DECEMBER 2022 PERFORMANCE

TOTAL NET RETURN

PERIOD	FUND RETURN
1 Month	-0.33%*
Life to date	-23.14%*

*Post management, performance and entry fees. Past performance is not indicative of future performance.

The Fort Stable Fund generated a return of -0.33% for the month of December 2022. We maintained a conservative long position in ETH at close to 5%. Digital assets generally consolidated with ETH lower by 7% over the month but more notable was the collapse of volatility as the wheels of justice turned for some (FTX defendants) and the pressure on others resolving outstanding potential bankruptcy for others (DCG / Genesis)

The Macro – some facts to close out the year

- $18 trillion was lost in 2022 across Global markets.
- The Nasdaq 100 has lost $5.6 trillion in market value this year.
- The 7th worst year for the S&P 500. Meta Is The S&P 500's Worst Performer Of 2022 with Losses near 75%
- The 3rd worst year for a 60/40 portfolio
- The worst year ever for 10-year treasuries
- Bitcoin lost close to 65% of its value in 2022 while ETH lost 68%.
- Other more marginal Layer 1 protocols such as Solana lost 94%.

Three things to bear in mind as we head into 2023:

1. This impending recession is the most well-announced recession in history.
2. The majority of strategists expects equities to drop 10% in 2023
3. There is a still an expectation of a Fed pivot due to this decline in equities in 2023

It's probably right to believe in 1). – The FED and other Global Central Banks have told us repeatedly that they will hike until they break the inflation fever, that's likely in Q2, however what's also likely is dramatic growth slowdown in the US and globally. Europe will continue to see higher rates, Japan has commenced its process of moving to a more restrictive stance and China will see an initial slowdown as it navigates exiting Covid 0. Investors in Risk assets are trying to position for 12-18m ahead normally, the dispersion of views however as to the severity of a downturn will large cash holdings and the relative attractiveness of Bonds will discourage risk seeking.

The idea of an interest rate Pivot perhaps misplaced outside of catastrophic economic or liquidity event. The FED may well stop hiking but the hurdle for cutting we think remains high, and even higher to reverse the reduction of liquidity in the system, that is Quantitative Tightening (QT). The tightening we have seen so far has rippled through the most economically sensitive and highly leveraged parts of the asset spectrum and distorted some of the world's largest markets. The idea that the repercussions of this last year won't continue into 2023 seems unlikely to us and such we remain defensive in our stance.

At the outset of the month, we maintained a long ETH exposure (at around 25% long ETH) which we had accumulated via our call options from the prior month's rally. We reduced our exposure down to 5% long ETH as the seriousness of the FTX situation became apparent and remain around this level.

Looking Back on 2022

As we look back on 2022, we are reminded of the series of crypto lenders, proprietary trading firms and exchanges which either lost hundreds of millions to billions of dollars and/or went bankrupt. Some of the names we remember include:

Alameda, Babel Finance, Blockchain.com, BlockFi, Celsius, FTX, Genesis Capital, Jump Capital, Three Arrows Capital, and Voyager.

Coinbase, the largest publicly traded crypto company saw its stock price decline 80% as trading volumes evaporated and US regulators remained hostile towards crypto tokens. Digital assets certainly suffered a significant setback with the total market capitalization of cryptocurrencies down 62% from US$2.2 trillion at the end of 2021 to around US$ 835bn at the end of 2022.

There's no doubt that the series of events which transpired in 2022 has led to increased scepticism about the value and future of DeFi projects and blockchain infrastructure. While some of the problems which arose in 2022 stemmed from an overreliance on unsustainable DeFi yields and synthetic trades, it's worth remembering that none of what happened in 2022 was a crypto-specific phenomenon. The main cause of the collapse of the CeFi crypto lenders was poor risk management and compounding bad bets. The 2008 "GFC" was TradFi's equivalent which led to the Dodd-Frank regulations imposed on the finance industry. We certainly expect regulation in the crypto industry to prevent another FTX will be forthcoming in 2023. Our hope is that the crypto industry can work with regulators to establish responsible guardrails for the industry allowing it to flourish rather than be stifled by unworkable rules.

The following extract is a section from Messari's lengthy "Crypto Theses for 2023" which traces back the origins of the Grayscale Trade which played a large part in the contagion of 2022, and which could still have some way to play out in early 2023.

3.3 Anatomy of a Crypto Credit Crisis

"The Grayscale Trade, aka crypto's "Windowmaker," was integral in helping create much of the crypto contagion we saw this year. It was a root cause of the Three Arrows Capital (3AC) and BlockFi bankruptcies, and its potential ripple effects on its distressed sister company Genesis Capital – and Genesis counterparties like Gemini – remain unresolved and could cause further damage still. The Grayscale products themselves continue to deteriorate for their investors as the discount to their fair value (the underlying assets held in the trusts) have widened to 40%, with no fee reductions or ETF conversion on the horizon.

This spring's Terra/Luna failure was simply a haymaker that followed years of body shots from the slow-bleeding bad bet on GBTC. Yield-hungry investors, forced further out onto the risk curve as Ethereum-based DeFi remained mired in a multi-year recession, gobbled up 20% teaser yields on an emerging algorithmic stablecoin (UST) and its rising star lending protocol (Anchor), not realizing it was laced with arsenic. It was a good reminder to use common sense in investing. If you don't understand the yield, you are the yield.

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Let's set the stage for this section on CeFi with a speed run through crypto's first credit crisis. CMS wrote up the cliff notes in just five tweets that explain how this all went down, but I will also attempt to summarize here:

1. It started with the Grayscale Trusts. These vehicles allowed investors to buy GBTC in their 401ks through OTC traded securities. But they weren't ETFs, so they didn't have typical creation and redemption mechanisms. Instead, accredited investors could create Trust shares with bitcoin, hold the shares for a six-month "seasoning" period, then flip them for what was a hefty GBTC Premium for quite a while pre-2021.

2. Flipping and rolling the GBTC Premium ballooned in popularity and The Grayscale Trade got crowded in 2020 hitting $40 billion in AUM at its peak due to stimulus, bitcoin halving, and zero interest rate COVID policies of 2020. 3AC and BlockFi accumulated 10% of the Trust's shares with $4 billion in exposure at the peak in February 2021. But then 3AC started offloading some of its exposure during the great GBTC Premium Crash.

3. Now a good chunk of the seasoning - GBTC is trapped and underwater with 3AC and BlockFi still subject to six months holding restrictions. They eat the unrealized losses and instead lean on lending desks to allow them to borrow against the GBTC collateral. Genesis Capital, a sister company to Grayscale, is one of the only lenders incentivized to treat the GBTC at good money, given its affiliate technically controls the share's redemption mechanism (that would make whole the principal of the collateral), and Genesis can milk the big borrowers for interest in the interim.

4. Exposed lending desks (BlockFi) and funds (3AC) let GBTC ride, but now they have to push further out the risk curve. This isn't a big deal in 2021 because everyone is making money hand over fist. The markets have come down from their tops in November, so the tide begins to go out. But Luna is still growing massively and raises a $1 billion round in Feb 2022 to diversify their treasury. 3AC is a big Luna investor.

5. The Luna Foundation buys $1.5 billion of BTC with UST (their collateralized stablecoin) from Genesis, who proceeds to sell off UST and knock off the peg. Other funds and trading desks see the peg break, and a bank run ensues on UST. Luna experiences a death spiral (great explainer piece from King Arthur). 3AC is now underwater on two mega trades (King Arthur part two) in size (UST/LUNA and GBTC) and becomes insolvent. Their GBTC gets liquidated, and Genesis takes possession of 35 million GBTC shares.

6.The contagion hits full swing, as multiple funds, and trading desks with ties to 3AC go under (Defiance) or get bailed out temporarily by FTX, who is also a lending counterparty (???) (BlockFi, Voyager). All duration bets in the crypto lending markets sour and die, and Genesis' active loans drop from $14.6 billion at the end of March to $2.8 billion at the end of September. As active deposits shrink, lending desks also call collateral and yank borrow from funds wherever they can. Credit seizes as everyone accelerates their de-risking. This includes Alameda in August, who has external borrow called after Genesis realizes they don't care much for FTT as collateral anymore.

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7. CoinDesk gets the scoop of the year and publishes details on Alameda's financials and token reserves. They are loaded with illiquid crap like FTX's own trading token FTT and several low-float DeFi tokens like Serum that FTX had backed and hyped in 2021. An analyst notices that Binance moves $2 billion worth of FTT on-chain, and speculates that CZ is preparing to dump the position. CZ confirms that he plans to sell FTT and fully sever ties with FTX days later. Uh oh. That's $2 billion of an illiquid token. FTT crashes, as do other major FTX / Alameda positions despite their best efforts at damage control. The entities go massively underwater as their collateral is now worthless and have no liquid accounts or access to other credit (all their counterparties are already dead or distressed). Even CZ says yuck, I'm not buying this.

8. No liquidity at FTX/Alameda and commingled customer funds (thanks to mislabelled accounts or some nonsense) causes customer funds to be at risk, there's a "bank run" on FTX that isn't really a bank run because FTX was not authorized to lend against customer deposits according to its terms of service. FTX dies and, as CMS sums up, "Margaritaville at risk." That's the synopsis so far (as of December 21, 2022), and the lessons are straightforward: don't commingle customer assets, cut losses early on bad trades vs. lever them up and pray, maintain internal controls and a fortress balance sheet, split assets across different custodians and counterparties, and of course, only keep on exchange what you can afford to lose."

Source:
https://messari.io/crypto-theses-for-2023

Looking at what might happen in 2023

Before we look at some of the opportunities we see for digital assets in 2023, we have one large risk which is a spill over from the Grayscale trade outlined above. Again we draw from the excellent summary provided by Messari in the same report.

3.4 DCG & Genesis Contagion Risk

"The most important trend to keep an eye on in early 2023 will be the evolving situation over at investment giant, Digital Currency Group ("DCG") and its lending arm Genesis Capital, which was a large counterparty to 3AC, FTX, and most other large lending and trading desks.

DCG is now one of the most systemically important companies in the crypto ecosystem, as the liquidity crisis at its subsidiary and $1 billion capital infusion requirement present further contagion risks for the industry. Gemini, and at least one other large European exchange, and dozens of high net worth creditors apparently have more than $2 billion in frozen deposits stuck at Genesis, whose primary borrower is its DCG parent.

The options look pretty bleak. Creditors could strike an out-of-court settlement with Genesis and agree to a haircut on their withdrawable deposits in exchange for other DCG debt or equity instruments. Genesis could file for bankruptcy protection, and potentially drag their parent and their deep-pocketed external creditors through a lengthy and expensive reorganization process.

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Or DCG could identify recapitalization options at the holding company level, in order to make whole Genesis Creditors and limit their liability but leveraging its other "good" assets. I wrote a full-length Enterprise research report on why a DCG recapitalization is a good idea and likely necessary to restore some stability to the crypto markets. (Laura Shin also hosted a good podcast on the subject.) But much of the viability of that plan ties back to the details regarding what's in the black box of lending agreements between DCG and Genesis. Here are the five open questions I'd be diligencing if I were looking at the deal, and determining whether there can be a resolution, or this is now an untouchable business.

1. Where's the Beef: Does DCG or Genesis hold the majority of the combined companies' $700 million worth of GBTC and ETHE shares? If DCG, that's a big slug of assets to borrow against. If already spoken for at Genesis, and Genesis still has a billion-dollar hole to fill in its balance sheet, we might yet see a further rippling out of contagion.

2. The Promissory Note: On a recent episode of Unchained's "The Chopping Block" podcast, Dragonfly partner Haseeb Qureshi said that the $1.1 bn "promissory note" that DCG extended to Genesis following the 3AC bankruptcy may have been structured as "callable" in the event of a Genesis liquidation. If true, Genesis could have treated the promissory note as a "current asset" (less than one year duration) even though it was nominally a ten-year note, something that would have been a material part of current assets Genesis showed subsequent creditors. Again, if true, that might reduce DCG's ability to limit liability from a Genesis bankruptcy. A callable note would mean that a Genesis liquidation process would put DCG on the hook to repay the full $1.1 billion immediately. DCG doesn't have that cash yet, so Genesis might not feel the urgency to rush into bankruptcy as they "have the assets" from DCG, if DCG can refinance.

3. Alameda Lending: Given the fact that Alameda and Genesis were two of the world's largest borrower-lender counterparties, it's likely they had loans together. From Genesis's quarterly reports, it appears that they were responsibly winding down many of their positions and yanking borrow. From the FTX bankruptcy filings, it also doesn't appear that FTX or Alameda are Genesis Capital creditors today. If that's true, then the two giants either had no relationship (unlikely) or they closed their positions. The precise dates of any closed positions with Alameda might end up being critical to the resolution for DCG-Genesis due to the 90 day clawback period that most bankruptcy cases contain. If Alameda had loans with Genesis that were repaid after August 13, they might *potentially* be subject to the clawbacks. If there was a big number that changed hands after August 13, I'm not sure how someone new to DCG assesses the risk of a clawback, which would be a *long-term liability* that hinges on the results of a multi-year, incredibly complex FTX bankruptcy process.

4. The Grayscale-GBTC Tie Up: Some of the details in Fir Tree Capital Management's lawsuit vs. Grayscale look pretty alarming. They point to the related party levered transactions with 3AC, the repeated tightening of Grayscale's control over the Trusts' redemption mechanisms (at the expense of shareholders), and Grayscale's ability, but "self-interested" refusal

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to pursue Reg M redemptions outside of an ETF conversion. That will take a long time to play out, but the one thing you should have your eye on as a GBTC shareholder is whether DCG's GBTC shares and Grayscale stay under common control for the foreseeable future. The alternative would not be good. Grayscale throws off $200 million+ in annualized cash flow even at today's distressed prices. Those assets under management are permanent capital given the trusts' structure (see below). So the question for a new DCG investor or creditor regarding what Grayscale is worth as a business revolves around your forward outlook for bitcoin. Grayscale may do $400 million in EBITDA this year, but only half of that on a run rate based on current prices.

If DCG explores a sale of Grayscale, they'll NEED to put the 67 million GBTC shares they own into the deal, too. A buyer without a large GBTC bag would have every incentive to shut down ETF conversion discussions and run the business as an annuity that's openly hostile to GBTC shareholders. DCG's $550 million of GBTC acts as an "ETF approval hedge" since they are financially incentivized to push for an ETF. Even though an ETF would open the door for redemptions and lower fees, DCG would notch a one time gain of $450 million from the closure of the GBTC discount to NAV. The incentives of the trust sponsor get ugly without that share hedge. A new buyer could be exploitative.

5. The Eldridge Revolver: The irony in all of this is that the smallest creditor could hypothetically become the most troublesome. Connecticut-based lender Eldridge had a $350 million revolving line of credit with DCG that they could have considered to be in cross default the moment that Genesis halted withdrawals in November. Since they are senior creditors at DCG and Genesis, their incentives are materially different from the Genesis credit holders, who seem much more inclined to strike a deal. In my mind, nothing else really matters in the markets right now.Until we see a bit more color around the DCG-Genesis resolution, it's tough to say the credit crisis has fully resolved. It's 50-50, at best.

3.5 Grayscale: Reflexivity up. Reflexivity down. There's a good case to be made that Grayscale was the entity most responsible for Bitcoin's ascent in late 2020. GBTC and ETHE assets under management exploded thanks to the Grayscale trade, and now the asset manager generates ~$300 million/year in high-margin, sticky annualized revenue, even at today's crypto prices. Grayscale's large AUM base and its Hotel California structure make it an attractive target for DCG's suitors. But it's DCG's ownership of underlying GBTC and ETHE that I'm watching most closely in February. That's when Grayscale's 10-K drops, which includes notes on affiliate ownership of shares in its Trust. DCG and Genesis (Grayscale affiliates) spent the better part of the past two years absorbing all of the sell pressure from the top GBTC trust shareholders.

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Largest GBTC Holder Analysis

Assets (in millions)	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022
Three Arrows Capital Shares	38.89	38.89	38.89	38.89	38.89	3.89	0.00
Blockfi Shares	36.16	19.85	19.85	19.85	0.00	0.00	0.00
ARK Invest Shares	8.68	9.56	8.82	7.91	6.92	6.79	6.49
Digital Currency Group Shares	12.01	16.57	16.53	25.33	30.15	66.98	66.97
DCG Change in Shares	-	4.56	(0.04)	8.80	4.82	36.83	-
Cash Paid	-	$181.05	-	$439.17	$131.10	$21.70	-
DCG Price Per Share Paid (Estimated)	-	$39.73	$34.60	$49.93	$27.71	$20.37	-
DCG Collateral Received (Shares)	-	-	-	-	-		35.00
Total Shares Outstanding	692.37	692.37	692.37	692.37	692.37	692.37	692.37
Top 3 Shares %	13%	11%	11%	12%	11%	11%	11%

Source: Messari, SEC Filings, Whale Wisdom

Notes: A share change in Q2 2021 highlights a purchase of DCG but the dollar value was not disclosed. Purchase assumed to be at average GBTC price. The share change in Q3 2021 was assumed to give money back to DCG at average share price for the quarter.

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Data as of November 30, 2022

But that $700 million in collateral (including ETHE, too) could be subject to forced selling in the event DCG and Genesis needs it in the short-term to make their creditors whole. I personally think the GBTC is better held as collateral that can be used to help refinance DCG's current debt load. (See the "ETF Approval Hedge" above.) It comes down to who holds the GBTC. The maximum amount that DCG and Genesis would be allowed to sell per quarter in the markets (under Rule 144 restrictions) would be 6.9 million shares, or about $80 million if they had sold during the first six weeks of the quarter when GBTC's discount to net asset value widened from 35% to 45%. (It would take the combined companies 2.5 years to unload the full position if that was their ultimate wish,.

The nuclear scenario (which I think is unlikely) would be for Grayscale to dissolve the trusts. That's something that would likely only happen if 1) Genesis went bankrupt, 2) DCG was pulled into Genesis's bankruptcy and also went bankrupt, 3) DCG was unable to spin off Grayscale to a buyer and exhausted all other financing options, and 4) the Trusts themselves were unable to find another financially stable sponsor. Like I said, unlikely. This whole thing is a bad look for crypto, but it's also a worse look for the SEC. GBTC was allowed to become toxic collateral because of the SEC's obstinance and dereliction of its duty to the American investing public. In a parallel universe in which the SEC prioritized investor protection, fair and efficient markets, and capital formation (its mandates), we might have escaped a great deal of the crypto credit carnage. GBTC investors wouldn't be billions of dollars underwater, institutions could begin to treat digital gold as a complement to their physical gold hedges via titled securities, and we wouldn't be staring down the barrel of a dozen crypto lending bankruptcies.Instead, the SEC is taking a victory lap over the carnage that they created after being played for fools and inviting the fox into the henhouse. It's utterly despicable."

Source:

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The nuclear scenario (which I think is unlikely) would be for Grayscale to dissolve the trusts. That's something

Despite the Setbacks, Crypto has made Considerable Progress

Despite the setbacks, significant progress has been made in the build-out of stablecoins, distributed computing, blockchain scalability, decentralized financial primitives (DEX, lending, asset issuance), and governance structures. Stablecoins represent four of the top ten crypto assets. Their volumes rival global card networks and banks, and they can actually generate sustainable yield now that the risk-free rate of return (US Treasuries) is above zero. The Ethereum Merge went through without incident. And while DeFi is two years into a secular bear market and still faces technical challenges (hacks) and regulatory pressures, the core primitives (Automated Market Makers, etc.) are all here to stay.

NFT's are data wrappers that allow for secure sharing of transactions of any intellectual property, synthetic asset, consumer digital good or identity token on-chain. While the early forms have looked a bit like a joke with monkey jpegs etc. they are an important technical primitive.

We now have true DAOs with on chain voting, delegation, and community treasury management. These entities cross borders and allow for the rapid formation and wind down of online communities and collectively managed property.

One frustrating aspect is that after seven years and several attempts we have not yet seen meaningful traction across projects targeting real world utility for block chain technology. Probably the main reason is that it's extremely challenging to disrupt existing Web 2 monopolies in already established verticals. It's even more challenging to do so when adoption means investing in technology and operational changes across multiple stakeholders with different priorities. And then add that the project is being run via decentralised governance.

With that said, we are beginning to see a number of genuinely useful "real world" platforms emerge. The reality is that it takes time to build and bootstrap these projects. Some projects may gain material traction in the next 12-18 months but serious user adoption could still be 2-5 years away. Let's take a look at a few promising examples.

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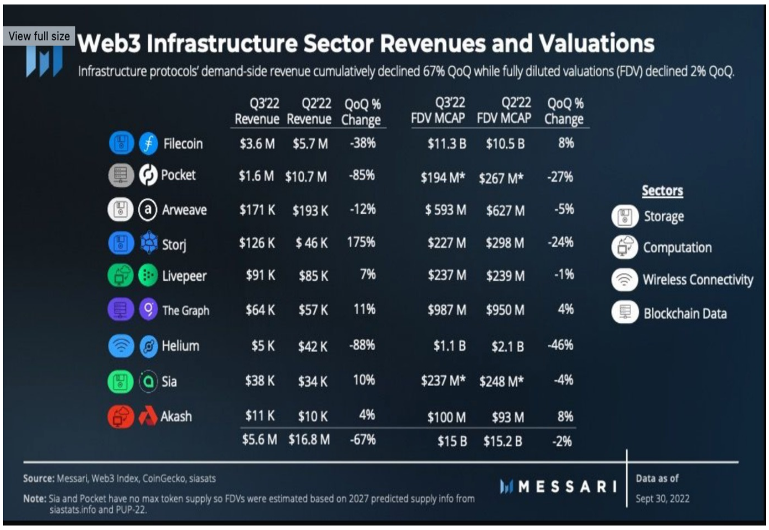
One class of real-world use case projects being developed is known as Token Incentivised Physical Infrastructure (TIPIN)

You can read more about TIPIN here:

https://medium.com/@mikezajko_16091/token-incentivized-physical-infrastructure-networks-3548b3182d82



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Web3 Infrastructure Sector Revenues and Valuations

Infrastructure protocols' demand-side revenue cumulatively declined 67% QoQ while fully diluted valuations (FDV) declined 2% QoQ.

	Q3'22 Revenue	Q2'22 Revenue	QoQ % Change	Q3'22 FDV MCAP	Q2'22 FDV MCAP	QoQ % Change
Filecoin	$3.6 M	$5.7 M	-38%	$11.3 B	$10.5 B	8%
Pocket	$1.6 M	$10.7 M	-85%	$194 M*	$267 M*	-27%
Arweave	$171 K	$193 K	-12%	$ 593 M	$627 M	-5%
Storj	$126 K	$ 46 K	175%	$227 M	$298 M	-24%
Livepeer	$91 K	$85 K	7%	$237 M	$239 M	-1%
The Graph	$64 K	$57 K	11%	$987 M	$950 M	4%
Helium	$5 K	$42 K	-88%	$1.1 B	$2.1 B	-46%
Sia	$38 K	$34 K	10%	$237 M*	$248 M*	-4%
Akash	$11 K	$10 K	4%	$100 M	$93 M	8%
	$5.6 M	$16.8 M	-67%	$15 B	$15.2 B	-2%

Sectors: Storage, Computation, Wireless Connectivity, Blockchain Data

Source: Messari, Web3 Index, CoinGecko, siasats

Note: Sia and Pocket have no max token supply so FDVs were estimated based on 2027 predicted supply info from siastats.info and PUP-22.

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File Storage

Decentralized storage enables protocols to operate trustlessly and securely. Storage protocols including Filecoin, Storj, Sia, and Arweave have emerged to serve in the critical layer of the Web3 infrastructure stack. These protocols represent over 80% of the Web3 infrastructure sector's total fully diluted valuation (FDV).

Computation

Compute resources are needed for a range of applications and services including rendering, hosting, and streaming. Web3 compute protocols allow node operators to receive payment for renting out their computing resources — GPUs and CPUs — to end users in need. Livepeer and Akash are the two most prominent computation protocols.

Wireless Connectivity

Helium is a decentralized economic system and platform for building wireless distributed networks. The protocol began with an IoT network, but a 5G network is currently in development.

Blockchain Data

The Graph is a decentralized protocol used to index and query data from blockchains. Demand comes from data consumers — typically app developers — who pay a fee per query to node operators. To bootstrap The Graph, a hosted service was initially created in 2021. The hosted service has since been fully subsidized. It aimed to host subgraphs as the protocol gradually transitioned into its decentralized mainnet. Today, The Graph protocol is a hybrid of its hosted service and decentralized mainnet.

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Despite the challenges of building and rolling out these sorts of applications, this type of real-world Web 3 looks to be a promising area for crypto for the following reasons:

- A decentralized platform has no rent seeking middleman – all margin goes to token-holders or users/producers
- Using a native currency reduces frictions and disintermediates payment networks
- Web3 businesses are highly automated (low fixed cost) and utilize open-source code and public infrastructure, with infrastructure costs (gas) mainly borne by users
- Using tokenomics to align incentives allows platforms to bootstrap without requiring huge upfront cash burn and therefore reliance on VCs, which drives faster innovation and reduces the barriers to new business formation

As users and producers accumulate tokens, they become far more loyal and engaged ultimately thinking and operating as a vested participant. This dramatically improves the long-term staying power of the business and builds a sense of community that brands recognize to create significant opportunities.

DeFi and Zero-Knowledge Privacy

Fully open ledgers will never be the basis upon which DeFi can go mainstream. If you don't want your existing bank account, investments and transactions residing in a publicly readable database now, then why would you accept that in crypto? Historical technical limitations are the only reason technologies like zero knowledge haven't been widely implemented yet. But the last two years have seen huge advances in capabilities, and we expect privacy to be fundamental in DeFi innovation over the near to medium term.

Zero-knowledge (ZK) technology will be the breakthrough feature that allows companies to leverage a public ledger while preserving details of sensitive data and information. While general ZK rollups and ZK-based smart contract networks have been the focal points of ZK development, progress is being made to bridge existing enterprise backends directly to established chains like Ethereum. In July 2021, EY contributed its code for Nightfall 3 to the public domain. Using a combination of ZK proofs and optimistic rollups built on Polygon, Nightfall can support complex business logic while preserving the privacy of transaction details. ZK technology development is still in its early stages, but along with progressions in smart contract scalability, tokenization, and automated markets, it will soon be a crucial element that fuses our physical and digital economies into one.

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Ethereum – Beyond The Merge

As we have highlighted over numerous pieces over 2022, Ethereum is an evolving protocol. There is a timeline that the Ethereum foundation has outlined that will allow it to properly scale. "Ethereum today can process about 15-20 transactions a second. This Ethereum including the rollups, including the sharding […] it's going to be able to process 100,000 transactions a second," Vitalik Buterin. The process while having the fun descriptions "surge," "verge," "purge," and "splurge," is basically a process by which the upgrades will improve usability, speed, and reduce cost. The Ethereum Foundation estimate that the actual protocol is 40% of the way towards its end state of being optimised.

The Surge - The surge refers to the addition of Ethereum sharding. Sharding is a scaling solution where transactions are executed for want of a better phrase "offline" at which point they are added in a bulk format to the Ethereum network. This process the Ethereum Foundation claims will further enable cheap layer-2 blockchains to flourish, lower the cost of rollups or bundled transactions, and make it easier for users to operate nodes that secure the Ethereum network. This we believe will be the year of Roll-Ups finding use cases and processing large blocks of transactions safely

The Verge and The Purge – the remainder of the upgrades are about managing and the reduction of storing huge amounts of data that will eventually slow the network. As we have discussed previously The Blockchain Trilemma that developers need to balance is - Decentralization, Scalability, and Security – The Merge has largely solved the decentralized question with many nodes verifying transactions. However the next challenge is scalability of which one key challenge is data management. The verge will implement "Verkle Trees" which are a type of mathematical proof and "stateless clients.". The purge will be a process designed to cut down the amount of space you have to have on your hard drive, trying to simplify the protocol which will in time not necessitate nodes to store the full history. These technical upgrades will allow users to become network validators without having to store extensive amounts of data on their machines. One of the security mechanisms in place on Blockchains is the idea that each validator stores and validates the entirety of the transactions. This allows verification and ensures the immutability of any new additional block. This series of upgrades will allow the verification without the data storage requirement.

The Splurge – the fun stuff. It's basically the last 10% fine tuning performance and usability.

Re-capping quickly the progress this year with the execution of The Merge. The blockchain is now secured entirely by staking, that is the process of verification of transactions is powered by putting at risk your asset (ETH) and in turn you are paid a return. This development is one that improves the security and the decentralization of the network. One feature of the upgrade however was to "lock" the ETH into this staking mechanism, i.e. not allow its redemption. This was done to ensure that the process worked smoothly with a stable pool of assets to validate transactions.

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The next upgrade is referred to as the "Shanghai" upgrade and will allow the un-staking of the locked ETH assets. The target date is the Northern Hemisphere Spring, potentially as early as March this year. This upgrade will be a two-edged sword. Long term positive and potentially short term disruptive. Let's focus on the positive first

For any asset to be truly scalable and adopted by institutions it needs to have either a yield or a prospect of capital appreciation and liquidity. ETH has had, for a brief period since The Merge, a yield of approximately 4-4.5% for staking. This has been during a period of low activity with asset prices deflated. So it meets the criteria of being a yielding asset and uniquely in the digital asset space one not being generated through inflationary token issuance.

Asset value appreciation is driven by the macro backdrop and unique idiosyncratic attributes that encourage adoption or more demand for the asset than there is supply. The macro matters greatly, the idiosyncratic determines your performance versus your peers or other alternatives. Post the merge the ETH blockchain has largely turned from being an inflationary token (one where more ETH is minted to pay for validation) to one that is at times deflationary and has over the last 30 days for example been operating, verifying, and paying validators with no net new inflationary issuance. This is quite constructive, (see chart below) particularly in the long run if activity picks up and demand for block space increases. So again it potentially can meet the appreciation criteria as demand for the asset outstrips supply.

Lastly liquidity. Again for any asset to enter any institutional investor's portfolio there must be an easy way to access and exit a trade. Interestingly the level of ETH staked is still low when compared to other Proof of Stake chains, currently at 14%, which indicates ETH holders are preferring liquidity over yield. To date then the theme has been for investors to hold and trade the ETH token with capital appreciation in mind. That however has been impacted by the degree to which the macro backdrop has clouded all risk assets. Moving forward, holding ETH as a play on a Distributed Ledger Based future while being paid a coupon makes ETH a unique proposition. The Shanghai upgrade allows ETH to be discussed in a different light as a long-term technology play for many investors.

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The short run.

While only 14% of ETH outstanding is being staked the ability for investors to redeem will be attractive for some. One thing to bear in mind is that the majority of ETH staked was at higher price levels for the Asset, the highest volumes of ETH staked was post The Merge and ahead of many of the collapses in the space. In the chart below you can see that the largest amounts staked in 2022 were in March when prices were above $3,000. Clearly people's financial situations have changed since then. There is some likelihood that many who staked at higher levels may need to withdraw when they can.

One mitigating factor and a view which is becoming more prevalent in recent weeks is that more ETH is likely to be staked via liquid staking protocols than the demand to unstake ETH.

As ETH stakers will no longer be required to lock up their ETH for an indefinite period, liquidity concerns should be alleviated.

Additionally, the rate at which currently staked ETH can be withdrawn is currently specified to be to six validators per epoch or a maximum of 1,350 validators per day compared to the ~478,000 validators currently staked.

Also, developers have confirmed that withdrawals will be processed according to the validator index number - unique and permanent identifiers assigned at the start of the staking process - rather than the order of requests in the exit queue. Concerns that the queue could get clogged should be alleviated to some extent by the dynamic nature of staking rewards, as they are inversely proportional to the square root of the total balance of all validators. A decline in net validators causes the protocol to automatically increase inflationary rewards; transaction fees and MEV rewards are also shared among a smaller number of validators. This should in theory increase the overall rate of reward and act as an incentive for ETH holders to stake.

In conclusion.

This last year has been tumultuous to say the least. This month's note is detailed and lengthy nevertheless we felt it important to walk you through the full arc of the year. The failures have been numerous and disappointing however they can probably be distilled down to a few key attributes. Excess leverage, limited regulation, fraud, and an unwillingness to correctly price the future of the technology.

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Regulation will be introduced in the coming years that will limit the prevalence of the first three attributes. In dealing with the last point, by correctly pricing the technology we mean to imply that the potential of blockchain technology is often so transformational and disruptive that once you start to understand its application you see use cases for it everywhere. Unfortunately, perhaps, at times, you fail to see the incumbent processes and the resistance that they may have to change and also the complexity of the implementation of blockchain technology. What this last year has taught many is that while change is inevitable its speed is far from predictable, we continue to have faith in the future of this technology and faith in the developers building this future.

William Pollard was a Nuclear physicist who participated in the Manhattan project, interestingly he was also an Episcopal Minister. The quote below sums up how we are viewing 2023 and the future landscape of the blockchain space as we move forward. The irony that it's a quote from a scientist who also was a religious man is not lost on us. Our job is to navigate the space between belief and fact and be part of the change.

"Without change there is no innovation, creativity, or incentive for improvement. Those who initiate change will have a better opportunity to manage the change that is inevitable."

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