December 2020

Xangle Research

Which Blockchain Mainnet Should Defi Projects Use?

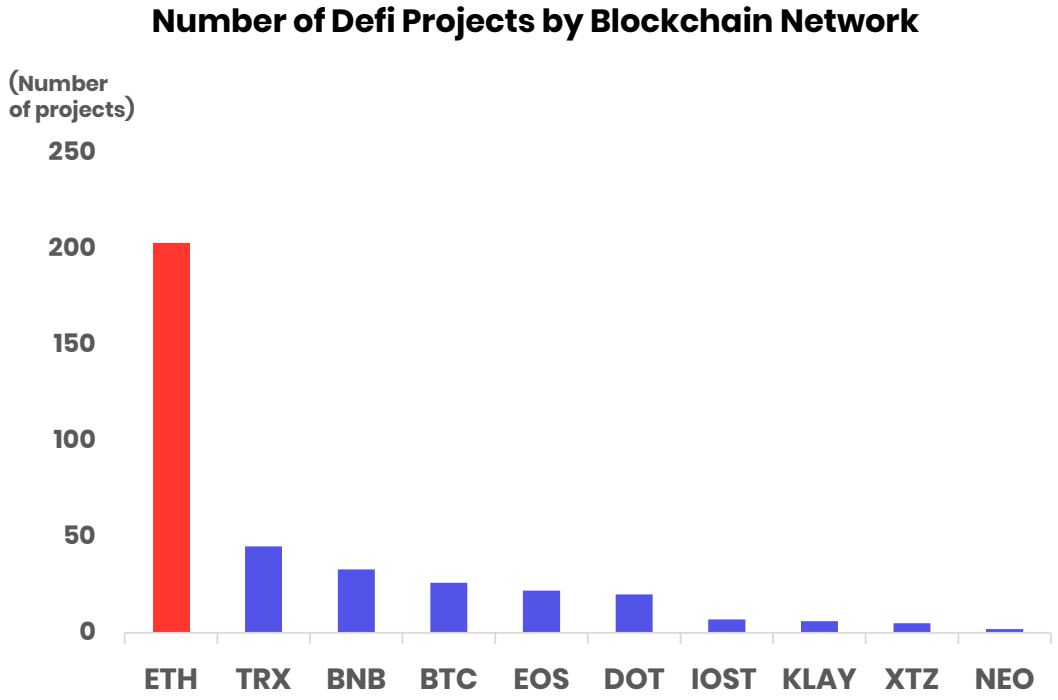
Blockchain Network Comparative Analysis for Defi Projects

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xangle.io

Ethereum has dominated the Defi ecosystem with an eager user base, a robust infrastructure, and expert developer support.

A majority of Defi projects are developed on Ethereum



Source: Defiprime, DappRadar, State of the Dapps, Dapp.com

Dominating Defi with a robust infrastructure

Projects that lead the Defi trend are all on the Ethereum platform

MAKER
Compound
UNISWAP
AAVE
ethereum

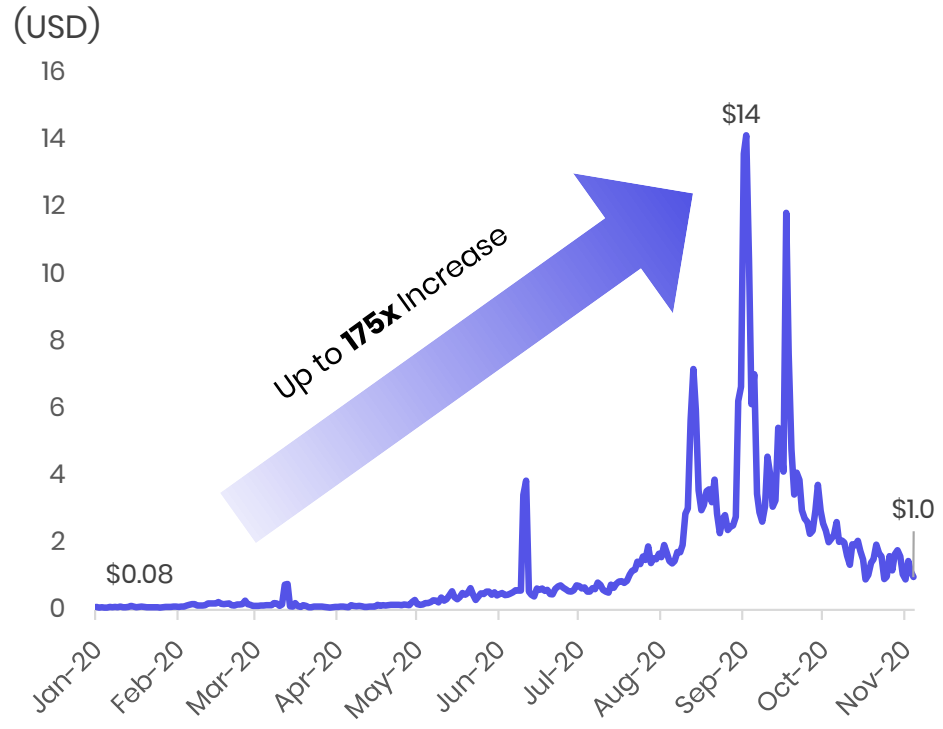
The Ethereum Network's key strengths

1. Convenient Development Environment
2. Solid Infrastructure and Wallet Support
3. Ample Stablecoin Support
4. Large Pre-existing User Base

Source: xangle.io

Despite its strengths, Ethereum has limitations, such as high transaction fees and limited scalability, which have drawn increasing attention to other viable blockchain networks.

ETH Tx fee skyrocketed as on-chain transactions increase



Source: xangle.io

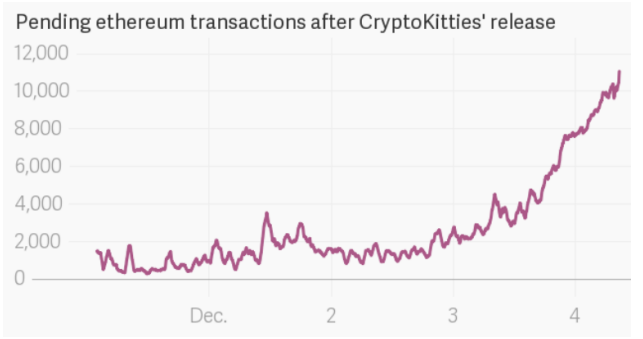
Ethereum Scalability Issue

Ethereum pending Tx rate swelled with the popularization of CryptoKitties

2017



CryptoKitties



Source: ATLAS

ETH Gas Fee increases with the expansion of Defi protocols

2020



Gas Fee & Pending Tx

Other blockchain mainnets now challenge Ethereum's dominance as they work to attract new and popular Defi projects to their platform.

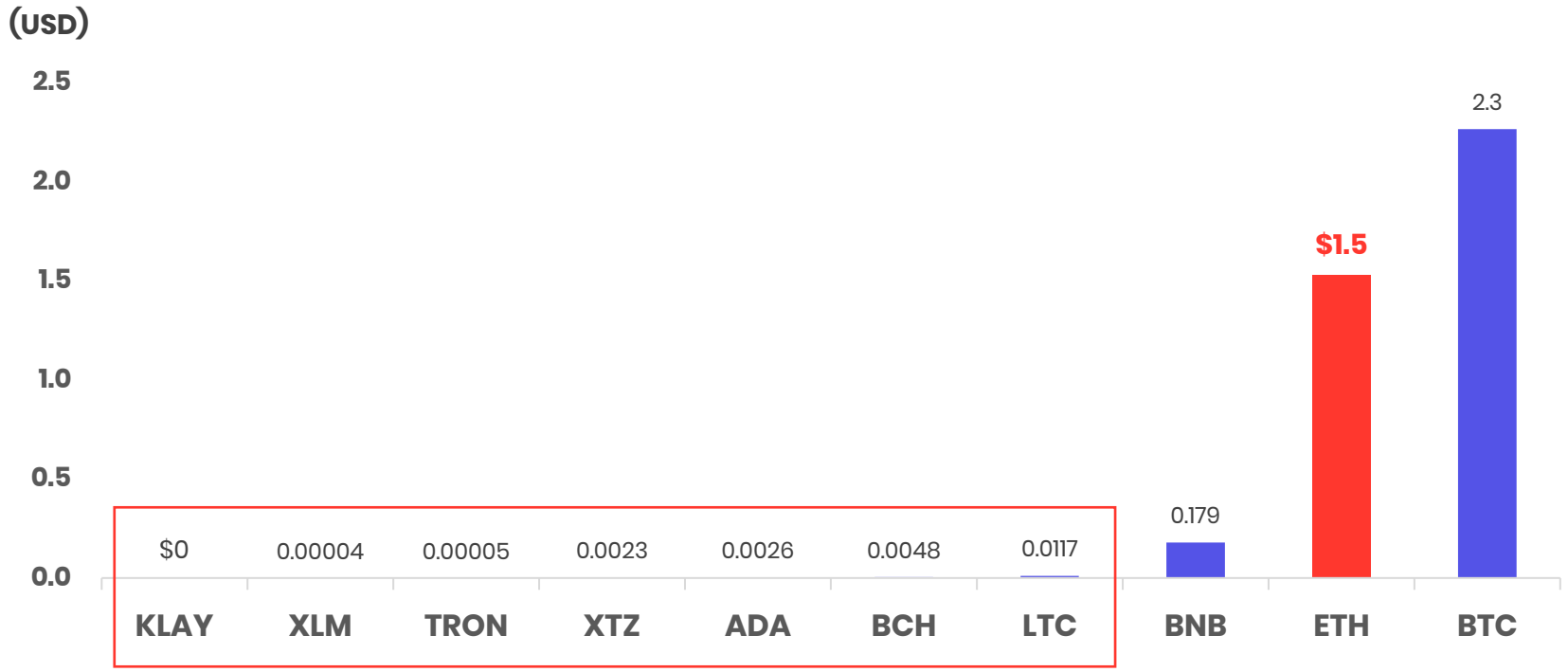
3rd Generation Blockchain Platforms' Advantages over Ethereum

1. Lower Transaction Fees
2. Faster Transaction Speed
3. Greater Project Funding
4. Improved Development Environment

1 Low Transaction Fee

Low fees are currently a major advantage for other mainnets. For example, Klaytn and other mainnets' average transaction fee in 2020 was $0 ~ 0.17, well above Ethereum's average transaction fee of $1.50.

Average Transaction Fee (2020 YTD)

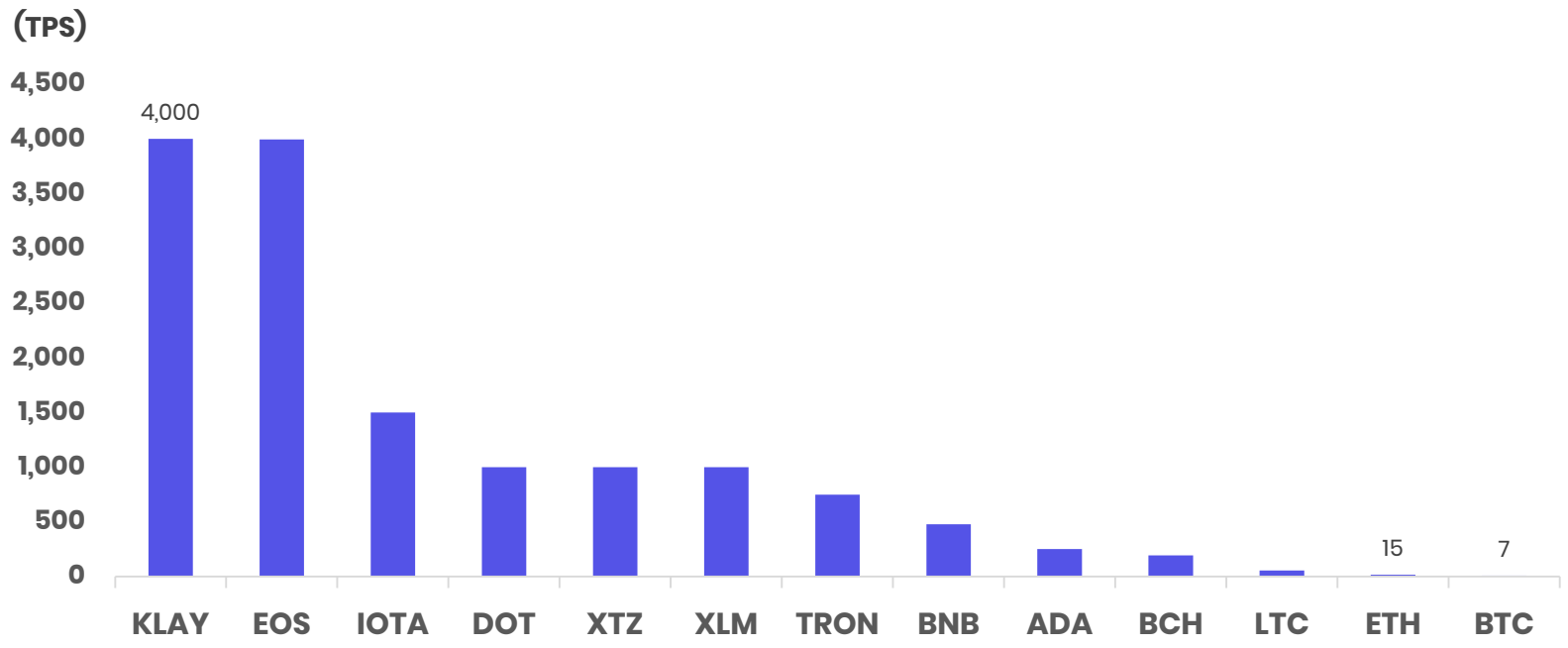


Note*: Klaytn covers all transaction fees for 1 year
Source: xangle.io, Klaytn, Tronstation, Coinmetrics, BSCscan

2 Fast Transaction Speed

Ethereum's TPS is 15, whereas other platforms' theoretical max TPS reaches 4000. This means they are capable of handling more transactions in the same timeframe.

Theoretical Max TPS Comparison by Mainnet



Source: Xangle.io, Klaytn, EosNetwork, IOTA, Gavin Wood, Securities.io, Cointelegraph, Tronstation, Coinmetrics, BSCscan

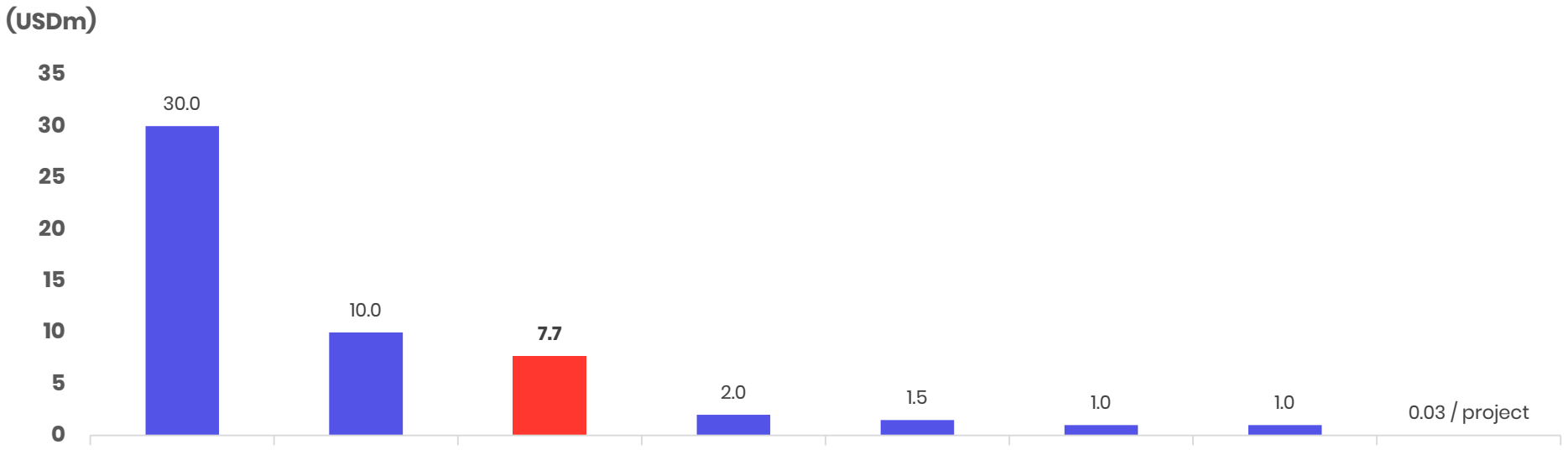
What is Max TPS?

TPS stands for Transactions per Second, and theoretical maximum TPS is the potential maximum number of transactions that the system can handle per second. Of course, it has been pointed out that maximum TPS is not an indicator that wholly shows the performance of a mainnet; and the measurement is inaccurate because the value varies depending on the environment. However, considering that both the Ethereum and Bitcoin networks get backed up due to the low maximum TPS, the high theoretical TPS on the other mainnets act as an indicator of improved performance.

3 Project Funding

Some projects have much more funding than Ethereum for infrastructure and ecosystem development. Considering the strong competition from the Ethereum ecosystem, the higher funding available to other mainnets is attractive.

Project Funding Program Budgets



	Tezos	Binance	Ethereum	Stellar	EOS	TRON	IOST	Polkadot
Program Name	Tezos Foundation Grants	Binance Smart Chain (BSC) Accelerator Fund	Ecosystem Support Program	Stellar Enterprise Fund	EOS VC Grants	Tron Accelerator	Noah Oracle Fund	Grants Program

Source: Project websites

4 Improving Dev Environment

Developers for Ethereum's competitors are continuously reshaping their platforms to be more convenient environments than Ethereum by becoming solidity-compatible.

Development Environment by Mainnet

	Ethereum	Binance	Klaytn	EOS	Tron	Tezos	Polkadot	Stellar
Development Language	Solidity, Vyper, etc.	Go, C, JavaScript	Solidity, Go	C++	JavaScript, Java	Ocaml	Rust	C/C++, Javascript, Go
Solidity Compatibility	Solidity	O	O	O	O			
SDK (Software Development Kit)	OpenZeppelin SDK	Go SDK, Java SDK, C#/C++ SDK, etc.	caver-java, caver-js	Javascript SDK, Swift SDK	Python SDK	Truffle	Substrate	JavaScript SDK, Go SDK, Java SDK, etc.
API (Application Programming Interface)	Ethereum Javascript API	REST API, Wallet API	Klaytn API Service	Nodeos RPC API	TronGrid API	SmartPy and Ligo	Polkadot API	REST API
IDE (Integrated Development Environment)	Remix, Ethereum Studio, Atom, etc.	N/A	Klaytn IDE	EOS Studio, Adappt IDE	TRON-IDE	SmartPy, Ligo	Remix	N/A
Formal Verification						O		

Source: Project data

Addressing Weaknesses

Stablecoin Support

Ethereum still supports the largest number of stablecoins. However, competing blockchain platforms are adding support for various stablecoins to their networks to facilitate their Defi infrastructure.

Stablecoin Support by Platform

	Ethereum	Stellar	Binance	Klaytn	EOS	Tron	IOST	Tezos	Polkadot
Stablecoin Types									To be supported

Which project could truly rival Ethereum?

1 Low Transaction Fees

Klaytn
Tezos
Stellar
TRON

2 Fast Transaction Speeds

CARDANO
IOTA
Polkadot.
EOS

3 Project Funding

Tezos
BINANCE

4 Development Environment Improvements

Polkadot.
BINANCE

Appendix. Blockchain Consensus

To overcome the limitations of Ethereum's governance, a variety of alternative blockchain protocols have been designed. Different platforms offer various benefits over Ethereum which future Defi projects may find work better in the long run.

Each Blockchain Protocols Has Distinct Advantages and Disadvantages

	Ethereum	Tezos	Binance	Klaytn	EOS	Tron	Polkadot	Stellar
Consensus Algorithm	PoW (Proof of Work)	LPoS (Liquidity Proof of Stake)	PoSA (Proof of Staked Authority)	PBFT (Practical Byzantine Fault Tolerance)	DPoS (Delegated Proof of Stake)	DPoS (Delegated Proof of Stake)	GRANDPA /BABE	SCP (Stellar Consensus Protocol)
No. of Consensus Nodes	4,085	427	Up to 21	31	Top 21	1348	Top 256	66
Advantages	- High decentralization - Stable operational record - Largest number of community supporters	- Self-correction mechanism facilitates platform improvements - Fast transaction speed - High security - Low energy consumption	- Fast transaction speed - Composability with Ethereum	- Fast transaction speed - High security - Low energy consumption - Klaytn is a platform that can utilize the superApp 'KakaoTalk'	- Fast transaction speed - Participation of small token holders - Small energy consumption	- Fast transaction speed - Participation of small token holders - Low energy consumption	- Interoperability that connects different blockchains - Relatively simpler platform improvement procedures	- High transaction speed
Disadvantages	- Slow decision making which slows down platform improvement - Need to maintain hash power - High energy consumption	- Small user base - Lack of operational record	- Low decentralization - Highly dependent on Binance	- Low on-chain transactions - Lack of operational record - Low decentralization	- Low decentralization - Holder's constant attention needed to sustain the network	- Low decentralization - Holder's constant attention needed to sustain the network	- Low userbase - Lack of operational record	- Low stability compared to its competitor Ripple - Low decentralization

Appendix. Sources

Note that all data used for this report comes from publicly-available sources including but not limited to project whitepapers and community-verified platform results. Below is a list of sources we used.

Transaction Fee Sources

KLAY – https://xangle.io/project/KLAY/recent-disclosure/5f058fe32b845f2001ff2813
XLM – coinmentrics.io
TRON – https://tronprotocol.github.io/documentation-en/mechanism-algorithm/resource/
XTZ – https://research.binance.com/en/projects/tezos
ADA – coinmetrics.io
BCH – https://xangle.io/mainnet-stats
LTC – https://xangle.io/mainnet-stats
BNB – https://bscscan.com/chart/gasprice
ETH – https://etherscan.io/chart/gasprice
BTC - https://xangle.io/mainnet-stats

Transaction per second Sources

KLAY – https://docs.klaytn.com/klaytn
EOS – https://eosnetworkmonitor.io/#liveTps
IOTA – https://blog.iota.org/chrysalis-iota-1-5-phase-1-now-live-on-mainnet-958ec4a4a415
DOT – https://bisontrails.co/polkadot-kusama/#:~:text=Polkadot%E2%80%94Designed
XTZ – https://www.securities.io/investing-in-tezos-everything-you-need-to-know/
XLM – https://www.lumenauts.com/blog/how-many-transactions-per-second-can-stellar-process
TRON – https://tronscan.org/#/
BNB – https://docs.binance.org/smart-chain/guides/concepts/genesis.html
ADA – https://forum.cardano.org/t/hydra-cardano-scalability-solution/31548
BCH – https://www.coincola.com/blog/faster-coins/
LTC – https://medium.com/@johnhinkle_80891/the-fastest-cryptocurrency-transaction-speeds-for-2018-498c1baf87ef#
ETH – https://blockchair.com/ethereum/charts/transactions-per-second
BTC - https://blockchair.com/bitcoin/charts/transactions-per-second

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KLAY – Klaytn Whitepaper
TEZOS - https://tezos.foundation/wp-content/uploads/2020/10/tezos-foundation-biannual-update-september-2020-en.pdf
Binance - https://www.binance.com/en/blog/421499824684901100/Binance-Smart-Chain-Accelerator-Fund-Launches-$10000000-Liquidity-Support
ETH – https://esp.ethereum.foundation/en/
Stellar – https://www.stellar.org/blog/introducing-stellar-partnership-grant-program?locale=en
EOS – https://block.one/news/eos-vc-announces-grants-program/
Tron – https://tronaccelerator.io/
IOST – https://xangle.io/market-watch/feed/5f56e9dc19cf8c93e25ce9ed
Polkadot – https://github.com/w3f/Open-Grants-Program