

Lisk

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Lisk (LSK) is a javascript-based blockchain application platform, it was developed by Max Kordek and Oliver Beddows in early 2016. It uses its own Blockchain network and token LSK, Lisk is still in development but its goal is to allow users to manage Blockchain applications through sidechained applications connected to the Lisk network. The applications is authenticated through custom tokens. Its biggest advantage will be its flexibility. [1] [2]

At the moment it is too early to try to develop anything with Lisk given its how little documentation there is for developers and there are no working examples online that modify Lisk Core or use the SDK.

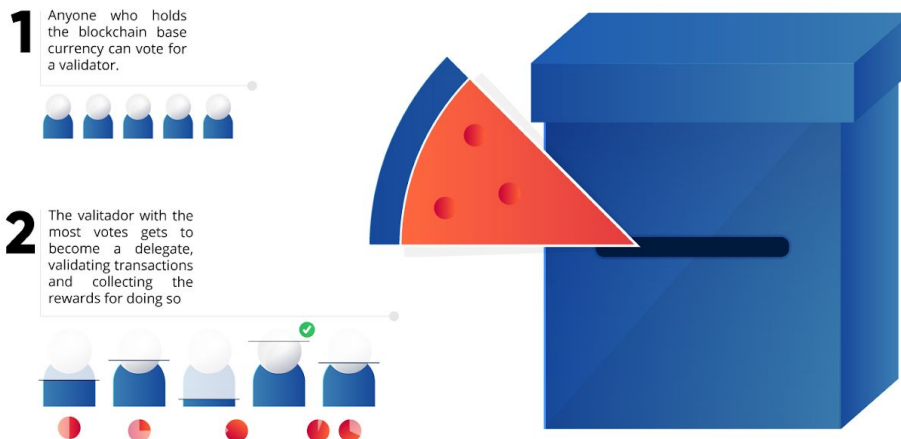
For now lisk cannot be bought directly with fiat money only with cryptocurrencies. It is currently valued at **\$1.73** through it value in bitcoin. Lisk began as a fork of Crypti and had an initial coin offering of 14.000 BTC which at the time made it the 2nd biggest ICO after bitcoin since then it has become the 4th. In november 2017 it has surpassed a market cap of \$1.000.000.000.

Blockchain technologies encrypt records named blocks formed by a hash of the previous block, transaction data and timestamp. Blockchains are open which means anyone should be able to verify them. They are immutable, data is only added to the blockchain. Blockchains generally don't rely on central authorities and are verified by either delegated users or users who must work to decrypt the record but there are exceptions. They blockchain was cemented by Satoshi Nakamoto through a paper where he describes the technology, it is from this paper that the blockchain got its name.

Lisk uses a delegated proof of stake that uses maximum 101 node maintainers called delegates selected through the votes of everyone in the network. The delegates are awarded with fees associated with each transaction alongside other decreasing monthly rewards for maintaining the node. Each delegate's vote is proportional to the amount of lisk they have. [11]

Delegated Proof of Stake

*In **Delegated Proof of Stake**, the voting power is dedicated to determining who will fill the role of delegate, maintaining the network and validating transactions.*



<https://lisk.io/academy/blockchain-basics/how-does-blockchain-work/delegated-proof-of-stake>

Lisk Components

The Lisk platform consists of: Lisk Core, Lisk Elements, Lisk Commander, Lisk Hub, Lisk Explorer and Lisk Mobile.

Lisk Core

Lisk Core implements the Lisk protocol. It is a tool where the blockchain data, network infrastructure and forging access can be accessed programmatically. The protocol makes use of Lisk tokens to ensure security through a consensus protocol called the Lisk DPoS (Delegated Proof of Stake). Lisk Core's functionality is contained in 2 modules: the Chain module, which interacts directly with the blockchain and thus exposes this functionality and HTTP API Module which provides HTTP endpoints through which users can connect to the network. Lisk Core uses PostgreSQL as a database. The supported operating systems are Ubuntu 16.04 and Ubuntu 18.04. [3]

Lisk SDK

The Lisk SDK available through the [LiskHQ github](#) The alpha version of the Lisk SDK can be installed through the `lisk-framework@alpha` npm package. This was used to develop many of the following Lisk components.

Lisk Elements

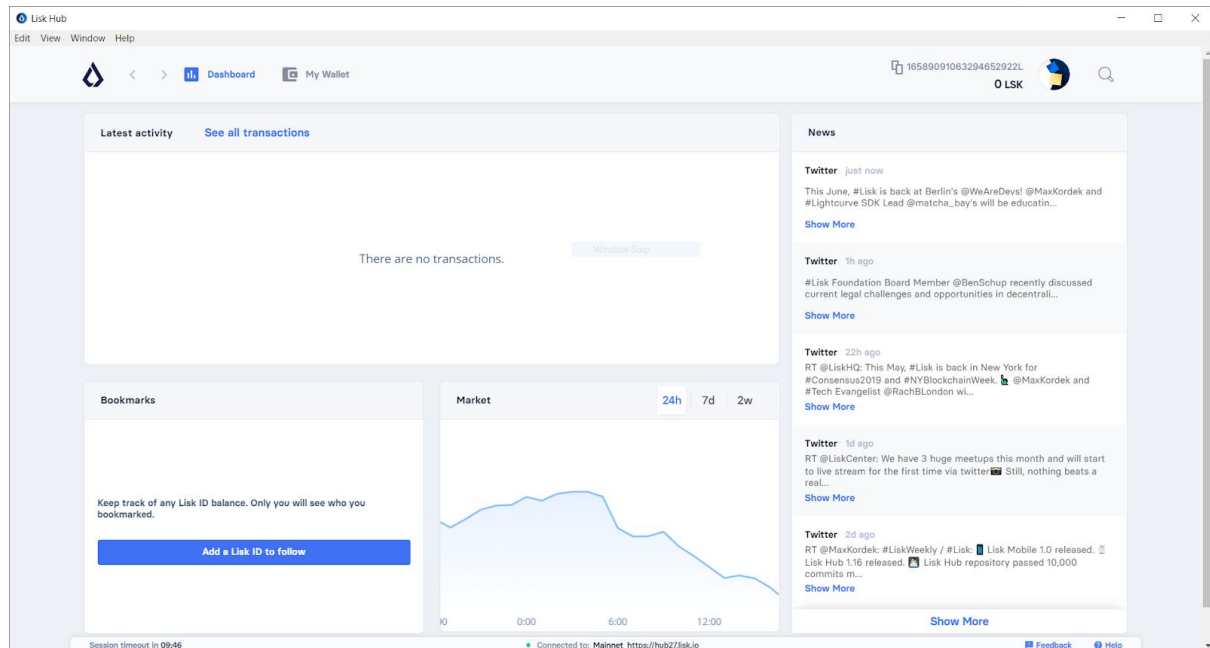
Lisk Elements is a collection of libraries of npm packages that contain various functionalities that deal with Lisk. The following libraries are available: API Client, a client for the Lisk network, Constants, several constants related to Lisk, Cryptography, contains the functions used for encryption, Passphrase, a library that contains functions for dealing with passphrase which are the way Lisk authenticates users and Transactions, library for making, signing and checking transactions

Lisk Commander

```
COMMANDS
account      Commands relating to Lisk accounts.
block        Commands relating to Lisk blocks.
config        Manages Lisk Commander configuration.
copyright     Displays copyright notice.
delegate      Commands relating to Lisk delegates.
help          Displays help.
message       Commands relating to user messages.
node          Commands relating to Lisk node.
passphrase    Commands relating to Lisk passphrases.
signature     Commands relating to signatures for Lisk transactions from
               multisignature accounts.
transaction   Commands relating to Lisk transactions.
warranty      Displays warranty notice.
```

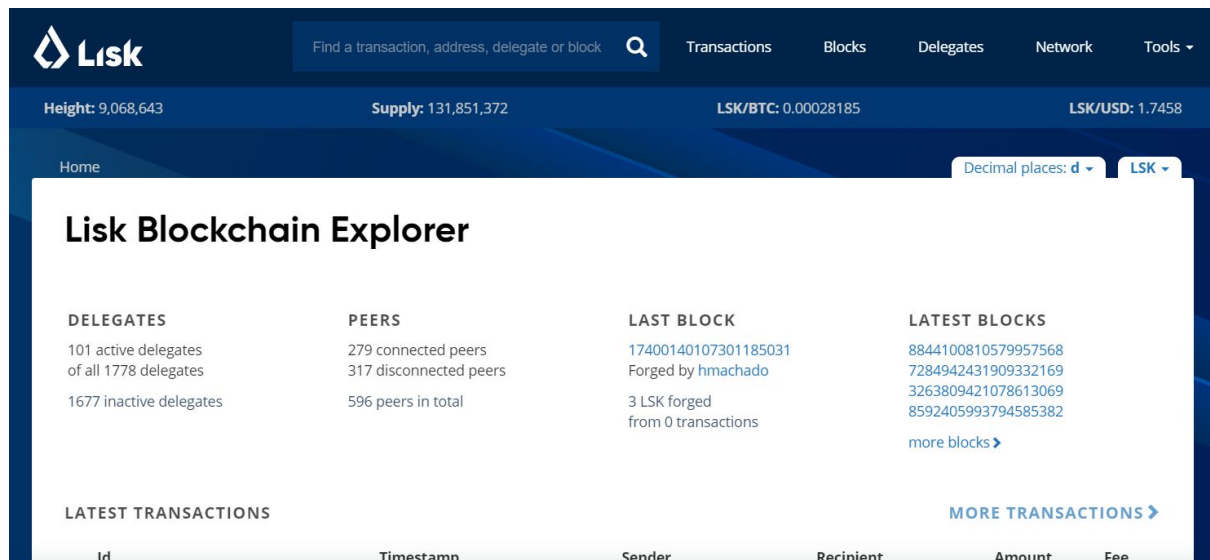
Lisk Commander is a CLI for the Lisk platform. It contains a [many useful commands](#) for interacting with the Lisk platform. Lisk Commander allows you to communicate with a remote or local node. It is continually updated as new functionalities arrive.

Lisk Hub



Lisk Hub provides a graphical user interface in which a user can manage their Lisk ID, access and send LSK tokens, as well as vote for delegates. It is an Electron application that communicates with the other components of the Lisk platform.

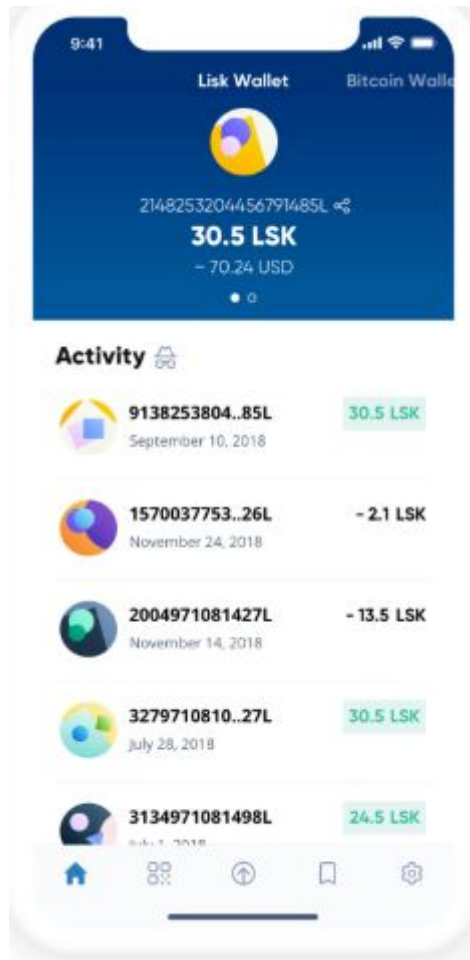
[Lisk Explorer](#)



<https://explorer.lisk.io/>

Lisk Explorer is the tool for accessing, visualising and analyzing the information and activity on the Lisk blockchain throughout its history. It enables the Lisk Clients to better understand what is happening in the platform.

Lisk Mobile



Request LSK tokens from other accounts.

14896310231828552578L



Chara a

Enter an address to send tokens to.

Address



Scan



Start adding them through the sending process.

<https://dribbble.com/shots/6132279-Lisk-Mobile-Light-and-Dark-Mode>

Lisk Mobile is a smartphone wallet application which contains standard functionalities for transactions and checking your account it also provides more ways for users to authenticate themselves through Face ID or Touch ID. To receive lisk users can send their identity through QR codes. It is available for both Android and iOS.

Blockchain use cases

While cryptocurrencies are the most widely known application of blockchain technologies Lisk is focused on a wider amount of use cases. The ledger allows decentralization of information while maintaining security and trust in the data. The use of tokens means that money can move around quicker.

Smart Contracts

Smart contracts are a way to write contracts through code. The code contains all the rules, conditions, expiry dates and all other relevant information needed for its fulfilment, which execute automatically once the terms are met.

Blockchains ensure decentralization and security for smart contracts.

Decentralization allows contracts to work in a trustless environment because the encrypted nature of blockchain technology means that the blockchain will store all smart contracts along with their history and any outside manipulation will be noticed and corrected by other nodes on the network. Because no participant is trusted on his own tampering with the system would be difficult as it would require a large amount of computing power which would not be financially or logistically viable. Also even if one contract fails that won't crash the system so it is fault tolerant. An example of smart contracts was done by the financial company Markeit in 2016 for credit default swaps trading.

Decentralized Government

The blockchain can be used to store data that is private to the user but ensure that it is correct. There is a lot of data stored in isolated databases these could be centralized without worrying about data privacy by using blockchain technologies. The blockchain could also allow people to vote in a manner that is secure and anonymous. Two cities in Switzerland allow citizens to pay some taxes through cryptocurrencies this makes it much easier to verify if, when and how those taxes were paid.

Data Storage

Blockchain technologies will also have an impact on data storage by providing a distributed system that stores data through many replications on various user's machines. This could alleviate some of the efforts companies make to ensure data durability and the encryption techniques used also provide security. The lack of a central authorities assures users that their data is not being used for other purposes since no single individual can access all the data.

IoT

Another use case for blockchain technologies is in the Internet of Things (IoT). The two problems that would be addressed are the security of the data and decentralized computing. The encryption methods used by blockchain technologies

would ensure that data is secure, Most of the data created through IoT is processed at single monolithic server by keeping all the information self contained inside the representation of the data it allows any device, including client devices to process the data.

Marketing

Many companies are spending increasingly more on marketing and getting a lower return, according to Forrester Research companies get only a return of \$0.44 per \$1 spent. The public doesn't like ads and one of the reason for this is their use of people's private data. If private data would indeed be private and each user could decide whether they want to sell their data to the advertisers the concern over privacy would be diminished. The blockchain could ensure that the user can decide to sell their data and it could maintain a record of how that data was used.

Supply Chain

Companies have invested in technology which can store information about a product through things like RFIDs. But these technologies have a couple of issues and using blockchain technologies could also provide new insights. One of the problems with RFIDs is that it isn't secure, anyone can read the information stored within, the encryption employed in blockchain technologies would solve this. Other issues with RFIDs are data flooding and cost. Additionally storing the whole history of the product through blockchain technologies would give companies new insights into the quality various suppliers produce and could reassure customers of some of the claims made by the product.

HR

Managing employee data and recruitment means dealing with private information and unreliable resume information. Blockchain technologies can help keep private information secure and in the hands of the person they belong to while allowing it to be shared. For resumes there could exist a standard blockchain based resume format which would store the skills and education of the person throughout time. If a standard exists that can be affirmed or inferred by other people so lies do not propagate and computers can do a better job filtering applicants using information that has a standard structure and is reliable.

Accounting

Keeping track of financial data for a company is difficult because of the large amount of formats that financial data comes in and rules it must enforce. Using blockchain technologies to keep track of financial data would mean that transactions

can be timestamped at every step of the process and automated audit software can be created that will be accurate. The accuracy is obtained from the fact that the blockchain cannot be easily modified by any one individual so tampering with the data would be difficult.

Impacts on industries

Banking

Last Barclays was the first bank to change their transaction process to incorporate the security and transparency parts of the blockchain. It did so through a blockchain-backed credit transaction between Ornuu and Seychelles Trading Company.

Another aspect that could benefit greatly from blockchain technologies is loans because they have many conditions and associated documentation which is centrally located in the bank offering the loan. This could be changed to a decentralized automated approach through the blockchain.

Accenture has recently estimated that the global financial industry could save up to \$10 billion by using blockchain to store and process clearing and settlement. Santander, Spain's biggest bank, estimates that implementing blockchain technology could save the financial industry up to \$20 billion per year.

Healthcare

Similar problems with the need to keep data private, record large amounts of data and transfer them to various people appears in healthcare. After surveying a quarter of its stakeholders Deloitte found an investment of over \$5 million or more into applying blockchain technologies to healthcare.

Real Estate

The amount of paperwork required for plots of land to change ownership takes a lot of time and money. These inefficiencies could be removed by using blockchain technologies where much of this can be automated. Another benefit is that the ownership history of the properties will be stored in a trustworthy way, this data can be important for how house prices are calculated. [4]

Lisk Core API

The Lisk Core API is a good way to interact through the Lisk platform programmatically. It provides [swagger annotations](#) for all its endpoints. It contains endpoints for searching for accounts, delegates or voters using various parameters such as their address, username or public keys, searching for various apps based on their name or transaction ids that are associated with the app, accessing node information or authorizing the node to be a delegate and functionality for transactions.

To submit a signed transaction for processing an object that fits the Transaction model must be provided. The model requires the **id** of the transaction derived from the signature, the **amount** of lisk transferred, the associated **fee**, the transaction **type**, **timestamp**, **senderPublicKey**, **recipientId**, **signature** and **asset**.

The type of transaction is a number from 0 to 7 each of which has an associated meaning and associated fee:

- 0 transmit funds to Lisk address.
- 1 register 2nd passphrase
- 2 register delegate
- 3 submit vote
- 4 Multisignature registration
- 5 Register app to blockchain
- 6 and 7 are for transferring Lisk to and out of a sidechain but are currently disabled

Lisk Core can be extended through custom modules that must extend the BaseModule class. This means it must call the default constructor and implement the following methods:

- alias - which returns the module name
- info - which must return an object with the following keys: author, version and name
- load - loads all the data for the module, the event lisk:ready is emitted when all everything is loaded
- defaults - returns supported configuration
- events - returns the list of events this module supports
- actions - returns an object with the types of actions that can be registered with the controller. The module can define the actions and other modules can invoke them.
- unload - cleanup function for when this module is loaded

To add a custom module it must be added in the constructor of the Application class in framework\src\controller\application.js by calling the registerModule method with the imported module as the argument along with parameters for its constructor.

Lisk SDK

The Lisk SDK can be used to develop new functionalities for Lisk though it is still in active development and only the alpha version is available. The Lisk SDK is installed as a single npm package named . The documentation for using the SDK can be found at [its github page](#) though it is very sparse and the provided example returns a schema validation error. To create an application mirroring a Lisk network that already exists the `Application` and `genesisBlockDevnet` are necessary to import from the 'lisk-framework'. The application is initialized with the app name and the `genesisBlockDevnet`. Once the app is initialized the run, then and catch methods can be used.

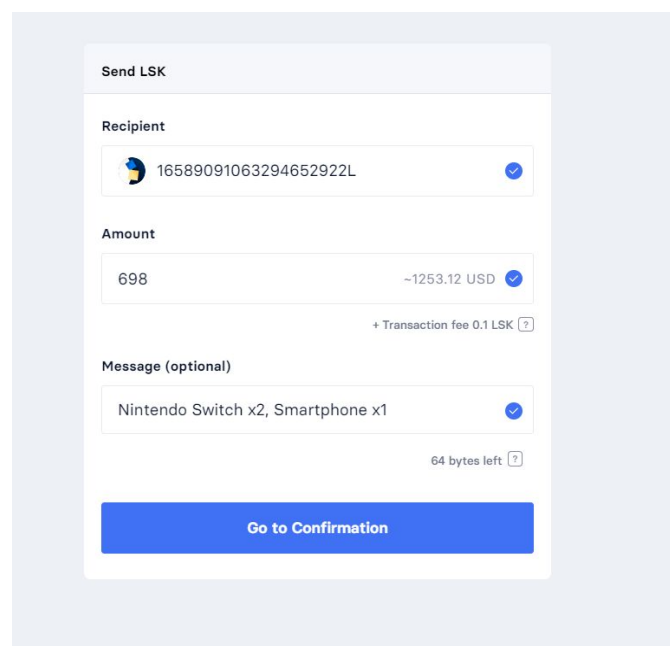
Lisk Hub

The Lisk Hub can be used to commit a transaction through an URL like the following

`lisk://wallet?recipient=${recepitainAdrees}&amount=${Fee}&reference=${otherInfo}`, this will open the Lisk Hub and ask for login and afterwards to confirm the

transaction.

The recipient is the Lisk address of an account, it is displayed at the top right in the Lisk Hub. The amount represents how many link tokens this transaction will transfer and the reference is an arbitrary string that describes the parameters of the transactions, different apps can use it to mean different things.























The screenshot shows the 'Send LSK' interface in the Lisk Hub. It features a light blue background with a white form. The form has four main sections: 'Recipient' with a Lisk logo and the address '16589091063294652922L'; 'Amount' with the value '698' and its USD equivalent '-1253.12 USD'; 'Message (optional)' with the text 'Nintendo Switch x2, Smartphone x1'; and a 'Go to Confirmation' button at the bottom. A transaction fee of '0.1 LSK' is also indicated.

Proposed App

At the moment the only part of Lisk that works is the transaction system. This allows people to replace other payment solutions with Lisk. A straightforward application of this would be in a virtual storefront where people can select the things they want to buy and when submitting a lisk transaction is activated through the Lisk Hub. This is the easiest method of interacting with Lisk.

Lisk Shop

			Common Projects Bball High White		0		59 LSK
			Nintendo Switch Its got a screen Oh, wait, no its got two		0		199 LSK
			Fancy Watch It tells the time Probably fake		0		250 LSK
			Smartphone Very Generic Brand Probably made in China		0		300 LSK

Submit

References

- [1] <https://en.bitcoinwiki.org/wiki/Lisk>
- [2] <https://lisk.io/>
- [3] <https://lisk.io/documentation>
- [4] <https://lisk.io/academy/blockchain-basics/use-cases>
- [5] <https://lisk.io/documentation/lisk-protocol/transactions>
- [6] <https://github.com/LiskHQ/lisk-sdk>
- [7] <https://blog.lisk.io/what-is-lisk-and-what-it-isnt-e7b6b6188211>
- [8] <https://www.youtube.com/channel/UChK8OwkMpXLKIO73h5qWaPw>
- [9] <https://github.com/Lemii/lisk-file-manager/blob/master/js/liskfilemanager.js>

[10] <https://en.wikipedia.org/wiki/Blockchain>

[11] <https://lisk.io/academy/blockchain-basics/how-does-blockchain-work/delegated-proof-of-stake>