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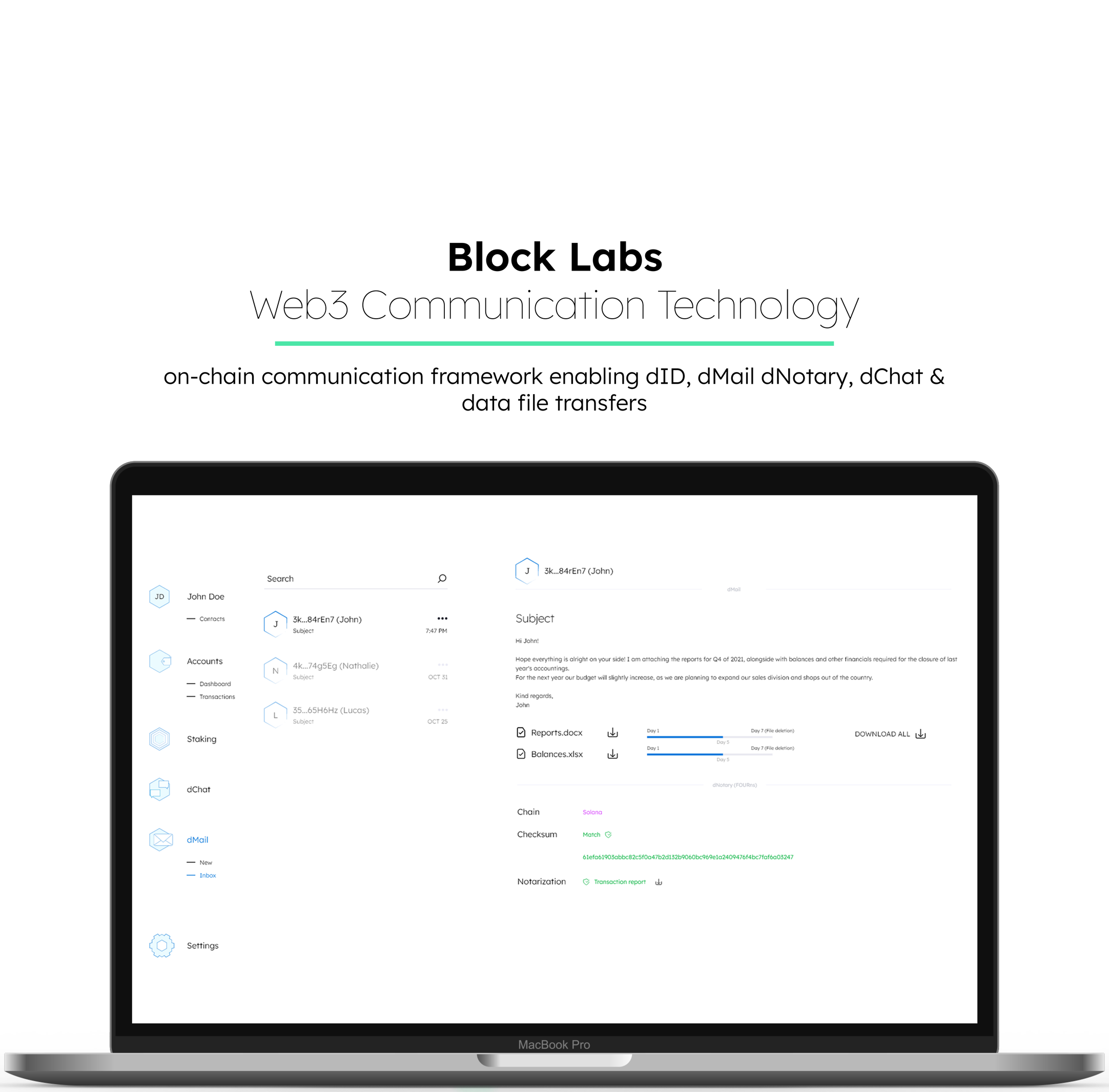
Block Labs

Web3 Communication Technology

on-chain communication framework enabling dID, dMail dNotary, dChat & data file transfers



Secure your enterprise communication with GDPR scalable public or DLT dID, dMail, dChat & dNotary platform designed for regulated markets.

Introduction

Blockchain has been acknowledged and recognised also in the mainstream enterprise sector. With its ability to improve online trust, transparency, efficiency and cut the middle man, blockchain solutions are developing at a light speed with the potential to revolutionise digital data communication. According to PwC Time to trust Report, blockchain has the potential to boost global domestic product (i.e. GDP) by 1.76 trillion dollars over the next decade and hit the mainstream by 2030. PwC report also points out that some 60% of CEOs are placing digital transformations among their top three priorities and that organisations have recognised the value of online trust and cybersecurity between their business partners and customers.

Problem

The current legacy Web2 data exchange and communication platforms do not provide suitable solutions that could be used by enterprises. There are free commercial services available, but the user pays greatly with the loss of privacy and data ownership. There are industry-based payable solutions on the market that offer higher security but are mostly based on centralized databases which are always vulnerable to SPOF (i.e. single point of failure). The exchange and ownership retention of confidential and process critical digital data and communication between partners in any industry relies on complete protection and privacy, whether from service providers, competitors or hackers in general. Enterprise data exchange and communication need dedicated services that use encryption and high-end security technology to enable privacy and data ownership as data is becoming a new digital oil.

Solution

To retain data ownership and privacy within secure enterprise data exchange and communication, Block Labs developed a unique and blockchain-based solution. Ecosystem, platform and a suite of multi-blockchain dApps that solve privacy, security and data ownership retention of digital communication. Block Labs enables E2EE (i.e. end-to-end encrypted) data exchange while providing file-checksum data notarisation, blockchain digital identity and on-chain instant messaging. At its core, Block Labs prevents data theft, data tracking or data mining, while it's impervious to content surveillance.

Why blockchain?

Blockchain technology enables enterprises to optimize business and industrial challenges with blockchain unique specific features; (1) blockchain enables trust and transparency by giving all parties access to reliable, immutable data; (2) encryption private key is used to verify the authenticity and grant access to the data or identity; (3) due to decentralization and core technology immutability, no single entity can alter the data; (4) smart contracts enable process automatization, and; (5) no need for trusted third-parties, disintermediation helps to streamline operations and saves time and money.

Blockchain vs Database

Blockchain brings significant security advantages, especially if it's paired with decentralization. At its core, blockchain works in an immutable decentralized manner, whereas the databases are in most cases centralized and non-persistence. In the database case, the administrator holds complete control, which means that he or she can edit, manage, modify, and control the database access and its data. The databases are usually based on a client-server architecture where communication is maintained with a secure but vulnerable connection. Blockchain on the other hand uses peer-to-peer distributed ledger architecture where each peer can communicate with another using a set of private and public keys. In the case of Block Labs, the communication is handled by FOURwaL & FOURid protocols paired with high-end AES and RSA encryption used to secure the data transactions. Most enterprises use Hybrid DLT or private blockchains, where the authority can be as decentralized as needed removing a one point failure weak spot, while the blockchain transactions immutability removes the risk of data falsification or data manipulation.

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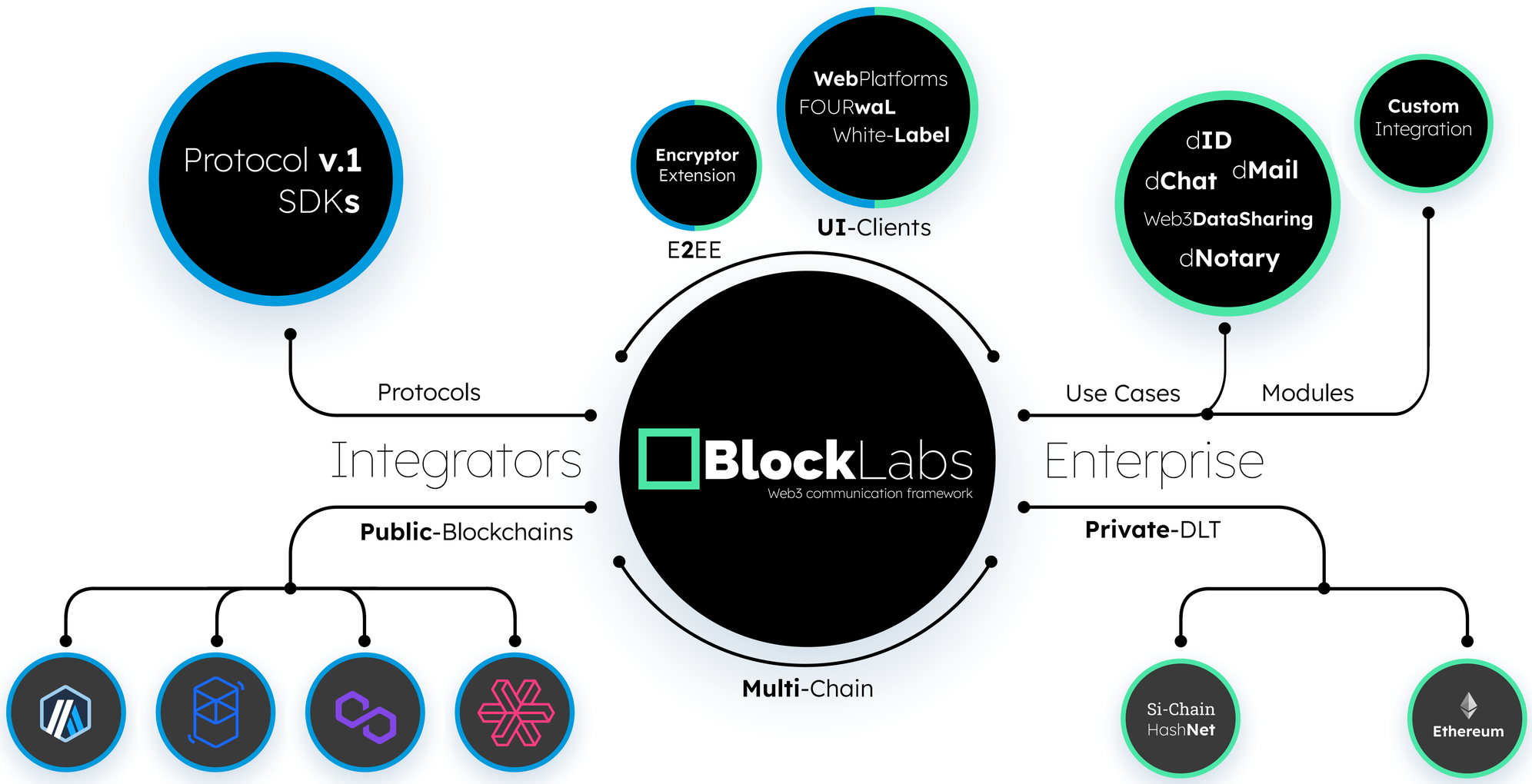
Overview

Horizontally, Block Labs expands to service end-users and enterprises, while Block Labs development expands vertically into products, clients, protocols and modules:



▶ UI-Platform Clients

(in production, open-source, white-label available)

Public & private-DLT Ethereum & Tolar HashNet, blockchain support

Connects and hosts all the Block Labs protocols and services in one UI ecosystem, giving the user all in one access.

(TypeScript, Vue 3, PHP)

▶ FOURwaL Client

(in production, open-source, white-label available)

Public & private-DLT Ethereum, Tolar HashNet, Substrate, Solana & Tron blockchain support

The multi-chain wallet provides a secure way to connect to the blockchain protocols as it contains a pair of public and private cryptographic keys. Deployed in production as Chromium and Mozilla extension.

(Javascript)

▶ UI-Staging Client

(open-source)

Ethereum ecosystem TestNet blockchain support

Connects and hosts all the Block Labs protocols and services in one UI ecosystem, giving the user all in one access and serves as an enterprise-pilot framework open for public testing.

(TypeScript, Vue 3, PHP)

Mails Protocol & dMail dApp
(open source with comercial restrictions, protocol module available)

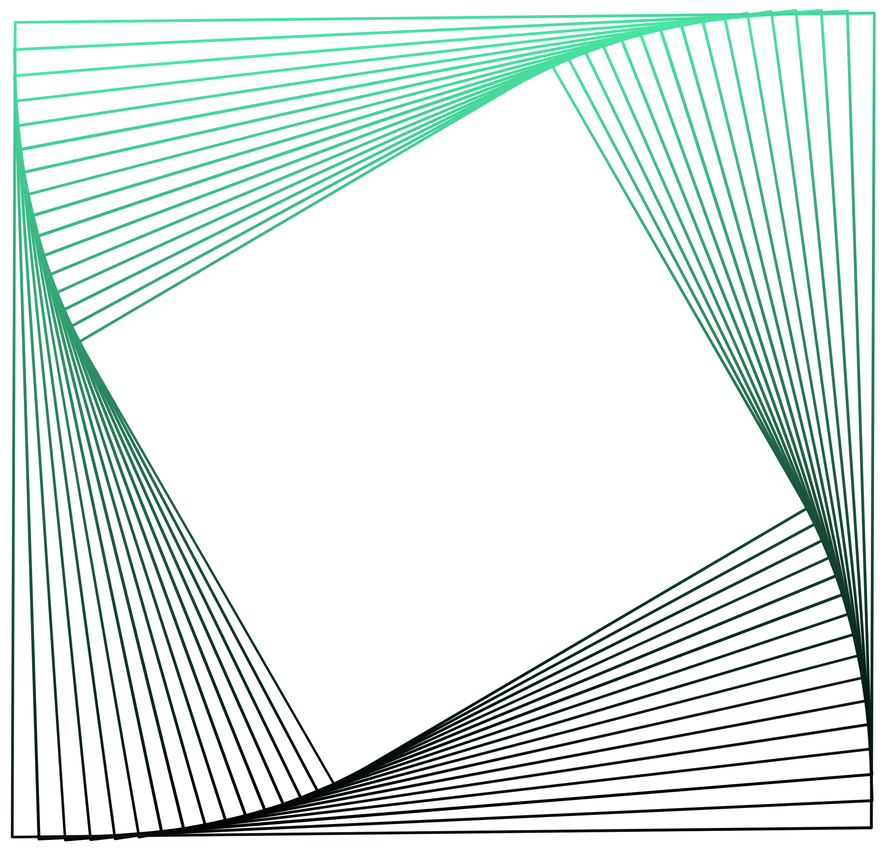
Public & private-DLT Ethereum blockchain support

dMail refers to decentralized email with specific web3 characteristics; 100% self-custodial, encrypted, immutable, and permissionless.

Based on the [Mails] smart contract, SDKs and white-label framework, the dMail UI showcases the UI/UX for future on-chain communication. As the first white-label iteration, the Immu3 Beta dApp reveals the dMail UI/UX and acts as a sandbox for this new on-chain communication technology.

dMail is data heavier so lite encrypted JSON objects are created to hold dMail metadata. The link to this metadata and checksum is recorded on the chain as a blockchain transaction; 1 email = 1 L1/L2-TX.

(TypeScript, Solidity, Ink!, Rust)



dNotary Service
(proprietary licence, protocol module available)

Public & private-DLT Ethereum blockchain support

Uses blockchain transaction file-checksum to check for potential data changes during the dMail data exchange. If one byte of the exchanged data changes, the checksum changes and invalidates the transmission.

Acts as a dNotary, bypassing notary intermediates and enables automatic data source verification and time-stamp.

(TypeScript, Solidity, Ink!, Rust)

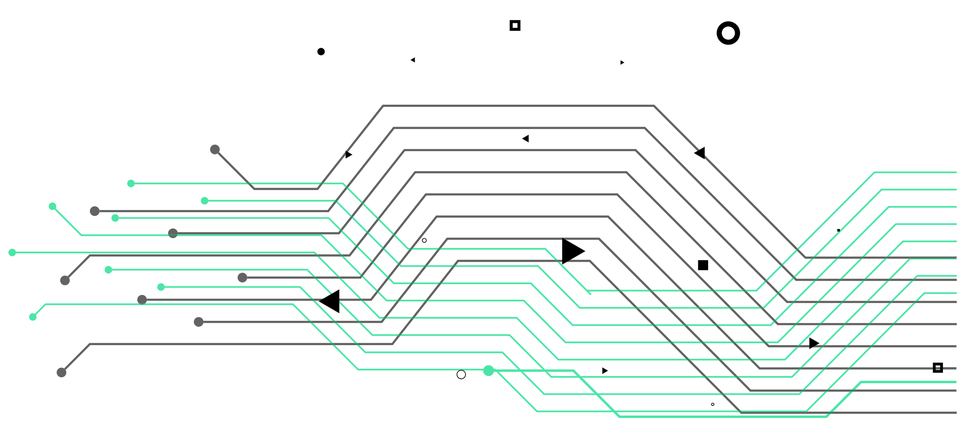
Chat Protocol & dChat dApp
(open source with comercial restrictions, protocol module available)

Public & private-DLT Ethereum, Solana blockchain support

Fully on-chain, the instant messaging protocol completes the communication suites of Block Labs Web3 solutions. The protocol enables E2EE (i.e. end-to-end encrypted) dChat interoperable with EVM & Solana blockchains and has the ability to exchange E2EE instant messages from wallet address A to wallet address B.

The solution targets security-sensitive users. The reality is that more and more companies are exchanging messages using services such as WhatsApp that are centralised in nature and are not secure or compliant enough for corporate communication.

(Solidity, Rust)

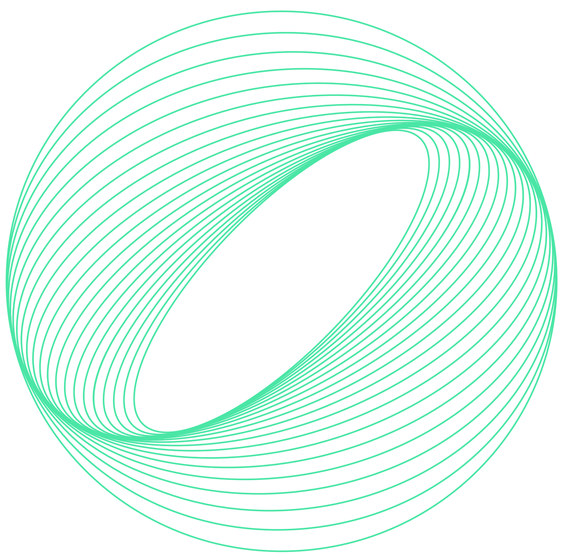


dID Platform
(proprietary licence, protocol module available)

Public & private-DLT Ethereum, Tolar HashNet, Substrate, Solana & Tron blockchain support

Connects wallets when data is exchanged and serves as the public key exchange point between users, while it enables a self-sovereign framework of data authorisation and ownership representation. All ID processes are fully automated and decentralized by their design, thereby enabling users to have full control and ownership of any data that may be connected with them.

(TypeScript, PHP)



Tokenization module
(proprietary licence, module available)

ERC20, BEP20, POS support

Tokenization addresses the weaknesses such as cybersecurity and disintermediation while enabling advantages such as; (1) 24/7 borderless access; (2); the speed of execution (3) lower transaction (i.e., TX) cost; (5) scalability, and; (6) transparency, as such it enables enterprise systems to evolve beyond the current Web 2.0 framework.

Block Labs enables organizations to deploy tokenization Web3 solutions in any shape or form.

dID Cards
(proprietary licence, module available)

Public & private-DLT Ethereum, Tolar HashNet, Substrate, Solana & Tron blockchain support

Enable users to organise, edit or add nicknames to multi-chain wallet addresses inside of the UI clients.

(TypeScript)

dID - X.509
(proprietary licence, protocol module available)

Public & private-DLT Ethereum, Tolar HashNet, Substrate, Solana & Tron blockchain support

When using decentralised blockchain technology, the organisations need to be able to identify and verify the recipients of the sent data or assets. Block Labs enables the connection of the off-chain X.509 digital identity certificate with the on-chain dID FOURwaL address. The connection process is executed off-chain and managed by the organisation admin, so it can comply with existing online regulations.

(TypeScript, PHP)

Staking protocol
(open-source smart contract available)

ERC20, BEP20, POS

As a part of tokenization, it enables enterprises to incentify users to stake tokens in exchange for rewards or right to services access.

(Solidity)

(TypeScript)

Dev Roadmap & Project Maturity

The evolution of Block Labs tech reaches back to 2018 when the first solution beta (i.e. v1.0) was deployed on Ethereum MainNet proving the Block Labs concept for encrypted wallet-to-wallet on-chain communication. The Si-Chain (i.e. Enterprise HashNet based DLT protocol with up to 50k TPS) integration and network support followed in 2020, which is now open to the public as a part of the staging environment. The 2.0 update in 2021 brought data notarisation (i.e. dNotary), upgraded on-chain identity (i.e. dID), FOURwaL support for all Chromium and Firefox browsers and added Substrate and Solana blockchain support. The 2023 releases revealed the Protocol v.1 with dedicated SDK support that enables multi-level integrator interactions.

Integration Use Cases

Block Labs blockchain technology enables enterprises to secure digital identities of employees and partners (i.e. dID), encrypt enterprise communication (i.e. dMail , dChat & Web3 Data file transfers), enable the immutability and self-custody of transactions and enable data verification with embedded notarisation features.

Enterprise dID; (1) secure digital identities of employees and partners in the form of a wallet address; (2) digital dSignature in the form of transaction signing; (3) X.509 digital certificate standard integration (i.e. connection is created between X.509 digital identity with users wallet address)

Enterprise on-chain communication; (1) highly secure encrypted dMail; (2) E2EE (i.e. end-to-end encrypted) and secure enterprise data file exchange and eDelivery, and; (3) E2EE on-chain enterprise short messaging.

Enterprise on-chain data management; (1) on-chain digital identity (2) file-checksum (i.e. checks for potential data changes during data exchange), and;(3) data delivery time-stamp feature.

Market Overview

Product & Licence	Platform	Data size limit	Used for	Security & Encryption	Adds & Privacy	Digital Identity
WeTransfer Pro (proprietary software)	Web & database	No size limits	Data file exchange	Centralised service and storage, TLS & AES-256, encryption	Data tracking, data gathering	No data available
Odette (proprietary software)	Desktop & database	Large file exchange supported	Secure data file exchange	Centralised service, PKI, CA	Not applicable	Odette CA
OpenDXM (proprietary software)	Web & database	Large file exchange supported	Large data file exchange	Centralised service, PKI	Not applicable	No data available
UBITECH (proprietary software)	Web, desktop & database	No data available	Secure data file exchange	Centralised service, PKI, CA	Not applicable	No data available
Block Labs (open-source & proprietary software)	Web, desktop, server, decentralized storage & blockchain	1 GB limit (public blockchains) No size limit (DLT)	On-chain identity, data file exchange, data, dMail, dChat, dNotary	Decentralized service, AES & RSA PKI E2EE, X.509	No adds, no data mining, no data tracking, no data sharing	X.509 Web3 on-chain identity

- **E2EE**, end-to-end encryption
- **PKI**, public key infrastructure
- **CA**, certificate authority
- **ERP**, organization back end systems
- **X509**, digital certificate based on the widely accepted International Telecommunications Union (ITU) X. 509 standard
- **DLT**, distributed ledger technology
- **AES**, advanced encryption standard
- **RSA**, public-key cryptosystem used for secure data transmission
- **Web3**, world Wide Web based on blockchain technology

Product Availability

Block Labs on-chain communication platform offers predictable budgeting with a plug-and-play solution. With no subscription and membership fees, there are several onboarding options available;

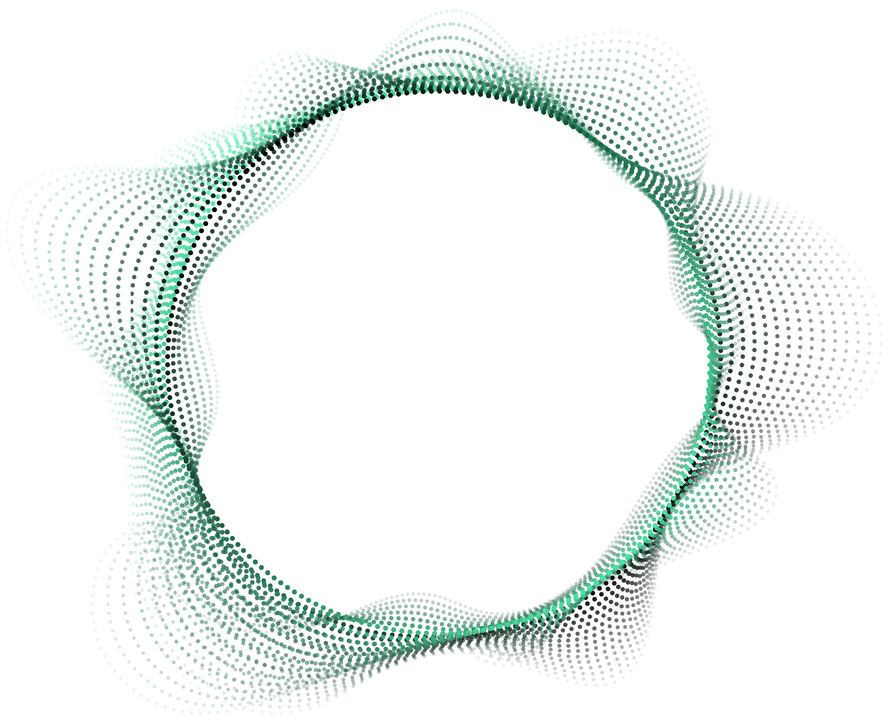
- Staging environment is a replica of the production environment and enables enterprises to test-drive the Block Labs solutions (no fee).

- Production solutions are available via Level-1 & Level-2 integrators and enable any user to connect and send or receive dMails or data files, exchange messages with dChat or establish his or her on-chain identity. Based on the “pay per transaction” model, the transaction cost depends on the chosen underlying network (i.e. +20 available in the future).

- Block Labs also offers custom white label solutions that are tailored to organizational needs. The offer consists of; (1) custom DLT infrastructure setup (i.e. Ethereum, HashNet, Tron); (2) deployment of selected communication protocols (i.e. dID, dMail, dChat, dNotary); (3) pre-build white-label UI install; (4) operational workshop, and; (5) tech support.

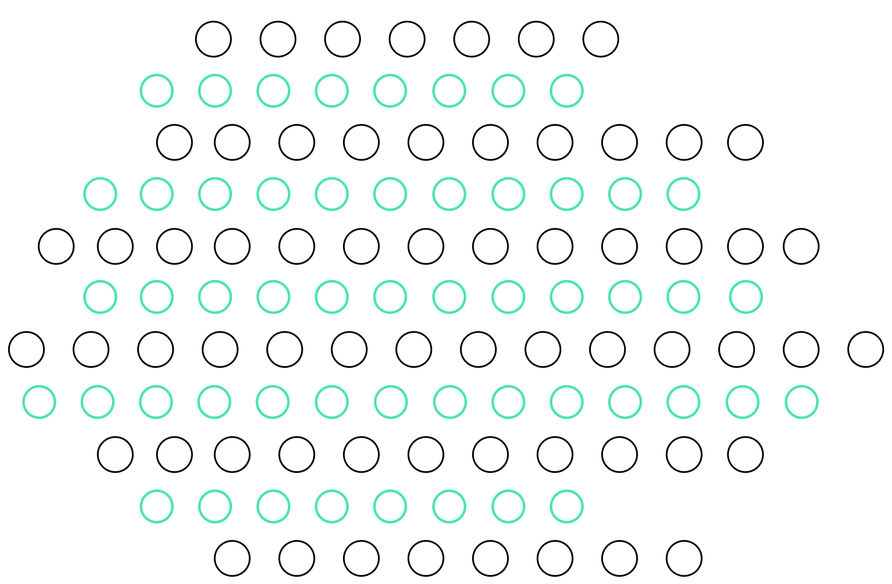
  Contact us for tailored build proposal.

- Custom module or protocol integration. Contact us for tailored build proposal.



Legal Framework

Incorporated in Luxembourg, Block Labs Sarl provides the technical support, legal and IP framework behind the solutions and implementation. All solutions are within the EU regulation guidelines.



Adoption, Events & Recognition

The project is a part of the UN/CEFACT, UNECE Chain initiative, awarded by the Adriatic Council for blockchain innovation and deployed on the first National Blockchain EU infrastructure SI-Chain. As a part of the Horizont 2020, the project received a commendation of excellence from the European Commission. The project also received a recommendation from the Slovenian Ministry of Economic Development and Technology and the Slovenian Ministry of Public Administration.

- UNECE Geneva (eDelivery DLT use case): Watch
- Blockchain Adria 2021 (enterprise adoption): Watch

Dr. Tali Rezun
Founder & Project Head

After finishing his doctorate, Dr Rezun established Block Labs, where he dedicates his time to Web3 R&D, more specifically he focuses on on-chain communication security. Tali is also a guest lecturer on the Cotrugli MBA program, Blockchain Adria resident speaker and a UNCEFACT expert.

Denis Jazbec
Head of Development Lab

Software engineer with more than a decade of experience. Highly proficient in PHP, JS, Vue.js, Typescript, MySQL and specializes in IT infrastructure, DLT networks and blockchain implementation, while developing in-depth knowledge on multi-blockchain processes and transactions, which makes Denis an expert in its field.

Vitaly Bondar
Legal Framework & Support

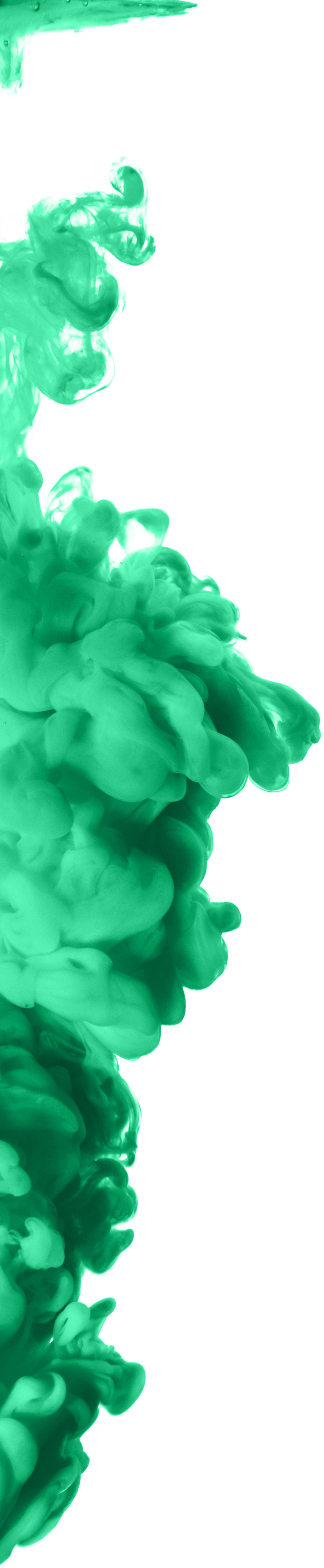
Blockchain legal expert and ACAMS Certified FinTech AML Associate with almost 20 years of legal experience. He helped clients to develop and launch a number of award-winning blockchain projects. Vitaly was featured in the GC BeNeLux POWER LIST of Legal 500 (leading ICT attorneys) and won three awards at the ICT Spring Europe with his LegalTech project.

Drazen Kapusta
Web3 Advisor

The Principal and founder of TOLAR.io, a cryptocurrency based on the revolutionary beyond blockchain project HashNet. Drazen is a successful entrepreneur with 30 years of business experience. Mr Kapusta also serves as Principal of COTRUGLI Business School and holds the function of Blockchain Adria president.

Sandi Nemet
Partner Development

Senior financial industry executive and entrepreneur with 20 years of international experience & expertise in Banking and Finance. Sandi spent most of his career as a dedicated leader in reputable international financial institutions e.g. UniCredit group, Bank Austria Creditanstalt and Alfa Group acting as a CEO of Alfa Asset Management (Europe) SA.



BlockLabs

Conclusion

It is imperative to identify beneficial enterprise adoption use-cases with questions such as; How an organization handles digital communication and data exchange? Where are the security and privacy vulnerabilities and how blockchain can be used to overcome them? Every organization exchanges digital data in one form or the other, is it payslips, contracts, merchandise manifests, cargo documents. With the help of advanced Web3 blockchain protocols as an underlying infrastructure, Block Labs provides a suitable blockchain adoption toolbox, helping individuals and organizations on their way towards the adoption of this new privacy-focused advanced technology. Despite the current adoption challenges, early blockchain technology adopters will be able to secure a considerable advantage in regard to technology understanding and tailored use-case solutions. Blockchain technology adoption is here with technology-specific solutions that will change the digital landscape as we know it.

- Additional project research
- Homepage: blocklabs.technology
- Documentation: wiki.4thtech.io
- GitHub: github.com/4thtech

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