Safe Exchange:
A Peer-to-Peer
Decentralized Contract Market Platform
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Abstract

Contract markets have been serving humanity for thousands of years to conduct trade, explore terms and conditions and to settle transactions. While engaging in contracts and markets is a learned or acquired skill, the advancements in technology allow humans to preserve the very nature of contracts and market activity in the form of digital content and data. People are consistently opening their eyes to the benefits afforded by technologies that are distributed therefore reducing operational risks and securing the physical and perceptive location and value defined using modern cryptography. The ideas presented here make up the construct that will allow the entire planet to trade unencumbered and with integrity.

1. Introduction

The Safe Exchange is a platform on which any person can create a digital item and also issue a digital contract. The Safe Network allows a person to store any kind of information and communicate any kind of information with cryptographic integrity. Through a client application a user can define an item's attributes and then later offer that item in a contract to a marketplace where other people can discover, scrutinize, and even fulfill the terms of the contract autonomously without the necessity of a 'trusted third party' to intervene in transactions.

The exchange allows people to store and trade structured data sets called Safe Contracts that permit people to deal with each other based on the terms of a Turing complete digital contract interface. The terms of the contract can be determined at creation and take input from any activity whether referencing other electronic data, manual input by a person or program through a client interface or even external influences from the environment (for example, weather conditions as reported by an external oracle). This

opens up many new possibilities in real-time transaction matching and clearing since the Safe Network storage system highly responsive. These features are essential to the success of any person and enterprise where security free from digital compromise and theft is of utmost importance. The advanced validity and settlement enhance users' experiences because of reduced friction in transactions.

2. Exchange Item

An Exchange Item is a singular object that has simple characteristics. Exchange Items are created by the users of the Safe Exchange and are used to describe digital goods. They can represent real world items because they can store a link to any supporting documentation that is stored on the Safe Network. This means that a person could document a good as a digital object using legal documents and fields as well as images. They can then make decisions about where this item's future and quantity will lead to.

For example:

Dally has a teacup. He uses the Safe Exchange client to define the characteristics of the teacup, gives it a name, writes a description, attaches some pictures, and he confirms the creation of the item by storing this information in its structure to the Safe Network.

An Exchange Item is a data structure that stores the originating information for the item object on the Safe Network:

```
let Dally's Teacup = Item {
name: Dally's Teacup,
description: Fine Porcelain Teacup, made in Turkey
quantity: 1000,
recommended_price: 5.00,
contact: 818 902 9111
brand_name: Dally's Teacups,
keywords: [Nice, Tea, Cups]
documents: Hash of a photo of the teacups,
alias_owner: Dally's_Public_key,
}
```

3. Safe Contract

A Safe Contract allows a person to present the terms of their transaction desires in the form of digital fields. These fields can be populated using digital files, digital directories, digital signatures of varying types, as well as manual input through a client interface. Since the Safe Network is an autonomous data switching network that also accepts data that can be dynamically utilized, this dynamic data type opens the possibility for a person to store data that contains Turing complete elements that are then also executed among clients and the network.

A simple example: Dally has his Item from before of 1000 fine porcelain teacups and wants to sell them using a Safe Contract.

First, Dally will open the client application and select this item from his inventory list. Then he will choose to create a new sell offer for this Item.

Dally would create a Sell Offer which is stored on the Safe Network and can be queried by any other participant of the Safe Exchange market place.

```
let Dally's_Teacup_SellOffer = SellOffer {
item: Dally's Teacup,
alias_owner: (Dally's_Public_key, Dally's_Safecoin_Public_Key),
quantity: 1000,
price: 5.00,
condition: Condition,
}
```

This structure will float a contract that other people can now discover and read what its requirements are. This could be a simple sell offer that will accept 5 Safecoins in exchange for 1 of the 1000 quantities of Dally's Teacup.

Shalla also using the client application will then be able to do a search of all items, and could type in Teacup and find Dally's Teacup among the listings. Shalla, having at least 5 Safecoins can then fulfill the Safe Contract by sending 5 Safecoins (in this case the amount demanded for 1 quantity of the SellOffer's item) to Dally's_Teacup_SellOffer. This will cause Dally to receive 5 Safecoins and since the terms have been met Shalla

will receive an Item in her inventory:

```
let Dally's_Teacup = Item {
name: Dally's Teacup,
description: Fine Porcelain Teacup, made in Turkey
quantity: 1,
recommended_price: 5.00,
contact: 818 902 9111

brand_name: Dally's Teacups,
keywords: [Nice, Tea, Cup]
documents: Hash of a photo of the teacups,
alias_owner: Shalla's_Public_key,
}
```

4. Safe Network

The Safe Network is a peer-to-peer, well-encrypted, well-obfuscated storage Distributed Hash Table network that uses the XOR arrangement of 2^{512} possible Sha512 hashes to represent data and its location. Because of consistently changing keys and 32 group consensus system, data is passed around like ants in a colony, ants geared with cryptographic libraries and client interfaces. It exposes a Network File System that accepts Safecoin in order to store files. The number of Safecoins that exist and the amount of Computer Resources are available per Safecoin determines their value.

If Dally wants to store a white paper on the Safe Network he would use a client application that lets him create an account with the Safe Network, which is a decentralized process through anonymous self-authentication, import Safecoin to the account also from a client application, and then spend Safecoin at the rate based on the size of his white paper and the network will accept the payment of the correct amount of Safecoin at that instantaneous rate of bytes/safecoin.

5. Dealing with Spam

While the Safe Exchange itself does not charge any fees to its users. It does require that users who are making items and contracts have some Safecoins on hand in order to

handle the costs to PUT and POST to the Safe Network. This also puts a limit on the amount of spam or irrelevant Items and Contracts that are put to the network since all participants have to somehow first obtain some Safecoins and then expend them as they find utility with the exchange. Although the cost to transact will be small, at least the initial hurdle will hinter excessive spam and any large scale spam attempts are thwarted by increasing costs as each new contract sale and each new item creation moment requires the payment to store their data to the network.

6. Friends

Data on the Safe Network can be shared publicly outright to all people and also directly to a singular recipient. Therefore, the Safe Exchange platform incorporates the ability for an exchange alias account to store an address book of friends. This means that Safe Contract issuers can share and transact exclusively with those identities that are already accepted as Friends. This affords people an increased level of privacy and security by being able to communicate with and evaluate trade partners before divulging any contract terms.

7. Safecoin – The Safe Network Currency

This is the currency of the Safe Network. It is used for storing data, it is also the reserve currency for buying and selling things on the Safe Network through the Safe Exchange. The exchange itself uses another coin called Safe Exchange Coin which is the owners of the Safe Exchange.

8. Safe Exchange Coin - The Safe Exchange: DBOT Voting Currency

This coin is introduced as a Omni layer asset for the purpose of raising money to fund development and expansion of the Safe Exchange platform. Dually, this coin serves as a representation of Trust that a person has bestowed with the community. These coins are transferable freely by their owners. The purpose of these coins in the Safe Exchange platform involves the ability to comment and vote on contracts that have been shared with this particular 'voting-enabled' alias. Individuals enable voting by depositing their acquired Safe Exchange Coins to their account's Alias Safe Exchange Coin wallet and that simply enables voting and comment privileges. A total of 2,147,483,647 Safe Exchange Coins will exist and will be sold during a crowd-sale and these coins can be

acquired from people who purchased them during the crowd-sale after it has concluded.

Up-votes and comments exist for only as long as the Safe Exchange Coins remain in the account's Alias balance. If an Alias was to reduce its Safe Exchange Coin holding, then it would reduce it's influence of up-votes. If the coins were to leave the account completely, then the comment and up-votes will disappear completely. This serves to allow people to be dedicated and committed to their comments and up-votes. Also coins will not be tied up because, for example, once Dally has sold all 1000 of his Teacups and the contract is expired, any up-votes will no longer be necessary on that contract.

9. Decentralized Board of Trade

The collective owners of Safe Exchange Coin form the "Decentralized Board of Trade". By possessing Safe Exchange Coin one effectively becomes a member of the Safe Exchange, and gains the power to vote on the validity and the trustworthiness of the contracts that float on the Safe Exchange. Your ownership of Safe Exchange Coins corresponds to the percentage of Trust that you have enabled in the Safe Exchange. For example:

In the case when Dally was selling his teacups, any person who owns Safe Exchange Coin and has registered an alias with that coin would then be able to vote and comment on a contract at any time. Essentially, if Shalla owned any Safe Exchange Coins, she could have verified her experience in buying the teacups by placing a comment and up-voting the contract with a score relative to the amount of Safe Exchange Coins she had registered with her Alias.

Additionally, it would be considered that members of the Safe Exchange would also be frequent and consistent users of the exchange and therefore will have a constant need to spend Safecoin in order to publish Items and Safe Contracts. Therefore, owners of Safe Exchange Coin will receive a dividend in the form of Safecoins residually, relative to the amount of Safe Exchange Coins owned at the time of a distribution. Since the Safe Network rewards application developers autonomously, the Safe Exchange as an application will be rewarded by the Safe Network and some of that reward is intended by the Safe Exchange development team to support its community of participants with a consistent stream of Safecoins from this source. These Safecoins are just like any other Safecoins and can be spent on any data storage event with the Safe Network, or

transacted for goods on the Safe Exchange or any other application that would accept Safecoins.

This Decentralized Board of Trade will serve to illuminate integrity, object to fraudulence, and maintain its participation in the marketplace.

The Decentralized Board of Trade is also a signing party on all funds belonging to the Safe Exchange proper. This means that all activities designated by the movement of coins can be understood and voted on by the entire Safe Exchange Coin member population with full accountability, and no chance for double votes, or miscounts. During the launch of Safe Exchange an autonomous contract will be formed on the Safe Network that enables it to submit text proposals and to accept votes from the instantaneous account of the ownership of Safe Exchange Coins.

Owners can deposit their Safe Exchange Coins into a Safe Exchange Alias. Then if a proposal is submitted, it can be viewed and understood by all other individuals who control an alias enabled with Safe Exchange Coin. This is the Decentralized Board of Trade, and they can vote in favor or against the proposal. 50% means it is enabled. The proposal can include payment and withdrawal from designated addresses submitted by the board. Included in a proposal could be code modifications to the Safe Exchange software, which is 100% open source.

This means that over time the Foundation vote will be best understood by our crowd so we can use the wisdom of the crowd to manage the 'corporate' type activities that could be best served automatically. This means that we can, for the first time, create a community body of true engagement that is free from exhaustive inefficiencies found in traditional banking and financing institutions.

For Example:

Bob wants to change the color of a button from blue to orange. Bob would spend some safecoin and submit a proposal to the Decentralized Board of Trade through the voting console. At that moment, people who have an alias enabled with safe exchange coin will be entitled to vote and comment on that proposal. If there is 51% agreeing to the terms of the proposal then it will be enabled. This could be pull requests on github.com, or other software version verification systems, especially ones hosted decentrally on the

Safe Network. Included will be votes on the exact terms of the budget for funding development, who gets to develop, including enabling other autonomous voting mechanisms and schemes. This enables a decentralized autonomous entity engaged by the the participants.

10. Future Maintenance of Safe Exchange

The Safe Exchange development team will be able to maintain and expand indefinitely into the future because the Exchange dwells amongst an autonomously rewarding network. The funds from the crowd-sale will bring out a maximum quality so that people can effectively and enjoyably engage in commerce through the Safe Network. The quality that is brought out to the ecosystem will determine its future existence because success in people's experience with the platform will feedback to the developers of it and they will have a sustainable income in the form of Safecoins.

During the launch of the Safe Network, when maidsafecoin is enabled to convert to safecoin, the Safe Exchange Foundation will be just the autonomous voting console software that enables owners of Safe Exchange Coin to vote on the future of the Safe Exchange protocol. The foundation in this case becomes the members of the Decentralized Board of Trade. Safe Exchange Coin will convert into a data set residing on the Safe Network much like Safecoin. Safe Exchange Coin will grant voting rights on activities of the Safe Exchange..

The initialization of the autonomous entity will be enabled with a contract that will designate a core development team, and an initial wallet address where application developer coins, donations, or payments can be distributed based on the voting by the community. This puts in the hands of the participants to the power to decentrally vote on the fate of their exchange. Communications and discussion will take place on discuss.safex.io designated forum.