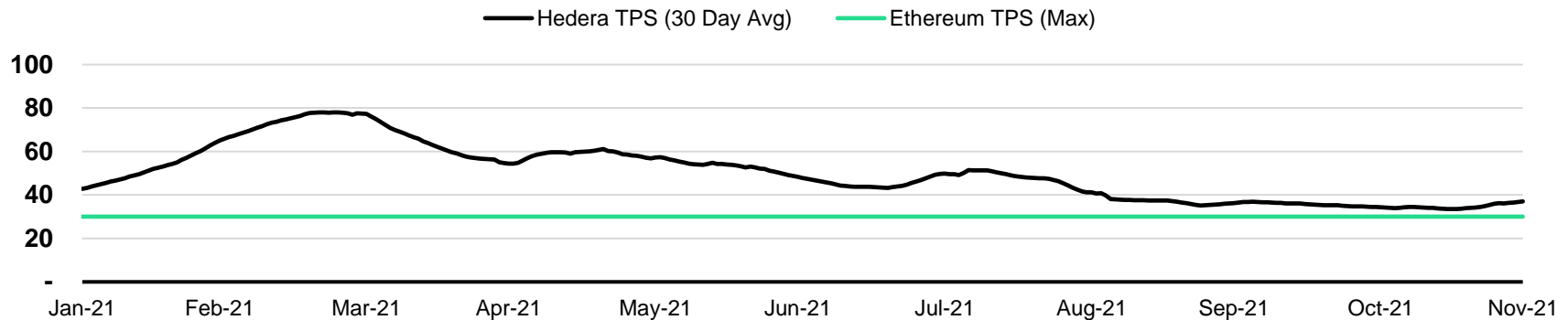
To-date $26.9 million* of HBAR has been allocated to developer and community incentives based on Hedera's latest Treasury Report – the result of which has been 110 apps built on the platform.

The Treasury Report also outlines an additional $378 million* of HBAR will be dedicated to ecosystem development through 2025 which we expect to drive an increase in total apps on the platform.

*HBAR price as of 9/30/21

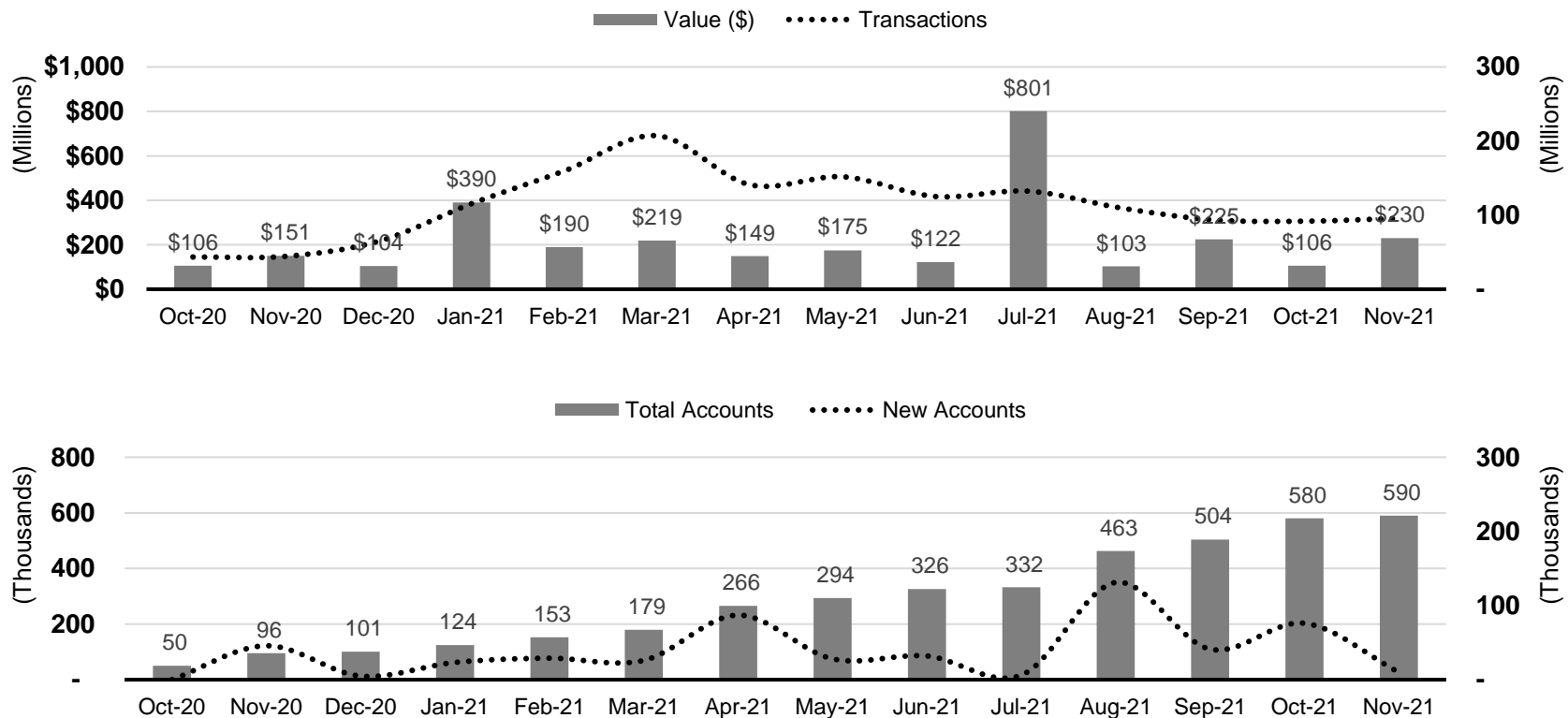Source: Fundstrat, Hedera Block Explorer, Hedera Hashgraph

Signs of Transaction Growth and Increasing Value Transfer
An increase in platform activity follows record new account growth

- In April, Hedera passed 1 billion total transactions since inception – a milestone few blockchains have reached. For context, Ethereum, which has existed for 3x longer than Hedera, just passed the 1 billion transaction mark this year.

- The network processed 129,000 monthly transactions in 2021 equating to $2.71 billion in total value transferred.

- Hedera averaged over 44,000 new accounts per month in 2021, reaching 590,000 total accounts as of November 2021. This represents a 515% YoY increase.

Figures: Accounts, Monthly Transactions on Hedera Network

Current Use Case: Everyware
Bringing security to the NHS' COVID-19 vaccine rollout

Figure: Everyware Overview

Project Overview

Company:	Everyware
Website:	everyware.co.uk
Industry Segment:	Decentralized Markets
Project Description:	Everyware produces smart sensors to better track and monitor the critical assets that make up our physical world. One use of their monitoring solution is to track the storage of temperature-sensitive assets including the Pfizer and Moderna COVID-19 vaccines.

UK hospitals are using blockchain to track the temperature of coronavirus vaccines

PUBLISHED TUE, JAN 19 2021·6:57 AM EST

Ryan Browne
@RYAN_BROWNE_

SHARE

"Hedera's distributed ledger technology provides that tamper-proof record-keeping system, making it perfect for recording and validating results efficiently and cost-effectively."
-Tom Screen, Technical Director for Everyware

COVID-19 Vaccine Cold Chain Monitoring

Everyware's Capabilities
Everyware's asset tracking solutions can be configured to monitor a wide variety of variables. One use of their monitoring solution is to track the storage of temperature-sensitive items, like blood and medical supplies. With constant, 24x7 temperature recordings, hospitals and their staff are able to more accurately and safely perform blood transfusions and administer vaccines.

NHS Needs
In January, as the UK prepared for its imminent vaccine rollout, the NHS needed to implement supply chain solutions to store and administer the vaccines. The COVID-19 vaccines approved for use in the UK require precise storage temperatures well below freezing in order to remain effective and must be monitored closely at all times.

Hedera's Role
Monitoring an asset such as the COVID-19 vaccine amidst a global pandemic carried greater risk and potential liability. Everyware and NHS required a more secure way to manage asset tracking data than a traditional centralized database. Hedera provided its tamper-proof DLT to validate results efficiently and cost-effectively.

Implementation
Everyware's vaccine monitoring solution was successfully implemented in NHS facilities in the U.K.'s South Warwickshire, Stratford Upon Avon, and Warwick hospitals.

Source: Fundstrat, Everyware, Hedera Hashgraph

Current Use Case: Atma
World's leading connected product cloud for supply chain transparency

Figure: Atma Overview

Project Overview

atma.io

Company:	Atma
Website:	atma.io
Founder:	Max Winogard
Industry Segment:	Decentralized Markets
Project Description:	Atma.io is a platform that unlocks the power of connected products by assigning unique digital IDs to every item, providing unparalleled end-to-end transparency by tracking, storing and managing all the events associated with each individual product – from source to consumer and beyond to enable circularity.

AVERY DENNISON

With atma.io, Avery Dennison is now able to bridge both worlds by coupling our progressive family of digital triggers and labeling technologies with the power of data in our atma.io platform all the way to the wafer level."

-Francisco Melo, VP, Avery Dennison Smartrac

Practical Applications

Apparel
Atma improves inventory accuracy from 65% without RFID to 99% with. This creates a more satisfying omnichannel shopper experience that optimizes for convenience and utility.

Food & Beverage
Atma enables products to become direct communication channels with customers by turning them into digital platforms. Customers see the full journey of a product, from farm to table.

Healthcare and Pharma
Atma leverages RFID and NFC technologies to help improve tracking and tracing, enhance inventory accuracy, bolster asset management, and authenticate products.

Partnerships

Higg | Trusted Sustainability Data

infor

Blue Bite

Microsoft

EVERLEDGER

mastercard

acsis ENTERPRISE SERIALIZATION

Source: Fundstrat, Atma, Hedera Hashgraph

In the Pipeline: Calaxy
Tokenized social ecosystem built on Hedera Hashgraph

Figure: Calaxy Overview

Project Overview

Company:	Calaxy (Beta)
Website:	calaxy.com
Founder:	Spencer Dinwiddie
Industry Segment:	Social Tokens
Project Description:	Calaxay, a portmanteau of "Creator's Galaxy," is a social media app designed to enable creators to sell their own tokens to fans in exchange for exclusive experiences ranging from live video calls to guest appearances. The project is currently still in beta, but all indications point toward a full launch in 2021.

"Hedera Hashgraph has a unique solution in the blockchain industry that enables high throughput transactions with near real-time latency, alongside an industry-leading enterprise governance model. Hashgraph's unmatched throughput will allow us to scale to millions of users seamlessly."
-Spencer Dinwiddie, NBA Player, Founder of Calaxy

How It Works for Creators

Launch Token
Athletes, entertainers, and influencers create their own Creator token. These tokens are sold to fans to unlock access to exclusive content and experiences.

Setup Perks
Creators must setup their perks, which include all of the ways in which fans can access you. Possible perks include a live video call and a fan club subscription.

Monetize Community
Calaxy provides community and token analytics to allow creators to track progress and leverage their fanbase.

Key Advisors

- **Roham Gharegozlou**, Founder & CEO of Dapper Labs, the creators of NBA Top Shot

- **Adrian Lai**, CEO of Liquefy

- **Rahul Kothari**, researcher at BlueSky, Twitter's decentralized social networking effort

- **Chad Richman**, Sr. Legal Counsel for Centre Consortium.

Source: Fundstrat, Calaxy, Hedera Hashgraph

Current Use Case: GOMint
GOMint utilizes Hedera for tokenization of digital content

Figure: GOMint Overview

1 ➕ Tokenize Digital Content
Create immutable records
Store a hash on HBAR
Mint tokens to represent value

Build Your Community ➕ 2
Promote your token to your fans
Set your terms using our standard contracts
Sell tokens to generate an income

3 ➕ Reward Your Fans
Fans able to authenticate tokens
Anyone can buy & trade your tokens
Earn a share in revenue

➕ Future Development
Plans to develop strategic partnerships
with video hosting and content platforms

The GOMint Team

Website: gomint.co

Alex Taylor
Co-Founder

Peter Uliano
Co-Founder

Richard MacNamara
Co-Founder

KPAY

HFX TECHNOLOGIES

citi

NATS

LSE

UCL

DEPARTMENT OF DEFENSE · UNITED STATES OF AMERICA

JUDICIAL BRANCH · NEW HAMPSHIRE

AAA BAIL BONDS

zain

ALSHAYA GROUP

Jardines

vodafone

Kingfisher

Source: Fundstrat, GOMint, Hedera Hashgraph

Raising Capital to Develop the Hedera Hashgraph Network
Issuance of Simple Agreements for Future Tokens ("SAFTs")

Figure: Summary of SAFT offerings

	SAFT Series 1	SAFT Series 2	SAFT Series 3
Date of Offering	Dec 2017 – Jan 2018 (~92% in Dec.)	Jan – Mar 2018 (institutional) (~95% in Jan – Feb)	Apr – Aug 2018 (institutional) Aug 1 – 18 (accredited crowdsale)
Price Per HBAR	$1.00 pre-split / $0.001 post-split	$5.00 pre-split / $0.005 post-split	SAFT 3A: $0.12 / SAFT 3B: $0.096
Total Raised (USD)	$4.7 million	$14.5 million	SAFT A: $81.5m / SAFT B: $22.3m
% of SAFT Funds	4%	12%	84%
Total Coins	4.9 billion	2.9 billion	922.5 million
% of Total SAFT HBARS	56%	33%	11%
% of Total HBAR Supply	10%	6%	2%
# SAFT Purchasers	40	40	528 SAFT A / 302 SAFT 3B (Mix)
Original Release Schedule	20% on Network Launch; 20% on Anniversary of Network Launch for 4 years; 1st distribution amended no sooner than 6 months after Network Launch	20% on Network Launch; 20% on Anniversary of Network Launch for 4 years; 1st distribution amended no sooner than 6 months after Network Launch	20% no sooner than 6 months after Network Launch (to coincide with Open Access); 3A: 10% per month for 8 months; 3B: 20% annually for 4 years
Current/Amended Release Schedule Before Exchange Offer	1% at Open Access; 1% within 1wk of Open Access; Remaining 98% at least quarterly over a total of 48 months	5% at Open Access; 5% within 1wk of Open Access; Remaining 90% at least quarterly over a total of 36 months	NA

Source: Fundstrat, Hedera Hashgraph

Executive Leadership
Decades of experience and proven success in technology industry

Figure: Hedera's Core Leadership Team

Dr. Leemon Baird
Co-Founder & Chief Scientist

- Inventor of the Hashgraph distributed consensus algorithm
- Former Professor of Computer Science at the US Air Force Academy
- PhD in Computer Science from Carnegie Mellon University

Mance Harmon
Co-Founder & CEO

- 20 years of experience in multi-national corporations, government agencies, and high-tech startups
- Former Head of Architecture and Labs at Ping Identity
- MS in Computer Science from the University of Massachusetts

Christian Hasker
Chief Marketing Officer

- 20 years of experience in enterprise software at startups and large companies
- Former Vice President of Marketing at DataStax
- Degrees from the University of Manchester and the London College of Music

Natalie Furman
General Counsel

- Former senior associate at Paul Hasting LLP with a focus on IP, competition, and rights of privacy and publicity
- Received her JD from Columbia University School of Law

Lionel Chocron
Chief Product Officer

- Former Vice President of Industry and Emerging Technology at Oracle
- MBA from UC Berkeley's Haas School of Business

Sam Brylski
Regulatory Counsel & Chief Compliance Officer

- Former General Counsel at ShapeShift
- Received his JD from the University of Minnesota Law School

Young Cho
Chief Financial Officer

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Source: Fundstrat, Hedera Hashgraph

Risks and Value Drivers to Consider
Key concerns are centered on distribution and incentives

Figures: Overview of Risks to Consider

USD-Pegged Fees
A fee schedule that is fixed to a nominal USD amount is highly conducive to scaling a protocol as it allows for low transaction costs regardless of usage. However, we note that both demand-based fees and native-token-denominated fees often provide greater incentives for investors and early developers to migrate to the platform since the token's value is directly tied to the demand for its use. In HBAR's case, the HBAR-denominated price of transactions *decreases* as the value of HBAR increases, thus demand is inversely proportional to the price of HBAR. Removing this market force may pose a challenge in obtaining significant returns on one's HBAR investment.

Centralized Ownership and Security
A key reason for the current centralized, permissioned model is to allow for increased adoption of the platform, and consequently, wider ownership of HBAR tokens. This is important for HBAR's success because in order to secure the platform in an open, permissionless environment, the HBAR token must be sufficiently distributed and valuable to prevent a malicious actor from acquiring 1/3 of the issued tokens, the threshold at which consensus can be disrupted. As Hedera progresses and we receive more insight into the account growth and application development, we will be able to observe whether the platform is sufficiently mitigating this risk.

Failure to Achieve Full Governing Council
Hedera's Governance Council currently boasts 25 members from generally diverse industries across the globe. While the roster to date has been impressive, nearly half of the seats on the Governance Council remain vacant. As discussed, wider adoption and enterprise implementation will be critical to the success of Hedera and therefore we will monitor Hedera's progress as it pertains to adding reputable partners to its Council.

Iterative Approach to Token Distribution & Centralized Control
Hedera's Governing Council amended the token issuance schedule in 2020 for the second time, providing SAFT investors additional HBAR tokens in exchange for a longer distribution timeline. While this may ultimately prove to be a necessary remedy for a faulty initial issuance, it is worth noting that the Council possesses centralized authority to adjust token attributes and supply schedule as it deems appropriate. We expect the Council to continue this iterative approach.

Source: Fundstrat, Hedera

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