BLOCK XPLORERS

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Project Goals

Submit a project with reference from TradeTrust GitHub, using Ethereum scaling solutions such as layer 2s and rollups, or even alternative chains

Major Requirements

1. Public
2. Permissionless
3. Support NFTs (erc721) / Smart Contracts
4. Accessibility of Blockchain State
    a. availability
    b. safety
    c. liveness
5. Impartial Security Model
6. Economically Secured
7. Open-Sourced
    a. Singularity
    b. Exclusive control
    c. Integrity

🎯 Chains Considered

Avalanche 

Polygon 

Build and Build Chain (BNB) 

Chain Chosen

Avalanche

- Number 10 most popular chain by market capitalization
- Avalanche features 3 built-in blockchains: Exchange Chain (X-Chain), Platform Chain (P-Chain), and Contract Chain (C-Chain)
- Sub-Second Time to Finality
- Process 45,000 Transactions Per Second
- $0.0680022 gas price*

How does Avalanche Work?

Chains

- X-Chain
  - acts as a decentralized platform for creating and trading digital smart assets
- P-Chain
  - metadata chain and coordinates validators, tracks active subnets and allows creation of more subnets
- C-Chain
  - Allows for creation of Smart Contracts

Evaluation

1. Subnetting
2. Consensus
3. Interoperability
4. Community
5. Shortcomings

Public	Permissionless	Smart Contracts	Accessibility of state	Impartial Security	Economically Secured	Open-Sourced

Subnetting

P-Chain + C-Chain

- Avalanche allows for mini new networks, dubbed ‘subnets’ to be connected to the Avalanche network
- Each subnet can be configured based on various parameters
  - Public, Permissionless and Compliance
- Supports ERC20 Tokens and Smart Contract Functionality

Public	Permissionless	Smart Contracts	Accessibility of state	Impartial Security	Economically Secured	Open-Sourced

Subnetting

Polygon

- Layer 2 solution that **does not support Subnetting**

BNB

- **Ability to Fork the blockchain instead of subnetting which requires a vast amount of resources and does not utilise the primary network for consensus**

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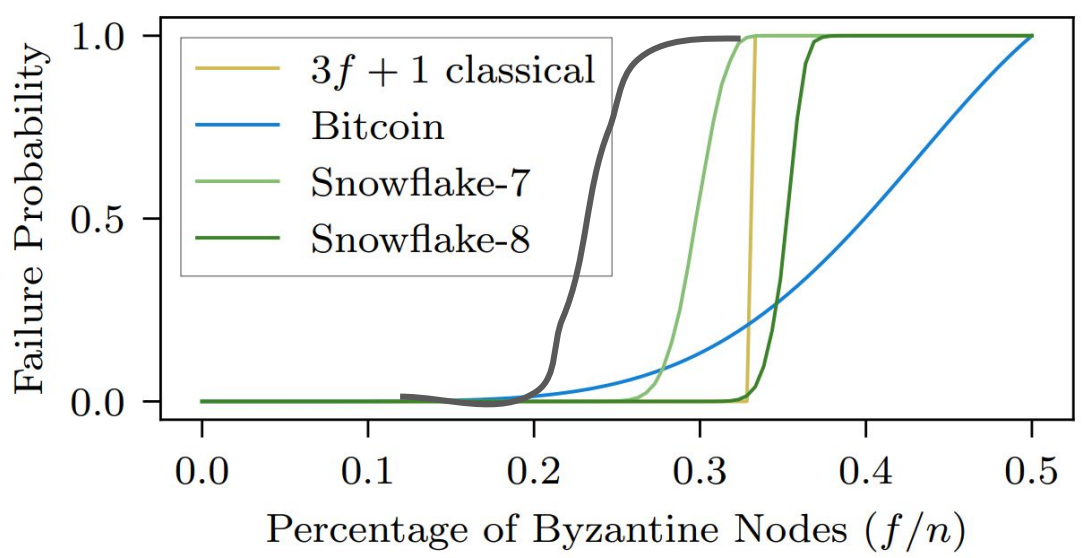
Consensus

Snowman Consensus Protocol

- Leaderless and uses a Directed Acyclic Graph Structure
  - Slush Algorithm (Ensures Metastability)
  - Snowflake Algorithm (Ensures Conviction)
  - Snowball Algorithm (Ensures Confidence)
  - Avalanche Algorithm (Confirmation)

Public	Permissionless	Smart Contracts	Accessibility of state	Impartial Security	Economically Secured	Open-Sourced

Consensus



* *Out of 10 nodes queried, for Snowflake-7, 7 nodes must agree on the decision made*

Public	Permissionless	Smart Contracts	Accessibility of state	Impartial Security	Economically Secured	Open-Sourced

Consensus

Avalanche	1351 Validators *
Polygon	100 Validators *
BNB	21 Validators *

Public	Permissionless	Smart Contracts	Accessibility of state	Impartial Security	Economically Secured	Open-Sourced

Community

Inclusivity

- Anyone can connect to its network and participate in validation and first hand governance

Incentive Programmes and Developer Network

- 290 million US dollar initiative to fund projects to grow the Avalanche multiverse and support Developers
- Rich Documentation and Resources on the creation of smart contract and Decentralised Applications

Public	Permissionless	Smart Contracts	Accessibility of state	Impartial Security	Economically Secured	Open-Sourced

Interoperability

EVM Compatible and Beyond

- Modular structure and subnetting allows Avalanche to be compatible with different Virtual Machines
- Opportunities in operate well in a Multichain Ecosystem
- Ability to serve as a Layer 2 solution for Ethereum and Bitcoin while maintaining primary network consensus

Public	Permissionless	Smart Contracts	Accessibility of state	Impartial Security	Economically Secured	Open-Sourced

Shortcomings

Tension between safety and liveness

- Invalid Minting Bug -> Heavy load triggered a non-deterministic bug related to state verification which stalled the C-Chain
- Transactions on Avalanche are irreversible. Conflicting transactions would result in the stoppage of liveness in the network although safety is maintained

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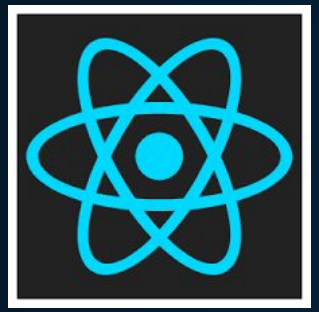
🚀 Deployment



React
- Front-End Framework

Trade Trust
- Back-End Smart Contracts

Avalanche
- C-Chain for deployment

Netlify
- Web Hosting

References

- https://hacksingapore.com/
- https://www.tradetrust.io/guidelines
- https://docs.avax.network/learn/platform-overview/
- https://cointool.app/gasPrice/avax
- https://cryptoseq.medium.com/a-quick-overview-of-avalanche-avax-and-why-you-should-be-paying-attention-612278598da2
- https://www.algorand.com/resources/blog/role-of-transaction-finality-speed-in-nft-minting
- https://gyuho.dev/nakamoto-bitcoin-vs-snow-avalanche-consensus.html#what-is-snow-consensus
- https://assets.website-files.com/5d80307810123f5ffbb34d6e/6009805681b416f34dcae012_Avalanche%20Consensus%20Whitepaper.pdf
- https://explorer-xp.avax.network/validators
- https://www.reddit.com/r/0xPolygon/comments/sy1u20/are_there_really_only_100_validators_on_polygon/
- https://docs.binance.org/faq/bsc/val.html#:~:text=Currently%2C%20there%20are%2011%20validators,have%20to%20stake%20their%20BNB

References

- https://www.reddit.com/r/Avax/comments/qwm7tt/how_much_decentralized_is_avalanche/
- https://www.avax.network/community
- https://www.avax.network/developers
- https://bowtiedisland.com/dfk-chain-avax-multiverse-first-subnet/
- https://blockworks.co/avalanche-foundations-multiverse-incentive-program-to-invest-up-to-290m/#:~:text=A%20non%2Dprofit%20fund%20for,also%20known%20as%20Avalanche%20Multiverse
- https://academy.binance.com/en/articles/what-is-avalanche-avax
- https://investotrend.com/first-bsc-then-polygon-avalanche-next/
- https://medium.com/avalancheavax/preliminary-analysis-of-the-invalid-minting-bug-bee940cbd9e9

Cost-Benefit Analysis

Polygon

- Number 16 most popular chain by market capitalization
- Four composable abstract layers, two of which rely on the Ethereum mainnet for Dispute resolution and Validator Management
- $0.00162855 gas price*

Cost-Benefit Analysis

BNB Chain 

- Number 4 most popular chain by market capitalization
- Comprised of the BNB Beacon Chain for Governance and the BNB Smart Chain which is EVM compatible with hubs to multi-chains
- $0.039880827 gas price*