



# Payment Infrastructure for Digital Assets

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## Abstract

Southeast Asia, home to over 600 million, aspires to triple its digital economy to \$240 billion by 2025.<sup>1</sup> This tremendous anticipated growth will require significant improvements in the existing financial infrastructure in the areas of settlement time, interoperability, and transparency.

In this V1.1 of the StraitsX whitepaper paper we introduce both the StraitsX initiative and the StraitsX SGD (XSGD) token, a digital token that is fully backed, one-for-one with the Singapore Dollar (SGD) - one XSGD represents one SGD. We describe the benefits, the use cases and the governance and oversight framework that enable StraitsX tokens to function as the improved model for ASEAN fiat currencies, hence empowering both individuals and institutions within the region.

This whitepaper will be updated by the StraitsX team at Xfers as and when StraitsX issues new stablecoins representative of and denominated in other ASEAN fiat currencies in the future.

## About Xfers

Founded in 2015, Xfers is Southeast Asia's leading Fintech platform for digital businesses, enabling financial access within Southeast Asia. It boasts a range of last-mile financial rails including Xfers Send, Xfers Accept, Xfers Wallet. Today, Xfers and its partnering merchants processed over US\$800 million for over 10 million unique active users across Singapore and Indonesia in 2020 alone. In Singapore, Xfers is the holder of a [Major Payment Institution license for e-money issuance](#) under the Payment Services Act. In Indonesia, Xfers connects online businesses to a range of payment methods which include bank transfers, e-wallets and offline channels such as agent banking networks and convenience stores. Xfers is backed by Y-Combinator, Quest Ventures, Golden Gate Ventures among many others. Xfers works closely with regulators to ensure that all its products and services are fully compliant with the highest regulatory standards. For more information, visit: <https://www.xfers.com/>.

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<sup>1</sup>Rajan Anandan, Rohit Sipahimalani, Samuele Saini, Srikanth Aryasomayajula, Well Smittinet, "Google-Temasek e-Conomy SEA report", <https://www.thinkwithgoogle.com/>, November 2018, <https://www.thinkwithgoogle.com/intl/en-apac/tools-resources/research-studies/e-conomy-sea-2018-south-east-asias-internet-economy-hits-inflection-point/>

## 1. The StraitsX initiative

StraitsX is the first stablecoin initiative with a focus on Southeast Asia. The initiative explores the migration of centralized ledgers which document fund flows onto distributed ledger technology (DLT), thus enabling a leap forward in speed, security and transparency for settlements within the region. By adopting a DLT-enabled ledger for Southeast Asia, the StraitsX initiative allows participants to transact using trusted and secure tokens that are one-for-one collateralized and denominated in their native ASEAN fiat currencies. StraitsX tokens are governed under the trusted oversight of local regulators and independent third-party auditors; these authorities ensure that every token issued by StraitsX truly represents its corresponding ASEAN currency. For instance, every XSGD token is fully collateralized one-for-one by Singapore Dollar (SGD) and can be redeemed for one SGD.

### 1.1 Why StraitsX

StraitsX's fully collateralized one-for-one stablecoins improve on the existing model of money. Money in most modern societies performs three main functions: unit of account, store of value, and medium of exchange. Through enabling users to convert fiat money seamlessly into widely accepted DLT-enabled digital tokens, StraitsX improves on these three key functions of regular money for ASEAN markets.

#### *1.1.1 Stablecoin as a Unit of Account: Enable DLT technology for ASEAN currencies*

Today, most active stablecoins are denominated in US Dollars. As of May 2021, 94% of active stablecoins in circulation are USD denominated and represent north of \$95 billion in cumulative value<sup>2</sup>. StraitsX believes that this current state is not representative of users' ultimate preferences but rather due to a lack of trusted and compliant alternatives denominated in other fiat currencies. StraitsX, with Xfers' strong presence in Singapore and Indonesia and its high level of regulatory compliance, is well positioned to enable and issue trusted stablecoins denominated in ASEAN currencies. As the new standard for instant settlement in the region, StraitsX tokens will play a significant role in empowering Southeast Asian-based individuals and institutions.

#### *1.1.2 Stablecoin as a Store of Value: Deliver Stability for Consumer Protection*

StraitsX tokens are fully collateralized one-for-one with their respective ASEAN fiat currencies, which means that StraitsX holds fiat money in its reserve for an amount equivalent to the amount of tokens in circulation. To ensure that the full collateralization nature of StraitsX's tokens is

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<sup>2</sup> CryptoSlate, "Stablecoin Coins", May 2021, <https://cryptoslate.com/cryptos/stablecoin/>,

maintained over time, StraitsX performs an internal daily reconciliation and its accounts are audited on a monthly basis by a reputable independent third-party audit firm.

Customers can mobilise the StraitsX tokens through various ways. The tokens can be purchased and redeemed one-for-one for their corresponding ASEAN currencies directly through the Graphic User Interface (GUI) on the StraitsX platform within one business day for all customers. The tokens can also be purchased and sold through the intermediary of StraitsX's partner merchants network. In the near future, StraitsX also plans to offer its merchant partners the StraitsX T0 instant settlement feature through private API connectivity upon request.

The combination of full one-for-one collateralization, availability and redeemability provides a simple and easy to understand model in which one unit of tokenized fiat currency represents one unit of fiat held in reserve. StraitsX has selected this approach after extensive review and research, whereby this approach currently provides the most appropriate mechanism to both maintain price stability with the underlying asset and comply with local regulations for user protection.

### *1.1.3 Stablecoin as a Medium of Exchange: Fast, Secure & Transparent Settlements*

Distributed Ledger Technology (DLT) eliminates the need for a central authority or intermediary to process, validate or authenticate transactions. StraitsX tokens are DLT-enabled extensions of the Xfers Wallet transactions ledger, which provide its holders with the additional security and transparency benefits of open and immutable cryptographic proof of consensus. In addition, because of their digital decentralised nature, StraitsX tokens are available 24/7 from anywhere in the world and can be mobilised within seconds. This equips holders with instant settlement capabilities across time and space.

StraitsX believes that due to the combination of these unique native characteristics StraitsX tokens improve on the widely accepted functions of regular fiat money in significant ways. StraitsX tokens will become the de facto settlement option for transactions denominated in ASEAN currencies.

## **1.2 Use cases**

Thanks to their ability to enable frictionless settlement, stablecoins have many widely accepted potential long-term use cases.

Stablecoins currently in circulation are primarily used as a means of payment for other digital assets. StraitsX anticipates that early adopters of StraitsX tokens will be cryptocurrency exchanges in Asia. Broad adoption of the StraitsX tokens by digital assets markets in Asia will then enable StraitsX to explore other potential use cases at scale including payments and remittances.

### *1.2.1 Digital Assets Settlement & Cryptoexchanges*

Most transaction settlements for Digital Assets involve fiat currencies for at least one the legs, either in the form of actual fiat, or more predominantly in the form of stablecoins. The strong predominance of USD denominated stablecoins to settle transactions in crypto-markets puts ASEAN institutions at a disadvantage due to forex risk, conversion fees and liquidity shortages. Moreover, StraitsX believes that USD denominated stablecoins generally do not offer adequate user protection measures to its ASEAN-based users. The underlying fiat assets for these tokens are generally stored in foreign banks, overseen by foreign institutions if any, hence providing little to no insurance to the foreign-based holders about the ways assets might be redistributed in the event of default.

The StraitsX initiative puts ASEAN-based institutions and individuals back at the center of crypto-markets by providing stablecoins that enable markets denominated in their national currencies.

### *1.2.2 Payments & Micropayments*

During the past decade, the exponential growth in smartphone ownership everywhere in the world has enabled mass adoption of different mobile e-wallets and digital payment is already a reality for many users. However a major challenge faced by fintech platforms is interoperability due to the limits of the centralized ledgers design brought about by walled garden business models. For instance, a Venmo user is unable to send funds to friends using other e-wallets such as WeChat or GrabPay, and the same phenomenon is observed across systems used by merchants. Another limitation of fiat based digital systems commonly used today is the number of available decimals, using the cent as the smallest unit of account in most cases. This limitation prevents the effective settlements of transactions for a fractional amount of cents from taking place.

Migrating centralised ledger onto Decentralised Ledger Technology (DLT) addresses these two limitations at once. First, StraitsX native tokens run on open-sourced protocols, hence are interoperable between different systems that can all communicate and exchange information between each other. Second, all StraitsX tokens are counted out to six decimal places, thus enabling micropayments. This feature may prove extremely useful for implementation of IoT systems that can settle with each other small amounts corresponding to the respective value they provide in a given economic system.

### *1.2.3 Remittances*

Remittances is another sector where the wide acceptance and usage of DLT-enabled stablecoins such as StraitsX tokens could have significant benefits. Foreign exchange markets today are particularly inefficient and are characterised by the billions required to be locked in as collateral. Enabling instant cross-border settlement through the use of stablecoins in forex

markets could both free up this significant amount of locked capital while removing most cross-border transaction fees, allowing global commerce and trade to be cost-efficient and hence flourish.

## 1.3 Oversight

StraitsX believes that high levels of regulatory compliance and oversight are required to enable users' trust in centrally-issued stablecoins. With this belief in mind StraitsX intends to operate its products with the highest level of transparency, independence and regulatory oversight.

### *1.3.1 Regulatory environment*

In Singapore, Xfers is one in four Major Payment Institution (MPI) licensed for e-money issuance services. Such MPIs provide any combination of regulated payment services, regardless of transactional volume or e-money held while safeguarding their customer's funds with an approved bank. XSGD is the DLT-enabled representation of the stored value in Xfers Wallet.

### *1.3.2 Independent third party audit*

The compliance with the one-for-one collateralization nature of StraitsX's native stablecoins is ensured through daily reconciliation by the StraitsX team and is audited by a reputable independent financial audit firm.

The security of the code for StraitsX's native tokens smart contracts has been audited by independent and widely recognized smart contract security third-party auditors.

### *1.3.3 Anti-Money Laundering & Transactions Monitoring*

StraitsX has engaged international blockchain intelligence and data surveillance third-party firms to provide the most technologically advanced anti-money laundering and onchain transaction monitoring tools, datasets and procedures to StraitsX's compliance teams.

## 1.4 Technology

StraitsX is a blockchain agnostic initiative aiming to leverage the available technology that is most likely to bring value and accessibility to the StraitsX token holders. As such, StraitsX recognizes that the various public open blockchain protocols available today offer different levels of performance in the areas that matter most, such as decentralisation, immutability, speed, scalability, governance, transparency, interoperability, adoption or cost of use. For this reason the StraitsX-issued tokens will run on blockchain protocols that offer the best of breed across these categories as assessed by the StraitsX team. It is likely that over time StraitsX will roll out its native stablecoins on an increasing number of blockchain protocols while StraitsX reserves

the right to retire smart contracts in the event that some protocols do not perform as intended. In the event that StraitsX decided to retire smart contracts it would always guarantee 1:1 conversion to token holders on the StraitsX platform.

## 1.5 Project Roadmap

XSGD is the first native StraitsX token on the StraitsX roadmap. XSGD is the first digital token that is fully collateralized one-for-one with the Singapore Dollar (SGD) and represents one SGD. StraitsX intends to leverage this experience with XSGD as a compliant and trusted stablecoin issuer to then replicate it at scale in various other jurisdictions in the ASEAN region. However, StraitsX will remain attentive to regulatory developments in various jurisdictions and reserves the right to update its token issuance roadmap on its own accord.

## 2. The XSGD token

StraitsX SGD (XSGD) is the Singapore Dollar Stablecoin. The XSGD token is fully collateralized one-for-one with the Singapore Dollar (SGD) and represents one SGD.

### 2.1 Product features and benefits

The XSGD token was designed by the StraitsX team for utmost efficiency and simplicity. XSGD tokens will always be convertible one-for-one with Singapore Dollar (SGD) on the StraitsX platform. Below is a comprehensive list of the features and benefits enabled by XSGD:

- **Convertibility:** XSGD will always be convertible 1:1 for SGD on the StraitsX platform within one business day, thus guaranteeing the appropriate peg in value of the token to the underlying fiat currency (SGD).
- **Availability:** XSGD will be available 24/7 and can be sent anywhere in the world in a matter of seconds.
- **Storability:** XSGD can be stored with any wallet or third party custodian supporting the open blockchain protocols it runs on.
- **Accessibility:** XSGD will be made available on selected digital payment tokens (DPT) service providers that StraitsX has partnered with, including some of the largest crypto exchanges in the world.



## 2.2 Supported blockchain protocols

### 2.2.1 Zilliqa

XSGD tokens has first been issued as a [smart contract on the Zilliqa public blockchain](#), following the ZRC2 protocol. Zilliqa is a scalable, secure and decentralized public blockchain platform with smart contract features. It is the first public blockchain platform to implement sharding, a mechanism to divide the network into smaller sub-networks that can process transactions in parallel, hence yielding a much higher transaction throughput.

Zilliqa as a protocol has several desirable properties that makes it a platform of choice for StraitsX to implement its stablecoin ecosystem on. These properties are presented in greater detail below:

- **Scalability:** Zilliqa's sharded architecture is designed to leverage parallelization. Running as a private testnet, Zilliqa reported a throughput of over 2000 transactions per second with 2400 nodes, which is two orders of magnitude greater than state-of-the-art platforms. Zilliqa is designed such that it is able to scale almost linearly with the number of sub-networks, ensuring future proofness as Zilliqa can continue to grow to meet the demands of a growing Stablecoin network.
- **Security:** Zilliqa employs a standard *Practical Byzantine Fault Tolerance (PBFT)* protocol to ensure that the network can reach consensus on valid transactions and reject invalid or fraudulent ones. The PBFT protocol works under the assumption that the network has a super-majority of honest nodes (i.e.,  $> \frac{2}{3}$ ) and hence can tolerate upto  $\frac{1}{3}$  of malicious nodes. In a situation whereby the number of malicious nodes goes above  $\frac{1}{3}$  but is still less than  $\frac{2}{3}$ , the network will only stall and hence will not process any invalid transaction. Zilliqa's protocol therefore trades-off availability for security under severe attacks.
- **Transaction Finality:** Zilliqa's use of PBFT as the underlying consensus protocol gives finality to the consensus decision. Compared to the more widely used Nakamoto consensus (used in Bitcoin and Ethereum) where the agreement is only probabilistic, transactions in Zilliqa are final and hence require no confirmation to protect against double spending attacks.
- **Safe-By-Design Smart Contract Language:** Smart contracts are essential to implementing a trusted stablecoin system. To this end, Zilliqa provides a safe-by-design smart contract language named *Scilla* which addresses many known security vulnerabilities in existing languages. Scilla is designed in accordance with functional programming language principles and provides a balance between security, scalability and tractability, enabling formal reasoning about contract behavior. This means that developers are able to easily ensure that their smart contracts work as intended and will not misbehave once deployed.

These combined characteristics ensure that users can expect XSGD (ZRC2) tokens to have high velocity, to be safe from hacks and programming errors and to be interoperable with the Zilliqa ecosystem.

### 2.2.2 Ethereum

Following the release of the XSGD smart contract on Zilliqa, StraitsX has released an ERC-20 version of the [XSGD smart contract running on the Ethereum protocol](#). Ethereum is currently the most widely used, global, open-source platform for decentralised applications. The release of the XSGD (ERC-20) token will improve on XSGD's interoperability through enabling it to grow at scale within the most widely adopted smart contract open platform.

## 2.3 Minting, Redemptions and Transfers

Minting, redeeming and transferring XSGD tokens will be available to users through different channels:

- **Mint & Transfer XSGD directly through the StraitsX Platform:** Users will be able to top up their XSGD wallet directly with the SGD available in their Xfers Digital Goods Wallet followed by initiating a withdrawal for the desired amount of XSGD tokens. Minting and transfers through this channel will be processed once every business day by the StraitsX team thus ensuring T+1 settlement.
- **Redeem XSGD directly through the StraitsX Platform:** Users will be able to top up their XSGD wallet directly with XSGD tokens by sending their tokens to their designated redemption address, followed by initiating a redemption for the desired SGD amount. Redemptions through this channel will be processed once every business day by the StraitsX team thus ensuring T+1 settlement.
- **Swap XSGD between blockchains through the StraitsX Platform:** Users will be able to swap XSGD (ERC-20) for XSGD (ZRC-2).
- **Transfer and Exchange XSGD through StraitsX's private APIs:** StraitsX will offer to its partners the possibility to gain access to StraitsX's T0 instant settlement feature through private API connectivity upon request.