

SANDBLOCK FINANCIAL ECOSYSTEM

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Abstract

SandBlock aims to harmonize the existing financial system by providing **financial infrastructure, operations and services** focusing on new means of cooperation that involve digital forms of money. It does so by bringing together the existing partners and solutions and ensuring their **co-operation and interoperability**. SandBlock Ecosystem is formed a balanced **partner network defined by their role**: SandBlock Core, Sand Vault, Sand Bank, Sand Identity, Sand Liquidity, along with its open governance standards ensured by SandBlock Foundation. This paper describes and analyses these roles in more detail.

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Introduction

An ecosystem by definition is a community of living organisms in conjunction with the nonliving components, **interacting as a system**. There is **no single central authority** in an ecosystem, the existence of it is purely defined by the **balanced cooperation** of its members. Since the introduction of Bitcoin, new financial ecosystems were born comprised of countless new startups and businesses that challenge existing solutions by more efficient, more secure and less costly **means to manage money**.

SandBlock aims to harmonize the existing financial system by providing **financial infrastructure, operations and services** focusing on new means of cooperation that involve digital forms of money. SandBlock Ecosystem includes the largest technology companies and organizations who are committed to working together and delivering blockchain-based financial products using their existing technological solutions and advance the enterprise-grade capabilities of blockchain technology.

As in any financial system, the technology is just a means to **provide services** to the community of users. The performance and function of the ecosystem is **defined by its members**. The **balanced interaction** of the members is defined by their specific roles and governance acting together in a network. The document further analyses the following roles in detail: Sand Vault, Sand Bank, Sand Identity, Sand Liquidity, Sand Audit.

The financial payments are based on the notion that it can be used by anyone where **all rights are equal** in the network. Each function and role in the Ecosystem can be delivered with the **SandBlock Core** technology or enhanced by interoperability with existing solutions. Formalization of the Ecosystem participation is where particular members bring their **know how, technology and operations** to support the network activities. Each member is free to **join the active community role** with the decision of its members.

Principles

SandBlock synthesizes the classic **principles of financial system** with the innovation through cooperation in distributed networks. These concepts are important to understand the strategic aims of the ecosystem as well as day to day SandBlock usage and operation:

- *Sand* - is the metaphor for material and time that are the basis for financial technology
- *Block* - symbolizes a single verified unit of financial information
- *Time has value* - financial resources are a result of effort accrued over time
- *Information drives decision* - all the actions in the system can be freely governed with the publicly available information available to all participants
- *Decision based on consensus* - prices and costs are settled by a common consensus of a group of people that form the market
- *Open* - not a single central authority can direct the way how the financial system or any of it's components operate
- *Cross-x* - technology seamlessly blends in to the existing solutions with minimal needs to adjust

Dual-coin system

Dual-coin blockchain system works in a way where one crypto asset takes the role **investment/stabilisation** of the blockchain and active participation in the consensus while the other functions as a **day-to-day transactional currency**. By dividing the currency into two structures, SandBlock can split the incentives between investors and buyers in this way providing stability for the blockchain POA consensus mechanism and allowing predictable transaction fees.

Sand Coin

As a means of exchange Sand will be used throughout the blockchain ecosystem.

Total supply: **5,000,000,000**

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Coin distribution:

- SandBlock Foundation members pool (Gold/Silver partners): 450,000,000
- Strategic partners pool: 550,000,000
- Private investors pool: 2,000,000,000 (average price 0.01\$)
- Public sale pool: 2,000,000,000 (average price 0.03\$)

Dust Coin

Dust Coin is a secondary coin used to pay for all transactions/actions on the blockchain.

- Sand Coin transfer costs - 1 Dust
- Any Asset transfer costs - 2 Dust
- Data / message transactions cost 1 Dust for x bytes of message body

Dust Coin is generated by Sand coin every time a new block is issued. 100 sand coins per year will generate 12 Dust Coins at the start. Generation rate is adjusted depending on blockchain usage (Technical Committee will set the rate, 12 Dust for 100 Sand is the lowest rate and it can be only increased)

Dust is burned with each transaction and authority node that mined the block with transactions takes 10% .

Other Assets

All Assets (tokens) have embedded security mechanisms allowing users to:

- Issue/buy-back new Assets via standardised interface in SandBlock Protocol
- Peg the rate of the newly issued Asset to Sand Coin as a guarantee fund (for ICOs and IEOs reaching their Soft-Cap)
- Embed the requirement for KYC into the issued Asset
- Define security roles: Sand-backed conversion rate (guarantee to convert), that allow Asset issues to request transaction rollbacks, and that request should be approved by x% of authority nodes (x is determined on Asset creation time but not less than 70) Asset can have it's transfer limited only to users having particular KYC or other identity Asset type (fiat-currency related Assets will be in their nature a requirement for KYC Asset)

SandBlock Ecosystem

SandBlock Ecosystem provides financial technology across a **broad range** of services and industries. The different business operations **join efforts** to deliver the best technology solutions for users. The **openness by design** ecosystem enables any network participant to join the network and take up a role that suits its interests.

The established **B2B partnerships** supporting the network are governed by open principles with regular member elections to Board of Directors and Technical committees.

SandBlock Core

Sand Core covers the essential **blockchain technology and governance** needed to support the crypto-based financial system. SandBlock aims to deliver **full-solutions** to users where each part in itself covers the needs of the users. Each solution carries with itself **infrastructure, software, protocol** that together act as a unit of the Ecosystem.

SandBlock Node

The most important **software-based** part of the network that uses the protocol to deliver direct value to the SB users. SandBlock Nodes software is freely available as an **Open Source** project, while its commercial distributions are delivered through a **verified partner network** of **cloud providers** with full Enterprise-level support.

As a solution SB Authority and Participant Nodes operate with the aim for maximum flexibility operating different modes of operation whether they are a part of public or private network, wide-area or single deployment. Any participant can use the software with minimal technological barrier as it works out-of-the-box without the need for specialist help and with the option to get it set up by local cloud engineer support.

SandBlock Node consists of **components** as follows:

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- Server Component – SB Node depends on a **long-running instance** which operates as a server. The server provides an API which clients interact with and manages the interaction between protocol engine and connected agents. Having a server based architecture **decouples** clients from the security keys and policies, enables **centralized audit** logging and **simplifies administration** for operators. It runs as a **Cloud native** solution connecting to the configured Private / Public SB network.
- Agent Component – Agent is a client daemon that provides the users with access to **UI and API interfaces** of the server components. Automatically authenticate to SB Node via provided **token authentication** mechanism, manage **locally stored information** of the Node. It also allows client-side **caching of responses** containing newly created wallets and responses containing encrypted transaction information generated for these wallets.
- Network Component – When a new node boots up, it must **discover other Nodes** on the network in order to participate. Nodes that participate in the network are peers to each other, that they are **all equal**, that there are no “special” nodes, and all nodes share the burden of providing network services via a **Network component**.
- Protocol Engine Component – SB Node is designed with multiple protocol engine support as its core feature with cross-compatibility to **Bitcoin, Ethereum, SandBlock** protocols. The protocol engines can be used in **parallel for cross-chain** operations.
- Storage Backend – A storage backend is responsible for durable storage of **encrypted data**. It holds the main **public/permissioned ledger** information and locally stored **metadata**.

SandBlock Node delivers **features to end users** as follows:

- **Authority/Validator Nodes** that conduct all block mining in the blockchain with a maximum of 25 nodes which are controlled by gold / silver partners. They have **strict hardware / network / power requirements** to ensure maximum blockchain performance and stability.

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- **Economic/Participant Nodes** act like regular Nodes on the network with the possibility to submit transactions and perform other native actions on the blockchain that are **confirmed instantly** with new blocks submitted to the blockchain.
- **Zero knowledge startup** as a single binary with the lowest barrier for anyone to join
- **Cross compatible** with other protocol engines Bitcoin, Ethereum, SandBlock as the native options
- Join existing public networks or to set up own private network with **permission and role based system**
- Provides **blockchain explorer** capabilities to navigate publicly available information on the network
- **Configurable and scalable** mode of operation acting as Server, Agent and Network acting as a Wallet, Network service or full blockchain node
- Acts as **information gateway** for value adding services in ecosystem: Vault, Bank, Identity, Audit, Liquidity
- Works as a **wallet** with no need to do full-chain synchronization
- **Issuing and managing assets** as a built-in functionality
- **Sending and signing transactions** including: multi-sign addresses, stop transaction addresses, westable addresses
- **B2B DEX functionality** to navigate markets and submit buy/sell orders
- Pluggable **enterprise-grade authentication** mechanisms starting from simplest token-based authentication enhanced by: Username+Password, 2FA (between multiple-controlled nodes), SSO, certificate-based auth, HSM for key storage and signatures
- Standard interface with **Web UI, CLI, REST API**
- **Customizable UI** with build-your-own interface branding options

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SandBlock Public Network

SandBlock is a collection of technologies communicating over SandBlock Protocol that form the **basis of a digital money ecosystem**. Units of currency called **Sand** are used to **store and transmit value** among participants in the SandBlock network.

SandBlock Protocol **addresses all existing difficulties** that end-users, businesses, merchants, developers and enterprises face on Bitcoin (mother of all blockchains), including but NOT limited to: prolonged transaction confirmation periods, slow performance, bugs and issues with handling of wallets and addresses, complexities with UTXOs. It is using SandBlock Protocol based on **Proof of Authority Consensus** algorithm .

SandBlock network is developed with **performance in mind** and the **ease of joining** as a participant in the network. For a truly decentralized ecosystem, the participant node Core Protocol and Node software is the same for all participants. It is adjusted according to specific needs and role in the Ecosystem.

SandBlock Network consists of **components** as follows:

- SB Node – **software-based client** acting as a Node for the Blockchain network
- Node/Cluster provisioning tools – **Cloud Native provisioning and deployment tools** allowing for easy Node cluster deployment in a variety of cloud providers: AWS, Azure, Google Cloud.
- Monitoring tools – as an integrated part of the Node, provides the ability to **monitor the network, storage, computing** operations of each Node
- Auditing / Error logging tools – **remote auditing and error logging** tools that can be configured for each Node in the network
- Software development kits and development tools – **Docker-based environment** for Blockchain development as well as **SDK** with instructions, code samples for easy integration of applications for developers

SandBlock Network delivers **features to end users** as follows:

- **Public / Private network configuration** with possibility to provision one Node, or a cluster of Nodes with a single deployment.

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- **Network whitelist** provides a list of IP ranges managed by Authority nodes
- Network configuration and deployment is focused to **cloud infrastructure engineers and admins** as it's core users, who provide Enterprise grade customer support for businesses and individuals
- Administrators are provided with the required **training** and information to **provision, diagnose and administer** network nodes in order to keep the overall infrastructure highly-available, secure and scalable
- Infrastructure administrators, can opt-in to see a more detailed **systematic dashboard** of an instance running on their own computer or a Virtual Machine or monitor the whole private network infrastructure.
- **API gateway** access can be set up for particular nodes to give to the developers to run the applications on blockchain network.

SandBlock Foundation

SandBlock Foundation is established so that technical decisions are in the hands of ethical **technical leaders** who put the interests of the projects and the foundation ahead of all else. Project Technical Leads supervise individual projects, make tough decision calls, organize teams and are ultimately responsible for the direction of each one of them. This leadership is **elected** by the body of contributors to that particular program overseen by the strategic guidelines and governance of the Board of Directors.

The Foundation Mission: To provide users with a reliable **blockchain-based distributed platform** they can rely on to realize their blockchain needs. SandBlock foundation is committed to **Protect and Empower the SandBlock community**, including users, developers, and the entire ecosystem.

SandBlock Foundation is set up with the aim to create the foundation of **highest technical standards** for blockchain projects, while preserving the technical meritocracy that governs the ecosystem. It is vital that smooth development is ensured in the foreseeable future with minimal disruption to the ongoing development or project management activities.

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SandBlock Foundation is governed by: **Board of Directors, Technical Committee, User Committee, Special Interest Groups**. With a transparent governance rules as a global Open Source project, SB Foundation aims to be totally transparent with Elections based on community votes.

Tangible goals the Foundation helps achieve:

- **Foster and protect** the SandBlock brand to benefit the community members
- **Build the ecosystem** around SandBlock to nourish the platform
- **Deliver high-quality projects** that users can rely on to create their own blockchain projects
- **Ensure interoperability** among SandBlock systems and with existing blockchain solutions
- **Ensure broad participation** in the community with a clear goal of fulfilling the SandBlock Mission

First and foremost, The SandBlock Foundation seeks to Protect and Empower the community, by effectively **coordinating resources and providing active leadership** in key areas that are required to fulfill SandBlock's mission. The **responsibilities** of the SandBlock Foundation include:

- **Development process and management** of the project
- **Brand management** and trademark policy
- **Organizing** summits, conferences, and informal meetups
- **Acting** on the feedback and direction of real word users

The **core values** of the SandBlock community:

- **Respect and appreciate** the efforts of all individual contributors
- Respect the meritocracy guiding our **decision-making** process
- Encourage **economic opportunity** with the help of SandBlock ecosystem
- Provide users with access to the ecosystem and **guide the development** of SandBlock Foundation through their input
- Community members to **organize events and engage in fruitful discussions**

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- Companies to build powerful and profitable projects around the blockchain ecosystem that creates new long-term business opportunities.
Preserve and improve SandBlock ecosystem
- Improve the information which guides our technical decisions
- Preserve our success in marketing and raising contributions from community members
- Improve our already strong ecosystem companies and private individuals who can succeed and fund further progress
- Preserve, encourage and reward contribution in all forms, such as testing, translating, integrating, educating, informing, funding, training, designing or operating.
- To weather all unforeseeable difficulties ahead.

Sand Vault

Sand Vault is the partner for **digitising assets** to be used within the ecosystem. It acts as a crypto **custody service** helping new assets to be easily deployed on the blockchain. The partners **issue initial currency** or buy it back and burn it to control the monetary supply of the currency in the system. These are big financial institutions, converting their book-value of the assets to **security tokens** as well as smaller **ICO/IEO community-driven projects** issuing utility tokens for their operations.

Sand Vault delivers **features to end users** as follows:

- Accept all kind of currency via direct, central or blockchain-based transactions and issue **native assets** i.e. depositing to one of the controlled BTC / ETH accounts and swap them to sBTC / sETH
- Convert back from native assets to **fiat currency backed** securities
- Defining assets with possibility to **regulate their supply** or make them unlimited
- Define **rules of participation** to the initial issuance crypto assets
- Provide **verifiable financial information and licenses** to operate security tokens
- Define **new forms of crypto assets**
- Delivering native **crypto wallet** functionality

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- **Escrow / asset lockdown** services

Sand Bank

Sand Bank represents a **digital payment proxy** institution bridging the gap between fiat and crypto currency operations. It works very closely with the fiat-currency backed Asset Issuers providing fiat-to-crypto gateways and instant and low cost FX conversion for all participants, including:

- Sand Bank has established truslines with Asset issuers/payment gateways which issued fiat-currency backed Assets. These are then exchanged to a commonly demonitated SEUR, SUSD operated by the Sand Bank.
- When a person deposits fiat currency to the exchange, Sand Bank is the middle man which acts as a gateway for fiat providers willing to accept that deposit with person's KYC details
- When a deposit in fiat-currency is submitted to the exchange or private wallet address, Sand Bank acts as a middle man querying payment gateways/providers who are willing to accept the deposit with the user's personal KYC details. The requested currency amount is instantly credited to the user wallet with fiat-backed Asset i.e. SEUR/SUSD.
- Interactions can be done directly in Sand Bank using app / UI (deposit / withdraw), as a user you will need just to provide blockchain address and fiat transfer details.
- Sand Bank natively support DEX of fiat-currency backed Assets providing cheap currency exchange possibility between financial institutions within the Partner Ecosystem
- On every transaction Sand Bank can request KYC details from Sand identity
- All transactions of fiat-currency backed Assets can be viewed and audited in a public ledger on the blockchain allowing for easier compliance with AML procedures
- Transaction fees for regular Sand Bank operations can easily be fixed depending on currency and delivery methods: deposit, withdrawal to local account, in-wallet transfer, withdrawal to SEPA account. All blockchain operations have a fixed minimal transaction cost for common operations.

Sand Identity

Sand Identity partners operate as verified **KYC providers** and issue KYC assets for specific user wallets. It provides SandBlock participants with KYC information about particular address information via **established trustlines** in this way ensuring **lower cost** than conducting KYC with each participant separately. Once verified the user can **provide KYC details** to a variety of different actors/roles in SandBlock Ecosystem: Sand Vault, Sand Bank, Sand Liquidity

Sand Identity delivers **features to end users** as follows:

- Any address can **pass KYC** with the participating KYC providers
- When the participant requests some KYC details address, the issuer/holder gets notification with the possibility to **restrict / grant permission** to requested details in the form of asset transfer to the user
- Each granted KYC token is issued in a similar manner as an asset, with a fixed supply that **deteriorates with time**. i.e. 365 KYC tokens deteriorate daily with time or with usage sending verified transactions

Sand Liquidity

A verified trustline with direct access to crypto pools provides the direct feed of orders for selected markets from the Sand Bank providers. Sand Liquidity partners provide pooled liquidity of assets. All historical transactions made through Sand liquidity are stored on a publicly accessible ledger, thus enabling operational transparency, public auditing and data analysis.

Sand Liquidity delivers **features to end users** as follows:

- **Aggregation of buy and sell orders** from different exchanges into a unified cross-platform orderbook
- Provides an alternative option to work directly with SB Protocol **without relying on OTC** desk as liquidity providers

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- Provide **orderbook APIs** with that can be integrated in with Sand Bank providers to fulfill orders and
- Provide **onboarding Sandbox** and related technical guidance for partners to easily move the Enterprise-level platform services to production stage
- Provides an aggregated feed of the overall market allowing to **reduce the price movements and lack of liquidity** due to fragmentation
- Newly issued assets can be immediately integrated to **liquidity pools**, picked up by Sand Bank providers
- Helps exchanges **reduce margin trading risk** with an option to liquidate assets immediately
- Trustlines between Sand Bank and Sand Liquidity are **verified by SandBlock Foundation** together with verified auditors
- A **chain of trustline** is built which are stored on a public ledger for easy auditing
- **DEX/Assets** only transact with accounts that have an established liquidity trustline

Sand Audit

Sand Auditors focus on **regulatory compliance**, like Anti-Money Laundering (AML) procedures. They take an active role in **monitoring the network** transactions, **reputation** of Nodes, **misbehavior** in the network with exclusive rights to provide **voting-based suggestions** to take actions with respect to participant behaviour. In private network deployments they also manage the access security roles and permissioning of the network Nodes via Whitelists/Blacklists.

Sand Audit delivers **features to end users** as follows:

- **Trusted source of auditing** information, granting verification Assets in the network
- Actively following and **monitoring reputation** for the Authority and Participant Nodes
- **Reviewing established trustlines** in the network, informing the participants of their expiry or new counterparties risk
- Ensuring network security via **Whitelist/Blacklist** list providing suggestions for inclusion based on Node reputation

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- Verifying newly issued Assets with the possibility to transfer their **audit Assets** as backers for wallets confirming their identity validation and status

Open Governance

The governance and strategic development of the Ecosystem is defined by **community vote** and by the **elected members** to Board of Directors and Technical committees. SandBlock foundation aims for **maximum transparency** providing all the information about the governance, meetings and strategic decisions online.

Every aspect of the SandBlock Foundation **governance** including, but not limited to: partner and committee members, meeting agendas, technical specifications, member elections procedures will be **freely available** to the end-users users, developers and supporters of SandBlock.

Participation

Participation in the Ecosystem is formed out of several governance levels where **SandBlock Foundation** elects initial Roles, can suggest new Roles/Members, Revoke existing Roles:

- Board of Directors - elected from members contributing to the SB Foundation according to the defined sponsorship plans that carry weight in the election process
- Technical committees - members are elected by suggesting candidates with a majority vote selected, with 2/3 of the votes being given by the Board of Directors

Ecosystem participants electing new Role candidates:

- Sand Identity (KYC) - create Trustlines between participants, verify and suggest candidates for Sand Vault, Sand Bank, Sand Identity, Sand Liquidity, Sand Auditor
- Sand Liquidity - Trustlines for markets created by general consensus among Sand Bank participants
- Sand Auditor - revoke any role if there is a critical breach in the SB Foundation Charter or it is a major breach of legal policy

Contribution

Contribution plans are defined in a separate document listing all the available plans to join the SandBlock Foundation becoming gold and silver partners. SandBlock Foundation actively support **individual contributions** to established technical projects and user groups where any member can **join freely** on existing development projects or suggest new projects for SandBlock.

The governing bodies and leaders of SandBlock Foundation are **regularly renewed** by a vote of our community members. More information about community-organized PTL and Technical Committee elections can be found on SandBlock Foundation website.