swipe™

whitepaper

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The purpose of this Whitepaper is to provide potential purchasers with the information on Swipe's project to allow the purchasers to make their own decision as to whether or not it wishes to proceed to purchase Swipe Tokens ("SXP") and use any of the Swipe products. This Whitepaper does not constitute an offer or invitation, or any other sale or purchase of shares, securities, or any of the assets. Any possession of SXP shall not grant any rights in any form to the user, including but not limited to any rights of ownership, interest, profit, redemption, property or intellectual property, decision making, or any other such rights, such as any rights of financial or legal nature, in Swipe or its affiliates.

Swipe

April 9, 2020

White Paper

Version 2

Abstract

The original cryptocurrency, Bitcoin, was designed to be a peer-to-peer cash system.[1] Bitcoin's purpose was to be a digital substitute to a cash payment instrument as described by the Bitcoin Whitepaper[2] written by Satoshi Nakamato. Since its inception there have been a variety of cryptocurrencies[3] for a wide selection of use cases, such as Ethereum and Litecoin. This white paper will focus on a platform that is designed for the new adopters who are not experienced with crypto and are looking to build a bridge between cryptocurrencies and fiat currencies without friction. The Swipe Network is a protocol that enables on-chain use of Swipe products directly with the Ethereum blockchain while connecting these processes to an off-chain dual processing system. The Swipe Network operates through smart-contract interactions on-chain given the security of Ethereum network while running an off-chain layer 2 network for speed, efficiency and cost. The on-chain part of the network will eventually run through a decentralized autonomous organization and will be secured by the platform's native cryptocurrency: SXP.

Introduction

Swipe was created with one mission in mind:

"Enabling Millions of Users access to Spend Crypto"

With this vision, Swipe has created a platform that is accessible to users via an Apple or Android device which enables them to buy, sell, or spend cryptocurrencies at millions of locations worldwide. The plan to execute this vision starts with implementing a highly secure, bank-grade, digital wallet infrastructure that will host multiple blockchain and legacy payment systems tied to a traditional debit card. With these two products, the Swipe Wallet and Swipe Card, users will be able to convert their cryptocurrencies to traditional fiat legal currencies and vice versa. The ecosystem powering the product line will be fueled by its native cryptocurrency Swipe Token (SXP) and is required to use the Swipe Network.

The Swipe Network is an open-source blockchain protocol that connects the Wallet and Card to the Swipe Smart-Contracts. These three systems power the Swipe ecosystem of products and perform the system's duties on-chain. This ensures visibility of all expected processes and functions, including network fees. The network will enable the functions to interact and execute directly on the Ethereum[4] blockchain and be validated directly within the smart contract.

1 Swipe Protocol Components

The *Swipe Network* consists of three (3) protocols that operate the network in an asynchronous format:

- **Swipe Card**: A Visa debit card that enables cardholders to spend balances that are linked to the Swipe Wallet mobile application.
- **Swipe Wallet:** A digital wallet application that enables users to buy, sell, spend, and more with their cryptocurrencies.
- **Swipe Smart-Contracts:** These delegated smart contracts are given to users within the Swipe Network and execute certain actions using its native SXP token.

While the Swipe Network is the core of the Swipe ecosystem of products, it's important to note that the Swipe Network requires all 3 components to operate as designed today on-chain. However, the other Swipe products, such as Swipe Wallet[5] and Swipe Card[6], can function independently with the Swipe Network off-chain.

In a future version, the Swipe Network on-chain process will be governed by a decentralized autonomous organization (DAO) and will utilize a proof-of-stake consensus method to secure the platform. This system will be secured via SXP staked on a smart-contract within the network that offers incentives, such as a transaction fees for validating transactions on-chain.

1.1 Off-Chain Core Features

The protocol requires an off-chain system to process transactions and commands with high throughputs. While considering the system may process thousands of transactions per second, the standard Ethereum blockchain, in its current state, cannot support this on-chain. Therefore, while we use the Etheruem blockchain as as security and authority layer, we run our transactions processing network off-chain. Once Ethereum has a scaleable on-chain native solution, Swipe plans to switch over to a complete on-chain system.

1.1.1 **Liquidity protocol**. The purpose of the Liquidity Protocol is to connect the Swipe Network to its exchange and OTC providers with a real time engine designated to source conversions and orders appropriately to the best platform to ensure the lowest slippage of any size order.

1.1.2 **Pricing Module:** This system provides Swipe Wallet users with the best pricing available in the market which is sourced from the most liquid exchanges and OTC providers in the industry via our Swipe Network. When an order is executed it will source the best price available in real-time.

1.1.3 **Compliance A.I**. The Compliance Artificial Intelligence system ("CAI) was built from the ground up to ensure it meets all regulatory rules and procedures while ensuring smooth user experience and user safety. CAI processes a series of fraud and risk rules to ensure suspicious transactions and high-risk transactions are being blocked with geo-location features and machine learning. CAI is also responsible for real-time automatic KYC directly built into the Swipe Wallet and connected via the Swipe Network to various KYC providers for global coverage.

1.1.4 **Banking Layer.** The Swipe Wallet is powered by a backend banking layer to give users access to multi-currency banking systems. Have this banking layer built into the Swipe Network natively gives the ability to dynamically present banking options to users through just one simple interface, the Swipe Wallet app. We are able to offer users crypto-to-fiat and fiat-to-crypto services through our banking networks and providers.

1.1.5 **Debit Card Processing System**. This part of the Swipe Network is essential to operating the Debit Card connected to the Swipe Wallet. This system allows users to control their debit card directly from the Swipe Wallet and link it to the cryptocurrency they plan to spend which will be converted at

point-of-sale in real time. It will also support the issuance of virtual and physical cards with the adding to Apple, Samsung, and Google Pay digital wallets. The system is dynamic to scale to numerous providers worldwide and to support white-label card products through the Swipe API.

2 Swipe Wallet

The protocols user-interface is packaged into the Swipe Wallet mobile application available on the Apple, Google and Samsung app stores. The Swipe Wallet has been architected and designed to offer users an unparalleled user experience and on-boarding process to mitigate frustration of the platform. The applications main features will give users the options to buy, sell, store, spend, and pay with cryptocurrencies while giving them access market data, news, and insight for all supported assets on the platform.

Swipe Wallet currently supports over twenty fiat and cryptocurrencies on its platform. With security in mind, all user's cryptocurrencies will be 100% stored with industry leading custodians which also offer an aggregate of $100,000,000 in insurance. Alongside the custody solution provided to Swipe users, the Swipe Wallet itself operates with PCI Level 1 DSS certification[7] which is one of the highest degrees of certifications for card processing platforms. The overall platform consists of protecting user data and sensitive information via AES-256 encryption to prevent exposure to bad actors.

2.1 Buying Cryptocurrency

Users will be able to buy Cryptocurrencies directly within the Swipe Wallet after successfully verifying their account. Users will be able to purchase all supported cryptocurrencies with their linked bank accounts, stablecoins, or their fiat wallets. Purchases done via stablecoins and fiat wallets will have instant settlement, while purchases made via bank accounts will vary based on the user's bank. Current payment rails let users buy cryptocurrencies with SEPA, Swift Wires,

Credit/Debit Cards, and Apple/Google Pay.

2.2 Selling Cryptocurrency

Users may sell any supported Cryptocurrencies directly in the Swipe Wallet to their fiat wallet, stablecoins, or bank accounts. Sales of cryptocurrencies to their fiat or stablecoins wallets will be instantly and bank transfers will depend on the method selected and the users bank.

2.3 Exchanging Cryptocurrency

Users will have the ability to exchange any supported cryptocurrency or fiat currency to another with instant settlement. This is provided through a combination of features in the Swipe Oracle directly into the users Swipe Wallet account.

2.4 Cryptocurrency Data & Analytics

Users have access to all supported cryptocurrency data and charts directly within the Swipe Wallet. These features will allow users to have full insight on the cryptocurrencies that Swipe Wallet supports with charts, circulating supply, total supply, daily volume, and more for each cryptocurrency.

2.5 Card Management System

Built directly in the Swipe Wallet application is a complete Card Management system that enables access to all of your Swipe Card's features.

2.6 Address Book

Users have access to all supported cryptocurrency data and charts directly within the Swipe Wallet. These features will allow users to have full insight on the cryptocurrencies that Swipe Wallet supports with charts, circulating supply, total supply, daily volume, and more for each cryptocurrency.

3 Swipe Card

The Swipe Card will be major network brand debit card that will be able to be accepted at millions of locations worldwide. Currently the Swipe Card is a Visa card that services 28 countries in the European Union and the United Kingdom.[8] This Cryptocurrency to Fiat funded Debit Card will be linked to the users Swipe Wallet and enable them to spend their cryptocurrencies with real-time conversion powered by the Swipe Network, which will be explained later in this white paper.

3.1 Card Features

The Swipe Card has been designed with security and efficiency in mind with the implementation of the following:

- Security settings
- Real time history
- ATM PIN access
- On-demand conversion
- Virtual & physical debit cards
- Digital Wallet compatible (Google & Samsung Pay)

3.1.1 Security Settings. The ability to control your Swipe Card directly within the Swipe Wallet app will give users peace of mind. Cardholders are able to access the card setting menu to access the card's security features. Within this menu users can instantly freeze and unfreeze their cards in case they lose their card or just want to block it temporarily. Users are also able to report fraud or unauthorized charges directly within the application available 24/7.

3.1.2 **Real Time History.** Included in the Card settings tab, cardholders are able to view the transactions made on their Swipe Cards. The transaction history will include which cryptocurrency was used as the funding source, the conversion rate, the fiat currency that it was converted to and used at the merchant, who the merchant is, when the transaction took place, and much more. There will be cardholder documents and statements available here as well.

3.1.3 **PIN with ATM Access.** The Swipe card enables users not only to spend crypto at millions of merchants, but also withdraw cash from millions of ATMs. When the cardholder activated their Swipe Card within the application, they will see their PIN instantly in the app. Thereafter, if users need to retrieve their PIN for ATM cash access, they can view it in the application after going through security authentication.

3.1.4 **On-Demand Conversions.** Cryptocurrency can be converted to fiat currency and spent instantly with the Swipe Card. When users activate their card, they will notice a drop-down box in the middle of the screen called "Funding Source" the funding source tells the application and card which balance from the Swipe Wallet it should use, such as Bitcoin. When, for example, Bitcoin, is selected all card transactions will be using Bitcoin as a funding source to convert to fiat currency at point-of-sale.

3.1.5 **Virtual and Physical cards.** Swipe Cards come in both a virtual and physical form. Cardholders have the option, depending on the user's region, to order a Virtual or Physical card. Virtual Cards are instantly issued and viewable in the application once approved by the bank. These virtual Swipe Cards are able to be used for online purchases or linked to a Digital Wallet app such as Google pay. The physical cards are dual-interface plastic cards which have both EMV chip protection and NFC paywave technology.

3.1.6 **Digital Cards.** Use Swipe Cards as Digital Cards on Google and

Samsung Pay. The Swipe Card is able to be tokenized and added to the Google and Samsung Pay networks. To do so, all a user needs to do, in approved regions, is add the card details in the Google Pay and Samsung Pay apps directly. Thereafter users can use their smartphones to pay where available.

3.2 Card Types

The Swipe Card is currently available in two types.

3.2.1 **Swipe Saffron**. The Swipe Saffron debit card will be an orange-peach color-based debit card that is a dual-interface card that enables chip based EMV payments and has Paywave NFC payments. Users are able to order and receive this card for a one-time cost of $25.00 and requires no SXP stake. There are no delivery fees, annual fees, and monthly maintenance fees. The Swipe Saffron also offers users 1% cash back. Lastly, users are able to earn $1,000 in referral rewards for other cardholders they refer.

3.2.2 **Swipe Slate**. The Swipe Slate debit card will be a black metal-designed card designed with a composite material on the logos to give it a metallic shine. The Swipe Slate card is also supported by dual-interface functions that enables chip based EMV payments and Paywave NFC payments. Users are able to order and receive this card for a one-time cost of $50.00 and requires a 300,000 SXP stake for 6 months. There are no delivery fees, annual fees, monthly maintenance fees, ATM fees, and foreign transaction fees (while SXP stake is active). The Swipe Slate also offers users 4% cash back while there is an on-going stake, and 2% cash back if the stake is released. Lastly users are able to earn $3,000 in referral rewards for other cardholders they refer.

4 Swipe Network – Mainnet v1

The Swipe Network, which is the core component of the project, facilitates almost all activity on the applications. For simplicity, we acknowledge the system as the *Swipe Network* which operates with three protocols that run together for parallel processing of its intended functions. The Swipe Network's off-chain system is a proprietary system designed by Swipe to provide real time market data, prices, and liquidity for cryptocurrencies, and within seconds convert them to local fiat being used on the Swipe Wallet or Swipe Card.

4.1 Contract Wallet

When users utilize the Swipe Network on-chain, all wallets will need to be activated to operate on the network whether it's in the flagship application or a future decentralized client.

4.1.1 **Activation**. The Swipe Network is designated with an activation fee which all Wallet-Contracts will implement to activate their features. On network inception the Swipe Network *activationFee* will be one **(1) SXP**. When a Wallet-Contract is issued it will not be enabled until the *activationFee* is paid. This fee is not burned or consumed, but rather the fee is locked within the smart-contract until the user plans to close his account and deactivate the contract. The Wallet Activation feature is implemented on both the Swipe Network and Swipe Wallet-Contracts. Before any operations can take place, it is important that the state of the Wallet-Contract is active based on the activation fee required by the Swipe Network.

Example:

```
function activateSXP() public onlyOwner {

    uint activationFee =
    swipeNetwork.viewActivationFee();
    require(getBalance() >= activationFee, 'not enough
```

```
    balance');
    activated = true;
    lockedSXP = activationFee;
    emit Activate(address(this);
  }
```

Once the *activateSXP* function is successful, it will enable the Wallet-Contract to be able to execute its other features. This activation state informs the protocol that it has now staked and locked the required *activationFee* as required by the Swipe Network.

4.1.2 **Deactivation.** The Swipe Network has a required activationFee which turns on the execution state of the Wallet-Contract. However, users do have the option to deactivateSXP which will remove the lock and stake of the activationFee from the contract and enable it to be withdrawn and closed. This is essential for users who want to close their Swipe Wallet accounts or any other product that requires a staked indefinite fee to activate the wallet.

Example:

```
function deactivateSXP() public onlyOwner returns (bool
success) {
    require(activated == true, 'user is not activated');
    require(lockedSXP > 0, 'there is no activation fee');
    if (token.transfer(owner, lockedSXP)) {
    lockedSXP = 0;
    return true;
  }
```

4.2 Network Fees

Network fees are on the protocol level and are all on-chain when using the Swipe Network. Network fees are traditionally destroyed/burned which

causes the network to have a deflationary supply model[9]. This model enables the supply of Swipe Token (SXP) to decrease over the course of time as the network is being used.

4.2.1 **Network Designated Fees.** The Swipe Network will designate network fees for the protocol. These fees are set from governance of the network and will require and Network Fee and Network Fee. Network fee is represented by NetworkFee which is the amount the protocol collects when a transaction is presented. Network fee is represented by netFee and is the amount that is destroyed by the network when a transaction fee is presented. Transaction Fees are presented to the network with the transactionSXP function. The amount of fees is determined by the product used and is dynamic to the service rendered.

4.2.2 **Oracle Fees.** Oracle Fees are what the Swipe Network will retain as its revenue for processing transactions in the network. These fees are transferred from the Wallet-Contract to the Swipe Network contract upon a successful completion of the transaction. When the DAO is launched, SXP stakers will be able to receive these oracle fees for securing the network which is currently set to 20% of the transaction fees occurring on the network.

4.2.3 **Network Fees.** Network Fees are fees that are destroyed when using the network as part of transaction fees. Similar to the Ripple network and other deflationary blockchain systems, destroying fees is on a protocol level and equivalent to gas of the system. When a *transactionFee* function is executed the *netFee* percentage designated by the Swipe Network will be burned and destroyed on-chain. On inception this is set at 80%.

Example:

```
function transactionSXP(uint tokenAmount) public
onlyOwner
  returns (bool success) {
```

```
        require(activated == true, 'user is not activated');
        require(getBalance() >=
       tokenAmount.add(lockedSXP).add(getLockedAmount()),
'not enough balance');
        uint netFee = swipeNetwork.viewNetworkFee();
        uint NetworkFee = swipeNetwork.viewNetworkFee();
        uint burnAmount =
tokenAmount.mul(netFee).div(100);
        uint fee = tokenAmount.mul(NetworkFee).div(100);
        if (token.burn(burnAmount)) {
        token.transfer(owner, fee);
        return true;
     }
     return false;
    }
```

4.2.4 Dynamic Fees. Fees that are operating on the Swipe Network are dynamic are designated by the dApp and/or product used. Therefore, when a product or dApp is calling transactionSXP they are the ones determing the fee of the service/product used. The Swipe-Oralce smart contract only determines the percentage of distribution between NetworkFee and netFee on the protocol so that they are proportional transferred and destroyed. Fees will be designated by the platforms/products using the network.

4.2.5 Burn Function. The burn function is inherent from the network level and adopted on the Swipe Token (SXP) ERC20 contract. As SXP is the main currency of the network all fees that are required to use the network will be in SXP. When the burn function is applicable to the network it will create a *token.burn* and will result in the destruction of *netFee* and other functions that require fees to be consumed and burned by the network. This function is called and triggers the SXP burn function as shown below.

Example

```
function burn(uint256 value) public validLock permissionCheck
returns (bool success) {
    require(msg.sender != address(0), "ERC20: burn from the
zero address");
    _totalSupply = _totalSupply.sub(value);
    balances[msg.sender] = balances[msg.sender].sub(value);
    emit Transfer(msg.sender, address(0), value);
return true;
}
```

4.3 Product Locks

The Swipe Network consists of operating the basis of the ecosystem of products designed by the community and Swipe Team. Product State locks are designed for tokens to be locked/staked on-chain within a Wallet-contract for certain products. Therefore, since there may be more than one product that requires a stake, the protocol is designated to execute these functions with *state ID* so that the lock function can be used for numerous products which each ID having its own state of lock functions. They can search for it with the following example:

```
function findLockState(uint _id) private view returns(uint) {
      for (uint i = 0; i < lockData.length; i ++) {
          if (lockData[i].id == _id) {
          return i;
        }
       }
       return error;
  }
```

4.3.1. SXP Lock. SXP locked for a product with a time-lock.

- When a product or service requires the staking of SXP, the protocol will use the *sxpLock* function, which will also be used in the future for staking features. When this function is executed it will need to be coupled with a *id* so that the state lock is

accumulative in the event there other products/services that require a lock-up/stake. There also needs to be a *lockTime* presented to inform the protocol when these lock-up tokens can be unlocked.

Example:

```
function sxpLock(uint _id, uint _amount, uint _lockTime)
public onlyOwner {
    require(findLockState(_id) == error, 'already locked');
    lockData.push(stateLockData(_id, _amount,
now.add(_lockTime)));
}
```

4.3.2. SXP Unlock. SXP unlocked for a product after time expired.

- The *sxpUnlock* function is presented to the network when the user wants to unlock their staked/locked SXP from the Wallet-Contract. This feature will check to make sure that *releaseTime* is available when previously designated from the *sxpLock* feature. If the time-lock is expired, the user will be able to unlock the SXP from the state *id* and make it available for use by the product/service.

  Example:

```
function sxpUnlock(uint _id) public onlyOwner{ uint index =
  findLockState(_id);
  require(index != error, 'cannot find lock');
  require(lockData[index].releaseTime <= now, 'not passed lock time');
  removeByIndex(index);
   }
}
```

4.4 Transfers

Users with Wallet-Contracts will be able to transfer SXP that is available and unlocked to other addresses through *transferSXP* functions. These functions will be on-chain and work hand-to-hand

with the products requesting this function to be executed against the Wallet-Contract. A dApp, platform, or user can execute this command when making a withdraw or when paying for a service. This feature allows a user to send the SXP outside of the network and to whichever address they choose.

4.4.1. SXP Transfers. Transfers of Swipe Token to external addresses.

- The Wallet-Contract will retain all SXP tokens for the user to consume and use. Any tokens that are unlocked and available will be enabled to be transferred to an external address or be used for various other functions.

  Example:

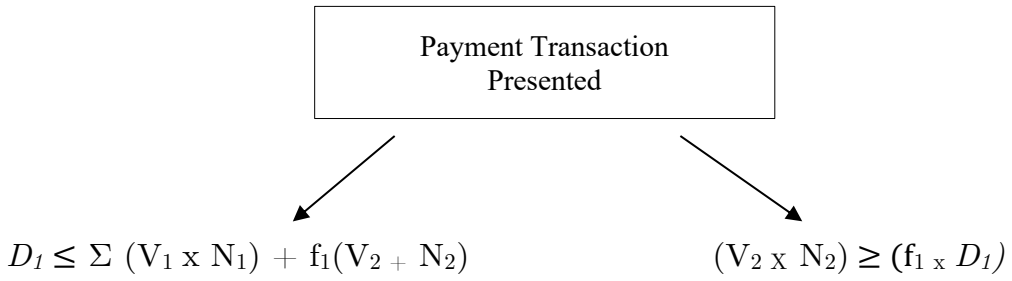
```
function transferSXP(address to, uint tokenAmount) public
onlyOwner returns (bool success) {
    require(activated == true, 'user is not activated');
   require(getBalance() >=
   tokenAmount.add(lockedSXP).add(getLockedAmount()), 'not
   enough balance'); if (token.transfer(to, tokenAmount)) { return
   true;
                }
        return false;
}
```

4.4.2. Verifying Activation. When a *transferSXP* is presented to the network the Wallet-Contract will check to make sure that the user is activated. Transfers of all SXP minus the *activateSXP* fee that is currently locked. A *transferSXP* function will fail if the state of the Wallet-Contract is not activated or has been deactivated.

4.4.3. Checking Lock States. The Wallet-Contract is also designated to check any state locks that are current within the protocol. Users who have *sxpLock* functions that are active with state *id*'s will be unable to transfer these allocations of the SXP until they have been successfully unlocked by the contract. If a user attempts to transfer any locked SXP they will return an error.

4.5 Payments

Functions within this subsection represent layer 1 services that will be payments made on the network for specific functions mentioned below. These functions will directly work with the dApp and/or Wallet to execute on chain services with SXP. When payment functions are performed the protocol will check to make sure that dollar value *(D1)* presented is less than or equal to the sum of the value in dollars of the liquidating asset (V_1) multiplied by the numerical integer of the liquidating asset balance located in the Wallet-Contract (N_1) plus the network fee percentage assigned by the Swipe Network (f_1) multiplied by the sum of the value in dollars for SXP (V_2) plus the numerical integer of SXP (N_2). While this function executes in parallel a fee check is performed to ensure that there is a sufficient fee balance available by checking if the value in dollars for SXP (V_2) multiplied by the numerical integer of SXP (N_2) is greater than or equal to the network fee percentage assigned by the Swipe Network (f_1) divided by the dollar value (D_1) presented. This ensures that the user has sufficient balance to perform a payment and has the necessary fee required by the Swipe Network to perform an on-chain function.



4.5.1. Buying. Users who are buying SXP on the Swipe Wallet will be able to settle their transaction directly on the Ethereum blockchain

with the *buySXP* feature. The *buySXP* feature will transfer funds purchased from the user to their designated Wallet-Contract address which is tied to their SXP funds. This will give the user on-chain settlement of their SXP just purchased from the Swipe Network and/or dApp/Wallet.

4.5.2. Selling. Users who are selling SXP on the Swipe Wallet will be transferring these funds from their Wallet-Contract to the Swipe Network via the *sellSXP* feature. This will move the amount of SXP they are selling on the Swipe Wallet and/or dApp from their Wallet-Contract and will transfer it with on-chain settlement to the Swipe Network contract or counter-party offering the service.

4.5.3. Purchases. When users make purchases on the Swipe Wallet or dApp this means not only are they required to pay transaction fees via *transactionSXP* but they will also be using *transferSXP* to move their SXP that they are attempting to redeem for a service such as spending it on the Swipe Card. This will enable on-chain settlement of this payment feature to ensure the Swipe Network receives the counter-party SXP and that the network receives its fee proportionally to what is supposed to be destroyed.

4.5.4. Rewards. Users receive rewards for a wide array of reasons. On layer 1, rewards will primarily be paid for Card rewards or other Wallet events. When rewards are paid out as SXP, they will entail on-chain settlement via *rewardSXP* which will transfer the amount rewarded to the user from the Swipe Network Oracles to the Wallet-Contract belonging to the user from the Swipe Wallet or dApp service.

5 Swipe Network – DAO & Staking v2

Any blockchain project requires a strong governance and consensus method or it will not succeed. We have delegated our network to rely on both Networks and Validators. On Layer 1, Swipe will be controlling the Swipe Network and Validation of the transactions by using the Swipe Wallet as a dApp connected to the Etheruem network. Eventually once the Swipe Network phase 2 is launched, the network will enable a Proof-of-Stake/Proof-of-Authority mechanism for users to be able to stake their SXP within an Ethereum Smart Contract and validate/secure the transactions on the network.

The Swipe Network is responsible for designating the fees for the network and collecting fees that it generates from transactions to the Network. The activation fees are also set by the Swipe Network. In the layer 1 version while the Swipe Network is connected to the Swipe Wallet solely alongside the owner of all Wallet-Contracts, the functions will be controlled by Swipe. On the layer 2 version of the Swipe Network there will be proper handling of decentralization where the Swipe Network is governed and controlled by consensus amongst the whole network of Validators. As SXP is staked and a minimum amount is required, this will incentivize users to not attempt to attack the network or risk losing their staked SXP.

The Swipe Network today operates via the Ethereum main network which we call “Layer-1”. To run the network as stated in the above mechanisms, it will require a significant volume of activity (with a large amount of state), which is not at this time suitable for all activity to occur on the Ethereum main chain. With our Layer-2 implementation the construction would be to bond trading activity in the public Ethereum chain with contract execution input being facilitated by the Swipe Network. This protocol is being designed as a scalable blockchain whose contract state is bonded by the activities of the Swipe Network itself. The Swipe Network validates the activity of the behavior of all participants which in other words, the role of the SXP token is providing enforcement and computation. SXP acts as a bond for its

activity on this blockchain, improper activity results in the bond/token being burned on the Swipe Network. By creating a custom processes with deep enforcement, we are able to construct a system where consensus rules optimize for high-performance activity. The design optimizes for rapid execution and clearing, with slower settlement thus enabling a payment network that can meet high-demand. Future versions of the Swipe Network may include sharding, but the initial iteration will presume high-throughput capacity for block propagation. Owning and using SXP tokens either can be consumed within the ecosystem of products or users can use the SXP they buy or earn to get the right to validate the network, within its consensus rules. Transaction fees on the network including (but not limited to) interchange, payment, trading, and settlement use, are given to validators who enforce bonded contract states such as staked SXP within smart contracts. The network will have its value derived from the networks operations which will also accumulate the fees it produces from tits products from providing validation to its users. As this will be designed as a high-performance system, a proof-via-linked blockchain construction is required. We expect that this system will be able to handle extremely high volumes of transactions and hence, will only do final delivery over Ethereum which is weather-tested and a battled secure network. Settlement, Payments and other various payments will occur directly over the Swipe Network Layer 2 blockchain. Consensus rules are enforced via this proof-of-stake network. The Swipe Network validator activity also may be enforced on the Ethereum chain via native Ethereum smart contracts.[10]

The entire Swipe Network system is not just on-chain, but also operates off-chain to run the Swipe ecosystem of products. The Swipe Network is responsible for price discovery on all digital assets and responsible for connecting third party system to and from the Swipe Wallet system such as banking partners to perform transaction through traditional payment rails.

5.1 Network Distribution

The Swipe Network is a fully distributed system, which means it operates on the Ethereum network while remaining decentralized. However, in layer 1, some functions and responsibilities of the Swipe Network remain centralized within the Swipe ecosystem to perform its duties correctly. The Network distribution is broken down into three segments which are the Ecosystem, the Validators, and the Third Parties which all play a part with the Swipe Network presently and/or in the future.

5.1.1. Ecosystem. Products that operate within the Swipe Network will be the ecosystem family. For example, two main products of the Swipe network will be the Swipe Wallet and the Swipe Card which will work together with the Swipe Network to perform its functions for users using the services. Ecosystem products rely on Swipe Network to receive certain functions such as price feeds, asset liquidations, and on-chain commands that will interact with Wallet Contracts. Ecosystem user will have incentives with rewards for using the systems.

5.1.2. Validators. Users who plan to run Validators on Swipe Network Layer-2 will be responsible for ensuring the network runs appropriately. They will be validating transactions that are operating on the network including payments. They will be rewarded with transaction fees collected by the Swipe Network. Validators will require to bond/stake their SXP on the Ethereum main network to ensure they perform their jobs honestly.

5.1.3. Third Parties. The key-value of using third parties comes when the payment rails need to merge with traditional financial operations to settle or clear certain transactions on SPP, Swipe Network, and/or Swipe Wallet. Having third parties can also set for liquidity pools in the future layer-2 version of Swipe Network where there can be decentralized settlement for an incentive network distribution.

5.2 Staking

For the protocol to run sufficiently secure there will be validators who have SXP staked within the protocol to validate transactions in the network. We examine to descriptions of staking that would work with the Swipe Network and the validation required in either scenarios. Proof-of-Stake, in conception, seems to offer a higher level of decentralization, while Proof-of-Authority provides the network with a higher level of security and accountability on who the Validators are securing the Swipe Network.

5.2.1. Proof of Stake. Proof of Stake consensus mechanism has recently received a lot of air time in the context of blockchain scalability issues. Without going into details about its advantages over Proof of Work, Proof of Stake eliminates the need to spend a huge amount of electric power to validate the blocks. Instead, blockchain participants with the most stake in it are selected by algorithm for the right to validate the blocks. The assumption behind Proof of Stake is the following: those who hold a stake in a network are incentivized to act in its interests. All else equal, the more stake one has, the higher should be his or her interest in preserving the system.

5.2.2. Proof of Authority. Proof of Authority (PoA)[12] is a modified form of Proof of Stake (PoS) where instead of stake with the monetary value, a validator's identity performs the role of stake. In this context, identity means the correspondence between a validator's personal identification on the platform with officially issued documentation for the same person, i.e. certainty that a validator is exactly who that person represents to be. Staking identity means voluntarily disclosing who you are in exchange for the right to validate the blocks. This means that the benefits you derive from it are public and so are the nefarious actions you might undertake. Identity placed at stake can serve as a great equalizer, understood and valued the same by all actors. Individuals whose identity (and reputation by extension) is at stake for the securing of a network are incentivized to preserve the network. While this may have some downside to the Validator, the end benefit

to the distributed network might out-weigh the probative value.

5.2.3. Validation. Network validation is the core of all underlying activity within the Swipe Network. The protocol is constructed as a high-performance network capable of handling many transactions, so it will become necessary to produce light client proofs for partial validation, as well as for external smart contract enforcement.

6 Swipe Smart Contracts

We have determined that operating the Swipe Network will require smart contracts that will execute functions on-chain to operate the network transparently. These smart-contracts will be deployed on the Ethereum main network blockchain.

6.1 Wallet Contracts

We start with a discussion of why Wallet-Contracts are important to the ecosystem and how they operate the protocol efficiently while enabling the user to be able to view the transactions directly on the blockchain via a block explorer such as Etherscan.

6.1.1. Applications and services. The Swipe Network will consist of "application" and "service" which will be used interchangeably. However, there is a synchronous usage within the two terms yet there is somewhat vague distinction because: an *application* usually provides some services directly to human users, while a *service* is usually exploited by other applications and services. Therefore, the Swipe Network enables the Swipe Wallet application to operate its services alongside a smart-contract that can execute pre-configured commands that are transparent to the user and can be interacted anywhere in the world that services are available.

6.1.2. Location of the application: on-chain, off-chain or mixed. A service or an application designed to operate on the Swipe Network or as a Swipe ecosystem of products needs to keep its data and process that data somewhere within the network. This entails the network setting three distinct classification of applications (and services):

- **On-chain applications**: All data and processing are in the Swipe Network or Ethereum Blockchain.
- **Off-chain applications:** All data and processing are outside the Swipe Network or Etheruem Blockchain, on servers available through the Swipe Network.
- **Mixed applications**: Some, but not all, data and processing are in the Swipe Network; the rest are on off-chain servers available through the Swipe Network such as the Swipe Card and certain functions on the Swipe Wallet.

6.2 Time Lock Contracts

To provide a high-level of confidence within the application to the open-community on a decentralized project, it's important to bring as much of verification as possible over trust. One methodology of doing this is the implementation of Time-Lock smart contracts that also play a role in the Wallet-Contract product state lock features.

6.2.1. Timed Release. For example, if one wants to set up a smart contract where they either lock or deposit a token like SXP with a pre-determined time slot, parties could agree to remove trust out of the equation and enable a Time-Lock contract to act as the trusted party. The code will pre-determine when the unit time of the release is where the owner or counter-party can withdraw their tokens.

6.2.2. Distributed Release Schedule. Similarly, if one wants to deposit coins or receive a loan through the Ethereum network, they can agree on a payment schedule which has a pre-defined distributed release schedule that does not need to be trusted as the verification is within the code itself. This allows parties, such as Swipe, to implement a distributed release schedule for their Founder and Advisor tokens and can be implemented in the Network level for other functions and service.

7 Swipe Tokens (SXP)

We have determined that operating the Swipe Network will require smart contracts that will execute functions on-chain to operate the network transparently. These smart-contracts will be deployed on the Ethereum main network blockchain.

The Swipe Token is the ecosystems native cryptocurrency which fuels the services that are performed on the Swipe product line. The Swipe Token will be minted on the Ethereum Platform as an ERC20 standard token. There will be in existence 300,000,000 SXP tokens as a fixed supply. The SXP token is designed with a deflationary monetary supply as all transaction fees will consist the use of SXP via the Wallet Smart Contract powered by the Swipe Oracle autonomously with the code published publicly and audited. The way this mechanism works is that when transactions are executed on the product line that involve fees, which will always be fueled by SXP, 80% of those transaction fees will destroyed while 20% of these fees will be retained by the platform.

Each user, upon activating the Swipe Network, will be set up with a Smart Contract that will require a 1 SXP tokens deposit to activate the contract and enable the features of the Swipe Wallet. Thereafter when each transaction is performed, the Smart Contract will validate through the Swipe Oracle the percentage of fee is required to execute the transaction. Initially this fee will be 1% and is adjustable by Swipe to become lower, not higher. This fee is dynamic because as the supply of SXP becomes lower over the course of its existence, this fee will be required to be lowered respectively to coincide with the monetary supply of Swipe Tokens. There will be a phase 2 governance smart contract designed to help govern these Swipe Network adjustments.

7.1 SXP Features & Utility

- Up to 75% discount on fees.
- Enhanced Rewards of up to 1% on top of existing card rewards percentages.
- Used as gas for the network fees on all transactions.
- Can be spent via the Swipe Card to fiat at millions of merchants worldwide.
- Deflationary Monetary Supply as 80% of transaction fees are destroyed by the network automatically via a smart contract on the Ethereum blockchain.
- Required to obtain the Swipe Slate Card.

7.2 SXP Discounts & Enhancements

Balance in Wallet Contract	Wallet Fee Discount	Card Reward Enhancements
500,000 SXP	75%	1%
250,000 SXP	50%	0.75%
100,000 SXP	25%	0.5%

7.3 SXP Distribution

There are currently over 64 million Swipe SXP Tokens circulating in the market in which 60 million were distributed when the platform launched. There are three additional allocations that are explained below.

7.3.1. Company Treasury. 20% of the total supply, which amounts to 60,000,000 SXP tokens, have been reserved for the Company to use as part of their operational treasury. These tokens have locked in a time-lock smart contract, which allows the release of 1% of this allocation monthly with a 100-month release schedule.

7.3.2. Team/Founder Treasury. 20% of the total supply, which amounts to 60,000,000 SXP tokens, have been reserved for the early team members and founder for their compensation. These tokens have been locked in a time-lock smart contract, which allows the release of 10,000,000 SXP annually over 6 years.

7.3.3. Ecosystem Reserves. 40% of the total supply, which amounts to 120,000,000 SXP tokens, have been reserved for the Company to incentivize the network and its participants with rewards and promotions throughout its inception and onwards. There will be many development bonuses awarded to the community contributing to the Wallet and other decentralized products in the future. Ecosystem reserves are released at 1% monthly which amounts to 1,200,000 SXP over a 100-month schedule.

Conclusion

The cryptocurrency landscape is ever changing and growing. Swipe has proposed a scalable multi-blockchain architecture designed with the capability of processing financial transactions efficiently with cost effectiveness in mind. Creating a dual layer protocol running off-chain and on-chain gives the protocol the battle-tested security of Ethereum while giving itself a high-performance second layer to process the necessary functions. Companies, like Swipe, will position themselves to be at the forefront of this fourth industrial revolution by offering a product line tailored and aimed towards financial inclusion to users worldwide with as little as a smart phone and internet connection.

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