

Web3.0 Biweekly

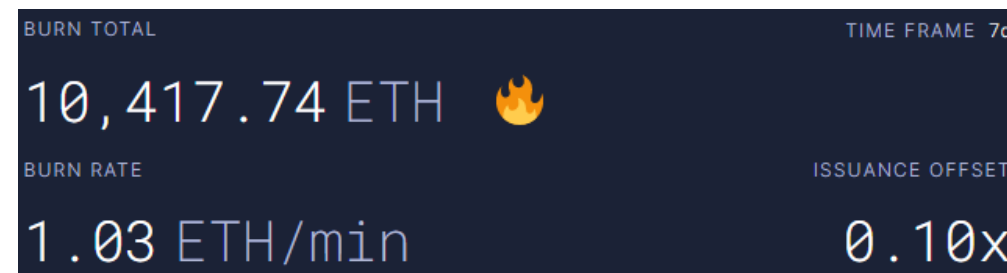
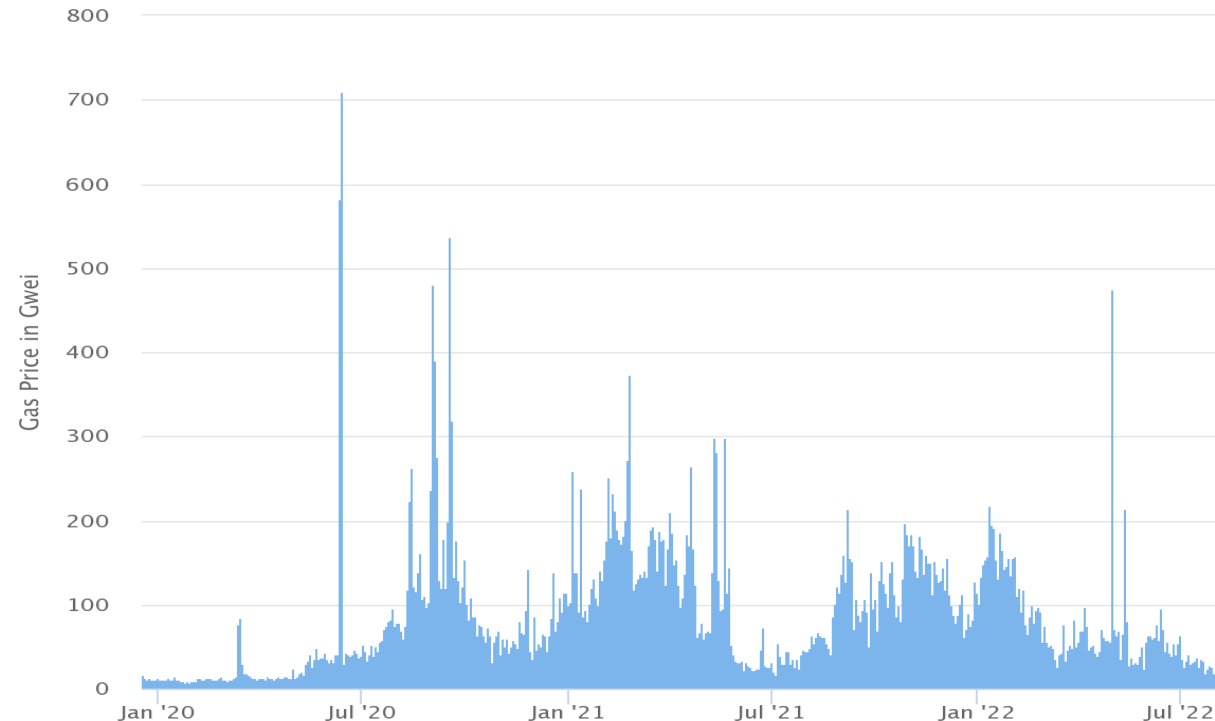
19 August 2022 | AMTD Research

Ethereum gas fees fall to two-year lows

- Average **Ethereum gas fees reached its lowest levels in over two years**, reaching ~11 gwei per transaction last week.
- The level was not seen since mid-April 2020, before the start of the great “DeFi Summer”.
- The decline in on-chain activity shows that, along with outsized demand for near-term call option contracts, the run-up in Ethereum price may be solely **due to event speculation (Merge) rather than network activity**.
- The bullish outlook on the Merge is partly attributable to EIP-1559, where a portion of each transaction fee is burned. Users cheered on the fact that Ethereum will potentially be **deflationary** after the Merge.
 - But this was more convincing during the height of the NFT run, where 12 ETH were burned every minute during its peak in January.
 - By contrast, roughly 1 ETH is burned every minute at present (based on 7 day average).
 - There needs to be at least 1.15 ETH/min burned for ETH to be deflationary, assuming ~607K ETH issuance per year post-Merge.

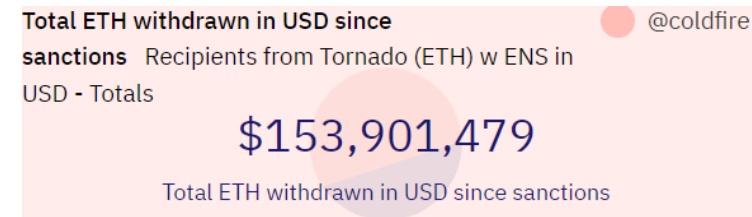
Ethereum Average Gas Price Chart

Source: Etherscan.io
Click and drag in the plot area to zoom in

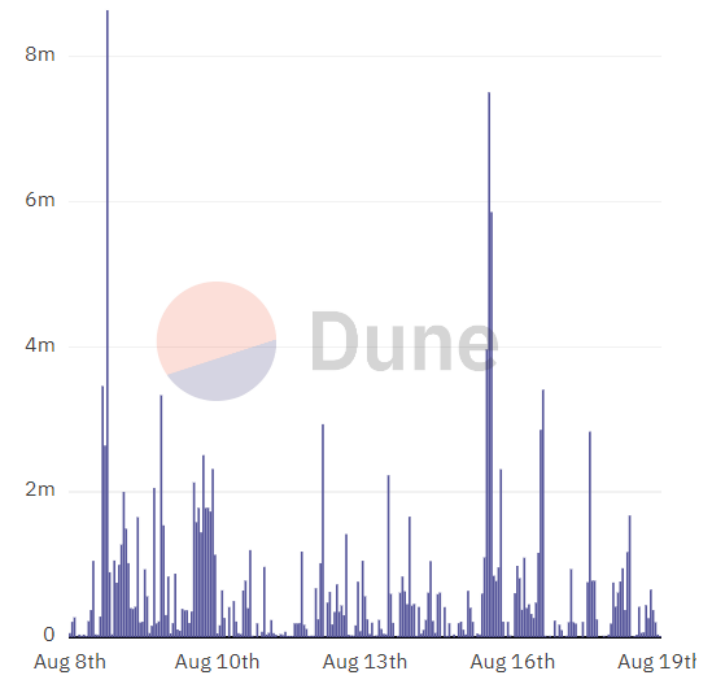


Tornado Cash sanctioned by US Treasury

- The **US Treasury sanctioned Tornado Cash**, a crypto mixer allegedly used by North Korean hacker group Lazarus Group.
- The sanction led to a chain of events, e.g., removal of GitHub accounts, shuttering of Discord server, and arrest of a developer. Some DeFi frontends have also blocked addresses that interacted with Tornado Cash.
- The implications are far-ranging and have started large-scale community discussion on the censorship resistance (or lack thereof) of crypto & DeFi.
- See page 35 for more information.



Recipients from Tornado (ETH) w ENS in USD over time @coldfire



Contents

1

Market Performance

Prices, Valuation, and Exchange Flows

2

Sector Updates

a

Layer-1 Blockchains — BTC correlation to equities decline, ETH spotlight on PoW hard forks & derivatives volume

b

Stablecoins — USDT & USDC supports ETH merge, DAI considers future without USDC

c

DeFi — TVL increase boosted by Ethereum and L2 chains, Tornado Cash sanction leads to wide scale blacklists

d

NFT & Metaverse — Floor price on “Tier-A” projects continue double-digit loss, Moonbirds goes CC0

e

Regulatory Updates — US Treasury sanctions Tornado Cash, Netherlands authorities arrest TC developer, US SEC investigates Coinbase staking programs

f

Notable Tweets

Market Performance

Summary

1. Prices

- **One-Year Price Recap**
- **Layer 1 Price Recap** (4 August – 17 August 2022)
 - DOGE led gains with the release of Dogechain, an Ethereum-compatible “L2 for Dogecoin”.
 - ETH continues to gain as investors speculate on the bullish Merge.
 - AVAX climbs as network activity reaches all time highs and token listed on Robinhood
- **Protocol Price Recap** (4 August – 17 August 2022)
 - OSMO continues price uptrend since mid-July respectively
 - AAVE also continues price gain with the start of OP rewards
 - GRT gains on the back of increase in activity and adoption

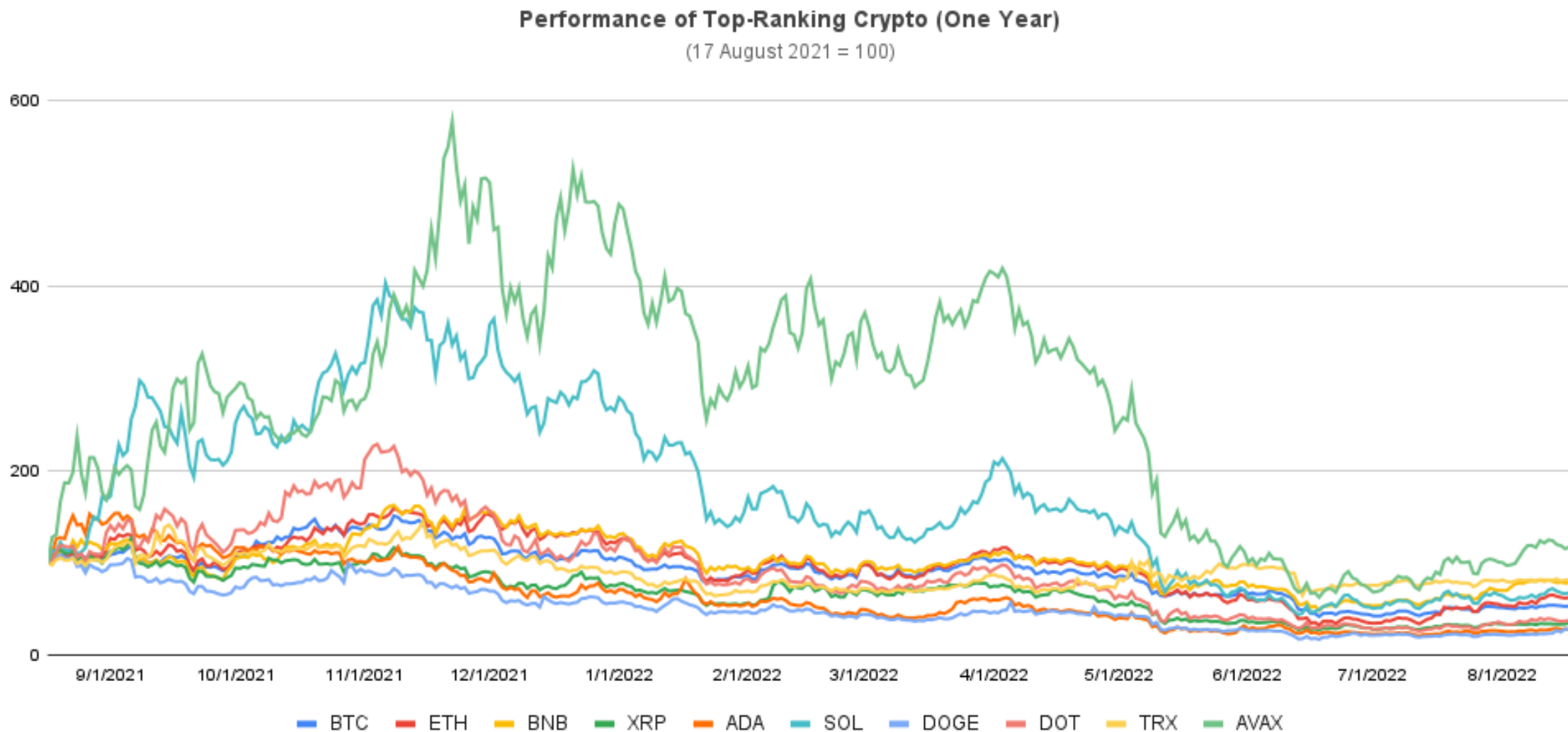
2. Valuation

- Market Cap to Active Addresses – ETH’s price rally driven more by multiple expansion than network usage

3. Exchange Flows

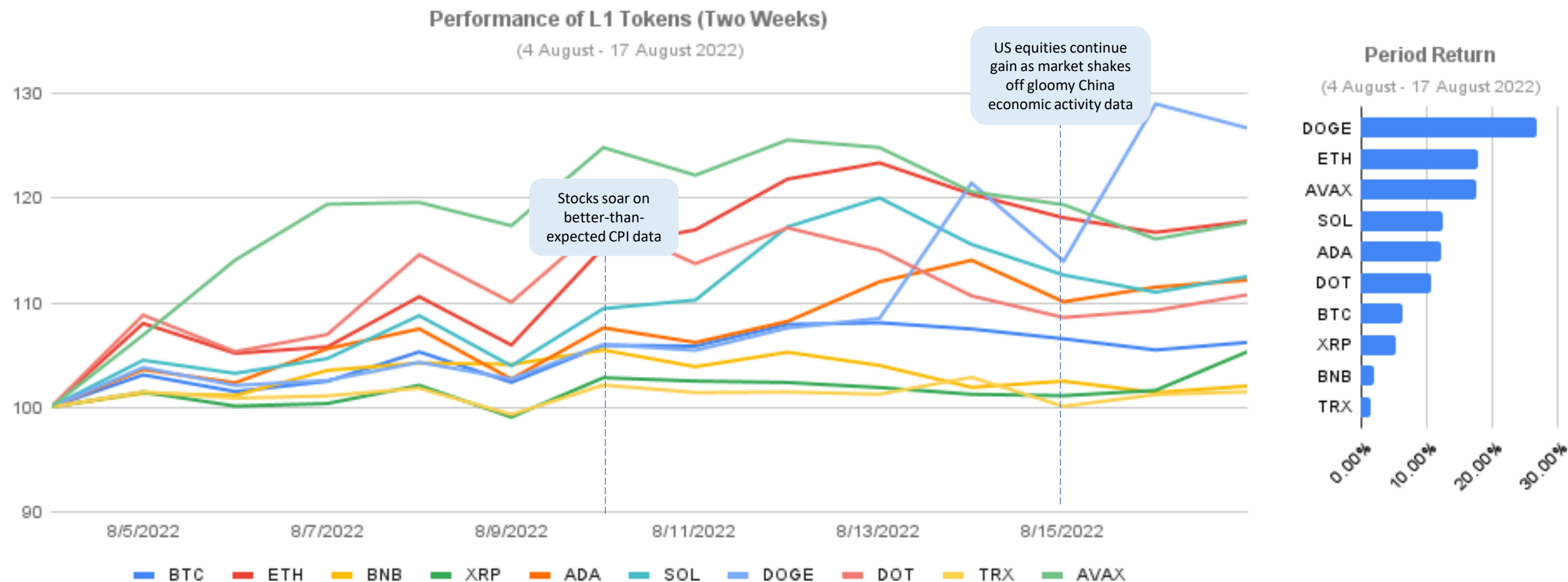
- Bitcoin - outflows pick up pace as exchange balances reach 4-year lows
- Ethereum - exchange position declines slightly, as some users move off exchanges on the back of Merge news while some take advantage of price movement and sells

One-Year Layer-1 Price Recap



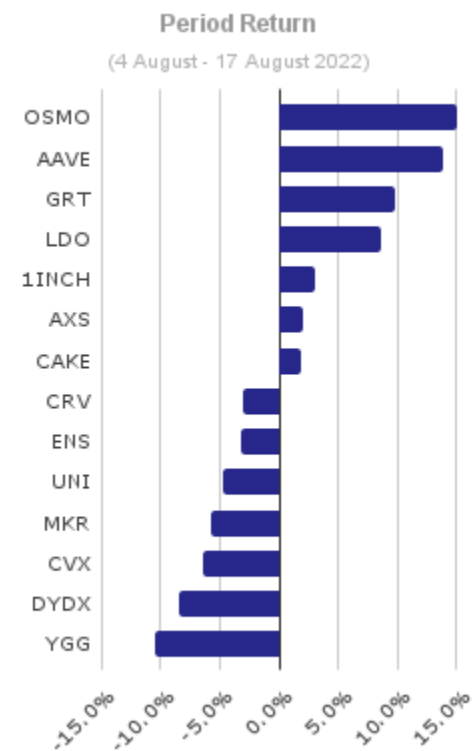
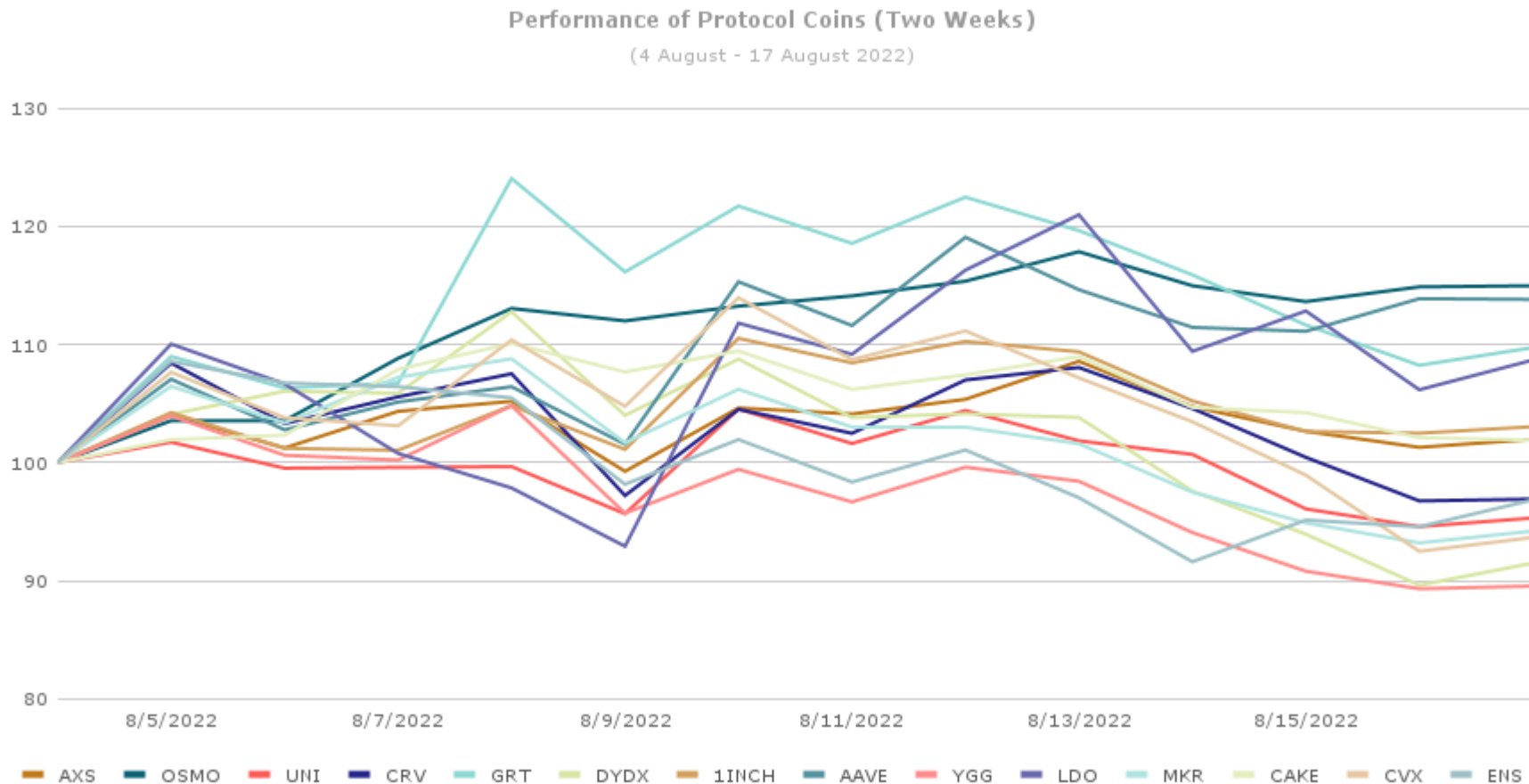
Layer-1 Price Recap (4 August – 17 August 2022)

- **DOGE** lead gains with the release of Dogechain, an Ethereum-compatible “L2 for Dogecoin”
- **ETH** continues to gain as investors speculate on the bullish Merge
- **AVAX** climbs as network activity reaches all time highs and token listed on Robinhood



Protocol Price Recap (4 August – 17 August 2022)

- OSMO continues price uptrend since mid-July respectively
- AAVE also continues price gain with the start of OP rewards
- GRT gains on the back of increase in activity and adoption



Valuation – BTC and ETH Market Cap to Active Addresses

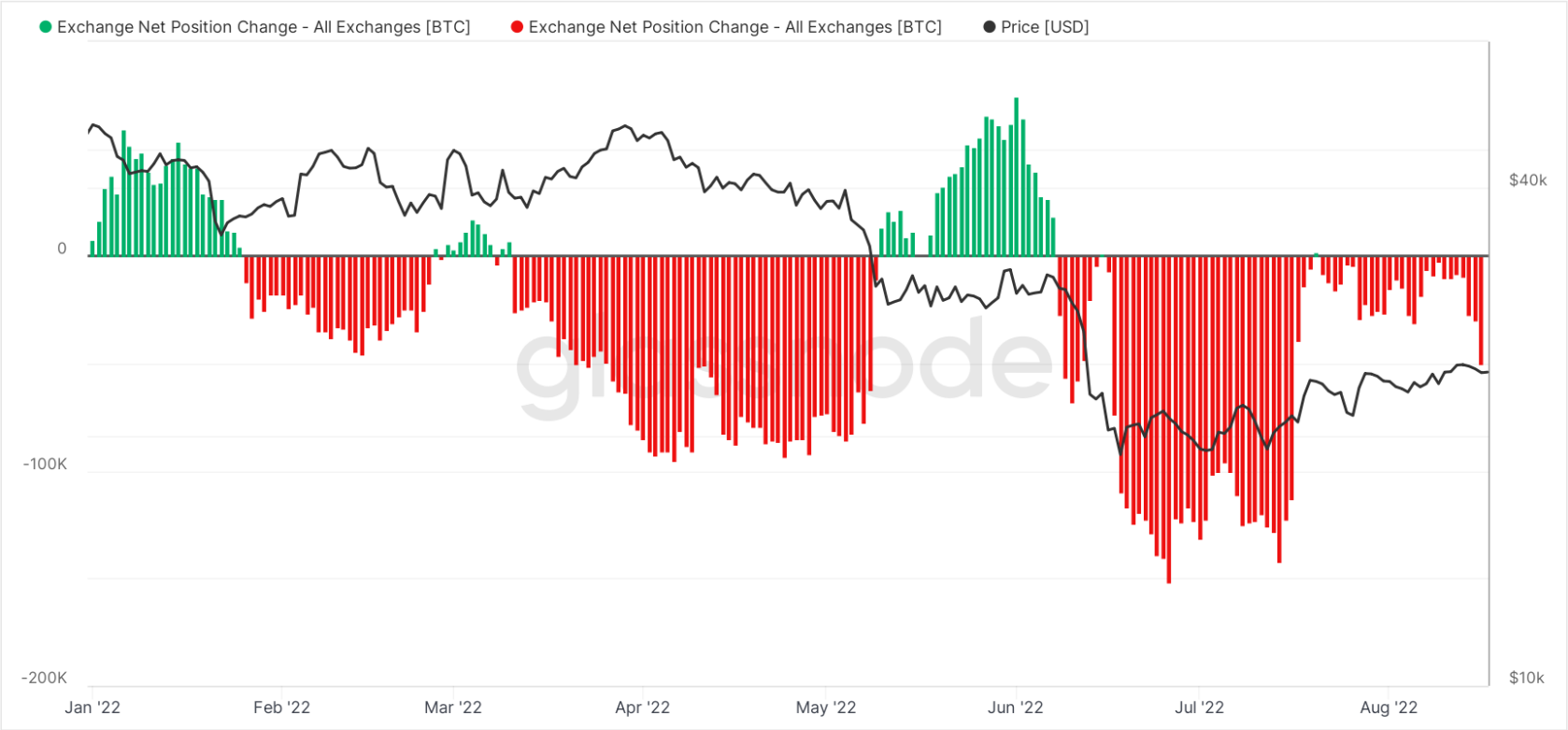


	BTC	ETH
Valuation Multiple		
2017-2018 Run	2.2x	7.1x
2020-2022 Run	5.6x	13.4x
Network Usage		
2017-2018 Run	1.3x	7.0x
2020-2022 Run	1.5x	2.8x

- Ethereum's price rally (30x+) in the 2020-2022 cycle was driven more by valuation multiple expansion (13x) than network activity increase (3x).
- The market cap to active address for ETH spiked last week as price speculators bet on the Merge event while active addresses fell slightly.

Bitcoin – outflows pick up pace as exchange balances reach 4-year lows

Bitcoin: Exchange Net Position Change [BTC] - All Exchanges



© 2022 Glassnode. All Rights Reserved.

Bitcoin: Balance on Exchanges [BTC] - All Exchanges

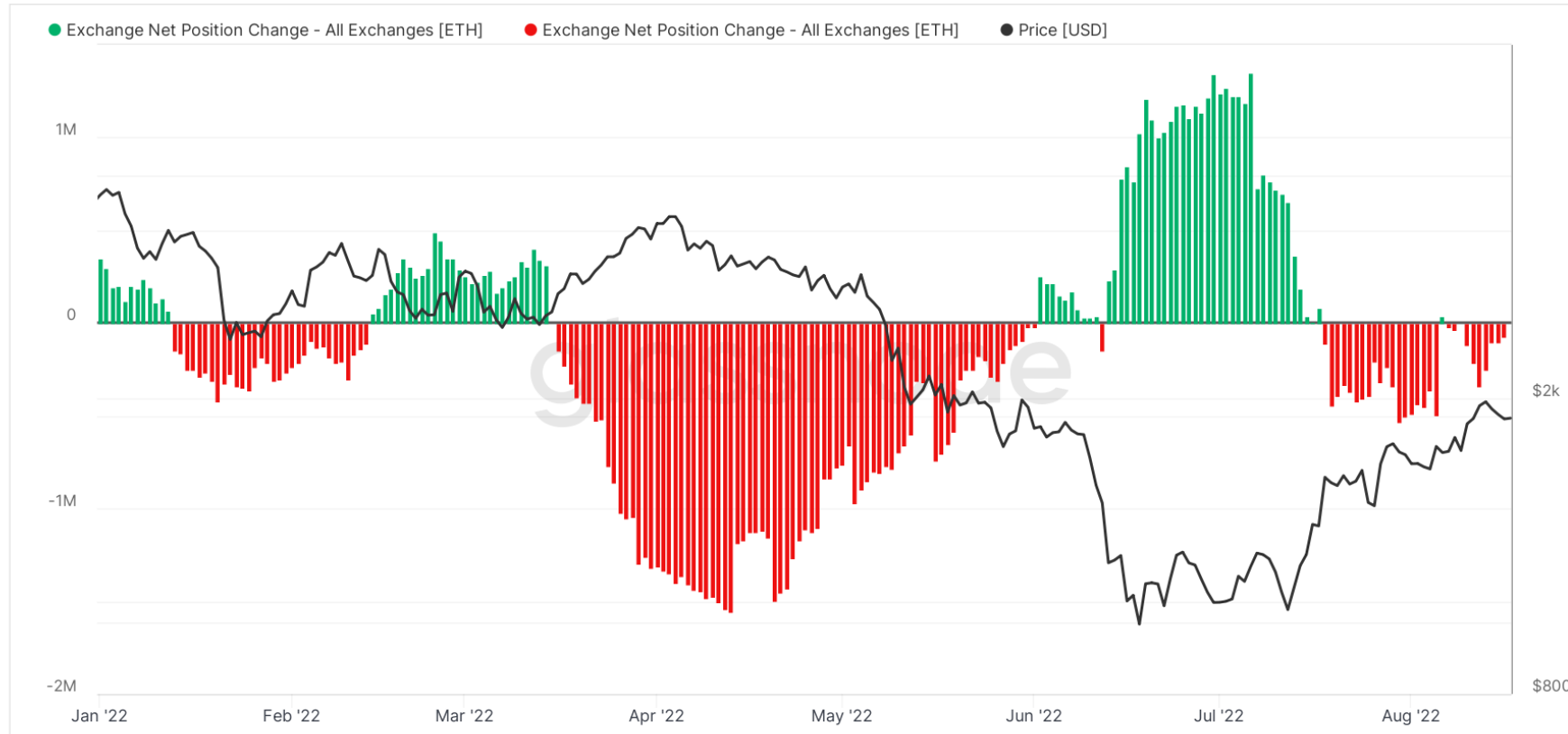


© 2022 Glassnode. All Rights Reserved.

glassnode

Ethereum - exchange position declines slightly, as some users move off exchanges on the back of Merge news while some take advantage of price movement and sells

Ethereum: Exchange Net Position Change [ETH] - All Exchanges



© 2022 Glassnode. All Rights Reserved.

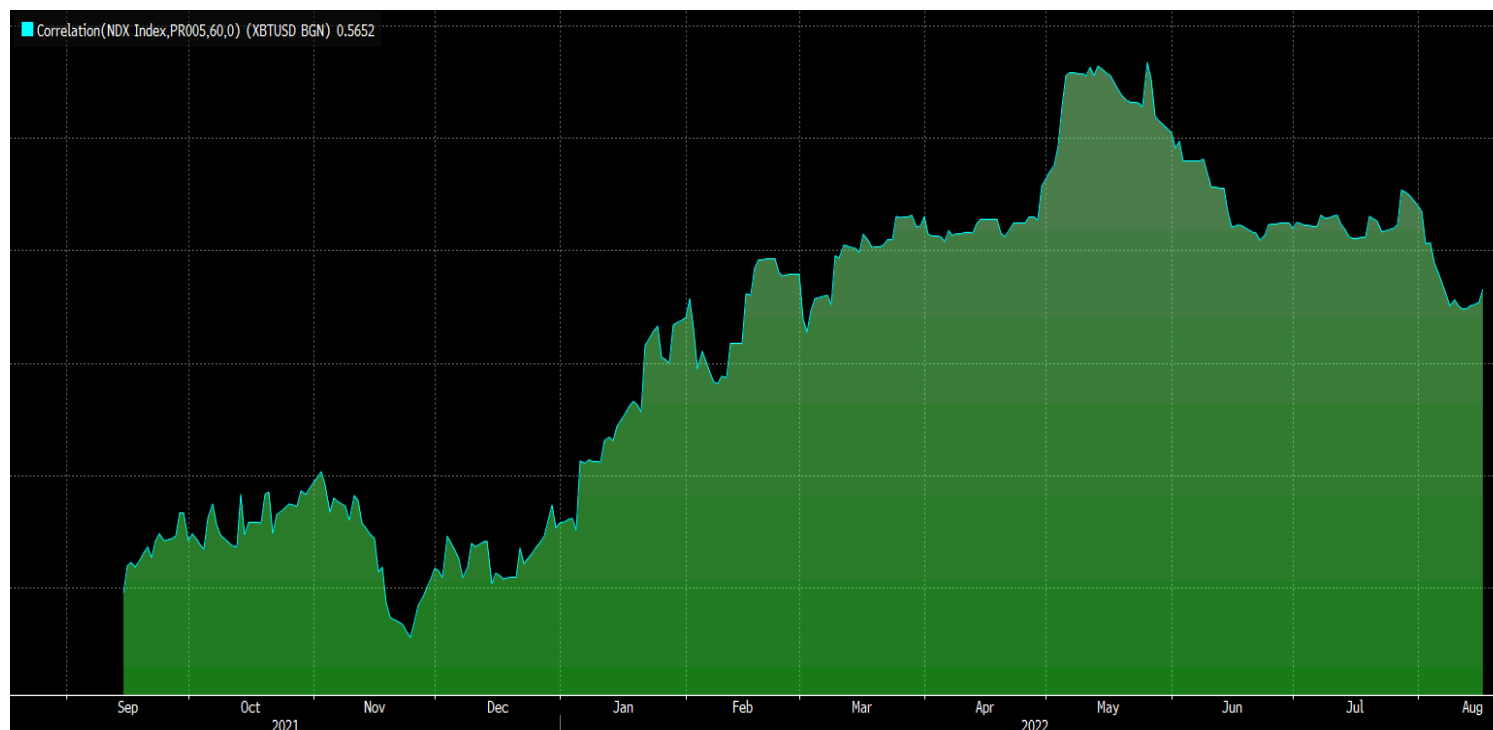
glassnode

Layer-1 Blockchains

Layer-1 Summary (4 August – 17 August 2022)

- 1. Bitcoin (2W: 5.9%)/(YTD: -49.8%)**
Correlation to equities decline
- 2. Ethereum (2W: 17.5%)/(YTD: -49.9%)**
Merge date set, hard forks, and derivative trades
- 3. News and Headlines**

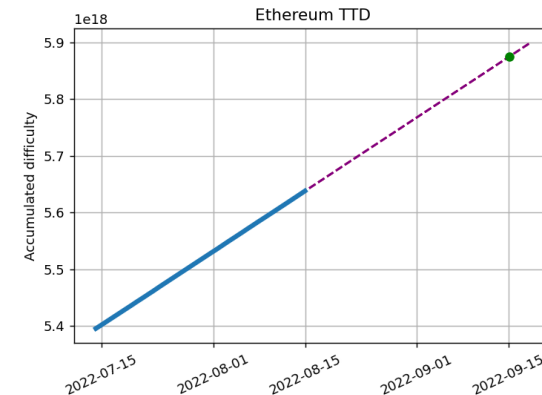
Bitcoin – Correlation to equities decline



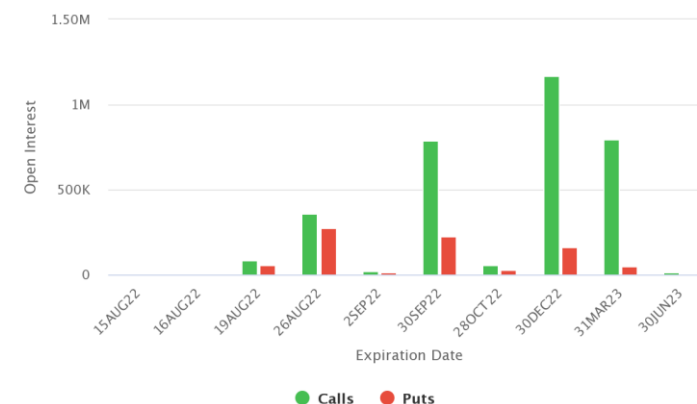
- Bitcoin correlation to the Nasdaq 100 Index has declined in recent weeks following a rather volatile and better-performing equities market.
- Correlation peaked in May and saw a more dramatic decline in the recent weeks. The price of Bitcoin seemed to stall against global events that have triggered movements in the wider stock market.
- Meanwhile, Ethereum prices were more volatile as traders moved prices based on the bets on the upcoming Merge in September.

Ethereum – Merge date set, hard forks, and derivative trades

- Excitement around ETH continues to build following the successful Goerli merge last week.
- The mainnet Merge has been scheduled for TTD 58,750,000,000,000,000,000, which is **approximately Sept 15**, according to present hashrate.
- **Ethereum POW Hard Fork**
 - Some miners are preparing for a hard fork to continue mining after Ethereum's Merge.
 - **EthereumPOW (ETHW)** is coming out as the prominent fork, with Tron founder Justin Sun supporting the hard fork with USDD stablecoin and its exchange Poloniex supporting the ETHW token (currently listed as IOU token).
 - ETHW is believed to spread the miner demand after the Merge, since the relatively small pool of ETC is unlikely to be able to accommodate all.
 - However, many in the community remain skeptical. Vitalik Buterin does not think it has a substantial and long-term effect. Stablecoin leaders USDT and USDC have pledged support for the transition for Ethereum POS.
- **Ethereum Options/Futures**
 - Traders are aggressively placing directional bets for Ethereum – Ethereum OI has exceeded Bitcoin OI (US\$6.6b v US\$4.8b)
 - Bullish bias for September ETH option contracts with 3.5x of calls versus puts.
 - Meanwhile, demand for October options are drastically less, signifying trader concern for price uncertainty post-Merge.
 - The volatility smile is relatively flat for October contracts, implying lower demand and a premium for downside risk protection post-Merge.



ETH Open Interest By Expiration



Ethereum: Options Implied Volatility Smile - Deribit - 28 Oct 2022



News & Headlines

BlackRock Partners with Coinbase for Crypto Offering

The world's largest asset manager has announced its partnership with Coinbase to provide cryptocurrency trading services to its institutional clients. The partnership will allow users of BlackRock's investment platform, Aladdin, access to trading, custody, prime brokerage, and reporting services. [[CoinDesk](#)]

Instagram Expands NFT Features

Instagram announced that its NFT integrations will expand to creators and businesses globally. Users will be able to connect with their wallet, share NFTs, and tag the creator for attribution. The app will also expand support to Coinbase Wallet and Dapper Wallets. [[Blockworks](#)]

Voyager Approved to Return Deposits to Customers

Voyager's Chapter 11 bankruptcy court judge has approved Voyager to return customer funds held at a custodial account at a bank of up to US\$270 million. The court has yet to decide on the crypto assets on the Voyager platform itself. [[The Block](#)]

Binance and Mastercard launches Crypto Card in Argentina

Binance and Mastercard announced a partnership for the Binance Card in Argentina, which will convert crypto to fiat in real time during purchase. The card will also provide up to 8% cash back in crypto on certain qualified purchases. [[The Block](#)]

Reddit Partners with FTX for Community Points

Reddit and FTX have announced a partnership to roll out tokenized Community Points. Reddit introduced Community Points to its community earlier and partnered with Arbitrum to bring the Points to Ethereum. The partnership with FTX will allow users to collect and get access to the points earned via FTX Pay. [[FTX](#)]

Hodlnaut Halts Withdrawals

Hodlnaut, a crypto platform which received an in-principle approval from the Monetary Authority of Singapore, announced that it would halt all withdrawals, swaps, and deposits due to "recent market conditions". It announced earlier in June that it had no exposure or loans to Three Arrows Capital or Celsius. [[CoinDesk](#)]

Interactive Brokers Expands Crypto Features

The stocks trading platform is expanding its crypto trading features with 24/7 trading through a Paxos web app which can hold both fiat and crypto. The commission fees charged are lower than exchanges like Coinbase and Gemini, though it is only slowly adding new coins available for trading. [[Blockworks](#)]

BlackRock Launches Spot Bitcoin Private Trust

BlackRock has launched a spot bitcoin private trust for its institutional clients in the US. It said that it is seeing substantial interest from its clients to access cryptocurrencies efficiently and cost effectively. [[Reuters](#)]

News & Headlines

Huobi Founder Seeks Exit

The founder of crypto exchange Huobi, Leon Li, is allegedly in talks to sell a majority stake in the company that would value the exchange at US\$3 billion or more. According to reports, Li is looking to sell ~60% of the firm and has held talks with Justin Sun and FTX, though the former is denied involvement. [[CoinDesk](#)]

Nuri Exchange Files for Insolvency

Crypto exchange Nuri has filed for insolvency in Berlin, but it said that its users can still access deposits. The platform said that it decided to file for insolvency due to the sell-off in the crypto market this year and the collapse of Celsius. [[CoinDesk](#)]

Galaxy Digital Abandons BitGo Acquisition

Galaxy Digital announced that it has terminated its acquisition of crypto custodian BitGo as it failed to deliver audited 2021 financial statements by the July deadline as part of its agreement. The deal, announced in May 2021, would have been worth US\$1.2 billion. [[The Block](#)]

Brazilian Broker XP Opens Crypto Trading Services

Major Brazilian broker XP launched its Xtage crypto trading platform today, allowing its mobile app users to trade bitcoin and ether. XP has more than 3.6 million active clients and launched the service after high demand from clients. [[The Block](#)]

Celsius's Mashinsky Ordered Trades Prior to Bankruptcy

According to reports, Alex Mashinsky personally took over and overruled investment decisions at Celsius. In one case, Mashinsky ordered the sale of hundreds of millions of dollars of bitcoin, only to buy it back a day later at a loss. [[FT](#)]

Genesis Trading CEO Steps Down

Genesis's CEO Michael Moro has stepped down effective immediately, leaving the firm after seven years, six of it as its CEO. The company has also confirmed that it will cut 20% of its staff to meet its strategic priorities. The company had a US\$2.6 billion exposure to Three Arrows Capital. [[The Block](#)]

Genesis Trading CEO Steps Down

Genesis's CEO Michael Moro has stepped down effective immediately, leaving the firm after seven years, six of it as its CEO. The company has also confirmed that it will cut 20% of its staff to meet its strategic priorities. The company had a US\$2.6 billion exposure to Three Arrows Capital. [[The Block](#)]

Stablecoins

Stablecoins Summary (4 August – 17 August)

1. **Centralized Stablecoins**

USDT and USDC pledges support for PoS ETH

2. **Decentralized Stablecoins**

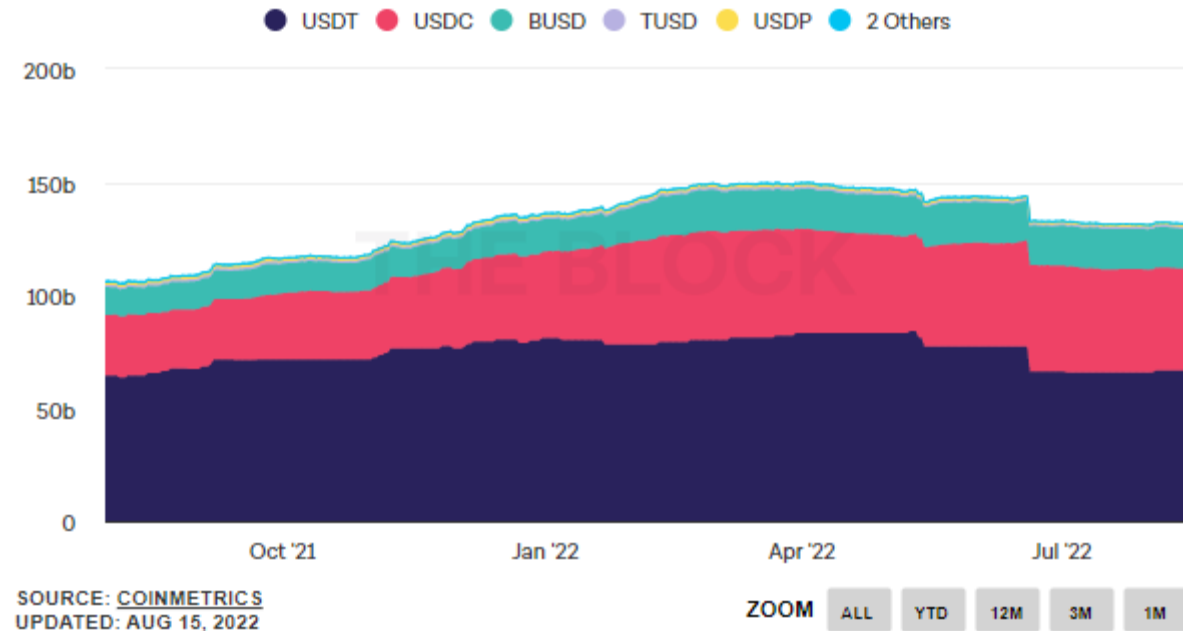
MakerDAO weighs abandoning DAI USD peg
aUSD falls 99% - and recovers – after exploit

Centralized Stablecoin Updates – USDT and USDC pledges support for PoS ETH

- In the past two weeks:
 - Total stablecoin supply and centralized stablecoin supply declined slightly to US\$142.7b (-1.4%) and US\$131.5b (-0.0%) respectively.
 - USDT supply was unchanged at US\$66.6b and USDC supply dropped 1% to US\$45b, affected by its blacklisting of Tornado Cash-related addresses..
- Among the noise in the crypto community regarding the Ethereum Merge and possible PoS hard forks, **Tether and Circle have announced support for the PoS transition.**
 - Tether said that it is “important that the transition to POS is not weaponized to cause confusion and harm”.
 - Circle stated its intention to “fully and solely support the Ethereum PoS chain post-merge”.
 - This brings the sustainability of the ETHW (PoW chain) in question since USDT and USDC stablecoins on the forked chain will not have fiat backing.
- The consortium behind **USDC has blacklisted Tornado Cash’s wallet addresses** after the US Treasury imposed sanctions against the crypto mixer.
 - This stops the movement of at least 75,000USDC, including those in the USDC pool, which means users may not be able to withdraw funds deposited in the USDC pool.



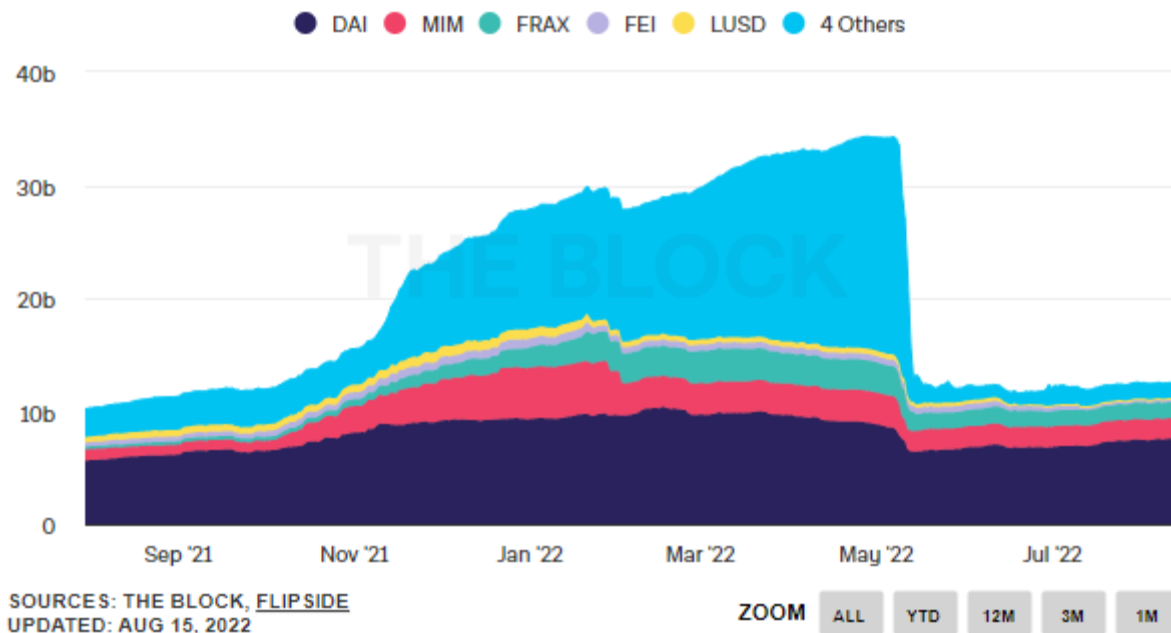
Total Fiat-backed Stablecoin Supply



Decentralized Stablecoin Updates – MakerDAO weighs abandoning DAI USD peg



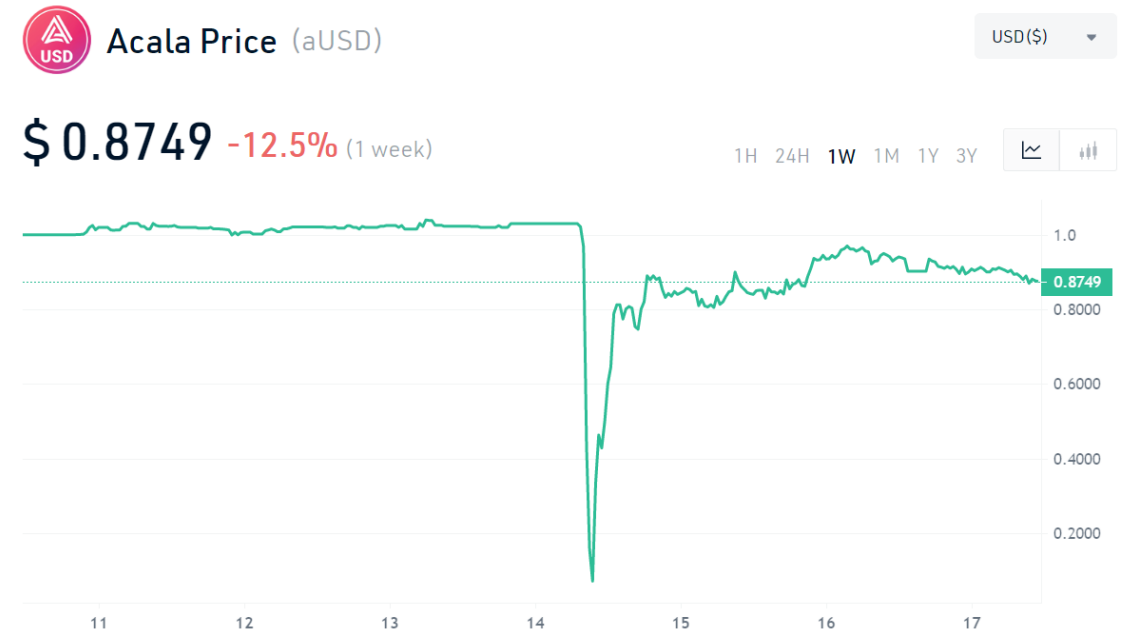
Total Crypto-backed and Algorithmic Stablecoin Supply



- Co-founder of MakerDAO Rune Christensen has suggested that the **recent US Treasury sanctions** against Tornado Cash were **more serious than he thought**, following USDC freezing Tornado Cash-related wallets due to the sanctions.
- Christensen followed by saying that **MakerDAO should “seriously consider” depegging from USD**. The process will see MakerDAO selling the USDC in its peg-stability module (PSM) for ETH (“yolo USDC into ETH”).
- DAI is currently backed by ~34% of USDC. The plan will convert US\$3.5 billion from USDC to ETH.
- Christensen’s comments have drawn criticism as well: Ethereum co-creator Vitalik Buterin said that the plan is a **“risky and terrible idea,”** since a large drop in ETH price will cause the system to become a fractional reserve.
- The announcement led to **~US\$400mn in redemptions** amid a small panic in the community, but it appears that the comments have been walked back.

Decentralized Stablecoin Updates – aUSD falls 99% - and almost recovers – after exploit

- Acala Network, a protocol on Polkadot, saw hackers exploiting a bug in a newly-deployed liquidity pool which allowed them to mint over 3 billion of aUSD, the platform's native stablecoin.
- The initial trace recovered 1.29 billion aUSD, and the second trace recovered 1.68 billion aUSD.
- The bug was caused by a misconfiguration of a new liquidity shortly after it went live. Shortly after, the Acala team disabled the transfer functionality of the exploited aUSD.
- The community governance acted swiftly on the case and passed a referendum to burn the erroneously-minted aUSD from the first trace (1.29 billion). A community proposal has been submitted to burn the remainder of aUSD recovered.
- The price of aUSD have nearly recovered to its peg, bouncing from ~US\$0.07 to US\$0.87 on Kucoin, where it is available for trading.



DeFi

DeFi Summary (4 August – 17 August 2022)

1. TVL by Chain

- TVL increase boosted by Ethereum and L2 chains

2. TVL by Protocol

- Aave led gains with the introduction of OP rewards
- Lido outperformed with the rise of ETH price
- Instadapp also benefitted from OP token incentives

3. DeFi Revenue

- Most major protocols seeing a revenue growth uptick after a comparably weaker period in July

4. DeFi Valuation – Uniswap and Curve relatively overvalued based on P/TVL and P/Revenue respectively

5. Top DEX Pools

- DAI-USDC pool liquidity drops as users exit amid USDC blacklist and DAI “yolo USDC into ETH” saga
- WISE-ETH pool takes top spot on Uniswap with little to no volume traded

6. Top Pools in terms of TVL/APY - Yield Farming

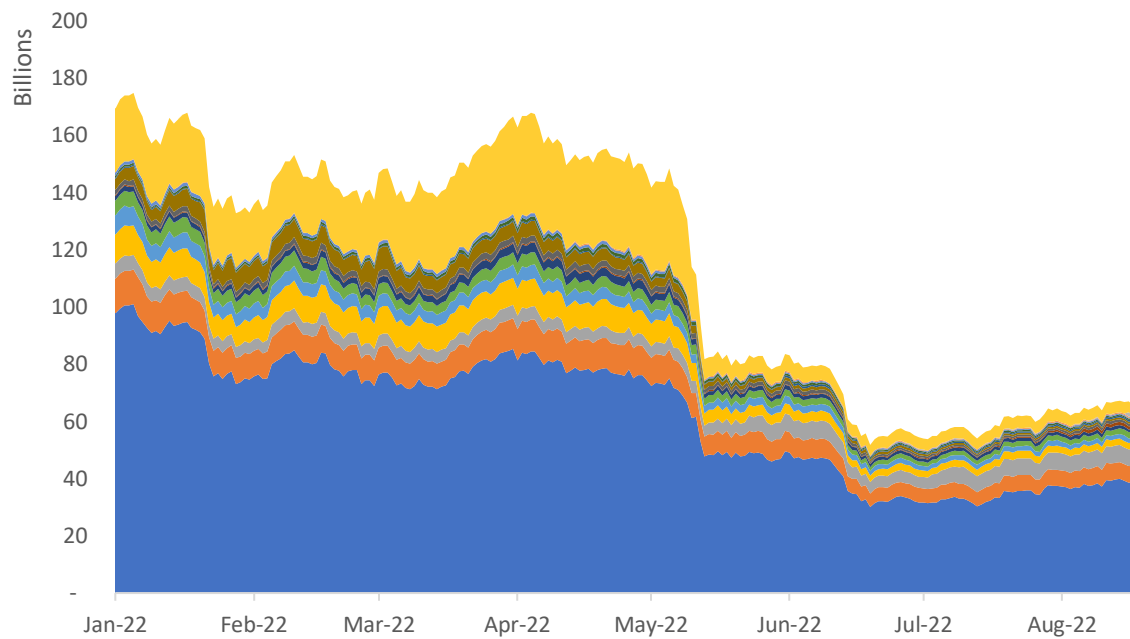
- ETH pools increase in TVL amid price rally

7. Noteworthy DeFi Protocols (Tornado Cash, Curve Finance, Arbitrum)

- Tornado Cash sanctioned by US Treasury
- Curve Finance hijacked for US\$600k
- Arbitrum launches Nova chain

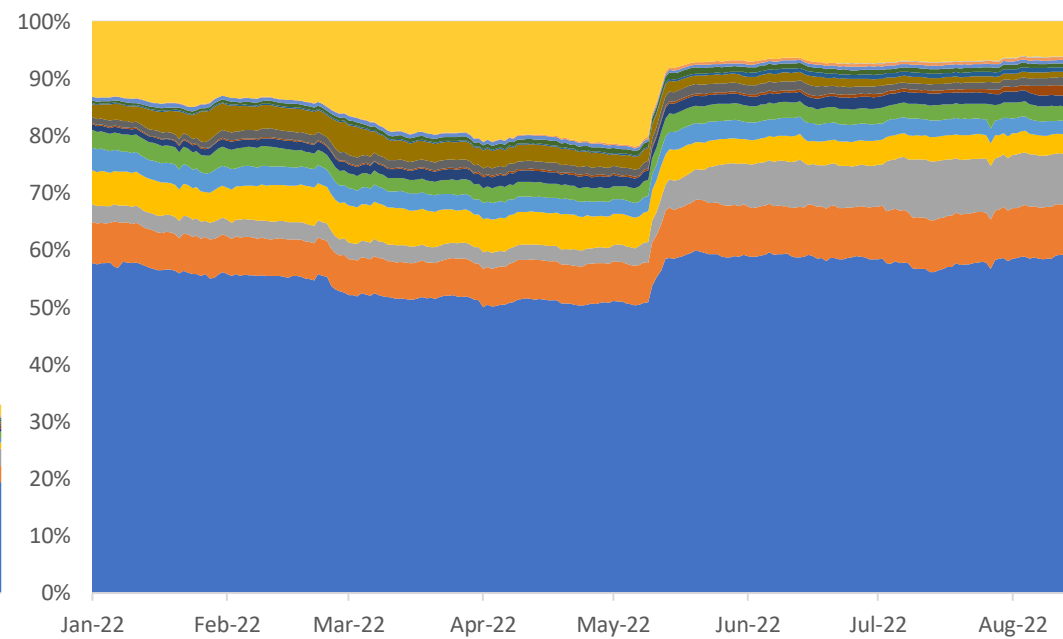
TVL Overview by Chain – TVL increase boosted by Ethereum and L2 chains

TVL Trend by Chain



■ Ethereum ■ BSC ■ Tron ■ Avalanche ■ Solana ■ Polygon ■ Cronos ■ Optimism
 ■ Arbitrum ■ Fantom ■ Mixin ■ DefiChain ■ Klaytn ■ Near ■ Acala ■ Others

TVL Breakdown by Chain



■ Ethereum ■ BSC ■ Tron ■ Avalanche ■ Solana ■ Polygon ■ Cronos ■ Optimism
 ■ Arbitrum ■ Fantom ■ Mixin ■ DefiChain ■ Klaytn ■ Near ■ Acala ■ Others

August 17, 2022

Ethereum : 58.93%

Tron : 8.99%

BSC : 8.70%

Avalanche : 3.36%

Polygon : 3.29%

Solana : 2.52%

Cronos : 1.66%

Optimism : 1.60%

Arbitrum : 1.42%

Fantom : 0.93%

Mixin : 0.80%

DefiChain : 0.68%

Klaytn : 0.58%

Waves : 0.48%

Near : 0.48%

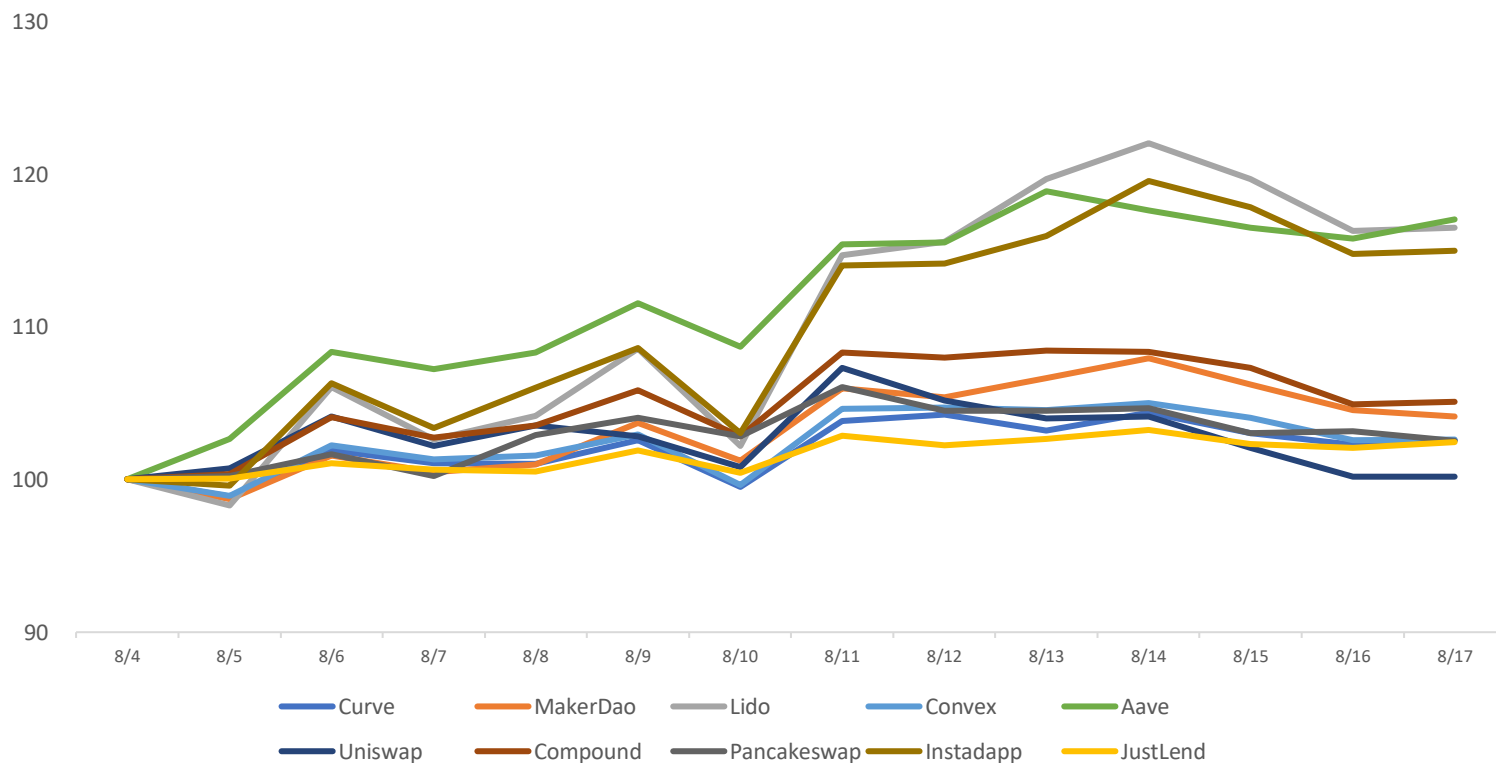
Total TVL gained 4.5%, similar to the gain two weeks ago, to US\$65.7bn. During the period, notable winners/losers were:

- Ethereum TVL gained 4.6% boosted by bullish token & network sentiment.
- Optimism TVL gained 88.9% to US\$1.05bn boosted by Aave v3 launching OP rewards.
- Polygon and Arbitrum TVL gained 28.7% and 12.4% respectively.
- Acala TVL plunged 40.6% after an eventful two weeks where TVL shot up from US\$90mn to US\$1.6bn and back down to US\$53mn due to aUSD exploit.

TVL Overview by Protocols

- Aave led gains with the introduction of OP rewards
- Lido outperformed with the rise of ETH price
- Instadapp also benefitted from OP token incentives

TVL of Top DeFi Protocols in Terms of TVL
(4 August 2022 = 100)



Proccol	4 Aug TVL (USD m)	17 Aug TVL (USD m)	Period Change
MakerDAO	8,513	8,863	4.1%
Uniswap	6,240	6,253	0.2%
Pancake	3,204	3,285	2.5%
Compound	2,885	3,032	5.1%
Instadapp	2,368	2,723	15.0%
Lido	7,164	8,346	16.5%
Uniswap	4,450	4,566	2.6%
Curve	6,014	6,170	2.6%
Convex	4,450	4,566	2.6%
Aave	6,364	7,448	17.0%
JustLend	3,331	3,413	2.4%

DeFi Revenue - DeFi Protocols

- Revenue monthly changes have seen a relatively healthy uptick, with major protocols seeing growth after a comparably weaker period in July.
- Of these, NFT players (OpenSea & LooksRare) have relatively lower growth than other protocols.
- Meanwhile, ENS continues rather volatile revenue growth over the past 7d/30d as activity picks up.

Top dapps based on cumulative total revenue in the past 180 days.

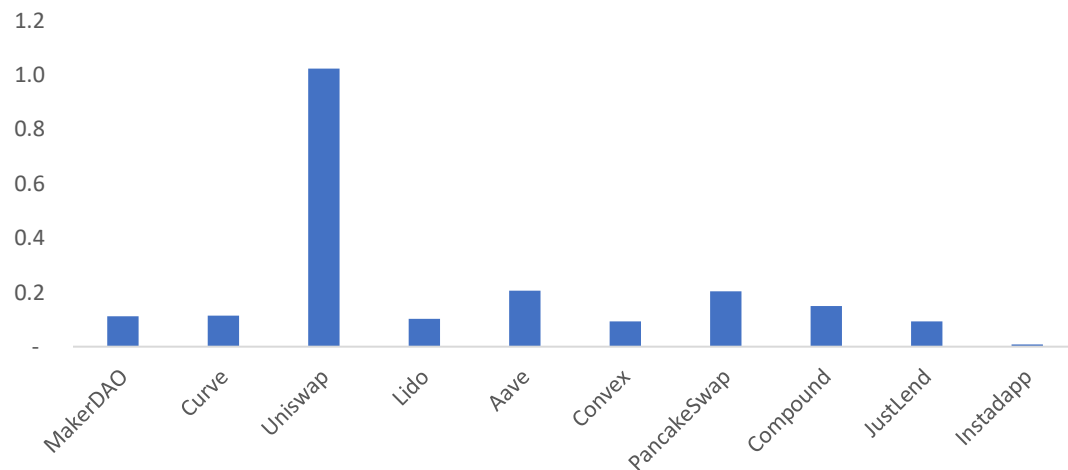


Project	Revenue 7d (US\$)	Revenue 30d (US\$)	Revenue 180d (US\$)	7d Change	30d Change
OpenSea	\$ 13.3m	\$ 56.4m	\$ 1,086.0m	11.4%	9.6%
Uniswap	\$ 12.0m	\$ 51.9m	\$ 391.5m	21.0%	13.8%
dYdX	\$ 6.1m	\$ 28.3m	\$ 190.4m	-0.8%	88.7%
Lido Finance	\$ 6.5m	\$ 25.0m	\$ 158.9m	11.7%	48.2%
Convex Finance	\$ 5.4m	\$ 24.1m	\$ 176.1m	-7.4%	59.6%
PancakeSwap	\$ 4.6m	\$ 19.9m	\$ 190.3m	-11.0%	86.7%
Aave	\$ 3.1m	\$ 9.9m	\$ 95.7m	26.5%	2.3%
Synthetix	\$ 1.5m	\$ 8.2m	\$ 25.1m	72.7%	-24.4%
SushiSwap	\$ 1.7m	\$ 6.1m	\$ 61.0m	53.9%	42.2%
GMX	\$ 1.7m	\$ 6.1m	\$ 33.3m	99.6%	91.8%
LooksRare	\$ 1.4m	\$ 5.8m	\$ 218.3m	7.6%	7.5%
1inch	\$ 0.2m	\$ 5.8m	\$ 23.1m	-96.2%	739.0%
ENS	\$ 0.9m	\$ 4.5m	\$ 32.3m	15.3%	-8.6%
Maple Finance	\$ 0.3m	\$ 3.9m	\$ 31.8m	-85.3%	-19.0%
MetaMask	\$ 1.0m	\$ 3.7m	\$ 64.5m	45.4%	9.8%
Balancer	\$ 0.7m	\$ 2.2m	\$ 22.3m	65.9%	-3.9%
Trader Joe	\$ 0.4m	\$ 2.0m	\$ 49.6m	0.2%	-16.7%
Compound	\$ 0.4m	\$ 1.8m	\$ 35.6m	-1.1%	8.8%
Curve	\$ 0.5m	\$ 1.6m	\$ 35.4m	98.2%	-56.1%
SpookySwap	\$ 0.2m	\$ 1.5m	\$ 45.1m	-19.5%	-47.7%

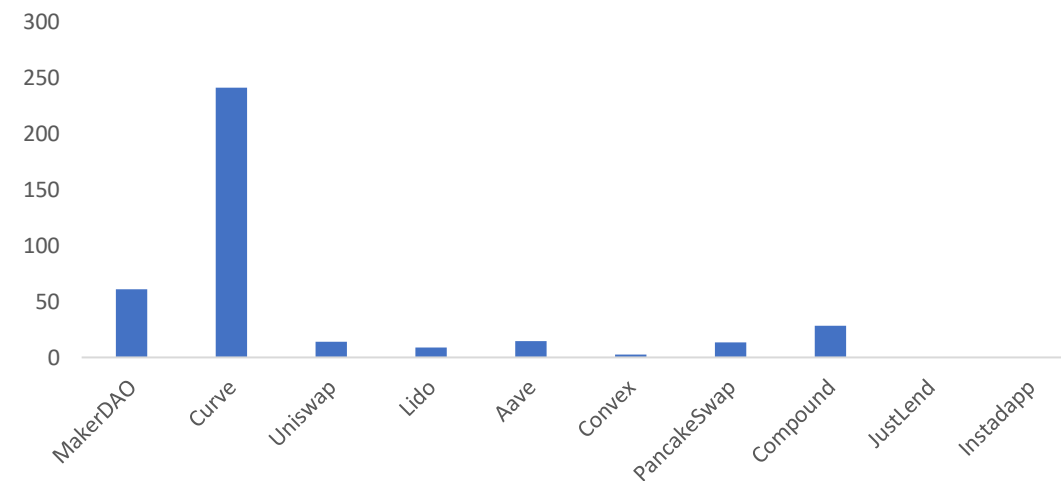
Note: As of 17 August 2022

DeFi Valuation

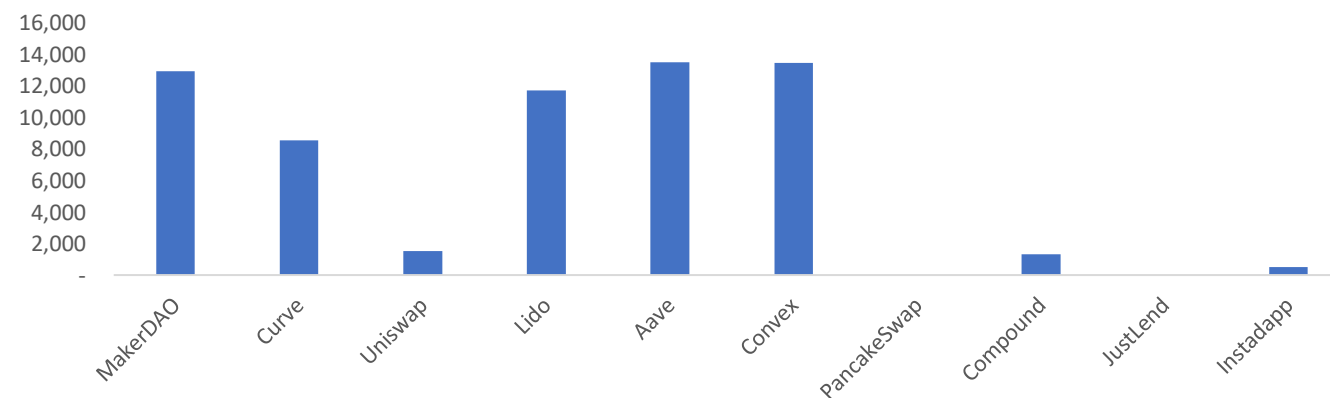
P/TVL Ratio (Top 10 Projects by TVL)



P/S Ratio (Annualized Revenue)



P/Users Ratio



Note: As of 17 August 2022. Protocols with a ratio of 0 means insufficient data.

Source: TokenTerminal, Dune Analytics, CoinMarketCap

Top DEX Pool Trends

- DAI-USDC pool liquidity drops as users exit amid USDC blacklist and DAI “yolo USDC into ETH” saga

Curve

Top Pools ?

#	Pool	Liquidity	Volume	Fees	ROL
1	steth	\$1.45b	\$12.68m	\$5.01k	0.13%
2	frax	\$1.04b	\$717.13k	\$555.24	0.11%
3	3pool	\$978.5m	\$108.95m	\$6.17k	0.23%
4	tricrypto2	\$280.62m	\$82.38m	\$12.37k	1.61%
5	mim	\$163.15m	\$443.57k	\$124.03	0.09%
6	susd	\$126.33m	\$14m	\$3.19k	0.92%
7	alusd	\$95.96m	\$728.8k	\$146.98	0.14%
8	tusd	\$83.47m	\$2.07m	\$413.65	0.30%
9	seth	\$74.49m	\$458.89k	\$211.84	0.10%
10	compound	\$64.02m	\$0.00	\$0.00	0.00%

Liquidity Provided



Uniswap

Top Pairs ?

#	Pair/Pool	Liquidity	Volume	Fees	ROL
1	WISE - ETH	\$138.19m	\$14.96k	\$44.88	0.01%
2	USDC - ETH	\$126.44m	\$8.31m	\$24.94k	7.20%
3	DAI - USDC	\$120.25m	\$46.64k	\$139.92	0.04%
4	FEI - TRIBE	\$88.18m	\$21.45k	\$64.35	0.03%
5	FXS - FRAX	\$63.28m	\$2.16m	\$6.47k	3.73%
6	ETH - USDT	\$35.82m	\$2.77m	\$8.31k	8.46%
7	FNK - USDT	\$29.85m	\$328.96	\$0.99	0.00%
8	MC - ETH	\$29.44m	\$273.38k	\$820.13	1.02%
9	UNI - ETH	\$25.98m	\$1.98m	\$5.94k	8.35%
10	PAXG - ETH	\$22.47m	\$698.94k	\$2.1k	3.41%

Liquidity Provided



SushiSwap

Top Pairs ?

#	Pair/Pool	Liquidity	Volume	Fees	ROL
1	ILV - ETH	\$98.15m	\$702.13k	\$2.11k	0.78%
2	USDC - ETH	\$59.74m	\$3.78m	\$11.34k	6.93%
3	ETH - USDT	\$28.5m	\$1.66m	\$4.98k	6.37%
4	OHM - DAI	\$27.44m	\$254.46k	\$763.38	1.02%
5	WBTC - ETH	\$26.14m	\$284.23k	\$852.68	1.19%
6	TOKE - ETH	\$16.17m	\$89.45k	\$268.36	0.61%
7	SUSHI - ETH	\$14.95m	\$1.67m	\$5.01k	12.23%
8	SYN - ETH	\$13.05m	\$473.54k	\$1.42k	3.97%
9	OHM - ETH	\$12.52m	\$334.62k	\$1k	2.93%
10	AAVE - ETH	\$11.35m	\$386k	\$1.16k	3.72%

Liquidity Provided



Top DEX Pool Trends – WISE-ETH pool takes top spot on Uniswap with little to no volume traded

Curve

Top Pair Data: steth

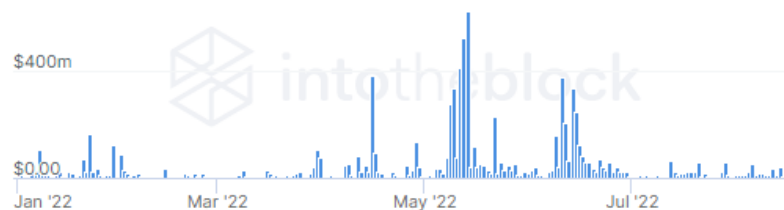
Total Liquidity, USD

\$7.5b



Volume Traded

\$800m



Fees per Liquidity

4%



Uniswap

Top Pair Data: WISE - ETH

Total Liquidity, USD

400M



Volume Traded

\$3.2m



Fees per Liquidity

1.5%



SushiSwap

Top Pair Data: ILV - ETH

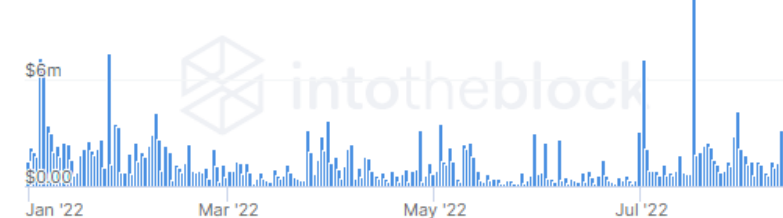
Total Liquidity, USD

500M



Volume Traded

\$12m



Fees per Liquidity

15%



Top Yield Farming Pools - TVL

Name	Protocol	Base APY	Reward APY	Rewards	APY	7d ago	TVL
ETH	Lido Ethereum	3.90%	-		3.90%	3.90%	\$8,128,161,565
WETH	Aave Ethereum	2.23%	-		2.23%	1.80%	\$1,645,147,914
USDC	Aave Ethereum	0.48%	-		0.48%	0.58%	\$1,434,524,420
stethETH stETH	Convex Ethereum	3.05%	6.26%	CRV CVX LDO	9.31%	9.25%	\$1,073,099,999
fraxFRAX 3Crv	Convex Ethereum	0.12%	4.22%	CRV CVX FXS	4.34%	5.25%	\$1,043,900,000
WBTC	Aave Ethereum	0.08%	-		0.08%	0.07%	\$943,037,719
ETH	Compound Ethereum	0.07%	0.09%	COMP	0.16%	0.15%	\$907,806,942
DAI USDC	Uniswap Ethereum	0.03%	-		0.03%	0.20%	\$883,073,575
USDC	Compound Ethereum	0.67%	0.50%	COMP	1.17%	1.20%	\$670,838,272
DAI USDC	Uniswap Ethereum	0.02%	-		0.02%	0.12%	\$601,076,822

Lido ETH pool increases ~31%

DAI-USDC pool begins decline as users exit amid uncertainty over stability of the stablecoins

Top Yield Farming Pools - APY

Top APY pool (TVL > 100m)

Name	Protocol	Base APY	Reward APY	Rewards	▼ APY	7d ago	TVL
WCRO WETH	WS Cronos	1.41%	31.42%		32.83%	32.34%	\$101,480,000
BTC DFI	DefiChain Defichain	-	28.13%	DFI	28.13%	29.75%	\$143,955,527
MEX EGLD	Maia Eidoo	0.05%	27.95%	MEX	28.00%	31.00%	\$124,041,396
USDC WETH	Uniswap Ethereum	27.97%	-		27.97%	45.29%	\$293,223,713
cvxcrvcrvCRV CRV	Convex Ethereum	0.65%	21.29%	CRV CVX	21.94%	27.05%	\$126,500,000
dolaDOLA 3Crv	Convex Ethereum	0.43%	15.51%	CRV CVX	15.94%	15.18%	\$102,300,000
USDC WETH	Uniswap Ethereum	12.82%	-		12.82%	29.54%	\$348,965,692
WETH USDT	Uniswap Ethereum	11.55%	-		11.55%	29.90%	\$133,930,883
mimMIM 3Crv	Convex Ethereum	0.15%	11.35%	CRV CVX SPELL	11.50%	12.49%	\$158,800,000
USDN	Vires Waves	10.73%	0.22%	VIRE	10.95%	10.33%	\$161,417,866

Top APY pool (TVL > 10m)

Name	Protocol	Base APY	Reward APY	Rewards	▼ APY	7d ago	TVL
VVS WCRO	WS Cronos	1.06%	119%		120%	121%	\$73,410,000
USDC WETH	Uniswap Polygon	70.73%	-		70.73%	76.46%	\$13,363,710
USDC OSMO	Osmosis Osmosis	68.59%	-		68.59%	66.15%	\$31,900,000
LDO WETH	Uniswap Ethereum	60.12%	-		60.12%	123%	\$14,986,416
WBTC OSMO	Osmosis Osmosis	58.36%	-		58.36%	63.55%	\$13,600,000
CRV (locker)	StakeDAO Ethereum	-	57.30%	CRV SGT 3CRV	57.30%	72.30%	\$23,471,729
XMON WETH	Uniswap Ethereum	56.40%	-		56.40%	31.03%	\$13,842,832
HEX USDC	Uniswap Ethereum	56.30%	-		56.30%	51.04%	\$19,239,600
WETH OSMO	Osmosis Osmosis	48.32%	-		48.32%	50.42%	\$16,600,000
BNB BSW	Biswap BNB Chain	6.90%	34.98%	BSW	41.88%	42.75%	\$18,804,534

APYs decline slightly as
crypto prices stabilize

Note: As of 17 August 2022

Source: Coindix

Noteworthy DeFi Protocols – Tornado Cash sanctioned by US Treasury

TORN 1M performance

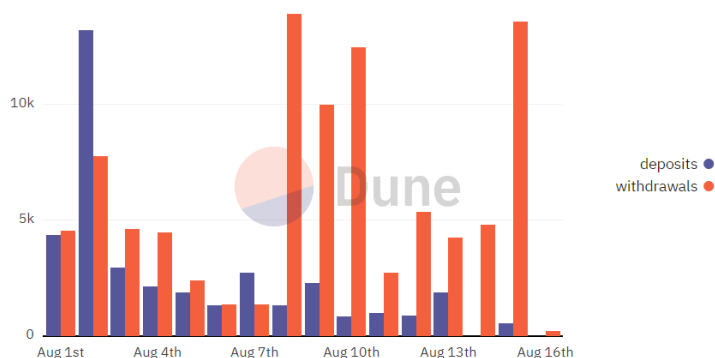


1,162

wallets withdrew after sanctions imposed

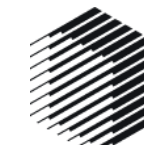
ETH Amount Since Aug 1st TornadoCash Deposit/Withdraw Per Day

@awesome



- The **US Treasury added Tornado Cash to OFAC's Specially Designated Nationals List**, on the grounds that the protocol allegedly helped North Korean hacker group Lazarus Group, among other hackers, to **obfuscate hacked crypto traces**.
- The GitHub accounts of the Tornado Cash contributors **have been suspended/removed**, and the Tornado Cash Discord server and governance website **have shut down**. Developer Alexey Pertsev was also **arrested by Dutch agencies**.
- **Several DeFi protocols have blocked addresses** that interacted with Tornado Cash, such as Uniswap, Aave, Balancer, and dYdX.
 - But these apps may have trouble identifying those who truly used Tornado Cash, since some in the community used Tornado Cash to send 0.1ETH to doxxed wallets of celebrities and crypto influencers in protest of the sanctions.
 - The issuer of UDSC banned 44 addresses from the SDN list, worth over 75K USDC.
- This highlighted the issue of simply sanctioning the protocol and the general community outcry view the sanction on open-source code as unconstitutional. The implications of this precedent-setting actions remains to be seen.
- In a Twitter poll, **61%, including Vitalik Buterin**, supported the idea **to burn the staked tokens** of validators who comply with censorship requests.

PROTOCOLS WITH RESTRICTIONS



Noteworthy DeFi Protocols – Curve Finance hijacked for US\$600k

CRV 1M performance



- The Curve Finance website was **exploited for at least US\$600K** after the platform was compromised in a DNS hijacking. The protocol and code remained safe.
- The protocol warned users to not use the front end as attackers managed to reroute the Curve Finance DNS to a fake clone webpage. Connected wallets were then drained by the hackers. The hijack was due to a compromise at Curve Finance website's name service provider.
- At least 600K USDC and 6,000 DAI were stolen, according to Elliptic. The funds were converted to ETH and siphoned through various channels, such as Tornado Cash and FixedFloat, which managed to freeze 112 ETH of the 292 ETH that flowed through.
- Later on, Binance CEO CZ said that the exchange has successfully frozen or recovered US\$450K from the hack and is working with law enforcement to return the funds.

Total ERC20 Token Amount Transferred to Hijack Address
Address curve-fi-hijack-erc-tranfer-amount

\$613,779.97USD

Amount Transferred

ETH Transferred To Hijack Address Calc In USD
Address curve-fi-hijack-eth-tranfer-amount

\$684,945.10 USD

Amount Transferred

ETH Transferred To Hijack Address
Address curve-fi-hijack-eth-tranfer-amount

363.24 ETH

ETH Amount

Hijacked Addresses Count
Address curve-hijack-addresses

6

Addresses Count

Transactions Count To the Hijack Contract
Address curve-fi-hijack-transactions

22

TX Count

Outbound Transactions Count From Hijacker
Address curve-fi-hijack-outbound-transactions

44

TX Count



CZ Binance
@cz_binance

Binance froze/recovered \$450k of the Curve stolen funds, representing 83%+ of the hack. We are working with LE to return the funds to the users. The hacker kept on sending the funds to Binance in different ways, thinking we can't catch it. 😂

#SAFU

CZ Binance @cz_binance · Aug 10

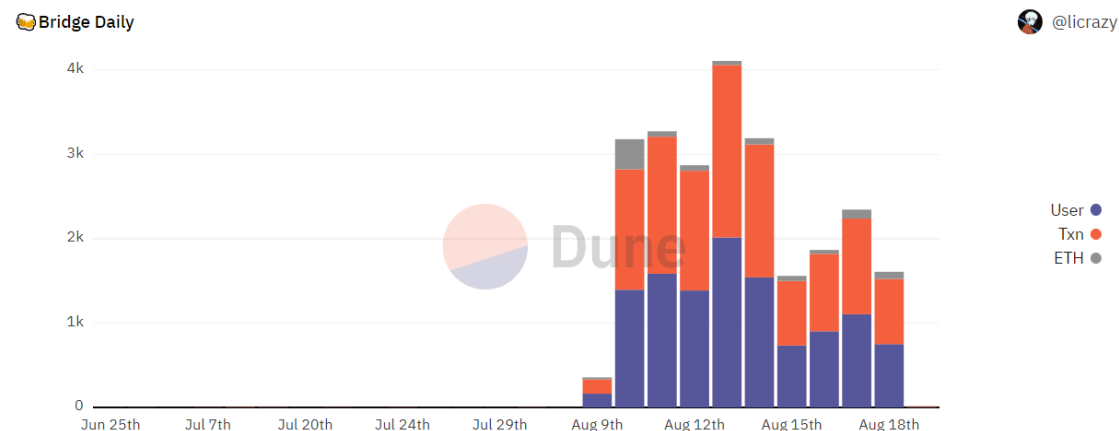
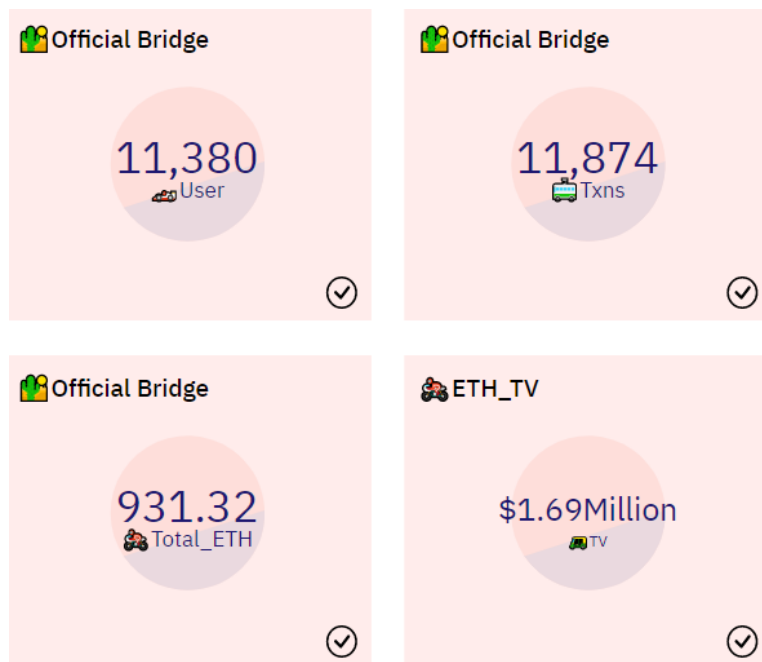
Curve. finance had their DNS hijacked in the past hour. Hacker put a malicious contract on the home page. When the victim approved the contract, it would drain the wallet. Damage is around \$570k so far. We are monitoring.

[Show this thread](#)

Noteworthy DeFi Protocols – Arbitrum launches Arbitrum Nova chain



- Arbitrum, an L2 scaling solution for Ethereum, launched the Arbitrum Nova chain. Nova is designed to serve Web3 gaming and social applications, which are more cost-sensitive and have higher transaction volume.
- The Nova chain is the second addition to the Arbitrum ecosystem, of which Arbitrum One is its chain designed for DeFi and NFT projects.
- The new chain is built using Arbitrum's AnyTrust technology which is optimized for ultra-low-cost transactions and strong security guarantees using a data availability committee.
- Google Cloud, Reddit, FTX, Consensys, P2P, and QuickNode as participating in the launch as inaugural members of the data availability committee.



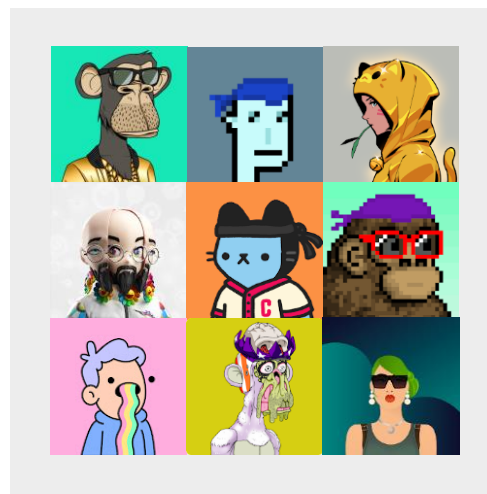
NFT & Metaverse

NFT & Metaverse Summary

1. **NFT Dashboard** – Floor price on “Tier-A” projects continue double-digit 14D loss
2. **ETH NFT volume still muted and blue-chip projects decline in floor price**
3. **OpenSea and Magic Eden daily users go neck and neck, but OpenSea not improving in SOL**
4. **Moonbirds goes CC0**
5. **GameFi & Play-to-Earn**
Polygon Partners with Neowiz for Gaming
6. **News & Headlines**

NFT Dashboard

Project	Floor Price	14D	YTD
"Blue Chip" Projects			
Bored Ape Yacht Club	77.0Ξ	-5.1%	21.0%
CryptoPunks	68.5Ξ	-8.3%	6.0%
Tier-A Projects			
Azuki	6.8Ξ	-23.7%	94.0%
Clone X	6.9Ξ	-14.8%	74.2%
Cool Cats	2.3Ξ	-22.2%	-83.1%
CyberKongz Genesis	15.5Ξ	-20.5%	-73.3%
Doodles	6.7Ξ	-33.4%	1.8%
Mutant Ape Yacht Club	13.0Ξ	-17.7%	11.5%
Otherdeeds	1.7Ξ	-20.6%	-74.6%
World of Women	2.7Ξ	-19.8%	29.6%

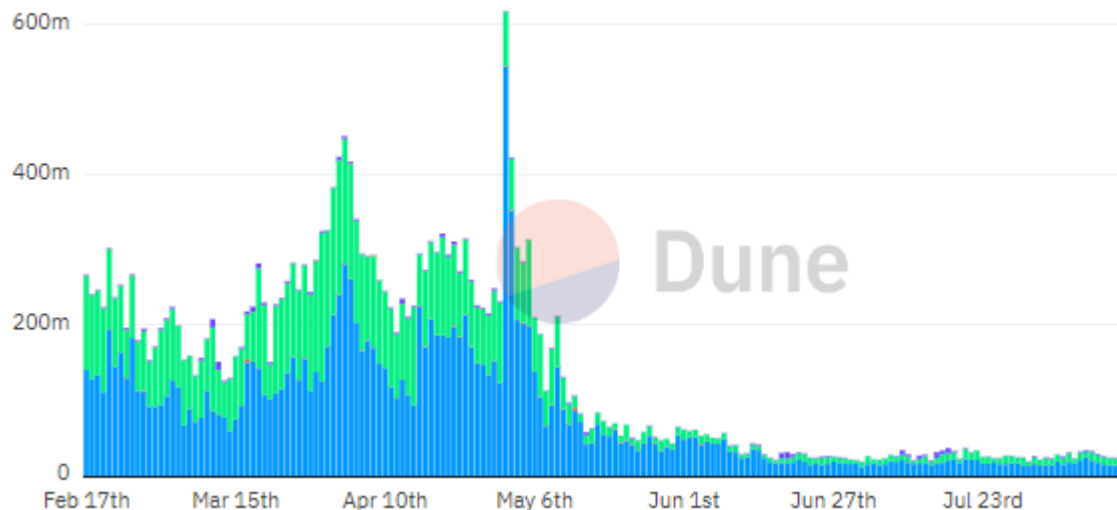


Top Sales of the Week*	Price
BAYC #5383	777.0Ξ
BAYC #7863	344.0Ξ
CryptoPunk #9400	300.0Ξ
CryptoPunk #8576	200.0Ξ
Otherdeed #25415	183.0Ξ
CryptoPunk #8374	165.0Ξ
CryptoPunk #1703	165.0Ξ
CryptoPunk #608	165.0Ξ
BAYC #1833	150.0Ξ
BAYC #949	145.0Ξ

Top Collections of the Week* (by volume)	Volume (USD)
Bored Ape Yacht Club	\$10.5m
CryptoPunks	\$8.8m
Mutant Ape Yacht Club	\$6.7m
Otherdeed	\$6.7m
Moonbirds	\$4.8m
ENS	\$3.8m
CloneX	\$2.8m
Doodles	\$2.5m
ImmutaSwap.io	\$2.5m
Art Blocks	\$2.0m

ETH NFT volume still muted and blue chip projects decline in floor price

NFTs - USD Volume
Daily, per Platform

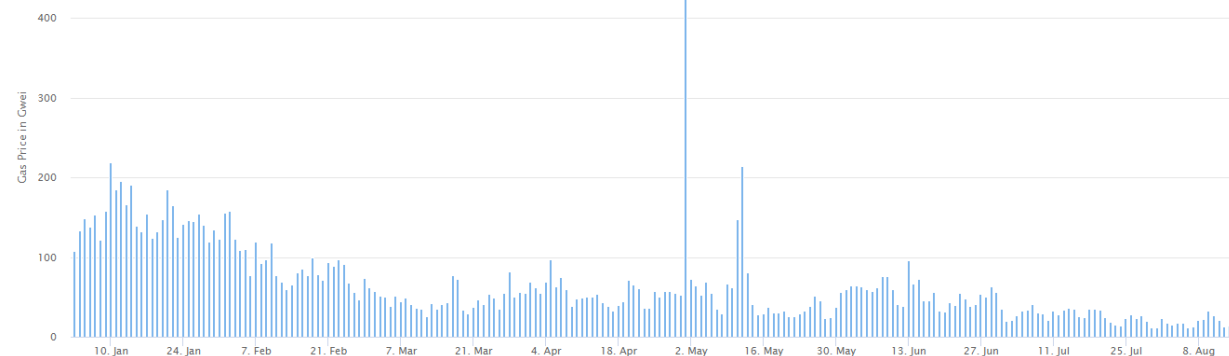


@hildobby

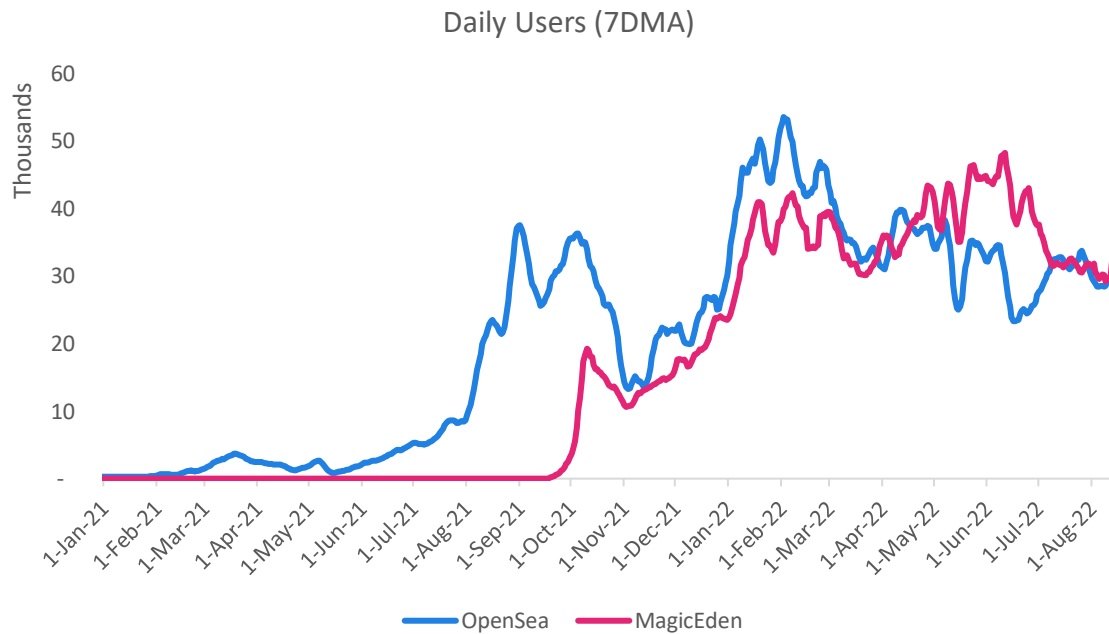
OpenSea
NFTX
LooksRare
SuperRare
Foundation
Rarible
LarvaLabs

- Daily NFT volume in ETH is very slightly lower than prior periods. Monthly volume since June has been on a continuous downtrend.
- LooksRare continues to maintain ~50% of OpenSea's volume.
- Activity for blue chips continue to be muted, with floor prices overall retreating from two weeks ago.

ETH Average Gas Price



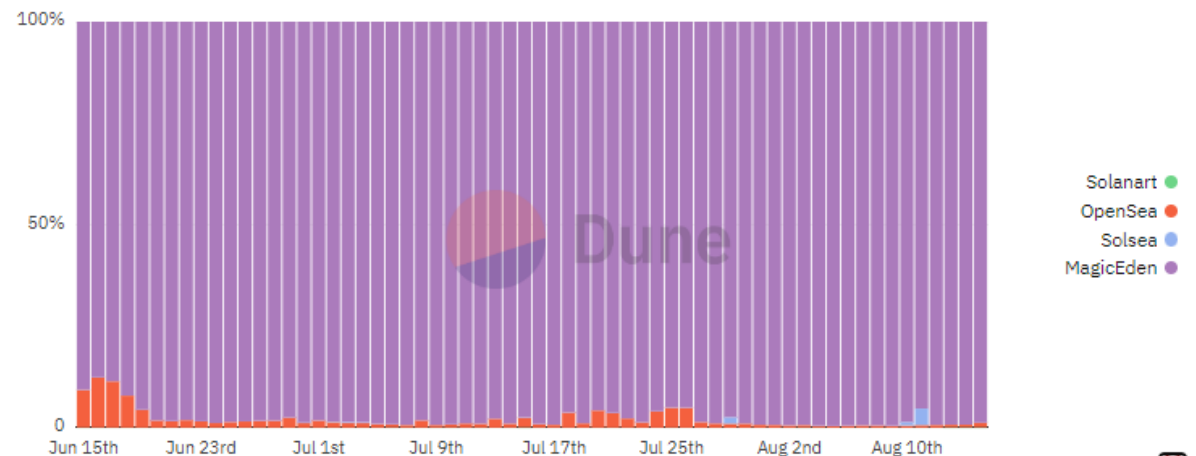
OpenSea and Magic Eden daily users go neck and neck, but OpenSea not improving in SOL



Marketplace	Average Price per Trade*
OpenSea	US\$132.0
MagicEden	US\$33.1

- The number of daily active users on Magic Eden and OpenSea are similar at ~30K/day, with Magic Eden leading slightly
- However, the gap may widen after Magic Eden's integration of Ethereum NFTs... if it doesn't go the same fate as did OpenSea with Solana NFTs.
- Magic Eden still dominates 98-99% of all Solana NFT volume; 7-day transaction count puts OpenSea at just ~0.7% of Magic Eden's.

Daily - Normalize Daily NFT Transaction count by marketplace



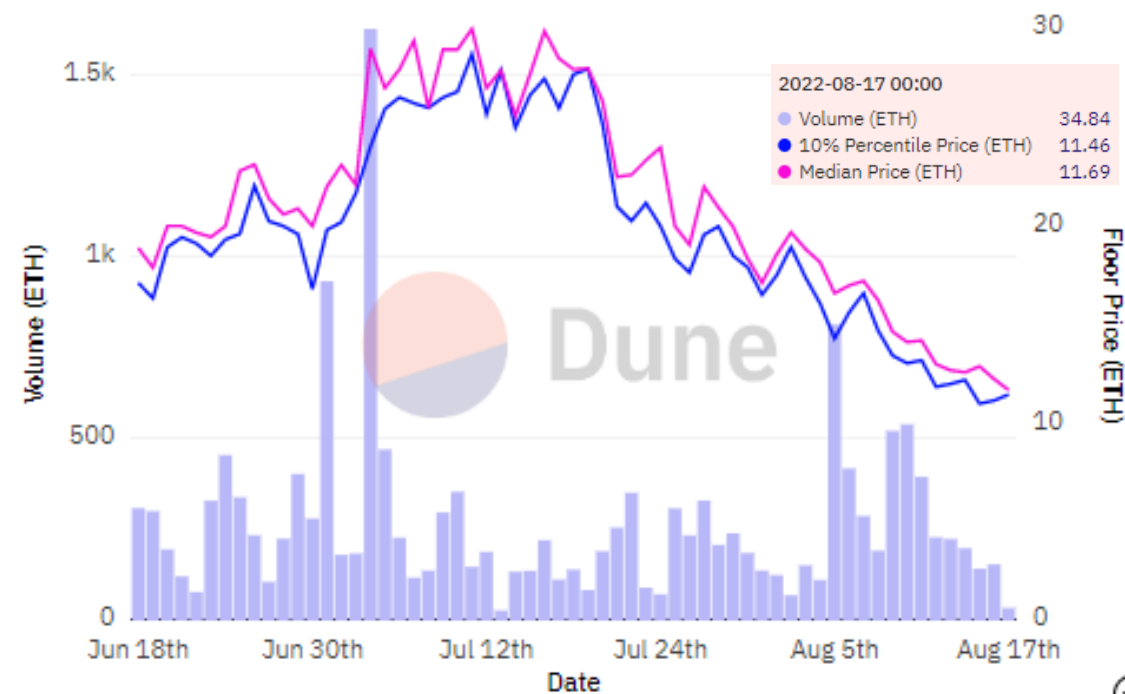
Moonbirds goes CC0



- Moonbirds announced last week that the project, along with Moonbirds Oddities, will **switch to the CC0 public license**.
- The CC0 allows creators to wave legal interest in the work and place it into the public domain as far as possible. In other words, **anyone can use Moonbirds NFT art freely without copyright infractions, forever**.
- The team also introduced a Moonbirds DAO, which will oversee licensing of the Moonbirds trademarks.
- Many existing Moonbirds holders were not happy over the change, since it was stated from the beginning that IP rights would be granted to the NFT buyer.
- Justin Taylor, Head of Consumer Product Marketing at Twitter, tweeted his disagreement with the CC0 move as it take away rights from holders. **Creators should “make the decision upfront,”** he said.
- Moonbirds floor price dropped 32% since the announcement. It is currently at 11.7 ETH, versus ~17.2 ETH pre-CC0 announcement.

Moonbirds Overview

@sealaunch

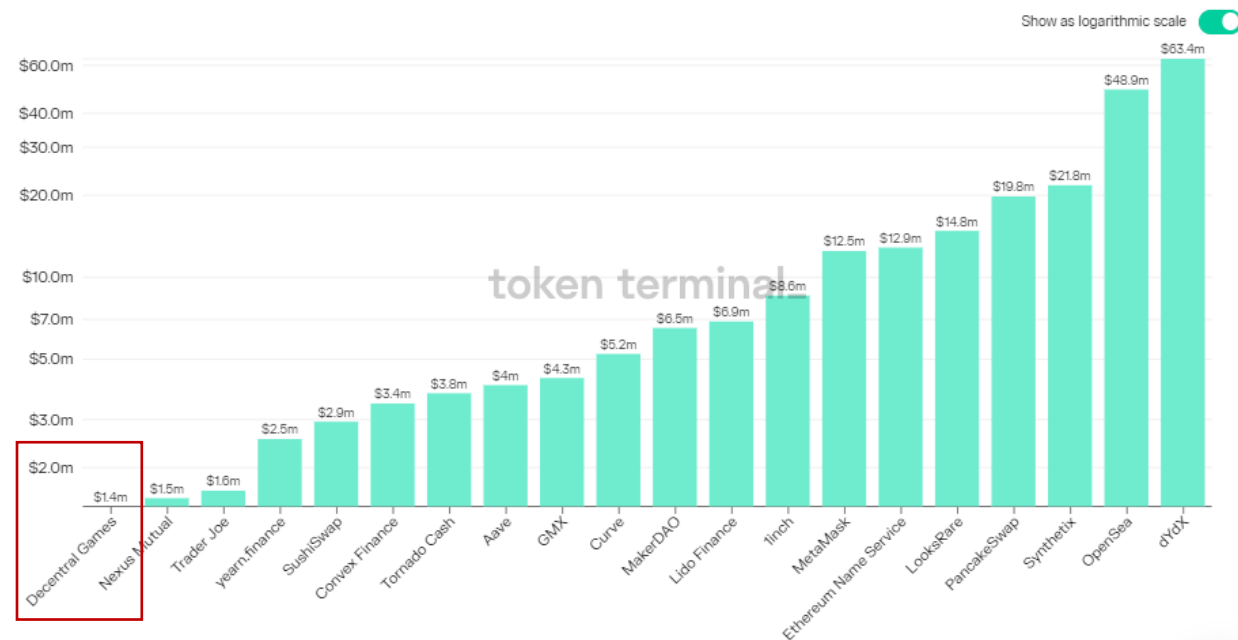


GameFi & Play-to-Earn

Polygon Partners with Neowiz for Gaming

- Polygon Network has announced a strategic partnership with South-Korean game developer Neowiz for blockchain gaming development.
- The partnership will create a blockchain gaming platform called Intella X, which will bring Neowiz's popular gaming IPs like "Cats & Soup" and "Brave Nine" to web3.
- The gaming platform will highlight user ownership, such as by staking and providing liquidity. Meanwhile, Intella X's native token may be earned by playing games.

Dapp 90D Protocol Revenue



News & Headlines

MagicEden Proposes to Build ApeCoinDAO NFT Marketplace

NFT marketplace MagicEden has submitted a proposal to the ApeCoinDAO for a marketplace for the Yuga Lab ecosystem. APE and BAYC/MAYC/BACK holders will have a discounted transaction fee of 0.75%, lower than other common marketplaces. APE holders will face a 1% fee. [[The Block](#)]

OpenSea Changes Stolen Assets Policy

After long-lasting complaints from the community, OpenSea announced that it is changing the way that it handles reportedly stolen NFTs. Previously, it blocked assets flagged as stolen but received backlash since it potentially punishes the unknowing buyers. The change will now require a police report to be submitted within seven days of reporting an NFT as stolen. [[Decrypt](#)]

MLS Signs BAYC

The Major League Soccer announced a new signing – Striker, a Bored Ape #6045. Striker will make his virtual debut at the MLS All-Star Game. The NFT was acquired for 100 ETH by marketing firm Get Engaged Media. [[NFT Now](#)]

Tencent Shuttters Sales on NFT Platform

Huanhe, Tencent's NFT platform, will cease digital collectible sales in light of increased scrutiny from regulators. Owners of NFTs will still be able to hold and display them. NFT trading failed to gain traction in China after NFT trading was banned, in essence removing price speculation and secondary market. [[CoinDesk](#)]

Regulatory Updates

Regulatory Updates

- A proposal by the US SEC and CFTC would require large hedge funds to report their cryptocurrency exposure through an expansion of the filing Form PF, created after the 2008 financial crisis to help spot stability risks in the opaque private funds ecosystem.
- The US Treasury have sanctioned crypto mixer Tornado Cash, effectively banning its use by all US persons and entities. According to the Treasury Department, Tornado Cash has been a key tool for North Korean hacking group Lazarus Group, helping hackers obfuscate funds.
- The US Federal Reserve published guidance for novel financial institutions (like crypto custody banks) to access its “master accounts,” a critical part of participating in the global payment system. The guidance will create a multi-tiered system to allow the Fed to evaluate the granting process for such financial institutions.
- Several US senators have formally asked the Office of the Comptroller of the Currency to withdraw interpretive letters allowing banks to engage in crypto activities. The senators called for coordination with the Federal Reserve and the FDIC to develop a comprehensive approach to protect consumers and soundness of the banking system instead.
- The Fiscal Information and Investigation Service of The Netherlands have arrested Tornado Cash developer Alexey Pertsev, which apparently began its investigation in June. The arrest came soon after the Tornado Cash blacklist by the US.
- The US SEC is reportedly investigating Coinbase’s staking programs and yield-generating products. According to its disclosure in the quarterly report, Coinbase received investigative subpoenas. The investigation adds on to insider-trading investigations over its token listing processes by the SEC earlier as well.
- The US Federal Reserve and Federal Deposit Insurance Corporation (FDIC) issued a joint cease and desist letter to crypto platform Voyager over its false claims of having FDIC insurance coverage. The letter comes a month after the firm filed for bankruptcy.
- The Reserve Bank of Australia announced that it is exploring CBDC use cases. The project will focus on the use cases and benefits of CBDCs and will feature a limited scale pilot program.

Regulatory Updates

- The Cyprus Securities and Exchange Commission has approved European digital bank Revolut to offer crypto services across the European Economic Area, which includes countries in the EU plus Iceland, Liechtenstein, and Norway.
- Gate.io's Hippo Financial Services has been granted a virtual asset custodial services license in Hong Kong.
- Crypto.com has received approval to be a cryptoasset service provider in the UK by the Financial Conduct Authority.
- New regulatory changes in Canada have taken effect, with four unrestricted cryptocurrencies (BTC/ETH/LTC/BCH) while and other cryptocurrencies would be considered restricted and will have a limit of CAD30,000 net buy per year. The annual net buy limits will affect all provinces except for Alberta, British Columbia, Manitoba, and Quebec.
- Binance US delisted the AMP token (Flexa Network) after the US SEC labeled it as a security in its statement on the arrest of former Coinbase product manager Ishan Wahi. Binance stated that the delisting would protect its community from “undue risk”.

Notable Tweets

Notable Tweets

Slope wallet...



storing private keys in plain-text, available via a public HTTP API is so negligent that I can't help but believe it was malicious in intent

7:20 AM · Aug 4, 2022 · Twitter for iPhone

Who's used Tornado Cash?



Jeff Coleman | Jeff.eth @technocrypto · Aug 9

Wanting to donate to Ukraine is a great example of a valid need for financial privacy: even if the government where you live is in full support, you might not want Russian government to have full details of your actions.

22 135 856



Jeff Coleman | Jeff.eth @technocrypto · Aug 9

On this note, curious if there are documented examples of TC having been used for this. Obviously self-identifying sort of defeats the point but e.g. groups or guides recommending people to do so?

5 8 382



vitalik.eth @VitalikButerin

Replying to @technocrypto

I'll out myself as someone who has used TC to donate to this exact cause.

4:49 PM · Aug 9, 2022 · Twitter Web App

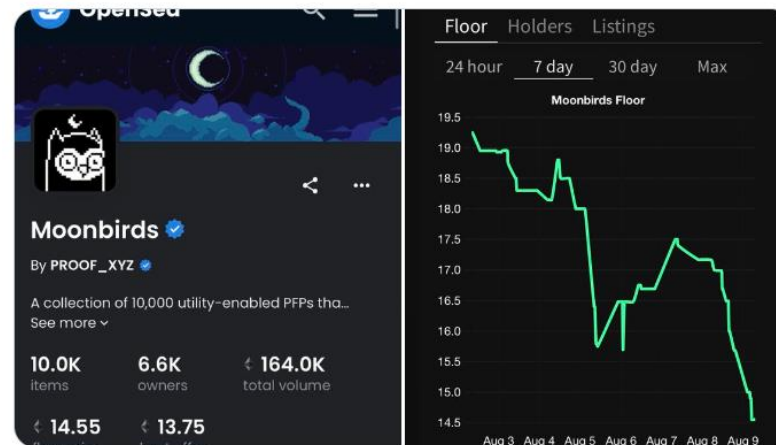
600 Retweets 107 Quote Tweets 4,169 Likes

Market reacts to Moonbirds CC0



Steve @NFTbark

Woke up to @moonbirds below a 14 ETH floor, down from 19.5 a week ago. Many of my friends who are HODLers have sold and I know more trying to trade their nested birds. I'm holding my Birb. I'm still hopeful. But make no mistake - this isn't about cc0. It's about a loss of trust.



8:27 PM · Aug 9, 2022 · Twitter for iPhone

Tornado Cash sanction precedent



Brian Armstrong - barmstrong.eth @brian_armstrong · Aug 15

Sanctioning a technology (as opposed to an individual or entity) seems like a bad precedent to me, and it should probably be challenged. Could have many downstream unintended consequences.

#TornadoCash

Hopefully obvious point: we will always follow the law.

279 324 2,014

MagicEden vs. OpenSea



Magic Eden @MagicEden · Aug 11

In our newest YouTube video, we took a look at the similarities & differences between Ethereum and Solana NFTs **

Which chain is your favorite and why? 🤔

Learn more about both chains here: youtu.be/2j858Sci55s



84 106 709



OpenSea @opensea · Aug 11

tOpShOt iS A NoTaBle EtHeReUm pRoJeCt

This is what happens when you don't DYOR @magiceden

525 712 3,406



Magic Eden @MagicEden

Replying to @opensea

Oh right THAT'S why my Topshot NFTs never got frozen

12:38 PM · Aug 11, 2022 · Twitter for Android

297 Retweets 54 Quote Tweets 5,388 Likes

DAI's stability



Robert Leshner @rleshner

The stability of DAI as a stablecoin (across various market environments) is its most important attribute.

Converting DAI into a price-elastic asset will ruin it, full stop.

Blockworks Research @blockworksres · Aug 11

MakerDAO founder @runkek considers the sale of a portion of DAI's USDC backing for ETH.

"The sanctions are a lot more serious than I first thought... we should seriously consider preparing to depeg from USD... 'uprooting' which is what I call the yolo USDC into ETH approach"

[Show this thread](#)

11:31 PM · Aug 11, 2022 · Twitter for iPhone

What are NFTs?



6529 @punk6529 · 15h

NFTs are definitely altcoins with pictures on them.

It is a feature, not a bug

Cobie @cobie · 15h

oki @2Yeahyeah is gonna organise an Up Only with all the NFT ppl hopefully @punk6529 and @krybharat and stuff who are going to school me on why NFTs are the greatest thing in the world and its defo not altcoins with pictures and music NFTs are totally a real thing etc

63 99 1,022

Is DAI's USDC -> ETH a good idea?



banteg @bantg · Aug 11

MakerDAO is considering a \$3.5 billion ETH market buy, converting all USDC from the peg stability module into ETH.

363 994 3,284



vitalik.eth @VitalikButerin

Replying to @bantg

Errr this seems like a risky and terrible idea. If ETH drops a lot, value of collateral would go way down but CDPs would not get liquidated, so the whole system would risk becoming a fractional reserve.

11:09 PM · Aug 11, 2022 · Twitter Web App

Velodrome hacker



Gabagool.Eth @gab... · 4/29/22

rly struggling with a moral dilemma for the first time since I started in crypto, not sure what to do

56 192



Cobie @cobie · 4/29/22

if in doubt, rug

10 9 427



Cobie @cobie

Replying to @cobie and @gabagooldoteth

bro this was a joke wtf

1:58 PM · 8/13/22 · Twitter for iPhone

13 Retweets 3 Quote Tweets 166 Likes

Protesting the sanction



Oxjim @OxJim · Aug 10

Max chaos — someone is sending TC'd ETH to big doxxed wallets like Shaq, Bepie, Randi Zuckerberg, Ben Horowitz, Brian Armstrong, etc

Tornado.Cash: 0.1 ETH	→	0xproxy.eth
Tornado.Cash: 0.1 ETH	→	0xd4402526d907f
Tornado.Cash: 0.1 ETH	→	0xproxy.eth
Tornado.Cash: 0.1 ETH	→	CozomoMedici
Tornado.Cash: 0.1 ETH	→	0xproxy.eth
Tornado.Cash: 0.1 ETH	→	shaqgivesback.
Tornado.Cash: 0.1 ETH	→	0xproxy.eth
Tornado.Cash: 0.1 ETH	→	0xb6aa5a1aa37a4
Tornado.Cash: 0.1 ETH	→	0xproxy.eth
Tornado.Cash: 0.1 ETH	→	PUMA
Tornado.Cash: 0.1 ETH	→	0xproxy.eth
Tornado.Cash: 0.1 ETH	→	randizuckerberg
Tornado.Cash: 0.1 ETH	→	*torn-relay.eth

IMPORTANT DISCLOSURES

Analyst Certification

We, Brian Li and Eugene Chin, hereby certify that (i) all of the views expressed in this research report reflect accurately our personal views about the subject company or companies and its or their securities; and (ii) no part of my compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed by us in this research report, nor is it tied to any specific investment banking transactions performed by AMTD Global Markets Limited.

AMTD Global Markets Limited

Address: 23/F - 25/F, Nexus Building, 41 Connaught Road Central, Hong Kong

Tel: (852) 3163-3288 **Fax:** (852) 3163-3289

GENERAL DISCLOSURES

The research report is prepared by AMTD Global Markets Limited (“AMTD”) and is distributed to its selected clients.

This research report provides general information only and is not to be construed as an offer to sell or a solicitation of an offer to buy any security in any jurisdiction where such offer or solicitation would be illegal. It does not (i) constitute a personal advice or recommendation, including but not limited to accounting, legal or tax advice, or investment recommendations; or (ii) take into account any specific clients’ particular needs, investment objectives and financial situation. AMTD does not act as an adviser and it accepts no fiduciary responsibility or liability for any financial or other consequences. This research report should not be taken in substitution for judgment to be exercised by clients. Clients should consider if any information, advice or recommendation in this research report is suitable for their particular circumstances and seek legal or professional advice, if appropriate.

This research report is based on information from sources that we considered reliable. We do not warrant its completeness or accuracy except with respect to any disclosures relative to AMTD and/or its affiliates. The value or price of investments referred to in this research report and the return from them may fluctuate. Past performance is not reliable indicator to future performance. Future returns are not guaranteed and a loss of original capital may occur.

The facts, estimates, opinions, forecasts and any other information contained in the research report are as of the date hereof and are subject to change without prior notification. AMTD, its group companies, or any of its or their directors or employees (“AMTD Group”) do not represent or warrant, expressly or impliedly, that the information contained in the research report is correct, accurate or complete and it should not be relied upon. AMTD Group will accept no responsibilities or liabilities whatsoever for any use of or reliance upon the research report and its contents.

This research report may contain information from third parties, such as credit ratings from credit ratings agencies. The reproduction and redistribution of the third party content in any form by any means is forbidden except with prior written consent from the relevant third party. Third party content providers do not guarantee the timeliness, completeness, accuracy or availability of any information. They are not responsible for any errors or omissions, regardless of the cause, or for the results obtained from the use of such content. Third party content providers give no express or implied warranties, including, but not limited to, any warranties of merchantability of fitness for a particular purpose or use. Third party content providers shall not be liable for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including lost income or profits and opportunity costs) in connection with any use of their content. Credit ratings are statements of opinions and are not statements of fact or recommendations to purchase, hold or sell securities. They do not address the suitability of securities for investment purposes, and should not be relied on as investment advice.

To the extent allowed by relevant and applicable law and/or regulation: (i) AMTD, and/or its directors and employees may deal as principal or agent, or buy or sell, or have long or short positions in, the securities or other instruments based thereon, of issuers or securities mentioned herein; (ii) AMTD may take part or make investment in financing transactions with, or provide other services to or solicit business from issuer(s) of the securities mentioned in the research report; (iii) AMTD may make a market in the securities in respect of the issuer mentioned in the research report; (iv) AMTD may have served as manager or co-manager of a public offering of securities for, or currently may make a primary market in issues of, any or all of the entities mentioned in this research report or may be providing, or have provided within the previous 12 months, other investment banking services, or investment services in relation to the investment concerned or a related investment.

AMTD controls information flow and manages conflicts of interest through its compliance policies and procedures (such as, Chinese Wall maintenance and staff dealing monitoring).

The research report is strictly confidential to the recipient. No part of this research report may be reproduced or redistributed in any form by any means to any other person without the prior written consent of AMTD Global Markets Limited.