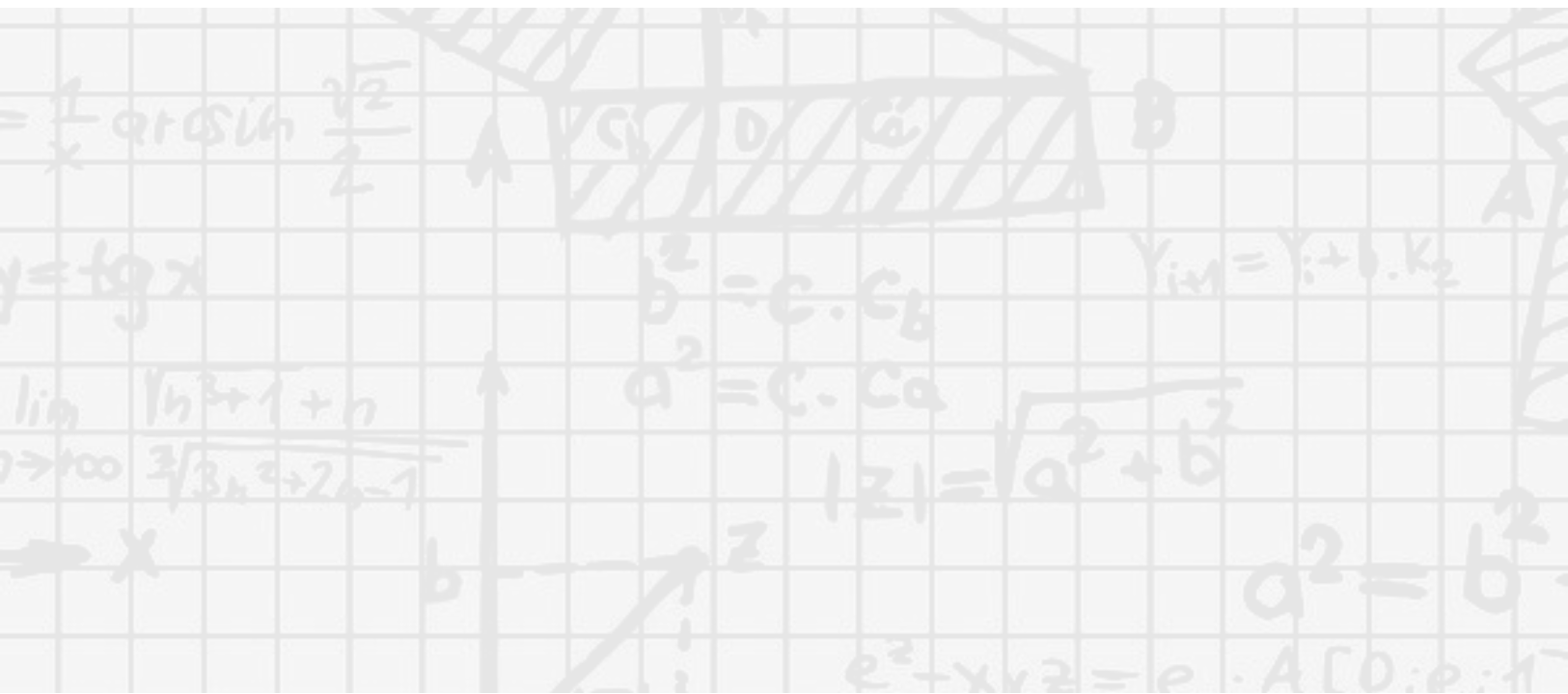S2F. | Intelligence

Digital Asset Markets Report

2H August 2022

Summary

The S2F Intelligence report examines network fundamentals using on-chain analysis, technical tools, and proprietary indicators. We aim to provide insight into how digital assets perform during these unprecedented times. By recognizing trends in both momentum and volatility, we seek to identify opportunities while navigating uncertain market conditions.

Macro Overview

- S&P 500 and DJIA indices declined this month, posting -17.4% and -13.6% YTD, with the NASDAQ continuing to outperform to the downside at -25.5% on the year. Markets reacted negatively to Fed chair Powell's hawkish remarks during the Jackson Hole symposium - reiterating the Fed's commitment to moderating demand and expressing caution in prematurely loosening monetary policy.
- Nonfarm payroll jobs data showed a strong MoM decline (315K jobs vs. 528K in July), and a 3.7% U.S. unemployment rate exceeded 3.5% expectations. With the median Fed Funds rate projected slightly below 4% by the end of the year, markets estimate a 59% likelihood of an additional 75 bps hike with only a 41% chance of a 50 bps hike at the September FOMC meeting.
- Prolonged concerns over inflated global gas costs have led to the Strategic Petroleum Reserve (SPR) falling to its lowest levels since 1985 - declining from 621 million barrels a year ago to 453.1 barrels.
- Since peaking at a rate of 993,000 units in January 2021, the highest level since the end of 2006, new home sales dropped 29.6% on a year-over-year basis in July. The seasonally adjusted rate of 511,000 units fell below the estimated 575,000 sales.

Macro Performance Page 1

- The decline in Russian natural gas imports to Europe has led to costs rising by more than 10x their average during this time of year.
- With Europe forecasting a more dovish monetary policy than the US, the Euro has retreated to parity with the dollar.
- Gold is trending further into negative territory -7.17% YTD.
- Commodities continue to outperform traditional indices, with the GSCI commodity index now +30.4% in 2022.
- Hawkish remarks from Federal Reserve officials sent the US10Y treasuries to highs not seen since 2011 (3.23%).
- Since retracing to 94.6 in January, the US dollar index (DXY) has surged to 109.3 - a level not seen since 2002.

On-Chain Analysis Page 2

- **ETH Net Position Change + Validator Deposits :** We continue to see a steady outflow in ETH from exchanges and new ETH 2.0 deposits in the staking contract - since Q4 2020, the ETH exchange balance has fallen from 25.87% to 16.76%.

- **Stablecoin Supply Ratio (SSR):** The ETH MVRV (market value divided by realized value) indicator came close to reaching oversold levels before recovering to its equilibrium level. Whether this level serves as resistance or support could determine price action's ability to test higher towards the MVRV momentum region as the highly anticipated PoS merge approaches.

Technical Levels Page 3

- **Bitcoin**: BTC lost its 50d MA after strong sell-side pressure following Powell's hawkish remarks at the WY symposium. Support continues to hold at the 2017 cycle ATH on high timeframes but remains under pressure along with all risk-on assets.

- **Ethereum**: Large volumes of sell-side pressure remain at the $1,750-2,000 level. While there is positive sentiment surrounding ETH 2.0 in September, the threat of further downside remains if price cannot reestablish itself above the 200d MA.

Momentum & Sentiment Pages 4-5

- **pMV momentum model**: Currently remains sidelined in cash.

- **Alt-season indicator**: Our indicator suggests strength in alts is gradually declining and trending towards neutral territory.

- **Delta risk**: Since managing to reach the indicator's lowest risk level for both BTC and ETH - the delta risk has begun to gradually increase, eventually reaching the highest level of risk.

Money Flows & Themes Pages 6-8

- **Ethereum Layer 2 Networks - Optimistic & ZK Rollups :** Rollups are layer two blockchains that offer users cheap transaction fees and fast execution while assisting in scaling the Ethereum network. L2 rollups compile large amounts of transactions into a single data transaction and securely settle user data using fraud proofs and validity proofs.

- **Ethereum Layer 2 Growth Metrics :** Transitioning to a proof of stake architecture allows Ethereum to unlock scaling efficiencies of L2 blockchain technology further - eventually resulting in a hypothetical 100,000+ TPS. Layer 2 metrics are growing across TVL (total value locked), weekly gas consumption, and percent of total ETH mainnet fees.
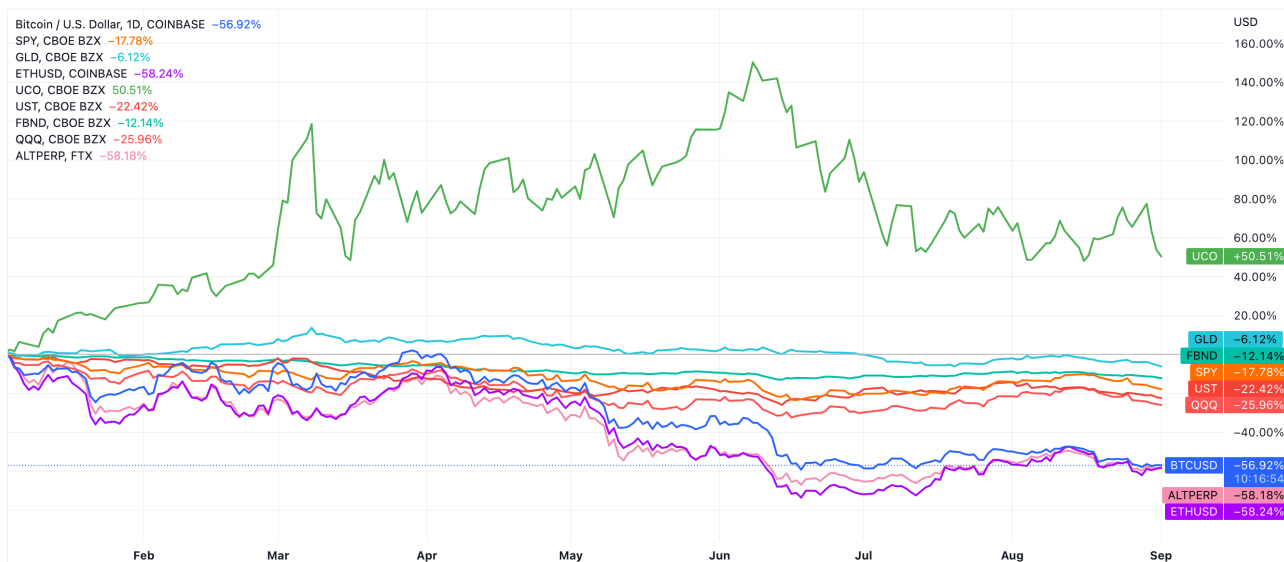
Notable News Page 9

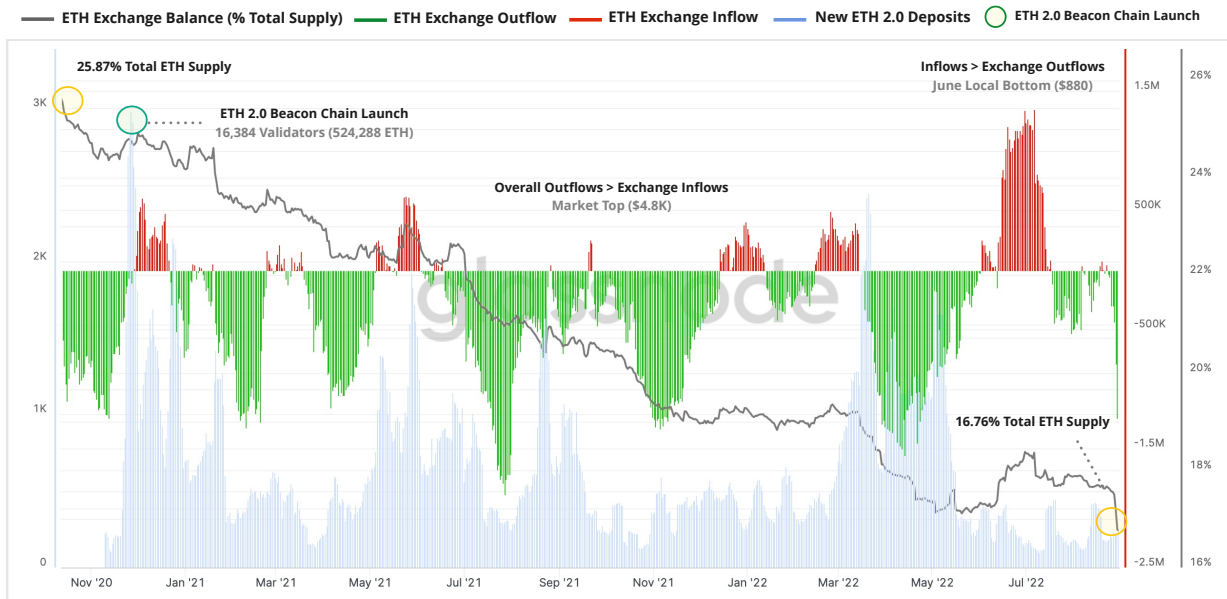- Bitcoin, Ethereum, Layer One, and Other Headlines.

Macro Performance

2022 Asset Returns

Bitcoin / U.S. Dollar, 1D, COINBASE −56.92%
SPY, CBOE BZX −17.78%
GLD, CBOE BZX −6.12%
ETHUSD, COINBASE −58.24%
UCO, CBOE BZX 50.51%
UST, CBOE BZX −22.42%
FBND, CBOE BZX −12.14%
QQQ, CBOE BZX −25.96%
ALTPERP, FTX −58.18%

| Asset	MtD*	QtD	YtD	Volatility (annualized)*	Sharpe (annualized)*	Correlation (to Bitcoin)**
Bitcoin	-14.0%	3.7%	-56.92%	68%	-1.53	1.0
Ethereum	-5.0%	46.0%	-58.24%	90%	-0.96	0.67
Altcoin Index	-6.8%	20.6%	-58.18%	80%	-1.34	0.73
SPY	-3.8%	3.7%	-17.78%	24%	-1.11	0.45
QQQ	-4.7%	4.3%	-25.96%	31%	-1.11	0.40
GLD	-3.5%	-5.4%	-6.12%	14%	-0.63	0.50
UCO	-6.0%	-20.6%	50.51%	82%	1.27	0.52
FBND	-3.0%	-0.5%	-12.14%	7%	-2.38	0.38
UST	9.0%	-5.0%	-22.42%	19%	-1.90	0.13

Sources: Glassnode, AlphaVantage
Assets: SPY = S&P500, QQQ = NASDAQ, GLD = Gold, UCO = Crude Oil, FBND = Total Bond Market , UST = 7-10 YR Treasury, Alt-Perp (FTX) = Altcoin Index
*as of August 31st, 2022
**last 90 days

Ethereum Net Position Change + New Validator Deposits

— ETH Exchange Balance (% Total Supply) — ETH Exchange Outflow — ETH Exchange Inflow — New ETH 2.0 Deposits ◯ ETH 2.0 Beacon Chain Launch

- As Ethereum draws closer to the PoS merge in September, we continue to see a steady outflow in ETH from exchanges (**green**) and new ETH 2.0 deposits in the staking contract (**light blue**).

- Since the beacon chain launch in late 2020, the **ETH exchange balance** (**gray**) *has fallen from **25.87%** to **16.76%***. The staking contract now holds more than 13.4 million ETH (11.2% of the total circulating supply of Ethereum).

Stablecoin Supply Ratio (SSR)

— BTC Price — Upper BB (200,2) — Lower BB (200,2) — Stablecoin Supply Ratio (SSR)
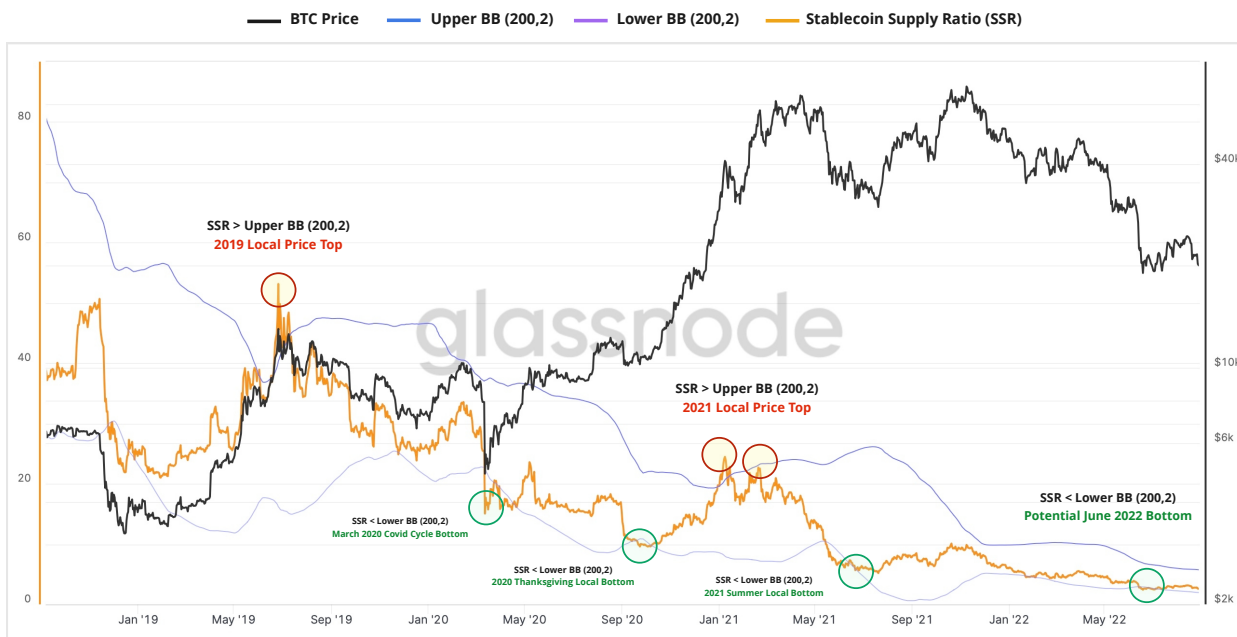
- The SSR (**orange**) is the ratio between Bitcoin supply and the supply of stablecoins - Bitcoin Market cap / Stablecoin Market cap. The following stablecoins are used for supply: USDT, TUSD, USDC, USDP, GUSD, DAI, SAI, and BUSD.

- When SSR is high (**red circles**), the stablecoin supply has "less purchasing power," and when the SSR is low (**green circles**), the current stablecoin supply has more "buying power" to purchase BTC.

- The stablecoin market cap has grown exponentially over the years, and we currently see almost ~$130 billion in sidelined value sitting at buying-power extremes.

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- **Bitcoin experienced strong sell-side pressure and lost the 50d MA (blue)** following Fed chair Powell's hawkish remarks at the Jackson Hole symposium.

- Support continues to hold at the 2017 cycle ATH on high timeframes but remains under pressure along with all risk-on assets.

- Previous levels of support have become resistance ($22.6K - $24K), and we continue to remain cautious of false momentum until critical levels of price structure are reclaimed.

- **Ethereum price is currently battling to reclaim the 50d MA level of support (blue).**

- Ethereum, unlike previous bear market cycles, has not underperformed Bitcoin- maintaining its correlation with BTC price as the Merge continues to be on the radar of both institutional and retail investors.

- Large volumes of sell-side pressure remain at the $1,750-2,000 level. Further downside remains if price cannot reestablish itself above the **200d MA (gold)**.

Momentum & Sentiment

S2F Alt-Season Indicator
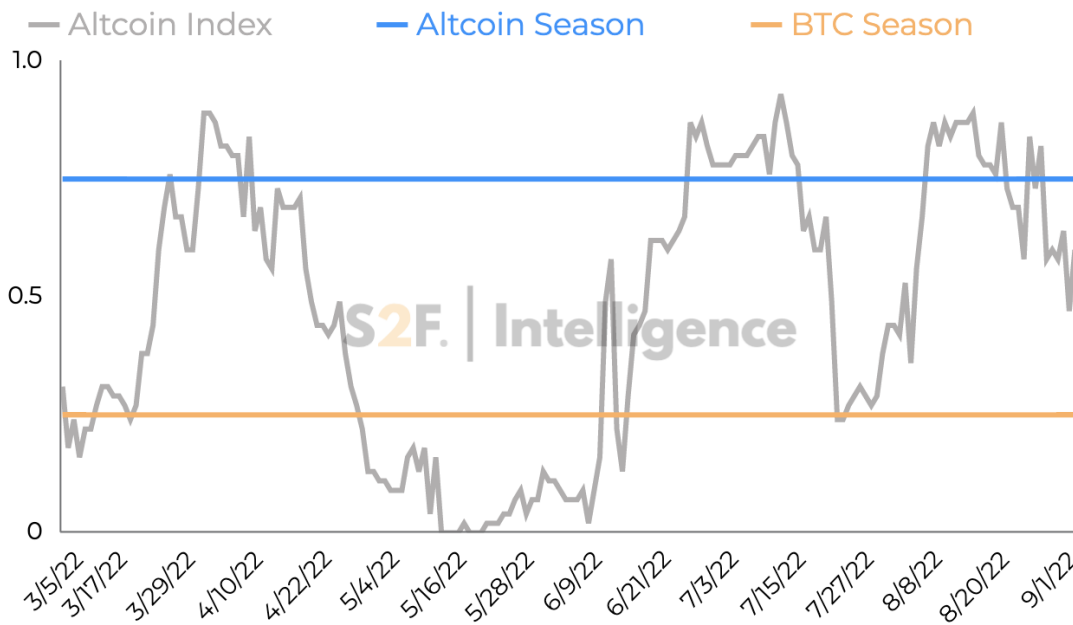
The S2F Alt-Season Indicator is a proprietary model that measures the capital flows between Bitcoin and a basket of major Altcoins. This indicator is especially helpful in **identifying where strength resides** in the cycle and can **potentially indicate what may happen next**. When the Index line (**gray**) is below the **orange line**, it generally signals strong momentum favoring Bitcoin vs. Altcoins.

S2F Momentum Model (pMV)
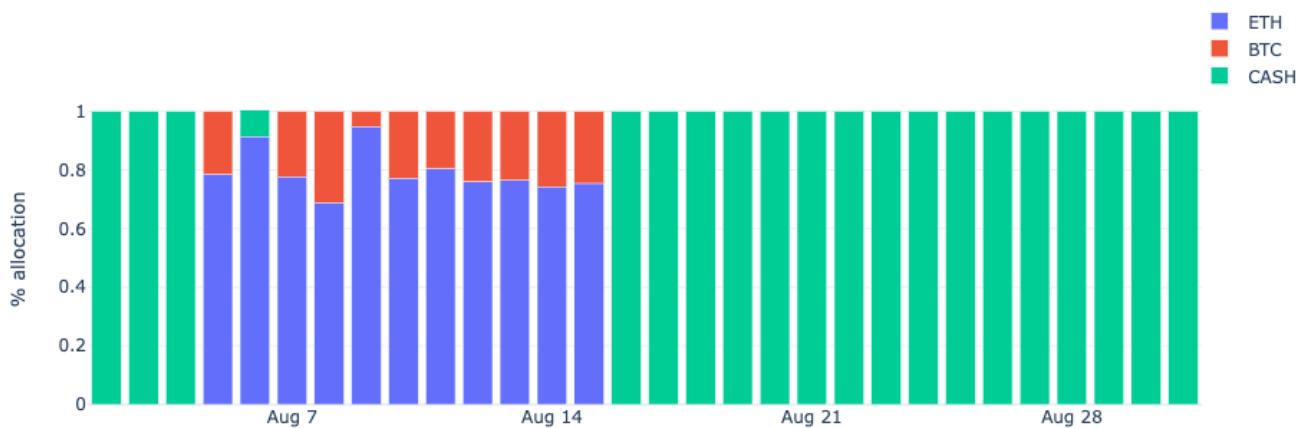
The S2F Momentum Model is a proprietary model that **compares the price momentum of BTC vs. ETH vs. USD** over a rolling window to suggest an optimal allocation of capital to each of these three assets. The entry and exit signals rely on two momentum indicators, one slow and one fast, to help determine portfolio over-or underweight-ness in each of the three assets.The chart above shows the suggested daily allocation over the last 30 days.

Delta Risk Score

The Delta Risk Score is a proprietary model that **measures the probability of an imminent retracement in price.** The indicator's value (**red line**) oscillates between 0 and 1, with the former signaling low-risk while the latter determines high-risk conditions. The chart below shows both indicators and the underlying asset's price (**grey line**) since Q1 2020.
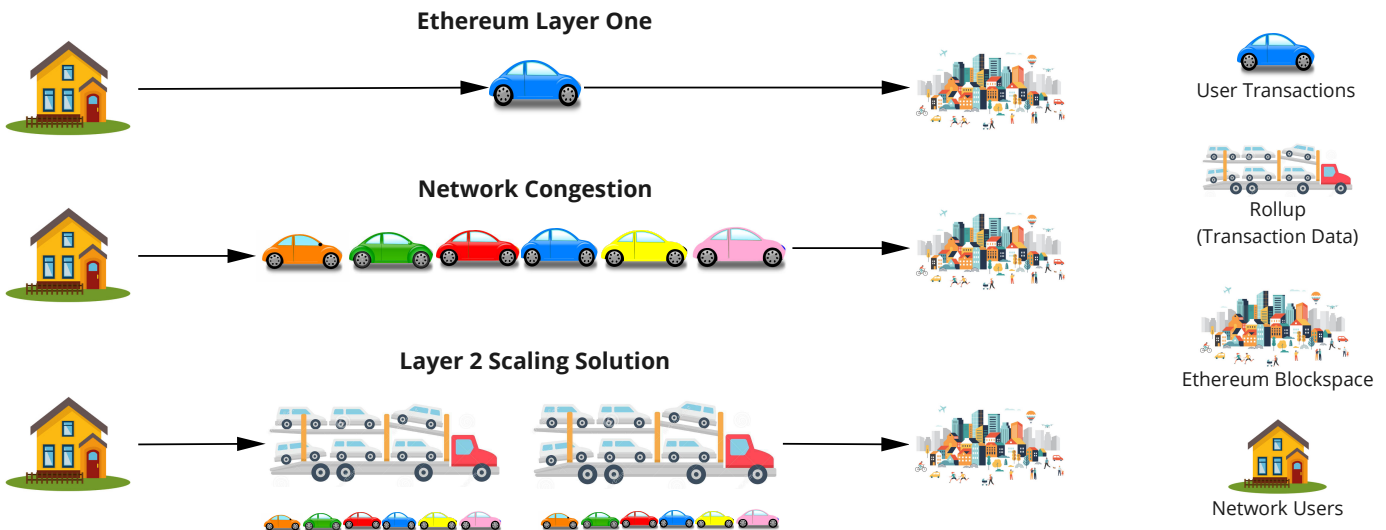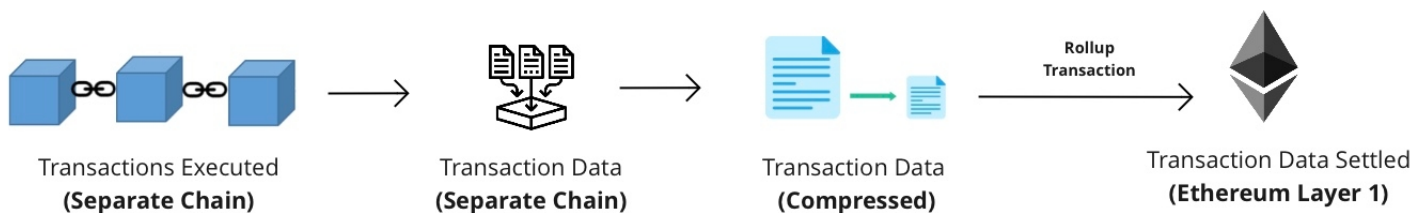
Bitcoin
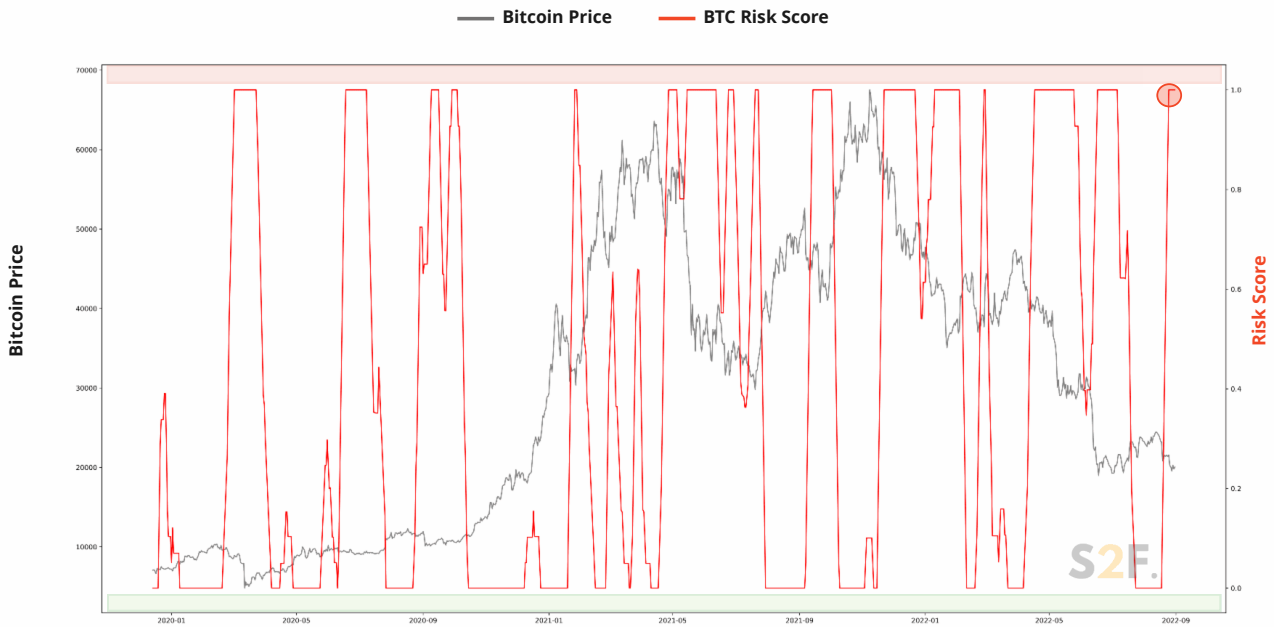
Ethereum
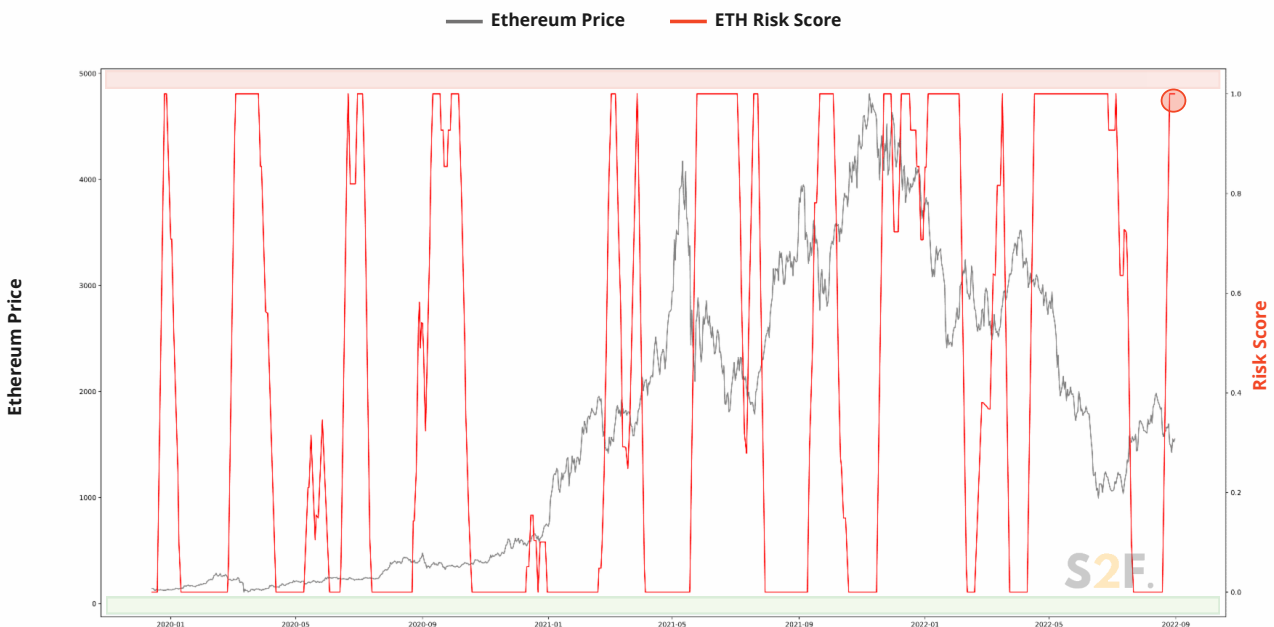
What is an Ethereum Layer 2 Rollup?

- A blockchain is responsible for storing user data, transaction history and executing smart contract programs - these functions create data. In 1H August, we discussed how more users joining the Ethereum ecosystem = could generate more demand for limited block space.

- When **demand for block space exceeds the available supply**, users are subjected to inflated gas prices to process their transactions. What if there was a way to increase the amount of block space so users could transact instantly for less? Enter rollups.

- Rollups are layer two blockchains that offer users cheap transaction fees and fast execution while assisting in scaling the Ethereum network. L2 rollups compile large amounts of transactions into a single data transaction - similar to a zip file. (see below for graphic explanation)

Ethereum Layer One

Network Congestion

Layer 2 Scaling Solution

User Transactions

Rollup
(Transaction Data)

Ethereum Blockspace

Network Users

Layer 2 Rollup Process + Security

- Rollups execute transactions **outside the L1** but **post transaction data on the L1**. The rollup ecosystem inherits security from the L1 mainnet because it is built on top of the base layer of Ethereum (L1).

- Moving computation off of the mainchain makes it possible to process more transactions - Arbitrum, the leading L2 on Ethereum, can process up to 4,500 transactions per second[3] vs. ETH L1, which can only process ~10-20 transactions per second.

Layer 2 Rollup Process

Transactions Executed
(Separate Chain)

Transaction Data
(Separate Chain)

Rollup Transaction

Transaction Data
(Compressed)

Transaction Data Settled
**(Ethereum Layer 1)**

- Rollup transactions are executed on a separate chain and then batched to the Ethereum Layer 1 chain.

- Rollups deploy smart contracts on Ethereum Layer 1. These smart contracts are responsible for deposits and withdrawals of user funds. Smart contracts are secured by validating cryptographic proofs to ensure data settled to Layer 1 is accurate.

- There are two different kinds of rollups, and the difference between them is their security model for submitting transaction data to Ethereum. **Optimistic rollups use Fraud proofs** and **ZK rollups use Validity proofs**.[2]

1 Offchain Labs Dev Center, Arbitrum Rollup Basics https://developer.offchainlabs.com/docs/Rollup_basics
2 101 Blockchains, Optimistic Rollups Vs Zero-Knowledge Rollups https://101blockchains.com/optimistic-rollups-vs-zk-rollups/

Optimistic Rollups + Fraud Proofs

In an optimistic rollup, users trust and rely upon network depositors to submit their transactions on Ethereum L1. Data posted to L1 is **assumed to be correct by participants**. This *optimistic assumption* feature of the rollup requires less computation than ZK rollups.
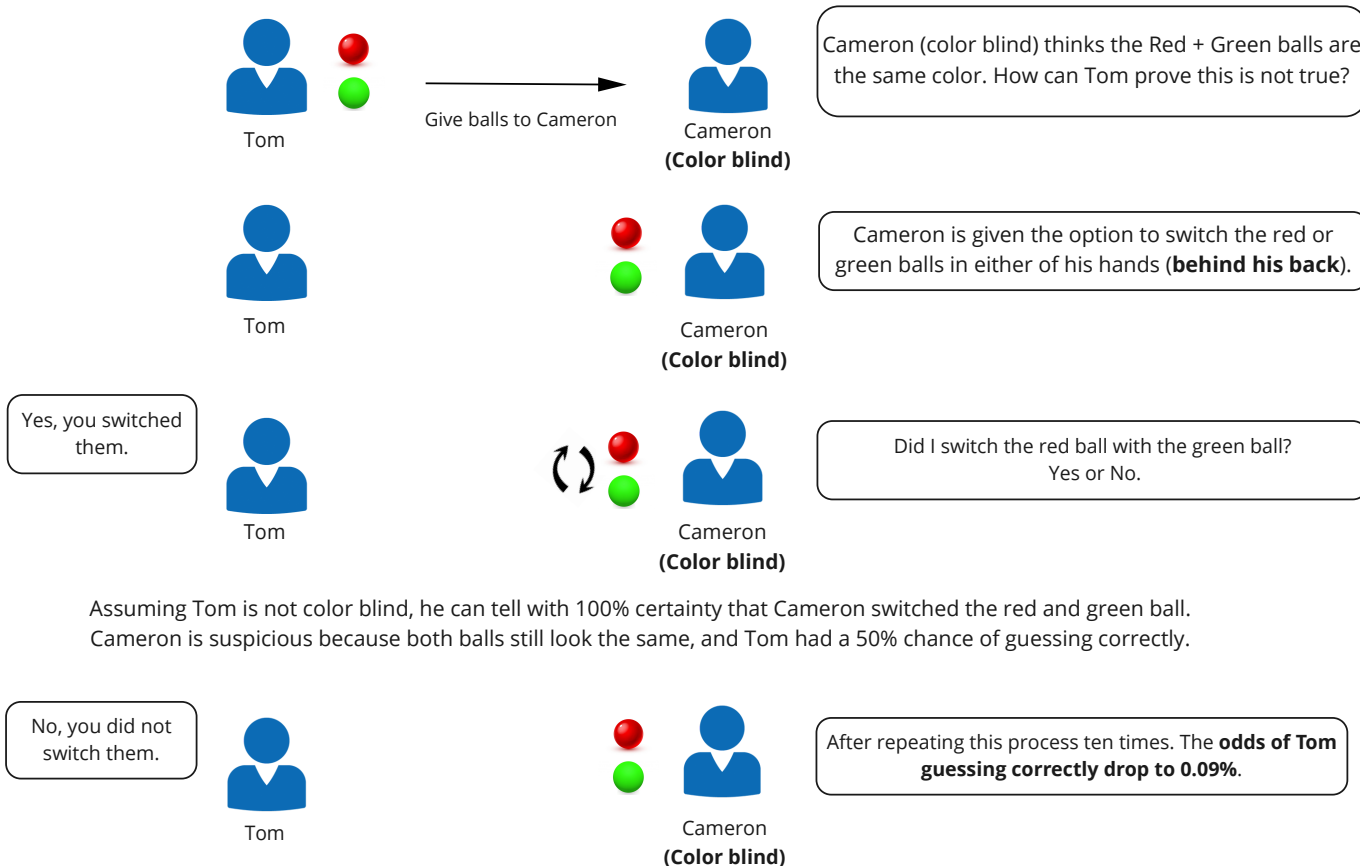
- Depositors are required to lock their own ETH as an incentive to behave in a trustworthy manner. If they submit incorrect data to the ETH L1, they risk penalization, and their bonded ETH will be forfeited.

- If a transaction is suspected of being invalid, the first step is to identify the error - once the mistake is verified, the bad actor is punished. This process is called a fraud-proof, and it's how optimistic rollups are secured.

- A dispute resolution in a fraud-proof requires re-submitting the transaction in question on Layer 1 instead of the Layer 2 ecosystem.

- If the **execution proves the transaction is invalid**, the **deposit validator is punished,** and their Ethereum is slashed. If the network participant who prompted the dispute is incorrect, the bonded Ethereum required to submit the fraud proof is slashed.

How Fraud Proofs Work

Submit T/X Data Fraud Proof

Depositor   (Ethereum Layer 1)   Network Participant
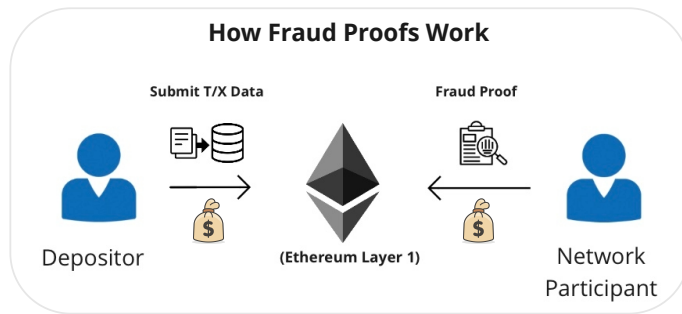
ZK Rollups and Zero-Knowledge Proofs

The other form of an L2 rollup is called a ZK rollup - it leverages cryptographic security using something called a zero-knowledge proof. Let's explore this concept - the goal of a **ZK Proof** is to prove something is true *without revealing what we're proving*. Here's an example:

Tom wants to prove to Cameron, **who is color blind**, that these two identical balls are different colors.

Tom

Give balls to Cameron

Cameron
(Color blind)

Cameron (color blind) thinks the Red + Green balls are the same color. How can Tom prove this is not true?

Tom

Cameron
(Color blind)

Cameron is given the option to switch the red or green balls in either of his hands (**behind his back**).

Yes, you switched them.

Tom

Cameron
(Color blind)

Did I switch the red ball with the green ball?
Yes or No.

Assuming Tom is not color blind, he can tell with 100% certainty that Cameron switched the red and green ball.
Cameron is suspicious because both balls still look the same, and Tom had a 50% chance of guessing correctly.

No, you did not switch them.

Tom

Cameron
(Color blind)

After repeating this process ten times. The **odds of Tom guessing correctly drop to 0.09%**.

Every time you repeat the process, the odds that Tom is cheating decrease.
Tom has proven to Cameron that the balls are different colors without revealing which ball is red or green. (**Zero-knowledge**)

Money Flows & Themes

ZK Rollups + Validity Proofs

- Like an optimistic rollup, ZK rollups are built on top of Layer 1. ZK rollups help scale transaction throughput in a trustless manner.

- Transactions and user data are computationally bundled off-chain and then submitted by a depositor. This compressed packet of user data requires a **validity proof**.

- Unlike an optimistic rollup, the validity proof model requires no network participant- ZK rollups don't permit depositors to act untrustworthy.

- ZK rollups leverage the cryptography technology of a zero-knowledge proof (discussed on the previous page), which mandates depositors submit cryptographic proof that any network participant can verify.

Validity Proof

Submit T/X Data

Depositor — SNARK → (Ethereum Layer 1)

(Transaction Data submitted with ZK cryptographic proof
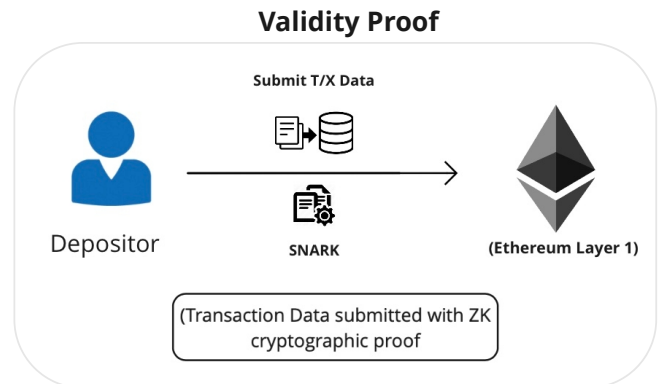
This form of a non-interactive zero-knowledge proof features **SNARKS** (Succinct Non-Interactive Arguments of Knowledge) cryptography.

Layer 2 Metrics Growth

Transitioning to a proof of stake architecture allows Ethereum to further unlock scaling efficiencies of L2 blockchain technology - eventually resulting in a hypothetical 100,000+ TPS.[1] L2s coupled with future ETH protocol improvements are already laying the foundation for current and future users.

Total Value Locked on Layer 2s (ETH)
November 13, 2019 - August 25, 2022

3,285,693 ETH
($5.575 million)
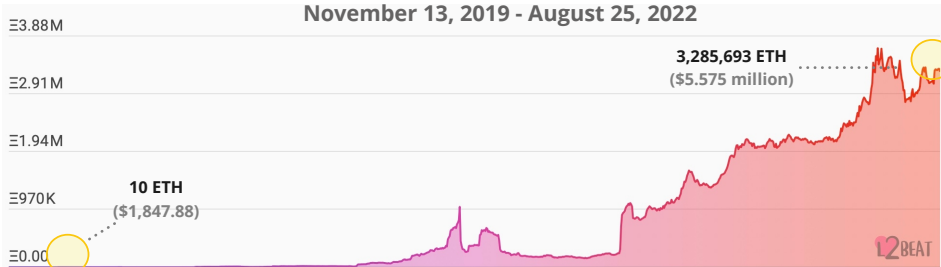
10 ETH
($1,847.88)

The impact L2 technological efficiencies have had on lowering gas fees has prompted the TVL (ETH) to grow from 10 ETH in Nov 2019 to almost 3.3 million ETH in August.[2]

Weekly Ethereum Layer 2 Gas Consumption
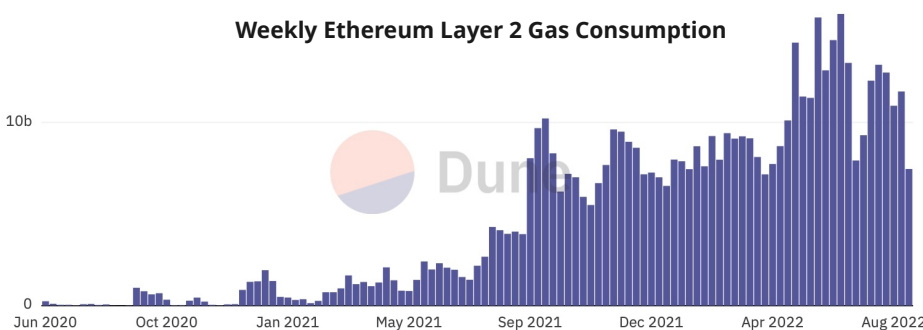
L2 user adoption has led to a steady increase in weekly gas consumption because L2 ecosystems are required to spend gas (GWEI) to settle rollup t/x's on L1, which creates a more efficient demand profile for block space.

L2 Percentage of L1 Mainnet Fees
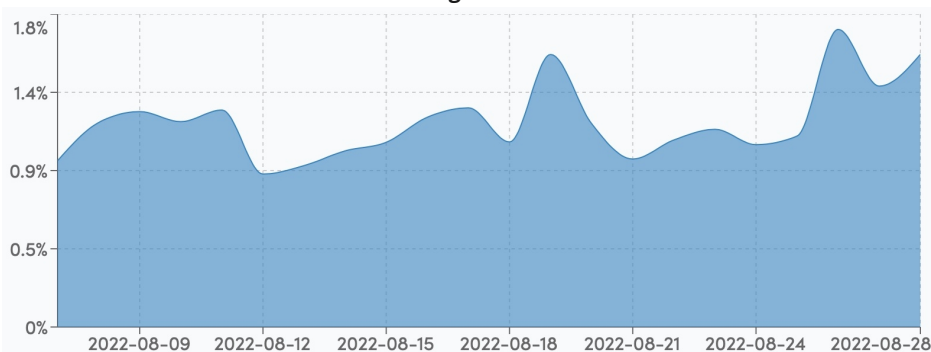
As of 08/30, L2s accounted for 2.0% of the daily mainnet protocol fees.[3] As popular applications migrate from Layer 1 mainnet to more accommodating and efficient network conditions, we expect users and value to follow, paving the way to network scaling.

1 Vitalik Buterin , Ethereum Community Conference (Ethcc 5) https://www.youtube.com/watch?v=kGjFTzRTH3Q&t=2356s
2 L2Beat, Total Value Locked https://l2beat.com/scaling/tvl/
3 L2Fees, How much are rollups paying for Ethereum's security? https://l2fees.info/l1-fees

Notable News

Bitcoin

- The NFL Houston Texans will accept Bitcoin as payment for single game suites - the announcement comes after digital currency wallet and payment processor, BitWallet became an official team sponsor.
- Intel announced plans to build "energy efficient" Blockscale ASIC bitcoin miners. The company recently secured $30 billion in funding to build a new chip manufacturing factory.
- Visa partners with NearPay to launch a virtual Bitcoin card - the NearPay card can make transactions with cryptocurrency across Europe, with physical cards launching soon.
- One of the largest North American crypto ATM providers, Bitcoin Depot, announces plans to go public in Q1 of 2023 with a $885 million SPAC deal.
- SEC postpones decision on VanEck Bitcoin ETF application until October 11.

Ethereum

- Coinbase announced it would be listing its Coinbase Wrapped Staked ETH (cbETH) on the Ethereum network as an ERC-20 token - the token allows customers to use their staked ETH while earning rewards on the exchange.
- The world's leading derivatives marketplace, CME, announced its plans to launch options on ETH futures on September 12, pending regulatory review.[1]
- Leading layer two rollup Arbitrum released their highly anticipated Nitro upgrade, offering users even lower fees and higher transaction throughput.[2]
- US Congressman Tom Emer (MN) publishes a public letter to Treasury Secretary Yellen challenging OFAC's recent decision to ban smart contract-powered software, stating it goes against FinCEN precedent.
- Diego Fernández, the secretary of innovation and digital transformation for Buenos Aires, announced plans to deploy Ethereum validation nodes in 2023. He added that the effort "has exploratory and regulatory purposes" and will help the city of three million people "develop adaptable regulation" for crypto.

Layer 1's

- Jump Crypto plans to build a new, open-source validator client for Solana, independent of Solana Labs.
- BarrelDAO, a brewery, and distillery that is user-governed, announces the release of its Solana Summer Shandy beer - the limited batch will be sold via NFTs on Magic Eden, the NFT marketplace on Solana, with each of the 16-packs being sold for 1.35 SOL.
- *Crypto Leaks* alleges that the Avalanche blockchain's development company, Ava Labs, allocated around 1% of the AVAX token supply and Ava Labs stock to law firm Roche Freedman as payment for the firm to stage litigations and class-action lawsuits against some of its competitors.
- Binance Smart Chain (BNB) announces the release of the DappBay hub for the BNB Chain ecosystem. The application features a contract risk scanning tool, Red Alarm which identifies potential high-risk projects to protect users.

Other Headlines

- Select provinces of Canada are enforcing purchasing limits for citizens buying more than $30,000 in restricted cryptocurrencies - BTC, ETH, BCH, and LTC will not have any purchasing limits.
- Tether Limited, which oversees the popular stablecoin USDT, has hired BDO Italia as its accounting firm in an effort to produce monthly proof of reserve reports.
- Samsung Securities and six other large domestic securities companies are seeking approval from South Korean financial authorities to establish a virtual asset exchange in 2023.[3]
- The editorial board of the Financial Times announced public support for the growing involvement of legacy financial institutions in crypto markets.
- Binance and FTX have shown interest in acquiring Voyager Digital assets - final bids will be due on September 6, with the final sale scheduled to take place via auction proceeding on September 29.

1 CME Group, Press Release 'Launch Ether Options on September 12' https://www.cmegroup.com/media-room/press-releases/2022/8/18/cme_group_to_launchetheroptionsonseptember12.html
2 CryptoMode , The Arbitrum Nitro Upgrade Introduces Many Crucial Benefits https://cryptomode.com/the-arbitrum-nitro-upgrade-introduces-many-crucial-benefits/
3 The Coin Republic, Samsung Tech Giant prepares to launch crypto Exchange https://www.thecoinrepublic.com/2022/08/27/samsung-tech-giant-prepares-to-launch-crypto-exchange-reports/

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Bitcoin Halving: Is the process of halving the rewards of mining Bitcoin blocks. This event occurs after each set of 210,000 blocks is mined (blocks are mined every 10 minutes, so around 4-years).

Block Proposer: Post-merge, Ethereum stakers, or validator nodes will function as block proposers who propose blocks for inclusion in the blockchain. This is a part of the normal ETH staking process and is the last step before the next block is confirmed.

Consensus: A consensus mechanism is a method for validating entries into a distributed database and keeping the database secure.

Ethereum Validator: A validator is an entity that participates in the consensus of the Ethereum protocol. Users stake 32 ETH to become a validator. Validators are chosen at random to create blocks and are responsible for checking and confirming the network ledger.

Hard Fork: A hard fork is a radical change to a network's protocol that makes previously invalid blocks and transactions valid, or vice-versa. A hard fork requires all nodes or users to upgrade to the latest version of the protocol software - if users prefer to utilize the blockchain without protocol upgrades, a chain split can occur.

Liquidity Pool: A liquidity pool allows depositors who provide digital assets to earn money from transaction fees generated by other users who buy and sell assets from the pool. Those transaction fees go back into the liquidity pool to further increase the value of your tokens and aid in growing the pool.

Mempool: Short for (memory pool) is a smaller database of unconfirmed or pending transactions which every node keeps. When a transaction is confirmed by being included in a block, it is removed from the mempool.

Modular Network Scaling: The separation of a blockchain's functions - consensus, data availability, and execution takes place on separate network layers instead of executing all tasks on one base layer. This design approach allows for network scaling without sacrificing decentralization or security.

Slashing: Slashing occurs when the Ethereum network confiscates some or all of a validator's staked ETH for proposing or confirming fraudulent blocks. Validators stake ETH in the first place so that the network can confiscate the tokens if a validator acts maliciously towards the network.

Realized Price: Measures the average price weighted by the supply of what all market participants paid for their coins. Realized price is calculated by dividing realized cap by total supply of tokens in circulation.

TVL (Total Value Locked): Representation of the total value of a crypto-asset that is "locked" in a DeFi (decentralized finance) application or smart contract. TVL can directly affect the yield and usability of these applications.

Disclaimer & Disclosures