STP Network

The Decentralized Digital Asset Platform

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Abstract

In this paper, we present STP Network, a decentralized platform for digital asset issuance powered by the STP token, a new smart contract protocol framework for compliant offerings. By issuing a permissioned token (STPT) on the Ethereum blockchain, STP Network ensures that compliance considerations are met at the token level through each STP token's adherence to the Compliance Validator restrictions. STP Network enables the movement of digital assets in a globally compliant manner.

1. Problems with Traditional Options

The cost-effectiveness of issuing private securities, as opposed to issuance via a public offering, generally appeals to companies exercising an initial or follow on offering of stocks or bonds. However, the issuance and secondary trading of privately issued securities requires middlemen, exchanges, and brokers in a highly manual and expensive process that places a high regulatory risk on the issuer. To minimize the regulatory risk and simplify the manual process of private security issuance and trading, many restrictions are typically imposed on the asset such as limits on the number of investors, type of investors, concentration of investors, holding period of investment, etc. The consequence of these restrictions is that private securities are much less liquid than public securities. Because of this illiquidity, the price of private securities is discounted by what is known as the "Illiquidity Discount," often 20-30% below the asset's true market value, hurting issuers and sellers while adding unnecessary risk for buyers.

Many Securities Exchanges are building their platform using blockchain(eg.The Australian Securities Exchange is notably rebuilding its ageing CHESS settlement platform using blockchain tech provided by Digital Asset. And other stock exchanges, including in Jamaica, Thailand and Spain, have also announced initiatives around blockchain and crypto assets.) STP can provide a new standard tokenization protocol that those tradition securities exchanges can easily implement on.

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2. Advantages of Digital Assets

Utility tokens are required for the use of the product or service provided by their associated network. One cannot interact with the Bitcoin blockchain without bearing ownership of a unit of the native token. This is fundamentally different from a share of stock, which one is able to own without interacting with the underlying product (e.g. Facebook shares are not needed to access the Facebook app). Security tokens, on the other hand, are simply a digital representation of legal rights or ownership of an asset - standard investor protections apply. When discussing Security Tokens, however, many reflexively cite William Hinman's SEC commentary (U.S. SEC, 2018)[2] which drew a distinction between "Utility Tokens" (sufficiently decentralized and therefore legal) and "Security Tokens" (everything else). The implication became that Bitcoin and Ethereum were the only true utility tokens and implied everything else was not. What often gets lost in the noise, however, is that this use of the term "Security Tokens" referred only to *unregistered* securities offerings, which are illegal by nature. Too many projects and investors still equate "Utility Token" with "legal" and "Security Token" with "illegal". To avoid this confusion, STP Network will refer to regulated offerings, meaning the digital representation of traditional assets (equity, real estate, etc.) to enable certain previously impossible features using blockchain technology. These features include smart contract programmability (reducing the number of third parties for issuers, thereby lowering costs for investors) and automated compliance (increasing assurances for investors while reducing costs for issuers). With this in mind, one can view STP as simply the compliant standard of a digital asset. This enables benefits that have previously been impossible, several of which are outlined below.

2.1 Programmability

Programmable money is a feature that is central to blockchain-native assets and entirely absent from traditional financial alternatives. The ability to program value to move from one person or entity to another if and only if certain conditions are met has enormous potential to create value and dramatically lower operational costs. A simple first example would be a share of stock that distributes a percentage of its net income as a quarterly dividend to its token holders if its quarterly net income is positive. Pre-programming this dividend feature into that entity's STP-Standard token would significantly reduce the manual and labor-intensive process of issuing quarterly dividends. A slightly more complex example could be tokens that convert between equity and debt-like instruments based on predefined parameters. And because of the STP-Standard's token-level compliance capability, programmable features such as automated onchain fundraising are now possible where investors send funds into an STP-Standard smart contract which verifies compliance with the project's parameters and issues the new token to investors who meet the requirements and refunds capital to investors who do not. The transparency of the public blockchain will allow anyone to confirm the protocol is functioning correctly.

2.2 Fractional Ownership

Fractional ownership of historically valuable assets such as fine art, stamps, wine collections, antique cars, and so on will open up new asset classes to the average investor and make possible smaller investable amounts. As an example, purchases in the art world are typically conducted through a private

[2]https://www.sec.gov/news/speech/speech-hinman-061418

auction process as opposed to a public market process, resulting in single ownership (one owner per asset) instead of fractional ownership (many co-owners of the same asset). For something like the Mona Lisa, an auction market's single ownership would essentially represent one "Mona Lisa share" worth $800m (William George & Co., 2018)[3], whereas market-based fractional ownership could potentially represent 10 million "Mona Lisa shares" worth $80 each. Because there are far more people on Earth who can afford to spend $80 to own a famous work of art, a more liquid market of buyers and sellers would emerge, making trades faster and cheaper. Compare this with the slow and expensive illiquid method today of having to search for a single buyer both willing and able to spend $800m to purchase the painting.

Another problem solved by fractional ownership is the Orphan Zone. This is what happens to assets which are simultaneously too large to attract individual investors and too small to attract institutional investors. These Orphan Zone assets will often be advised to either discount their price until they become attractive to smaller investors or else wait (often several years) to grow into a valuation large enough to attract institutional investors. Fractional ownership allows investments of $100 and $100m to sit next to each other on the cap table, making it more difficult for an asset to fall into the Orphan Zone.

2.3 Increased Liquidity

Liquidity is one of the most important characteristics of well-functioning markets. Simply put, liquidity is the willingness of prospective buyers to purchase an asset, and the willingness of prospective sellers to sell an asset. Liquid markets provide traders the ability to trade large size quickly, with minimal transaction costs, when they deem it prudent to do so, whereas illiquid markets make it difficult to build exposure or exit positions in an efficient manner.

Liquidity is the object of a bilateral search in which buyers look for sellers, and sellers look for buyers. When a buyer finds a seller who will trade at mutually acceptable terms, the buyer has found liquidity. Likewise, when a seller finds a buyer who will trade at mutually acceptable terms, the seller has found liquidity. This interplay between supply (sellers) and demand (buyers) is referred to as "price discovery," and is ultimately responsible for setting the spot price for an asset.

As referenced in the Mona Lisa example from Section 2.2, fractionalization can facilitate more favorable liquidity on behalf of buyers and sellers, thus allowing them to transact in a frictionless manner. To be clear, it is not the tokenization process itself that deepens liquidity pools, but the increase in potential buyers and sellers *enabled by the fractional ownership feature of tokenization* that deepens liquidity pools. Because investors of illiquid assets take on the risk of not finding a buyer when they want to sell, they must be incentivized with a discounted price, known as the "Illiquidity Discount." This discount applies to all illiquid assets and is estimated to be as high as 20-30% of the assets' true price. Through the process of tokenization, markets for previously illiquid asset classes can be optimized, and value currently trapped in the illiquidity discount can be unlocked.

[3]https://wgandco.com/journal/antiques-artwork-collectibles/how-much-is-the-mona-lisa-worth-

2.4 Peer-to-Peer Transfer

At the core of the blockchain ethos is the principle of disintermediated transfers of asset ownership. The STP-Standard upholds this as a core tenet, enabling direct, peer-to-peer token transfers with no third party involvement. The onchain Compliance Validator confirms that these transfers are executed in accordance with the pre-programmed rules of the issuer and/or regulator. In this way, the STP-Standard ensures parties are able to directly transact with each other while ensuring compliance is upheld at the token level. This feature is not possible in the traditional financial world, and is a core feature of the STP-Standard.

2.5 Automated Compliance

Traditional securities compliance as it exists today is a highly manual process of confirming KYC, AML, and accreditation status with legal guidance only in the jurisdiction of issuance, and does little to prevent non-compliant trades, often leading to expensive arbitration occurring years thereafter. However, the level of transparency provided by tokenization enables brand new features such as real-time capitalization tables benefitting issuers, auditors, and compliance teams. Tokenized asset compliance confirms legal compliance at all times, provides clear legal guidance for all jurisdictions included in the protocol and includes the preventative rejection of non-compliant trades via the token's code. This represents a fundamental shift from reactive to proactive compliance which was not possible before regulated STP offerings.

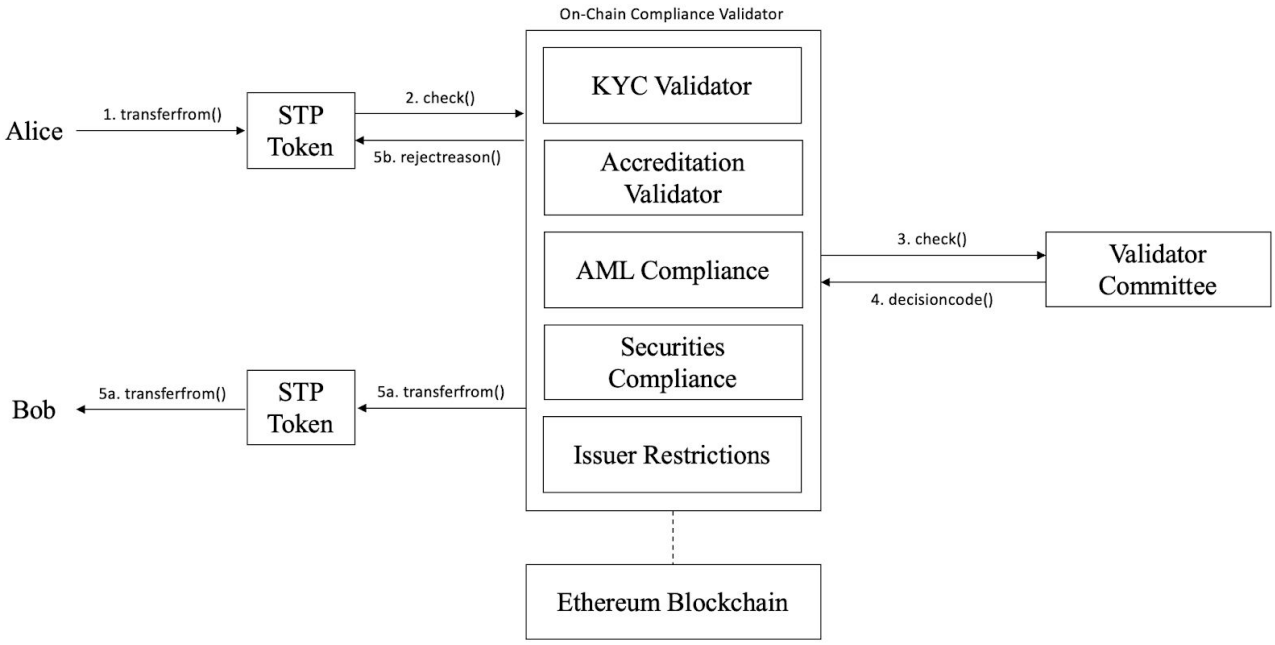
2.6 New Financial Product Possibilities

The compliant tokenization of assets also enables the creation of brand new financial products. For example, using the STP-Standard to tokenize ownership of a valuable wine collection would enable the owner to use that STP-Standard token as collateral for an onchain loan. This example use case further unlocks value trapped in historically valuable assets and allows it to be put to work in other ways. Additional digitally-native financial products are being explored and launched as this space matures.

3. STP-Standard

STP Network's STP-Standard is an open-source standard that defines how ownership of tokenized assets are generated, issued, sent, and received while complying with all necessary regulations. Everything built on top of the STP-Standard will use the protocol's on-chain Compliance Validator to verify compliance with relevant regulations (in the below example this includes KYC, AML, Accreditation, etc.) as well as any issuer-specific requirements (i.e. ownership concentration, holding periods, voting). The Validator Committee will serve an advisory function to ensure the Compliance Validator is enforcing the most up-to-date legislation at all times. STP Network allows assets the freedom to move across jurisdictions and platforms in a way that is fully compliant across jurisdictions and platforms.

A depiction of the main STP Network functions is provided below:



Alice sends 10 STPT to Bob. First, a request is sent to the Compliance Validator for confirmation that Bob has successfully passed KYC checks, is an accredited investor, is compliant with the appropriate AML regulations, and will not be breaking any issuer-imposed restrictions by accepting the tokens (i.e. majority ownership rules). If any of the conditions are not met, Alice receives a reject reason. Otherwise, Bob receives the 10 STP tokens.

3.1 Compliance Validator

The on-chain Compliance Validator serves two main functions: Jurisdictional Compliance and Issuer Compliance. First, it must ensure adherence to the respective laws of the jurisdictions included in the protocol's code; second, it must ensure compliance with the parameters and restrictions imposed by the issuer prior to the issuance of the asset.

3.1.1 Jurisdictional Compliance

For tokenized assets subject to existing regulations (for example, a token constituting a security under a specific region), certain jurisdictional requirements must be met in order to avoid public filing requirements. As an example, a jurisdictional restriction may be imposed limiting the number of investors allowed to participate in the initial offering. While compliance verification of this type of jurisdictional regulation has traditionally been a highly manual and human capital-intensive process, the STP Compliance Validator simplifies and expedites the verification process in a provably compliant way.

3.1.2 Issuer Compliance

Absent any jurisdictional restrictions, an issuer may desire specific restrictions on their token's issuance and transferability. For example, the issuer of a digital asset with a "one token, one vote" governance model may wish to ensure that no one investor can own greater than 49% of the outstanding token supply at a given time, even if 100% of the token supply is in circulation. This is another task at which the STP

Compliance Validator's onchain compliance automation is well-equipped to handle. There are countless other issuer-specific features programmable via the STP Token Standard including common ones such as fixed lock-up periods, minimum and/or maximum investment amount, and limitations by accreditation status.

Jurisdictional and issuer-specific requirements together comprise the Compliance Validator which itself is the core of the STP Token Standard, ensuring provable compliance of both types is met at the token level with every trade.

3.2 Token Holder-Elected Validator Committee

In order to ensure the protocol is enforcing compliance of the most up-to-date regulatory standards at all times, an initial committee will be established to validate operational accuracy. It will be comprised of a token holder-elected group including but not limited to the industry's leading thought leaders, advisors, securities lawyers, and regulators across jurisdictions to make sure any changes in the regulatory landscape are reflected in the protocol. For the provisioning of their services to the STP Network network, the Validator Committee will be compensated by the network with the network's native token, STP.

3.2.1 Service Providers

In the case of enforcing issuer-specific parameters, these committees will be comprised of individuals and/or institutions which token holders believe will ensure the proper structuring of the offering and maintain the Compliance Validator. For example, prior to initial issuance, the majority token holder would likely be the project itself which may vote to elect a Validator Committee that includes the underwriter and the listing exchange in order to ensure proper structuring of the offering. As the token supply becomes more distributed over time, the token holder community may elect others onto the Committee in order to uphold the issuer-specific parameters.

In partnership with the Validator Committee, issuers and Validators may elect to include certain service providers to establish credibility and reliable network functioning. This may include digital identity solutions such as Civic, Uport, Ontology, Bloom ID; crypto-focused or traditional KYC/AML third parties like Onfido, Argos-Solutions, Identity Mind Global, and Shufti-Pro; and/or various blockchain compliance companies including Ciphertrace, Chainalysis, Coinfirm, and the Blockchain Transparency Institute.

4. STP Token

STP Network's platform token (STPT) will serve as an incentive structure that aligns all participants and strengthens the overall network. The token will be necessary for the proper functioning of the network and have the following utility:

4.1 Issuance Fee

Issuers can use STP Network to fractionalize legal ownership of their assets or features of their assets including provisioned resources, profits, etc. by creating STP-Standard tokens corresponding to a certain percentage of ownership. These tokens built on top of the STP Network STP-Standard will conform to the global regulatory framework embedded in the Compliance Validator, thus removing the burden of compliance from the issuer. For this tokenization process to occur, issuers will pay an initial issuance fee to the STP Network, denominated in STPT, to initiate the tokenization of their asset. Any issuer-specific requirements, parameters, and rules around token transfers will be implemented by STP Network into the Compliance Validator as part of the initial issuance fee.

4.2 Compliance Validator Gas

In order for the Compliance Validator to execute verification that both sides of a transaction (sender and receiver) comply with all necessary jurisdictional and issuer-specific requirements, a certain amount of Gas is needed. Gas is a small amount of an STPT token that is used by the smart contract to incentivize validators to prove that a transaction meets the CV requirements. To enable this, senders of any STP-Standard token will need to use some amount of STPT tokens as Gas to power the Compliance Validator when a transaction occurs. This Gas is then pooled and paid out to stakers and Regulatory Committee members as a reward for honest network behavior.

4.3 Staking

In addition to the prior two use cases of the STPT token, the network also enables a Proof of Stake mechanism that allows token holders to stake and earn STPT. Specifically, token holders stake an amount of STPT proportional to their confidence that all Compliance Validator requirements are met, and they either earn Compliance Validator Gas tokens in return as a reward for honest behavior or else lose their stake to reward honest stakers.

4.4 Governance

Token holders who desire to stake their STPT tokens will do so by delegating their stake to a token-elected Validator Committee. The validators who comprise this Committee will earn STPT for submitting publicly auditable proof that the Compliance Validator matches the laws of their jurisdiction or is otherwise functioning properly. Given the rational behavior of STP token holders, they will seek to delegate their stake to credible advisors, partners, and authorities of their market segment or jurisdiction such as securities lawyers, regulators, and legislators in order to protect their stake. The Validator Committee STPT rewards should incentivize these groups to participate in a meaningful way and become integral participants of the STP network.

5. Network Rewards

Below is an articulation of the ideal token reward allocation formula for the STP network assuming no restraints on computation. Here, STP_{cs} is the amount of STPT rewards given to contributor c for service s, prior to any normalization of all contributors and services ($STP_{cs,norm}$).

$$STP_{cs} = \log_{10}(V_{cs}) * \log_{10}(Q_s) * STP_c$$

$$STP_{cs,norm} = \frac{STP_{cs}}{\sum_c \sum_s STP_{cs}} * M$$

S_{cs}	=	Contributor *c*'s stake in service *s*, in STPT tokens
Q_s	=	Quantity of service *s* contributions to the network within a single time interval
STP_c	=	Percentage of contributor *c*'s database accessing vs. serving up
M	=	Maximum amount of STPT tokens distributed within a single time interval

The first term $\log_{10}(V_{cs})$ reflects the contributor's confidence in the popularity of the dataset. As in curation markets, contributors may stake greater than the minimum amount if they have high confidence in their data and receive more STPT accordingly. This reward structure incentivizes Validators to submit accurate and relevant datasets to the network and earn STPT in return for their contributions. Using $\log_{10}$ on curation market stake levels the playing field with respect to large token holders, so they are incentivized to make a greater number of data contributions.

6. STP Ecosystem

To better understand the unique capability of STP to add value in this space, it is important to note the differences between this new decentralized asset class and traditional finance. In a decentralized ecosystem, network effects are fundamental to any project's success. In the early stages, community engagement is achieved by injecting traffic from traffic owners such as exchanges, wallets, investment banking firms, and similar retail-focused platforms. Traditional assets, on the other hand, are relatively indifferent between one large owner vs. many small owners. Concentration matters less when the business model doesn't rely on community-based network effects. However, for digital assets to succeed, they require widespread token distribution, not high concentration. This is not only in-line with the blockchain community's ethos of decentralization, but also helps spur the necessary network effects critical for a token's chance of success. The best token distribution models for projects optimize for wide distribution among many participants.. The STP ecosystem will develop to facilitate this through its protocol and existing network of key players in this environment.

6.1 Competitive Advantages

6.1.1 Experience:

STP's leadership team has many years of experience in both the traditional finance and blockchain industries. The combination of investment banking experience and a deep understanding of digital assets enables the application of operational professionalism to the emergent asset class of blockchain-based products. Over the last few years, the team has worked directly with many renowned blockchain projects including Aelf, Algorand, Basic Attention Token, Decentraland, Hedera Hashgraph, Ontology, Theta, Zilliqa, and many others. In addition to its existing relationships with blockchain projects, the team also

has existing strategic relationships with global exchanges (Bitfinex, Bittrex, BitMax, Huobi, etc.), top blockchain media (Coindesk, Cryptobriefing, BlockInPress, JingSe, etc.) and crypto investment funds (FBG Capital, GBIC, NEO Global Capital, etc.)

6.1.2 Global Presence:

Additionally, the STP team is globally decentralized with multiple hubs in the major cities of key blockchain regions such as China, Korea, and the United States. STP also has a growing presence in various other emerging markets such as Russia, India, and Southeast Asia which will allow for those regions to participate in the STP Ecosystem in a meaningful way. Over the past several years, the team has hosted countless offline hackathons, meetups, and annual conferences as well as online AMAs, live interviews, and more, leading to a large following of blockchain-focused users, developers, and participants. By leveraging its relationships with key industry players and key industry regions, STP will help launch and develop digital assets by providing all the resources necessary to achieve proper network effects and decentralization.

6.2 Use cases

Having built strong relationships with both crypto projects as well as communities, STP Network will utilize its STP token to develop important use cases through its unique position in the blockchain ecosystem. Beginning with the compliant tokenization of new types of decentralized financial products and assets, STP could then embed community building features for projects and their communities to encourage participation, reward active engagement, and maximize awareness. Leveraging its unique industry position, STP could help its ecosystem partners (global media outlets, exchange partners, funds, service providers, etc.) reach the community base they need, while at the same time helping individuals from its massive global following get educated and connected with those same ecosystem partners. The STP token will enable both sides to connect in a trustless, efficient, and incentive-driven way that hasn't been possible before.

7. Conclusion

STP Network sets a new global standard for the issuance of all types of digital assets. The decentralized smart contract platform utilizes the native STP token to ensure that compliance considerations (both jurisdictional and issuer-specific) are met at the token level. Since each STP token adheres to the Compliance Validator's parameters, the burden of regulatory compliance is removed from the issuer and each token interaction can be proven to be compliant with the Validator restrictions. The STP token facilitates the incentive alignment of network participants by rewarding honest actors and stakers with STP tokens for their respective roles in maintaining the integrity and performance of the STP network. STP helps set the standard for a new method of fundraising and issuance that is more transparent, accessible, compliant, and efficient in today's digital world.

APPENDIX

STP Network: Roadmap

November 2018	**STP Network Founded** The concept for a tokenization standard is created when the founders draft an initial idea of token-level compliance aimed at solving the problems of current fundraising options as they exist today.
April 2019	**Whitepaper Release** Version 1.0.0 release of the STP whitepaper, using feedback from key industry players to finalize the concept and lay out the high-level roadmap for the network.
April 2019	**STP Private Sale** During the Private Sale of STPT tokens, 30% of the tokens will be sold, allowing early investors to help bootstrap the network for the next phase of development and engage as network participants.
June 2019	**STP Launch Pad Offering** The Public Sale of STPT tokens is planned for 2Q 2019 on a Launch Pad offering. After token distribution, we will hold the first token-holder election for the STP Validator Committee.
September 2019	**Inaugural Issuance** This will mark the first issuance built using the STP-Standard as well as the beginning of a new global phase of asset tokenization and token-level compliant fundraising. STP Network will look to help any issuer who wishes to tokenize their asset in a compliant manner.
February 2020	**Data Service Provider Partnerships** Build partnerships with global and regional service providers, including legal teams, token advisors, developer communities, regulatory bodies, data analytics platforms, and other groups which may assist in helping issuers meet their needs.
1Q 2021 (est.)	**White Label Offering** Depending on future market conditions, STP Network may work with other exchanges, entities, and token issuing teams to offer all or some services under a whitelabel service. This may be targeted at enterprise and governmental bodies for large scale tokenization projects.

2Q 2021 (est.) **New Financial Products Issuance**
The STP Network team is actively exploring the possibility and potential benefits of issuing new decentralized financial products on its platform. These are assets that are currently being developed and have the potential to be widespread by this time.

STP Network

Team

Mike Chen: Chief Executive Officer
Sinhae Lee: Chief Operating Officer
Richard Lee: Co-Founder
Nathan Montone: Co-Founder

Advisors

Vincent Zhou: Founding Partner at FBG Capital
George Cao: CEO and Founder at BitMax

Strategic Partnerships

GBIC, FBG Capital, Block72, BitMax

Disclaimer

This white paper ("White Paper") is meant to describe the currently anticipated plans of STP Network ("STP Network") for developing a new blockchain token mechanism ("STP Network"), which will be an open source standard that defines a mechanism in which digital assets can be compliantly issued and subsequently transferred on a blockchain (the "STP Network Standard"). Nothing in this document should be treated as a guarantee of how the STP Token or STP Network Standard will develop or of the utility or value of the STP Token or STP Network Standard. This White Paper outlines STP Network's current plans, which could change at its discretion, and the success of which will depend on many factors outside STP Network's control, including market-based factors and factors within the digital asset industry,

among others. Any statements about future events are based solely on STP Network's analysis of the issues described in the document which may or may not prove to be correct.

This document does not constitute an offer or sale of the STP Tokens or any other mechanism for purchasing STP Tokens (such as, without limitation, a "Simple Agreement for Future Tokens" related to the STP Tokens). Any offer or sale of the STP Tokens or any related instrument will occur only based on definitive offering documents for the STP Tokens or the applicable instrument.