



STELLAR

Market Research

Summary

Stellar is a network for decentralized payments that offers extremely fast transactions with negligible fees and the possibility of exchanging directly between different currencies. With these characteristics, **Stellar** aims to become a standard solution for banking services and international remittances all over the world.

The mission of **Stellar** is to implement a blockchain solution that can improve the state of our global financial system by drastically reducing transaction times and costs.

All information is valid as of June 11th, 2018. All feedback is welcome.

Basic Stats

- **Crypto-asset type:** Utility Token
- **Total Supply:** 103,926,681,379 XLM
- **Circul. supply:** 18,576,319,348 XLM
 - New XLM tokens are released periodically to individuals, partners, and charities. This give away will continue until 95% of the total supply are released (5% is assigned to the Stellar Foundation).
- **Market Capitalization:** \$6.8 bn
- **Token Economics:** Inflationary Asset
 - 100 billion created initially and 1% annual inflation rate since.
- **Protocol:** Stellar Consensus Protocol (SCP), implementation of Federated Byzantine Agreement.

History

Stellar was created in 2014 by developer Jed McCaleb and technology entrepreneur and attorney Joyce Kim. The former was already one of the main faces in the cryptocurrency sphere after founding Mt. Gox, the most important **Bitcoin** exchange at the time. After selling most of his stakes at Mt. Gox, which would end up filing for bankruptcy in February 2014, he co-founded **Ripple**, one of the most well-known cryptocurrencies. Due to differences with the rest of the **Ripple** team, McCaleb decided to launch a new cryptocurrency inheriting the main

structure of his former project and implementing some of his new ideas.

The non-profit Stellar Development Foundation, with the initial support of private payments company Stripe, released the **Stellar** network as a blockchain for decentralized payments. Originally, the currency itself was named **stellars** (with ticker **STR**) and was then rebranded to **Lumens (XLM)**. Lumens have been given away ever since to individuals in small quantities, to **Bitcoin** and **Ripple** holders and to nonprofit and strategic partners. 5% of the total supply is assigned to the Stellar Foundation for supporting the network operations, and the remaining Lumens will continue to be released periodically.

The network was completely overhauled in late 2015, introducing a new consensus protocol called SCP, and has since experienced a dramatic rise in price and usage and has been consistently ranked among the top 10 cryptocurrencies in terms of market capitalization ever since.

Development Team

As co-founder, Jed McCaleb has been the main figure behind **Stellar** since its creation. The role of David Mazières as creator of the unique Stellar Consensus Protocol is also remarkable. Finally, Patrick Collison is the third member of the Stellar Development Foundation, and acts as an important advisor for the project.



Jed McCaleb is an American developer and entrepreneur. In 2000, he co-created **eDonkey**, a peer-to-peer file sharing platform. During the surge of **Bitcoin**, he focused on cryptocurrencies and created **Mt. Gox**, by far the most important **Bitcoin** exchange in the world at the time, and later co-founded **Ripple**, currently the third most valuable cryptocurrency after **Bitcoin** and **Ethereum**. After leaving the **Ripple** team, he created **Stellar** and has since acted as its main leader.

David Mazières is a Professor of Computer Sciences at Stanford with a PhD from MIT who has focused his academic career on cybersecurity. He is the creator of the secure consensus protocol that powers the **Stellar** network, and has also been involved in a variety of other open-source projects.



Keith Rabois is an American technology entrepreneur famous for his very early investments and involvement with several extremely successful companies. He has held executive positions at PayPal, LinkedIn, Square and



Khosla Ventures, among others. He is part of the Stellar Foundation board, and has stated in several occasions how **Stellar** can achieve the original goal of PayPal.

Use Cases

Stellar has built a powerful network with **XLM** as its network currency. Its main use case is analogous to that of a traditional fiat currency like euros or dollars, but with the advantages of a decentralized and secure online network.

Stellar implements a network specially targeted for companies, banks and payment providers. A significant part of the global population, even in first-world countries like the [United States](#), does not use or does not even have access to banking and financial services. The possibilities of a global, instant and essentially free network are almost limitless for a variety of applications.

- **Remittances:** bank transfers, particularly those that are relatively small or that are sent abroad, can greatly benefit from a network with almost instant transactions, negligible fees (below \$0.01) and no physical restrictions. **Deloitte**, one of the biggest consulting firms in the world, partnered with **Stellar** to develop a mobile app prototype to make international payments. **Tempo** is another partner of **Stellar** that offers a working solution for international payments from Europe

to the rest of the world, with presence in more than 120 countries.

- **Currency Exchange:** as an interesting extension of the previous point, exchanging between different fiat currencies with instant transactions and no hidden fees can be readily implemented with **Stellar** as long as there is a liquid market between **XLM** and the desired fiat currencies.
- **Mobile Money:** mobile payments are an increasingly popular solution for sending money to friends, family and local businesses. **Parkway** is another partner of **Stellar** that focuses on offering payment solutions for African countries where customers of different telecommunication companies can send money to each other or pay for different products and services.
- **Banking:** banks and other financial institutions can use **Stellar** to offer online-based banking solutions to customers, without the physical restrictions of traditional banking or the costs associated with having a physical branch.

Some ICOs have already raised large amounts of capital on the **Stellar** network. Although it does not offer Turing-complete smart contracts like **Ethereum**, by far the most popular blockchain for ICOs at the moment, **Stellar** can provide a faster and cheaper way of raising money for ICOs.

An **Initial Coin Offering (ICO)** is the equivalent in the crypto-sphere of securities' IPOs. Unlike IPOs, which are harshly regulated, ICOs are still lacking significant regulation and allow average Joe investors to support their favourite projects from a very early stage.

Some ICOs have been extremely successful, raising hundreds of millions of dollars.

Technical Description

Transactions on the **Stellar** network have a tiny associated fee of 0.00001 XLM or 100 stroops (around \$0.000003 at current prices). This fee acts mainly as an anti-spam measure, in order to prevent users from flooding the network with thousands of transactions. The fee is not "gained" by anyone, they are instead redistributed through inflation by the ledger itself. The network is completely free to use for start-ups, companies and institutions that want to integrate the network with their services.

The **Stellar** network is considered much more scalable than some of the other popular blockchains. Compared to the 5 transactions per second of **Bitcoin** and 20 transactions per second of **Ethereum**, **Stellar** can handle more than 1,000 transactions per second in the network. This, along with the negligible fees, makes

it much more suitable for mainstream global application.

An important difference between **Stellar** and most other digital currencies is that it lets you use fiat currencies like USD or EUR for your transactions. The distributed exchange built natively in the **Stellar** network allows anyone to send money to a different currency, by using the different anchors of the network and the current exchange prices. With this system, anyone can send money anywhere in the world instantly and without any of the fees associated with currency exchange and international transactions. **Stellar** will use the most convenient chain of transactions (with XLM as the intermediate currency) to reach the currency of the recipient. For instance, a European user sending EUR to someone in America would automatically use a EUR → XLM → USD. If certain exchange pairs are very illiquid, the **Stellar** network will try to find a better chain perhaps involving additional intermediate currencies.

The **Stellar Consensus Protocol (SCP)** is the mechanism by which the transactions are confirmed and secured in the **Stellar** network. SCP claims to be the first consensus protocol that gathers four very important features at the same time: decentralization, low latency, flexible trust and asymptotic security.

In sum, SCP is a form of *federated byzantine agreement*. This means that the protocol tolerates byzantine failure, that is, nodes of the network sending wrong or random

information. The federated attribute is also important. A *quorum* is defined in a consensus protocol as the number of nodes necessary to reach agreement. Stellar introduces the concept of *quorum slice*, which is the set of nodes that a particular node decides to trust. Effectively, this means that a participant of the network can decide who needs to validate a certain transaction for them to believe it. Nodes that lie or provide wrong information will generally not be trusted by the rest of the network. The different slices will then intersect with each other conforming the whole **Stellar** network. Each quorum slice will ratify the different transactions, which are then confirmed by the totality of the network.

A **smart contract** is analogous to a traditional contract between two parties, with the difference that the enforcement of the contract is guaranteed by the underlying blockchain and therefore there is no need for a central authority or legal system to enforce it.

Smart contracts were first proposed in 1994 by Nick Szabo and found their first large-scale implementation on the **Ethereum** network.

Stellar can also be used to build smart contracts. In the **Stellar** network, these are formed by a series of transactions that are executed in connection with each other and depending on a set of constraints. Multi-signature accounts, escrow services

or scheduling transactions for a certain time frame are some of the immediate applications of smart contracts in the **Stellar** network.

Future Developments

Stellar keeps securing important partnerships in the payment and banking industries. **BloomX**, a company focusing on providing platforms and solutions for banks and Money Service Businesses (MSBs), has recently chosen **Stellar** as their preferred blockchain and digital currency.

Another important recent partnership is **IBM**. The tech giant has chosen **Stellar** as its main blockchain solution for cross-border payments and remittances, and is running verification nodes and developing projects in the network. These huge partnerships can bring **Stellar** to a much wider audience.

Kik, the popular messaging app, is also working on the **Stellar** network through its Kin ecosystem. Concerned with the scalability problems of **Ethereum**, they see **Stellar** as a more suitable option for micro-payments integrated in their messaging app. They will in fact use a forked version of the network with completely nonexistent transaction fees.

Upcoming Projects

As stated above, some important ICOs have already taken place in the **Stellar** network and will continue to do so. Some of the best examples are:



- **SureRemit** is a project that aims to provide a simple app solution to pay for bills, food, send vouchers, etc. They have already released working versions of their apps.
- **Ternio** is developing a network able to support over 1 million transactions per second that will be focused on the multi-billion advertisement and marketing industry.
- **Mobius** is a project supported by Jed McCaleb himself that aims to connect the blockchain with the “real world”, that is, with existing businesses, apps and data from around the Internet. **Mobius** raised a reported \$39 million during their ICO.

Lumen Distribution

An important difference between **Stellar** and most other blockchains is that the **XLM** tokens were not sold in an ICO or mined, but are rather distributed for free by the Stellar Foundation. The distribution of the initial 100 billion **XLM** considers the following breakdown:

- 50% are distributed in small batches (50 to 300 XLM) to individuals that register through invitation links that are regularly given away in meet-ups, partner events, etc.
- 25% are given to partners, organizations and companies that support and bring adoption to the Stellar network.
- 20% was scheduled to be given to holders of other cryptocurrencies, **Bitcoin** (19%) and **Ripple** (1%). These **XLM** were already distributed in two rounds in 2016 and 2017.

The remaining 5% is reserved for the Stellar Foundation to cover operational expenses of running the network and are sold periodically in auctions. The Stellar Foundation has so far distributed 8 billion tokens in total.

Giving away their tokens in this fashion instead of raising money with an ICO or selling batches to strategic investors has allowed **Stellar** to reach a great number of potential users and provide them with a small number of tokens to use the service

for free. It is certainly a very interesting approach to increase the adoption and recognition of the project.

Token Valuation Analysis

The characteristics of the **Stellar** network make a valuation analysis of the **XLM** token particularly complex. It is not clear if the use of **XLM** purely as a medium of exchange will justify a very large market capitalization for a variety of reasons:

- Fees are virtually negligible in order to make the network suitable for micropayments.
- Transactions are extremely fast, taking only 4 to 5 seconds to go through.
- One of the main uses of **Stellar** is to act as a sort of intermediary token between other currencies.

When these three points are considered together, it is clear that at least some users of the network may simply hold **XLM** during the few seconds that a transaction lasts. In other words, the value of a certain asset, in this case the market capitalization of the **Stellar** network, does not equal necessarily the transaction volume of the network. These two quantities are in fact connected by a parameter known as the *velocity of money*, following is the prevailing equation for calculating the value of a cryptocurrency:

$$MV = PQ$$

where:

- **M** is the total supply of the cryptocurrency.
- **V** is the velocity of money, which measures how many times a unit of the currency is used in a certain period.
- **P** and **Q** are the price and quantity of the digital service or resource, and can be thought of as the transaction volume of the blockchain (the economic value transacted in a certain period).

It is typically very hard to provide an estimation for the value of the velocity of money. For reference, the US dollar M1 supply (coins, notes and readily accessible deposits) [typically](#) has a velocity between 5 and 10. It is clear from the equation above that a larger value of the velocity will lead to a less valuable currency, since the same supply can be used to provide a larger transaction volume.

In the case of **Stellar**, it can be expected that the velocity will be quite high if there is a significant adoption of the network, due to the three reasons outlined above. This could change if **XLM** are used as a store of value and a significant amount of the supply is hodled instead of exchanged frequently. This process has occurred with **Bitcoin** and is perhaps the main driver of the price of the first cryptocurrency.

In fact, when using the values of transaction volume and market capitalization [available online](#), the possible

value of the velocity obtained is extremely low:

$$V = \frac{T \times Volume}{Supply} = \frac{\$170,000/day \times \frac{365 \text{ days}}{year}}{\$5,630,000,000} = 0.011$$

It should be noted however that only the **XLM** on-chain transactions are included in the value of the transaction volume above.

Anchors providing the possibility of exchanging **XLM** for other currencies will also need to hold significant amounts of the token to provide liquidity for the exchange markets. It is not clear however if this could drive the price up since these agents are frequently distributed tokens directly from the Stellar Foundation.

Another mechanism that incentivizes holding the token is programmatic inflation. As stated before, there is a 1% yearly inflation rate, with new tokens being created weekly and distributed to **XLM** accounts that receive a certain number of votes. Since these votes depend on the number of **XLM** a certain account has, holding a significant amount of **XLM** can provide a user with a portion of the tokens created every week.

On a separate note, the fact that a vast majority of the token supply is still locked by the Stellar Foundation and has not been distributed yet introduces a certain degree of uncertainty, since it is not clear how it will affect the price of the token once the whole supply is in circulation.

The decision of how and when to release these tokens is currently decided by Stellar

Development Foundation and its community and advisors, and the foundation intends to further decentralize this decision-making in 2018. It is important that the tokens are distributed in a gradual way and that they are distributed to strategic institutions and initiatives that can give further value to the network.

In short, because the transaction fees are so incredibly low and the total supply of coins is so incredibly high, the velocity of the tokens is virtually insignificant and though we feel that the Stellar network can completely revolutionize the remittance industry and other vital parts of our economy, there is very little economic case for the tokens to rise in value in the near future.

There is however significant upside potential for the whole cryptocurrency market, and if the total crypto market capitalization were to rise to \$10 trillion an increase of approximately +1,900%, as hypothesized by a [research paper](#) from RBC, and **Stellar** maintained its share of the market, one **XLM** would be worth \$8.55.

Investments Risks

Trading cryptocurrencies can potentially be very profitable as seen in the past, but it is also a very challenging activity that can carry a significant level of risk. Cryptocurrency markets are associated

with high volatility, and **Stellar** is no exception.

Although the technology, concept and use case of **Stellar** is really groundbreaking, we believe it is not completely clear yet what the actual adoption of the network will be and how that will influence the performance of the **XLM** token as an investment. However, developers and money transmitters may find useful utility in using XLM to operate on the Stellar network.

It is important to carefully assess your investment goals, methodology and level of experience before deciding to start investing in a new market. It is also extremely important to diversify and view cryptocurrency as an additional element of your portfolio. Given the high risk associated with this type of asset, it is recommended not to allocate more than 20% of your portfolio into cryptocurrencies. Given that the possibility to lose a part or even all the money invested exists, it is extremely important to invest only money that you can afford to lose.

In any case, all the information presented in this Market Report does not constitute financial advice, and introduces no obligation or recommendations for action.

Technical Analysis



Exhibit 1: Evolution of **XLM/USD** price since February 2017. Note that the scale is **logarithmic**.

Exhibit 1 shows the historical evolution of the **XLM/USD** price since February 2017 (when it was trading at less than a cent, \$0.0021) until June 2018, trading now around \$0.294. This spectacular 14,000% rise has made **Stellar** one of the most successful projects in the cryptocurrency environment, although it reached an all-time high value of \$0.933 in January 2018. Please note, that we have used a log-scale graph, which is very popular for showing relative percentage movements.

Since the aforementioned all-time high of \$0.933, **XLM** has experienced a severe correction of 68.7%. Like the vast majority of cryptocurrencies, **XLM** is strongly dependent on the price evolution of

Bitcoin, and it also follows quite closely that of **Ripple**, something that could be expected given the origins of **Stellar** and their similar use cases.

An evolution of the price during 2018 is shown in **Exhibit 2**. A clear downtrend from January to the beginning of April brought the price down to \$0.16. **Stellar** then doubled in price quickly during April and has now corrected and found a relatively stable value around \$0.30. A clear descending wedge was broken in the last week and **XLM** seems to have found a rather solid support which could act as a starting point for an uptrend in the short and mid-term. Its evolution will however depend greatly on how **Bitcoin** performs.

Exhibit 2 also shows a comparison with **Bitcoin** and **Ethereum**. **Stellar** rose dramatically in the lapse of just a few days in January 2018 when compared to the two

main cryptocurrencies, but has since followed quite closely the major trends of the cryptocurrency market.



Exhibit 2: Percentual evolution of **XLM/USD** price since December 2017, compared with **Bitcoin** and **Ethereum**. A descending wedge forming during May is also shown.

Resources

- [On Worldwide Consensus: Summary of the Stellar Consensus Protocol](#)
- [Stellar Network Stats](#)
- [David Mazieres: Stellar Consensus Protocol](#)
- [Adventures in Galactic Consensus: A graphic novel explaining the SCP](#)
- [Stellar Consensus Protocol Whitepaper](#)
- [What Stellar Lumens Teaches Us About Token Economics](#)

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