



LIBRUM

Whitepaper

Librum
01/2022



Brief description

In the blockchain industry, the most important element of a functioning business relationship is mutual trust. Blockchain-based decentralized infrastructures were developed in various industries to ensure the protection of privacy, the safeguarding of business contracts, data and document protection and the handling of particularly sensitive customer data in everyday business. This is where the Librumchain comes in, which is based on the highly efficient Apache-Kafka consensus. Buying, selling and investing digitally via blockchains means trusting a business partner whom you cannot sit across in person. The DLT Distributed Ledger Technology provides you with digital investment and asset values, regardless of whether they are physically available, virtually designed, tokenized, material or immaterial, in a manipulation-proof and fail-safe system. The additional integration of the Apache-Kafka consensus is intended to strengthen the building of trust many times over. Provide transparency, high scalability and maximum data security is the basic structure of Librumchain.

Librumchain offers the possibilities for business solutions in various areas such as supply chain, document chain, streaming, payment, investment and many more. From mid-2022, Librumchain will map tokenization on the MatrixChange and will also be able to display non-fungible tokens (NFT). So far, such solutions have only been known in Europe from Ethereum or IOTA. Librumchain can execute transactions in real time through the Apache-Kafka-based consensus and on the basis of the Validate-Execute-Blockchain-Architecture.

The smart contract platform helps to improve transaction speed, as transactions can even be executed at the same time. In addition, Librumchain offers further advantages:

- high scalability with maximum transaction speed
- high energy efficiency through an energy-saving consensus mechanism
- Data analysis through intelligent analysis management
- System supports high transaction throughput, processes large amounts of data in the shortest possible time
- based on DLT, so-called failure and manipulation security technology (Distributed Ledger Technology)
- seamless high quality system
- decentrally managed network

More security, more transparency and higher transaction speed can be described with the Librumchain technology. In the future, you can trade even more securely, faster and more easily and use Librumchain with unique security technology.





Background / company:

The Librumchain is programmed by a team consisting of experienced developers who have been dealing with blockchain technology for many years. Following the developments in this technology since 2020, we are of the opinion that a blockchain must be able to offer more than just be a virtual means of payment.

With this development, Librumchain is THE blockchain with which everything related to this technology can be carried out for the next few years. It includes the possibility of smart contracts, the creation of NFTs as well as database systems based on blockchain and much more.

Over the next few months and years we are planning various partnerships with major global corporations that have recognized that the future of IT security lies in blockchain technology.

Furthermore, closer cooperations with partner companies are planned for 2022 in order to strengthen and expand any synergies.

Librumchain aims to climb to the top 100 in the world of crypto and blockchain technology within the next 24 months. Therefore we will increase the focus on cooperations with other companies and a massive expansion of our marketing activities.

From 2022, we will focus the Librumchain on the area of smart contracts and the wide range of applications for the Librum.

Regulation

Up until now, Switzerland, Liechtenstein and Malta have been crypto-friendly in Europe. Malta, a member of the European Union, has been an attractive location for crypto companies for several years. Well-known crypto exchanges such as Binance, OKEx and ZBX have their headquarters on Malta - nicknamed "Blockchain Island". But a wind of change is now blowing on the Mediterranean island: While a provisional regulation has previously applied to crypto companies in Malta, a law called the Virtual Financial Assets Act was tightened last year. Since then a license has been required, issued by the Malta Financial Services Authority (MFSA).

Because currently applicable law still differs from country to country, the EU is pushing the regulation of crypto assets. The regulation, called "Markets in Crypto Assets" (MiCA), which was officially announced in September 2020 and contains 150 pages, is intended to ensure uniform EU-wide regulations in the crypto area. It is scheduled to come into force in all member states at the end of 2022. MiCA will have the greatest impact on issuers, service providers and trading platforms:

They must comply with the information obligation and publish a white paper on their products.

The Matrixchain OÜ, which is the owner and operator of the Librumchain, was founded in 2020. Matrixchain OÜ is based in Estonia and has a crypto license (License No. 14926847) from the Estonian Financial Supervisory Authority.

The regulations for crypto companies will be tightened further in the coming years. We definitely welcome this approach.



Anonymous transactions are impossible due to the necessary legitimization of every "active" user. Know your customer (KYC) is the key designation that obliges every user to document and disclose their personal data by means of a valid, officially recognized identification document (identity card, passport) together with current proof of address (e.g. gas and electricity bills).



Due to the complete transparency of the Librum, payment ways within the Librum ecosystem can be traced without restriction. The reputation of the industry as a money laundering instrument for criminal activities is thus counteracted 100%. The anti-money laundering (AML) guidelines for combating money laundering are actively applied and met. Since Estonia is part of the European Union, EU law applies in this case, and this license / regulation must therefore be recognized by all member states throughout the EU.

Librum also has a branch in Germany.



Taxation

As part of the "New EU Tax Package", the EU Commission is taking measures to expand tax transparency for crypto currencies and assets. Tax authorities are empowered to ensure appropriate taxation and to effectively prosecute tax evasion through more effective enforcement of existing tax regulations.

This approach shows that crypto currencies no longer have to lead a shadowy existence, as they are recognized by the tax and government side and are therefore an indispensable part of our lives.



LIBRUM

Technology

Librumchain

Librum is a highly scalable blockchain platform for enterprise applications. At Librumchain, we have mainly focused on big data, IoT, banking, finance and healthcare applications. Librumchain is not only a blockchain platform, but also a framework for developing and providing highly scalable business applications with a microservices-based architecture [1]. The following are the main features of the Librumchain:

1.1 Real-time- transactions

Librumchain has introduced a new scalable group blockchain architecture that enables real-time transactions. The proposed architecture is based on Apache-Kafka-based consensus [2] and reduces the overhead of the order-execute architecture in traditional blockchain systems. Backpressure operations on scalable real-time applications are treated with a methodology based on reactive streaming [3].

1.2 Simultaneous Smart Contracts

Librumchain supports functional programming and an actor-based concurrent smart contract platform called Aplos. All blockchain-based software programs and the messages that are exchanged between them are written as a functional Scala programming language based on Akka actors. Aplos is called a smart actor platform because it supports the simultaneous execution of blockchain transactions with the help of actor-based simultaneity handling [4].

Technology

1.3 Sharding

The Librumchain uses a sharding-based consensus. The consensus processing of the blockchain can be delegated in subgroups (shards) and works independently. Librumchain uses Apache-Kafka for local joint consensus and Raft for global consensus [5]. In addition, the data replication of the blockchain supports a sharding-based architecture. Instead of data replication on the blockchain across all nodes, sharding-based data replication was used to reduce the network and communication overhead in the blockchain [6].

1.4 Microservices

The Librumchain was developed with a microservices-based architecture. The functions of consensus processing, smart contracts, asset storage and block generation are implemented in independent microservices in the Librumchain. Each blockchain node contains four different microservices: 1. Storage, 2. Aplos, 3. Lokka, 4. Librum-ML. All of these microservices are docked and available for deployment with Kubernetes [7].

1.5 Data Analysis

Librumchain uses Apache-Cassandra based storage as blockchain asset storage. All assets stored in memory are indexed using an elastic search-based full-text search API. Librumchain facilitates full-text searches of blockchain data by using this search API. Librumchain's elastic blockchain search API can be connected to analytical dashboards such as Kibana and Grafana. In this way, we make the blockchain more scalable, more secure, more structured and more meaningful for further data analysis [8].

Technology

1.6 Maschine Learning „AI“

The Librumchain features the federated learning based on the machine learning service Librum-ML. The data on the various blockchain peers can be analyzed and the machine learning models can be created in a privacy-friendly manner with federated learning. Librum-ML supports the integration of Pytorch, Pysoft and TensorFlow for machine learning in a network [8].

1.7 Support for non-fungible Token (NFT)

NFT's (or "non-fungible tokens") are a special type of crypto-asset where each token is unique - as opposed to "fungible" assets like bitcoin and dollars, which all have the same value. Since each NFT is unique, they can be used to authenticate ownership of digital assets such as works of art, recordings or virtual real estate [9]. Librumchain supports the representation of the ownership of digital and physical assets (e.g. digital art, physical art, real estate, sneakers etc.) using non-forgable tokens (NFT). It supports the token standards ERC-20 and ERC-721 [10]. The metadata of the NFT's are stored in the blockchain ledger and the digital objects in off-chain storage or public storage such as IPFS [11].

1.8 Tokenization of projects and companies

One of the most important functions of Librumchain is the tokenization of projects, objects and companies. The Librumchain creates this possibility in order to create the opportunity for visionaries and companies to implement their projects in a cost-effective and user-friendly manner.

Tokenization – what is that, actually?

Various studies by the World Economic Forum predict that around 10% of gross domestic product will be tokenized by 2029. This share of global GDP would correspond to around 10 trillion US dollars.

The German Federal Government has also become aware of this development and initiated corresponding changes in the law on November 14, 2019. The changes ensure that token assets are considered official financial instruments and are therefore subject to financial market regulation. This step is also necessary to respond to the increasing of tokenization. As part of this process, digital images of an asset including the corresponding rights and obligations are mapped in the form of tokens.

In addition to goods, physical objects, rights and licenses can also be tokenized. The generated tokens represent the ownership right to the respective assets and are in a decentralized database, the blockchain. In theory, all assets can be represented using tokens. Accordingly, government bonds, company shares, buildings or license rights can be securitized using a token. The generated tokens regulate the ownership of the respective object.

Librum would like to play a leading role in this area in the future and become one of the top 10 companies in Europe.

Architecture of the Librumchain:

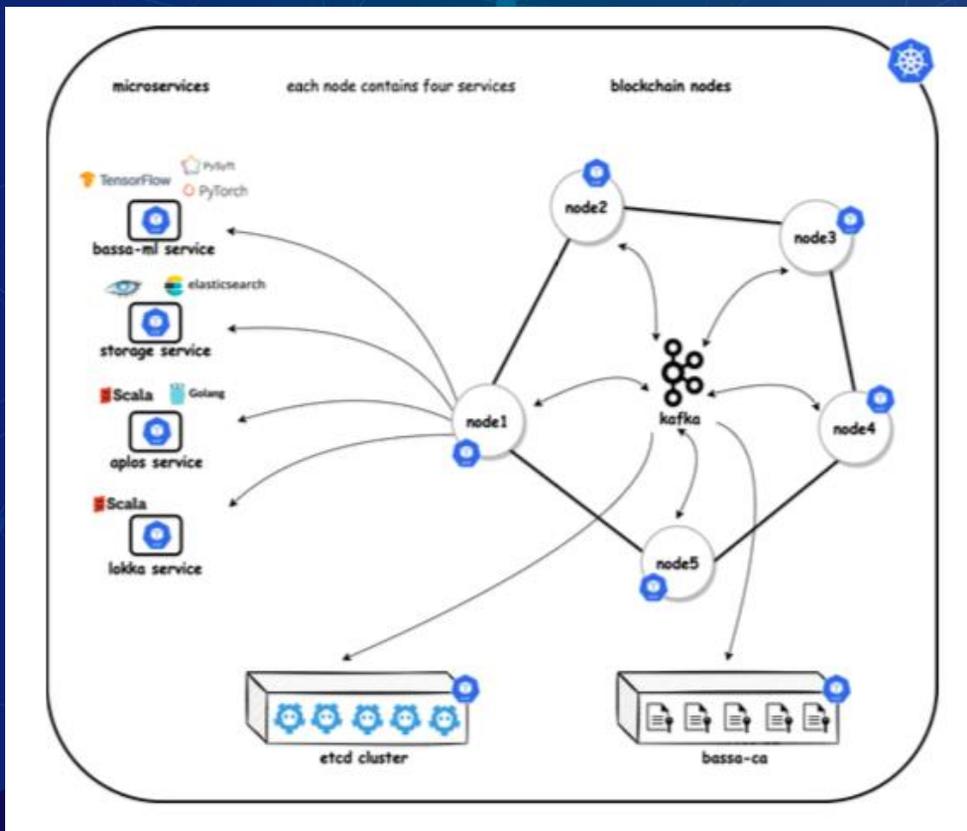


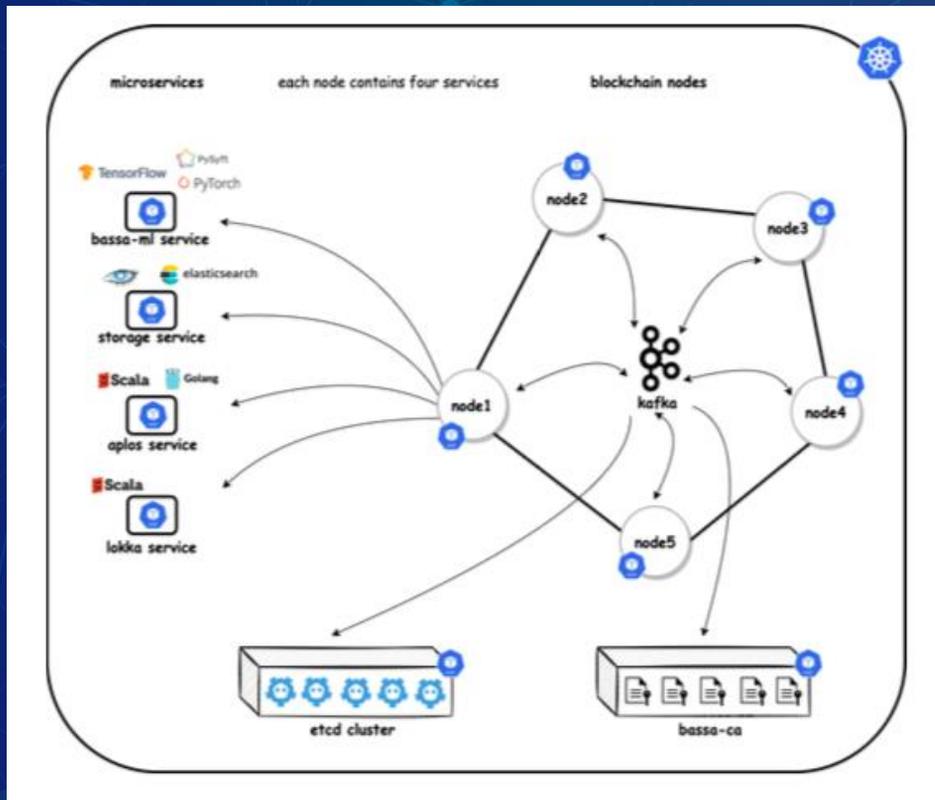
Figure 1: Microservice-based architecture of the Librumchain. Each blockchain node contains four services:

1. Storage service,
2. Lokka service,
3. Aplos service,
4. Librum ML service.

Most of the existing blockchain systems are built as monolithic systems. A single program / service on the blockchain manages all functions of the blockchain. This includes handling the consensus, maintaining the decentralized ledger, transferring transactions, checking for duplicate spend, etc.

We believe this is not an ideal design for a distributed system environment. With a monolithic systems approach, you have to do everything in a single programming language. As the code base grows, it becomes unwieldy. Since there is only a single service available, it is not possible to scale it.

Architecture of the Librumchain



We are therefore developing Librum with a microservice architecture [1] that solves all of the above-mentioned problems. In the Librumchain, all functionalities are implemented as small services (microservices). All of these services are dockerized [12] and are available for deployment with Kubernetes [13]. Figure 1 shows the architecture of Librumchain.

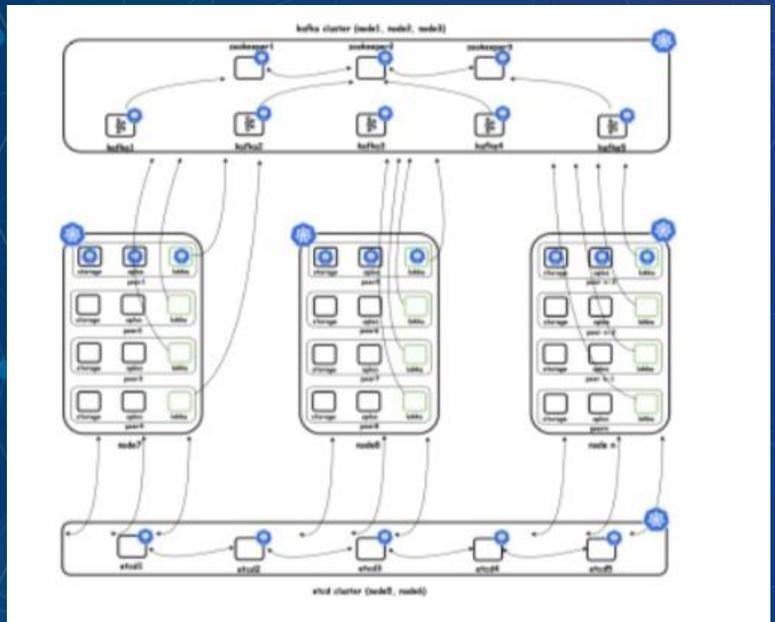
It contains the following services / components:

1. Aplos service - intelligent contract service implemented with the functional programming language Scala [14,15] and Akka actors. [16]
2. Storage service - Apache-Cassandra [17] based block, transaction and asset storage service.
3. Lokka service - block creation service implemented with Scala and Akka streams. [18]
4. Kafka Message Broker - Kafka [2] based distributed publisher/subscriber service.
5. Librum-ML - Federated Machine Learning Service. It enables the creation and sharing of ML models while maintaining privacy.
6. Librum - Certificate Authority in Librumchain.
7. Etcd Cluster - Service registers and memory for configurations

Librum Mission:

Figure 2: Use of the Librumchain with docker, kubernetes and helm charts.

The Librumchain is operated with Apache-Kafka-based consensus and Apache-Cassandra [17] state database.



The smart contracts on the Librumchain are implemented with functional Scala programming and Akka actors.

The Librumchain is deployed using docker, kubernetes and helm charts [19] orchestrated as shown in Figure 2. We used a 20-node kubernetes cluster and deployed 100 Librumchain nodes on it.

The deployment contains a separate Kafka cluster and Etcd cluster [20]. The Lokka service of each blockchain node communicates with the Kafka cluster when the consensus is carried out. Etcd was used for service registration in the environment [21].

All service information and Kafka topic information are stored in the Etcd. The services in each blockchain node run as kubernetes pods with a separate pod for each service in the blockchain node.

The Apache Cassandra Asset storage is connected to kubernetes persistent volume for permanent data storage. The evaluation tests the performance of the Librumchain for a different number of blockchain peers (1 to 100 peers).

Use of funds

Pre-sale phase

Token name: Librum

Total token supply pre-sale: 150 Million Coins

Token symbol: LCNC



- Team 15%
- Charity 5%
- Marketing & development 55%
- Reserved 25%

Tokenomics

Token name: Librum

Token supply : 35 Billion Coins

Token symbol: LCNC



- Development / System 12%
- Marketing / Community 5%
- Team / Consultants 9%
- Circulating supply 74%

Roadmap

08/2021

Start of the development of Librumchain

03/2022

Start of the new face of Librumchain (new website,) increased marketing

05/2022

Start of the first pilot project for tokenization on the Librumchain with a well-known company

07/2022

Official start Librumchain

2023

More listings on international exchanges

01/2022

Start ICO/ Pre Sale Librum

04/2022

Listing at 1 or 2 more exchanges

06/2022

Test phase with selected users for Librumchain

08/2022

Implementation of further token projects

2023

Plan: at least 10 tokenized projects on the Librumchain

Visions of the future of Librumchain:

- The commitment, the further development of own technologies as well as companies and in the future also the promotion of promising start-ups is useful for economy and society.
- New future-oriented jobs will be created, tax revenues increased for local and national governments, and economic growth promoted.
- Development of solutions and technologies that make everyday life easier for everyone and are practically available to everyone.

The further development of the blockchain as a basis plays an important role, which we have been tackling since 2021 with the start of Librumchain. In addition to financial independence and the ability to carry out financial transactions for everyone worldwide, the focus is on leaving behind an intact environment for future generations..

The focus is therefore on the following areas:

Smart City & Building Solutions

Energy efficient
blockchain solutions in all areas
of life
on a Librumchain basis

Intelligently and sustainably
produced food

Sustainable organic cosmetics
and pharmaceutical products

Innovative solutions for mobility
and transport

Database systems on a
Librumchain basis for everyday
life

Of course, the idea of profit should not be neglected.

Librumchain supports 360 ° in stimulating economies with positive effects on society and the environment.



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Conclusion:

Librum is in a continuous development cycle, which will now lead to the introduction of Librumchain in 2022.

It is also important to overcome major hurdles in the abstraction of the complexity of the blockchain and the technologies in order to make them accessible for everyday use.

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Librumchain has multiple layers of proprietary technology, secure processes and protocols to keep our customers' assets safe.

Our servers are located in carefully selected jurisdictions, which reduces political risks and the risks of adverse regulatory measures or natural disasters.

We take security very seriously, this is our number one priority.

Furthermore we provide Librumchain customers with full financial freedom and enable people to make decisions about investing in secure assets in a transparent and decentralized manner.

Our aim is to give everyone easy access to the world of digital currency and to promote its progress and further development.

With Librumchain, we are prepared to be one of the leading blockchain companies and cryptocurrencies in a rapidly developing world for the next few years.

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