Ultimate Blockchain Developer Report 2021

For Developers

TATUM

Introduction

2021 was yet again an unprecedented and incredibly interesting year in the blockchain space. NFTs brought blockchain not only to pop-culture, art, and collectibles, but also to enterprises.

Many newer blockchains established them-selves as formidable contenders throughout the year, indicating developers' rising confidence in alternatives to the trusted blockchains of previous years. Celo, Solana, and Polygon all gained ground in terms of adoption, and many other new players successfully launched blockchains that are already showing upward trends.

More than 30,000 developers are now building on Tatum, powering more than 6,000 projects and dozens of millions of users

The rise of cross-chain bridges and the increased focus on interoperability indicate that there is a strong demand for leveraging multiple chains and their respective advantages. The demand for cross-blockchain capabilities is also evident by exploring Tatum's usage data.

Another interesting and reaffirming statistic from 2021 highlights the skyrocketing preference of developers for our custom, abstracted features. Whereas at the beginning of 2021, most developers were primarily building apps with traditional direct node RPC calls, by the end of 2021, the percentage of abstracted API calls rose to over 90%.

This trend shows that once developers find out there is a simple, yet powerful and frictionless framework, they immediately migrate from the traditional way of coding for each individual blockchain.
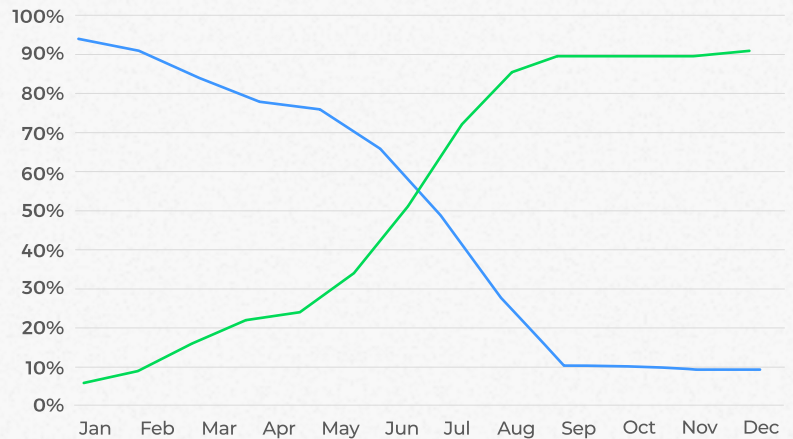
■ *usage of direct node RPC/WS calls , the traditional way of developing blockchain apps*

■ *usage of abstraction framework*

This report covers all blockchains supported by Tatum for at least 6 months. Solana and others were integrated at the end of 2021, and thus its internal usage statistics have been omitted from this report.
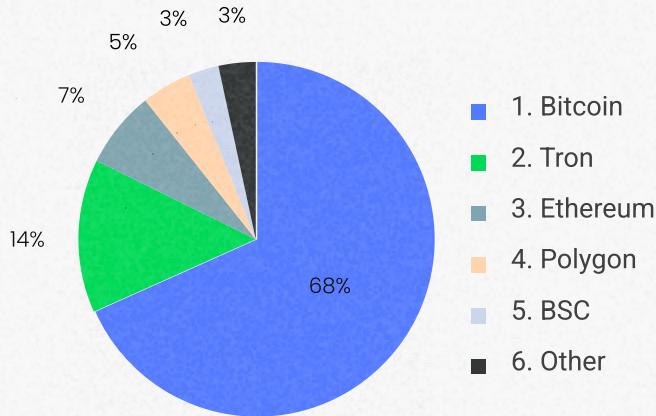
We are analyzing the health of blockchains supported by Tatum based on various parameters including network health, hard forks / soft-forks, nodes and node distribution.

The blockchains covered in this report are: Tron, Bitcoin, Ethereum, Polygon, Bcash, Litecoin, Dogecoin, Flow, Ripple, Stellar, BNB, BSC, VET, NEO, Cardano, Celo, Harmony One, Xinfin, Algorand.
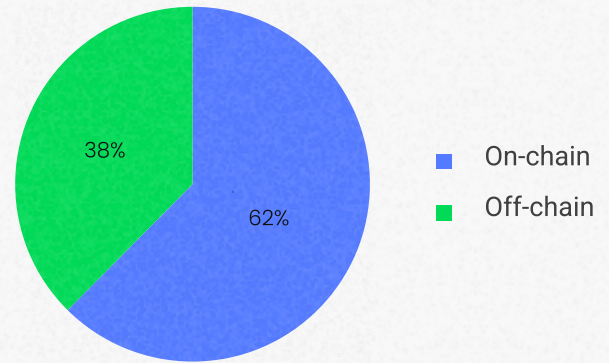
2021 Tatum Overview

APPLICATION USAGE

- 1. Bitcoin
- 2. Tron
- 3. Ethereum
- 4. Polygon
- 5. BSC
- 6. Other

TRANSACTION VALUE USD

- 1. Tron
- 2. Litecoin
- 3. Bitcoin
- 4. Ethereum
- 5. Dogecoin
- 6. Other

NUMBER OF TRANSACTIONS

- 1. Polygon
- 2. BSC
- 3. Tron
- 4. Xinfin
- 5. Celo
- 6. Other

ONCHAIN VS OFFCHAIN TRANSACTIONS


- On-chain
- Off-chain

Although the vast majority of transactions were processed on-chain, off-chain features gained traction in 2021, which is most likely a result of gas fees spiking to new all-time highs in 2021. Off-chain transactions are related to blockchains but do not take place directly on them. Instead, they are performed, verified, and stored entirely off the blockchain, or away from its main chain, on a sidechain. Transactions recorded in this way can be reunited with the main chain at a later time, if necessary.

The major advantages of off-chain transactions include higher speed, lower costs, higher system scalability, and higher transaction anonymity.
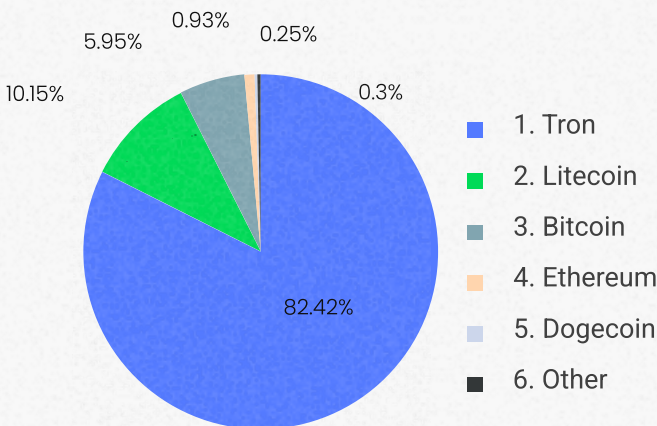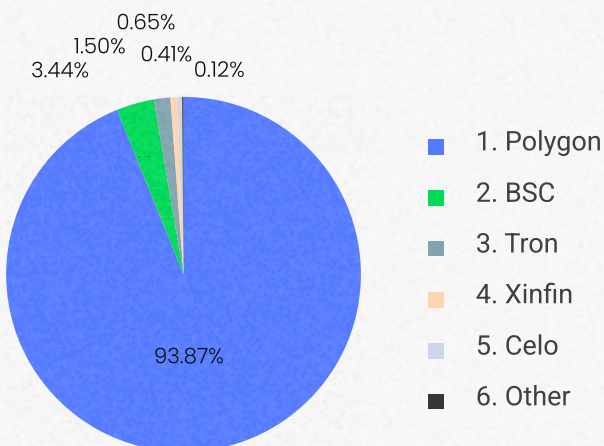
2021 Tatum Overview

- NFT Contracts
- ERC-20 Contracts

17,24%
82.76%
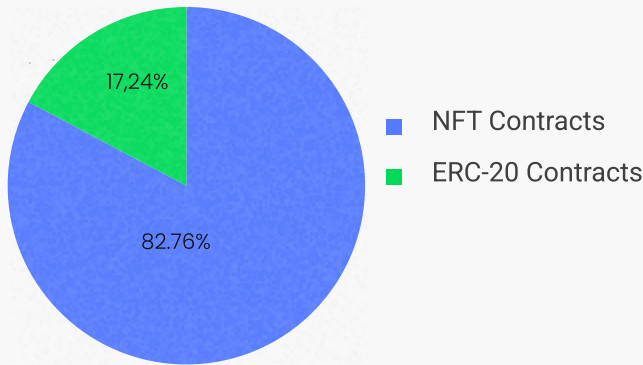
Developers deployed 160 times more NFTs contracts than ERC-20 contracts, clearly proving the importance of the advanced capabilities of NFTs, including royalty payments and provenance data.

However, ERC-20 Tokens were transferred seven times more than NFTs, which shows that NFTs still have one primary use case - as digital art that doesn't change hands very often.

The multi-token standard (ERC-1155) gained traction this year, accounting for 2% of new NFTs minted. This is the first Ethereum token standard that allows users to combine both fungible and non-fungible assets into a single smart contract - enabling the creation of any type of asset, from digital currency to tokenized real estate to gaming and digital art.

- Polygon
- Celo
- Ethereum
- Binance
- Harmony

3%
35%
53%
4%
5%
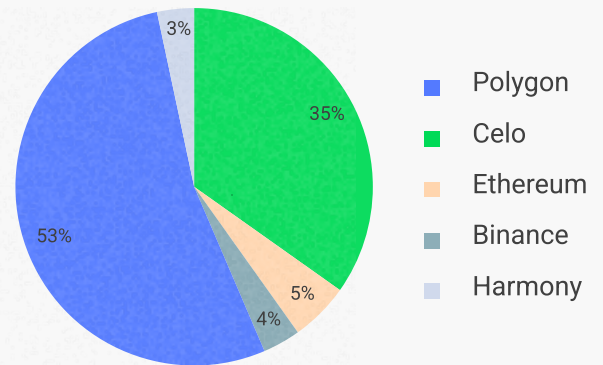
As with overall transactions, Polygon was the most used blockchain for minting NFTs - a trend is fueled by Polygon's firmly established dominance as the blockchain of choice for some of the biggest NFT marketplaces.

Even so, Celo has presented incredibly promising growth numbers and could be outperforming Polygon soon, considering that it's 42 times cheaper, on average, to mint NFTs on Celo compared to Polygon.

Of all the NFT-related operations conducted by blockchain developers, deploying new NFT contracts accounted for 0.05%, minting NFTs for 1.69%, and transactions made up the overwhelming majority of all activity at 98.26%.

2021 Tatum Awards

BITCOIN

TATUM AWARD

Used in most
Projects

The award for "blockchain used in the most projects" goes to Bitcoin. Bitcoin has the biggest application usage. Nevertheless, based on our data we believe, that Bitcoin has the highest application usage based on historical compatibility requirements. Most developers are solely reading historical data, rather than building new features on top of Bitcoin.

CELO

TATUM AWARD

Rising Star Award

There is a new contender in the space! Celo - We're impressed by this blockchain and clearly developers are as well. With almost 6% of transaction activity – 17x more than Ethereum, and being used by many projects, we are honored to name Celo as Rising Star! This blockchain will definitely go up in 2022 and developers should consider building their projects on Celo.

POLYGON

TATUM AWARD

Highest number of
transactions

It's absolutely clear, that Polygon is the king of 2021 in terms of transactions. Almost 94 % of all transactions were processed by Polygon. What is interesting, Polygon did about 18 % of transactions out of all operations on the blockchain. To give you some comparison, Bitcoin did only 0.01% transactions out of all operations, and Ethereum 0.34%. That being said, Polygon had 53x more activity & engagement than Ethereum.

TRON

TATUM AWARD

Highest Transaction
Value

The overall highest transactions value goes to Tron. A lot of developers are using Tron to send transactions, especially using stable coins. Applications running on Tron processed over hundreds of millions of USD per week. Of course, Tron being the main chain for USDT had a significant impact here.

GitHub	github.com/bitcoin
Ticker Symbol	BTC
Average Transaction Fee	15.97 USD
Network Nodes	14,587

APPLICATION USAGE
Used in most projects built on Tatum

#1. Bitcoin

SUMMARY   02

When it comes to security, usage and marketcap Bitcoin remains king of all chains. 68.3% of Tatum developers are using Bitcoin in their applications.

NOTABLE UPDATES   03

Block 709,632

Taproot

The Taproot soft-fork contained three Bitcoin Improvement Proposals (BIPs), including BIP340 (BIP – Schnorr), BIP341 (BIP – Taproot), BIP342 (BIP – Tapscript).

With Taproot, the Bitcoin community introduces Schnorr signatures, which primarily increases the privacy and security of transactions.
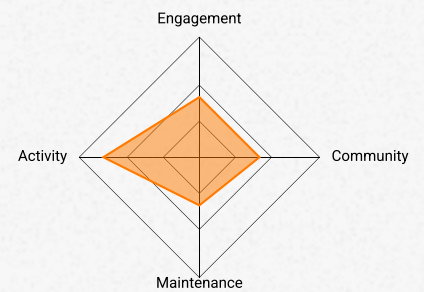
GITHUB STATS   04

Stars	60,249
Watchers	3,887
Forks	30,937
Commits	32,030
Contributors	1,035

RELATIVE ACTIVITY   05

TRANSACTIONS PER DAY   06
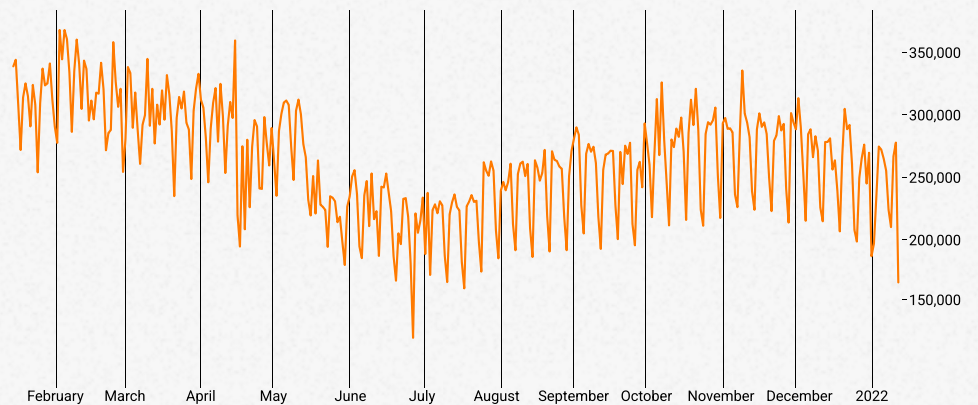
GitHub   github.com/tronprotocol

Ticker Symbol   TRX

Avarage Transaction Fee   0.085 USD

TRANSACTION VALUE
Highest Transaction Value in Tatum

APPLICATION USAGE
2nd Highest Application Usage in Tatum

#2. Tron

SUMMARY 02

TRON has had a stellar year, continuously making headlines in 2021, and has been one of the most used blockchains within the Tatum community.

NOTEWORTHY ACHIEVEMENTS 03

7th of July 2021
Transactions All-Time-High
The number of daily transactions on Tron surpassed 9.2 million - a new all-time-high.

12th of December 2021
Bittorrent Mainnet went live
Bittorrent Chain (BTTC) Mainnet went live.

17th of December
Justin Sun resigns as CEO
Justin Sun has reported his resignation as TRON CEO to become Grenada's WTO Ambassador. The TRON Foundation is also set to dissolve on July 25, 2022.

GITHUB STATS 04

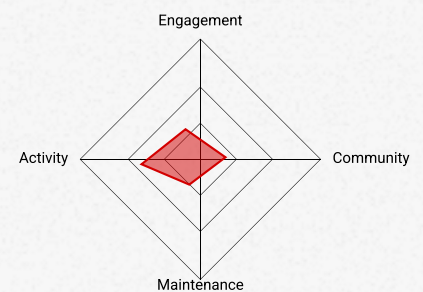|	
Stars	2,901
Watchers	331
Forks	1,014
Commits	16,625
Contributors	226

RELATIVE ACTIVITY 05
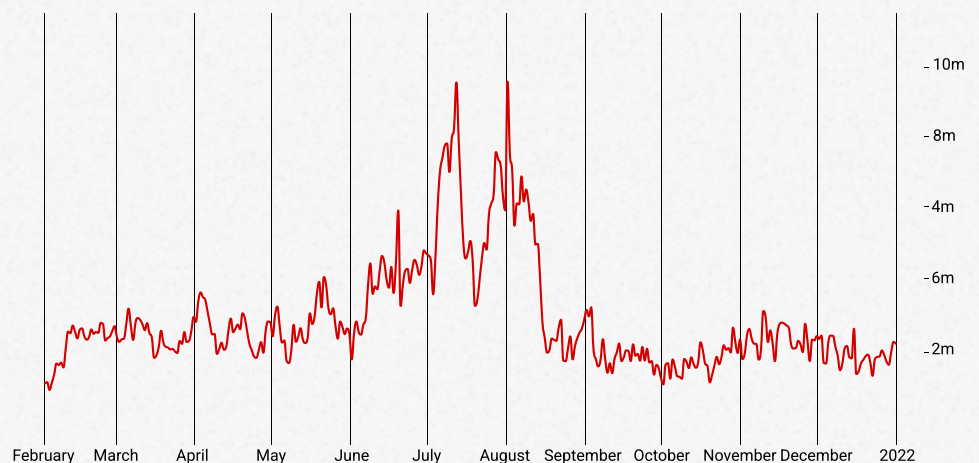
TRANSACTIONS PER DAY 06

February March April May June July August September October November December 2022

#3. Ethereum

SUMMARY   02

Ethereum saw several all time highs in 2021, but not only in a positive way. Extremely high transaction costs result in an evergrowing demand for Ethereum 2.0

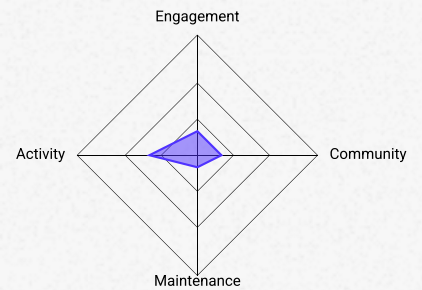## FORKS   03

Block Number: #13,773,000

Arrow Glacier

Postponed the difficulty bomb by several months – a planned difficulty exponential increase in proof-of-work difficulty, designed to motivate the transition to proof-of-stake

Block Number: #:12,965,000

London

An attempt to reduce transaction fees and prepare for the migration from proof of work to proof of stake.
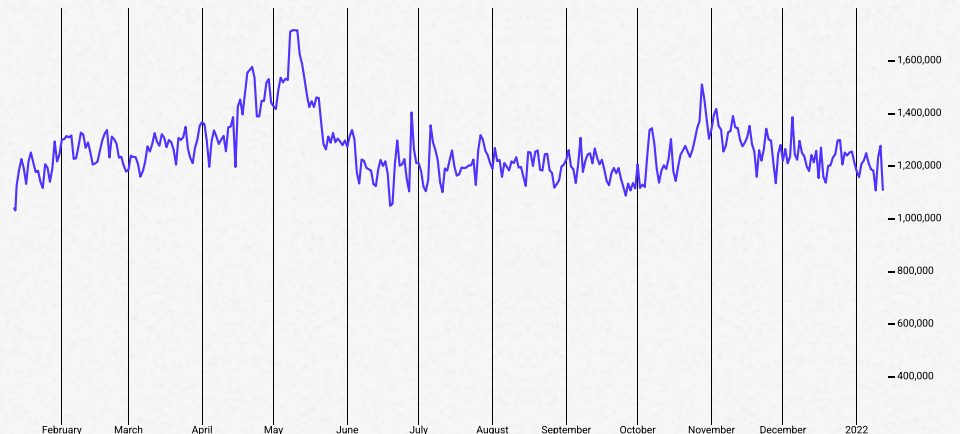
Block Number: #:12,244,000

Berlin

The Berlin upgrade optimized gas cost for certain EVM actions, and increases support for multiple transaction types.

GITHUB STATS   04

Stars	34,219
Watchers	2,134
Forks	12,651
Commits	13,071
Contributors	662

RELATIVE ACTIVITY   05

TRANSACTIONS PER DAY   06

TATUM

GitHub   github.com/maticnetwork

Ticker Symbol   MATIC

Avarage Transaction Fee   0.002 USD

TRANSACTIONS
Highest Number of Transactions

#4. Polygon

SUMMARY 02

Polygon had its breakthrough in 2021 and managed to attract some of the biggest projects in decentralized finance (DeFi) and non-fungible tokens (NFTs).

FORKS 03

05.12.2021
Bor update
A critical security update still requiring further information. Polygon announced it on Github as "This release contains some bug fixes and also a hardfork" - only mentioning the hardfork as a side topic.

Block Number: #:14,750,000
Berlin Fork Upgrade
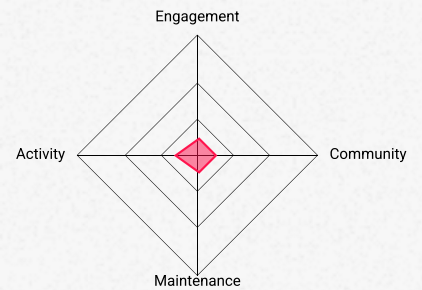Update to geth v1.10.1 that includes Berlin hardfork.

GITHUB STATS 04

Stars	261
Watchers	42
Forks	129
Commits	13,347
Contributors	661

RELATIVE ACTIVITY 05

Engagement

Activity

Community

Maintenance

TRANSACTIONS PER DAY 06

- 10m
- 8m
- 4m
- 6m
- 2m

February March April May June July August September October November December 2022
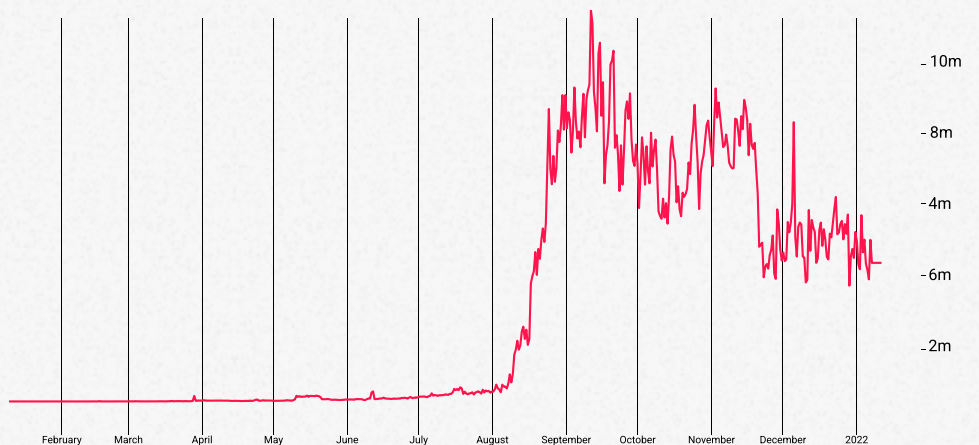
#5. BSC

GitHub   github.com/binance-chain

Ticker Symbol   BSC

Average Transaction Fee   0.42 USD

NUMBER OF TRANSACTIONS
2nd Highest Transaction Number in Tatum

SUMMARY   02

Binance Smart Chain has experienced significant growth in 2021, as a result of high Ethereum Gas Fees. The network managed 2.14 Billion transactions in total, with an ATH of 16.26 million daily transactions recorded on 25th Nov.

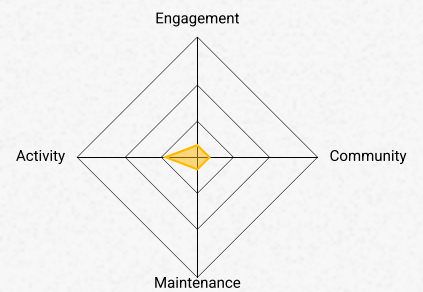## FORKS   03

Block Height #13,082,000

Bruno Upgrade v1.1.5

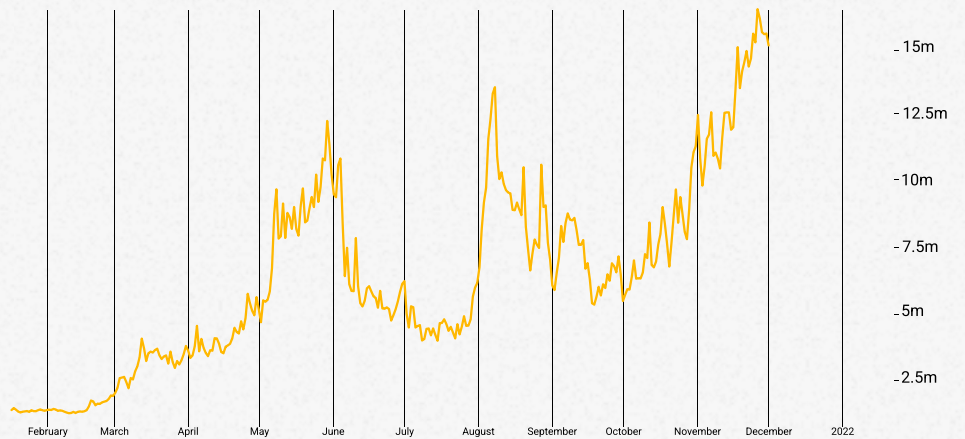Introduced a burning mechanism into the economic model of BSC, and speeded up the full node sync.

GITHUB STATS   04

Stars	1,296
Watchers	68
Forks	533
Commits	12,790
Contributors	613

RELATIVE ACTIVITY   05

Engagement
Activity
Community
Maintenance

TRANSACTIONS PER DAY   06

February March April May June July August September October November December 2022

15m
12.5m
10m
7.5m
5m
2.5m

The following tables provide a comparison of blockchains supported by Tatum, which didn't make the top five. The tables are sorted by application usage and provide a comprehensive overview of internal Tatum Data and open-source data including Github activity.

	Celo	Litecoin	Ripple	Cardano	Dogecoin
Tatum Usage	#6	#7	#8	#9	#10
Ticker Symbol	CELO	LTC	XRP	ADA	DOGE
Average tx fee	0.001	0.04	0.87	0.25	0.18
Nodes	-	1,348	-	-	1,532
Github	GITHUB.COM/ CELO-ORG	GITHUB.COM/ LITECOIN-PROJECT	GITHUB.COM/ RIPPLE	GITHUB.COM/ INPUT-OUTPUT-HK	GITHUB.COM/ DOGECOIN
Github Forks	105	2,984	1,304	462	2,417
Commits	14,335	19,975	12,575	5,302	13,953
Contributors	679	759	115	101	606
Stars	330	4,011	4,03	2,385	13,596
Watchers	67	530	509	200	867

	NEO	Xinfin	BTC Cash	Flow	VeChain
Tatum Usage	#11	#12	#13	#14	#15
Ticker Symbol	NEO	XDC	BTCC	FLOW	VET
Average tx fee	0	-	-	0.03	-
Nodes	-	1,348	1,049	-	1.872
Github	GITHUB.COM/ NEO-PROJECT	GITHUB.COM/ XINFINORG	-	GITHUB.COM/ ONFLOW	GITHUB.COM/ VECHAIN
Github Forks	972	36	16	462	2,417
Commits	1,330	11,136	4,384	5,302	13,953
Contributors	66	434	128	101	606
Stars	3,336	27	27	2,385	13,596
Watchers	388	16	16	200	867

2021: A huge year for Tatum

The past year has been an incredibly exciting year for Tatum. Our user base has grown from a few thousand developers to over 20,000 at the time of writing. We have added numerous blockchains, and innovative features. We added some of the most in-demand and fastest growing blockchains to Tatum in 2021, opening up a multitude of possibilities for both novice and experienced blockchain developers. We've released features and improved NFT smart contracts that have pushed the boundaries of what was previously imaginable in the world of blockchain. Our API and JavaScript SDKs expanded considerably to include over 300 features, many of which are completely unparalleled in other platforms.

Out of all that happened throughout the year, our journey to the finals of the TechCrunch Startup Battlefield 2021 was a major achievement for our team and the whole blockchain community. We were the FIRST blockchain project to have ever been selected to present at the famous TechCrunch Disrupt.

We are confident that 2022 will be even bigger for developers. While we can't disclose the many of the specifics of our plans just yet, suffice it to say, we will be dramatically transforming our platform to further improve developer experience and streamline access to blockchain development for everyone.

We are confident that 2022 will be even bigger for Tatum.

We appreciate everyone's support and enthusiasm for what we have accomplished so far, and we are extremely excited to keep pushing blockchain into the mainstream in the months and years to come.

Jiri Kobelka – CEO Tatum

Disclaimer

This report has been written by Tatum Technology LLC (Tatum) with the assistance of individuals and groups, software product companies, their users, the industry, and Tatum consultants. Information was gathered using detailed questionnaires, public data, Tatum's internal data, and interviews.

The intention was to objectively present the facts and developer experiences of the leading blockchains. Significant effort has been put into validating the data, and Tatum believes the sources, data, statements, and opinions in this report to be accurate. However, Tatum cannot warrant the content. As such, no guarantee of any kind, either expressed or implied, is made as to the information contained in these pages including, but not limited to, any implied guarantee of merchantability, fitness for a particular purpose, or non-infringement of third party intellectual property by Tatum.
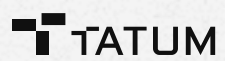
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