Solar Network

Delegated Proof-of-Stake Payments Blockchain

Abstract: Solar is designed from open-source blockchain protocols to powers peer-to-peer decentralized payments. Built with a DPoS consensus, Solar is secured and validated by block producers known as Delegates who are voted in based on SXP vote delegation. SXP is the native cryptocurrency of the network and is used throughout the protocol and Solar ecosystem.

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Introduction

Solar is a delegated proof-of-stake blockchain which enables SXP holders to control and dictate the network through voting weight. The consensus mechanism is utilized through open-source block-chain protocols where 51 delegates produce blocks and validate transactions throughout the network. Solar offers users block speed that is fast and secure at 8 seconds per block.

Other blockchain networks strive to become the distributed ledger protocol for smart contract developers to build their own token and platform that benefits the third party. Solar focuses on building plugins and applications that directly benefit the solar ecosystem and SXP as opposed to attracting other tokens to benefit from the base layer.

Architecture

Consensus

Solar is operated and secured by a Delegated Proof of Stake (DPoS) algorithm which ensures high performance of 8 second block files and 53 voters in delegates that produce blocks and validate transactions in the network. SXP is the central unit of currency for the blockchain which also represents the voting power to vote in Delegates whom are block producers. Delegates that are in the top 53 earn block rewards and transactions fees all proportionally per block. Delegates may change over time as difference ones enter the top 53 as each 1 SXP in a users wallet represents 1 vote. When these tokens are moved the vote weight is removed thus encouraging on-chain use of SXP. Users are able to change their votes to any other delegate at any time.

Decentralization & Performance

Based on SXP's transactional activity on Ethereum and Binance Chain, the performance of 8 second block times exceeds what is currently required by a great margin. By compromising block time against some block chains that offer few seconds of block confirmations, ensuring security and decentralization is the trade off. By having 53 distributed delegates that all receive equal block rewards protects consensus throughout the network. Relay Nodes work in tandem with Delegate Nodes which also confirm and maintain copies of the ledger for distributed data validation.

Voting for Delegates that control the network gives the full power to SXP holders. Built into the protocol is voting capabilities that users can assign to any Delegate of their choice through nominal block fees. Votes are tallied per block and delegates are voted in as the primary 53 block producers and back up producers if one goes offline or misses blacks.

SXP Incentive Mechanics

Delegates are incentivized to produce blocks and validate transactions by earning a block reward and transaction fees included in that block. Therefore every 8 seconds, 51 delegates validate in a round that takes 408 seconds to produce and validate blocks. Every round will have a random order of Delegates to produce blocks to ensure all delegates are always online. Once a block is produced, 10 SXP is awarded to that Block Producers as well as all transaction fees in the block.

If the Delegate is not online or fails to produce the block timely, the Delegate looses their turn and will be marked offline. Therefore, network uptime for these Delegates is essential or they miss the economic incentives. Delegates can set up pools and distribute rewards to their voters.

Delegates

Swipechain Delegates are 53 community groups or members that operate Delegate Nodes and are voted in through the top 53 SXP vote weights. Delegates do not just run Delegate Nodes known as Forging Nodes and produce blocks. They are a pillar to the Swipechain infrastructure offering developer resources, marketing resources, or other various contributions to the network. Voting for Delegates that offer more than just distributing block rewards is highly recommended. Delegates have a pledge to the network to voice their support on protocol improvements and enhancements and should create their own respective sub communities to promote to their audience.

Preventing Spam

To ensure malicious actors don't flood and spam the network, each transaction will go through a simple payment verification (SPV) on a isolated server or process before entering the mempool. This protects the network by segregating the network against attacks. Transaction fees acts as a second layer of protecting the network from spam as free based transactions could potentially give no economics disadvantage to spam the network whereas having fees does.

Modular Architecture

Solar is using forked and open-source infrastructure to create a core that is scalable through multiple standalone packages. By setting this base layer, upgrades and custom implementations can be achieved by the broader community without significant core changes.

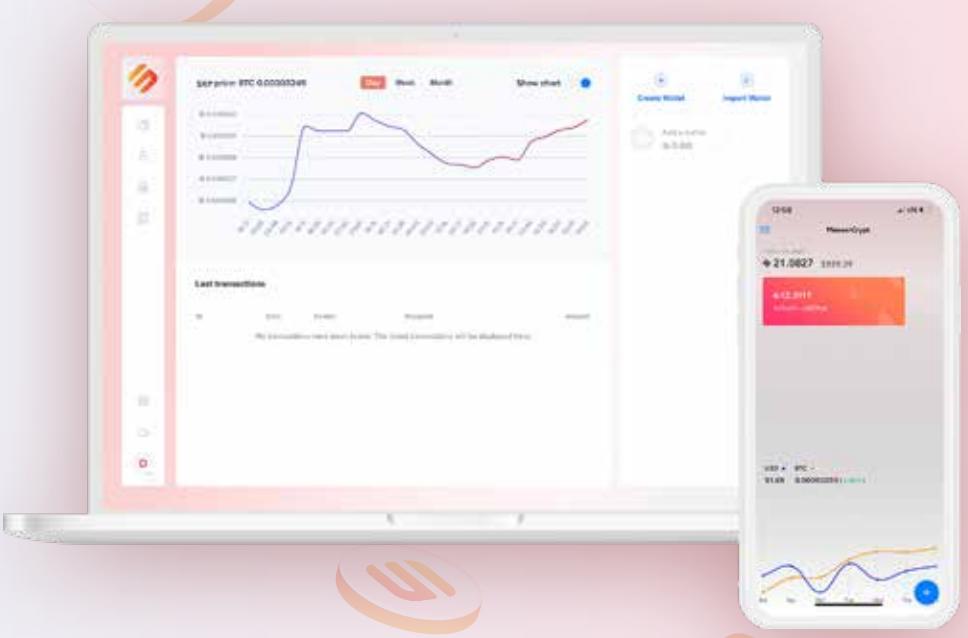
Plugin Architecture

The modular architecture core gives the ability to add improvements to the core of the blockchain like smart contracts called Plugins. All plugins developed by the community are interconnected via the Core Plugin Manager package which serves as a container to incorporate all of the instances across all sharers plucks.

This Plugin Manager allows developers to provision difference Bootstrap commands for processes like spinning a relay node or delegate node. This system accepts two key parameters to a core folder that contains the plugin.json file and a parameter that is optional which has the ability to include and exclude plugins from the Bootstrap process.

Custom and Dynamic Fees

Transaction Fees are required to prevent spam attacks on the network and to pay for transaction processing to Delegate nodes. However, instead of static base fees Solar enables users to replicate gas fee implementions based on other blockchains on the network. Dynamic fees are a benefit to users to set low fees when Solar is not full of transactions in the memoiok and beneficial to Delegates when higher fees need to be paid due to high transaction performance.



Special Transaction Types

Built into Solar are an array of transaction types aside from transferring SXP which are articulated below:

Bridgechain registration:

Vendor Field:

A special data field allowing raw data, code or plain text that Vendors can use as a memo or other function.

Delegate Registration & Resignation:

Any user globally can register their wallet address to become a delegate by broadcasting a delegate registeration transaction, paying the fees and setting a custom name. Once the wallet receives enough voting weight either independently or through community voting, they can begin producing blocks with a forging node. Delegates may also resign from their position by broadcasting and paying for the resignation.

Vote & Unvote:

Each Wallet can vote and unvote for their delegates on-demand. Vote weight is factored as long as SXP remains in the wallet.

Second Signature:

Each Wallet can vote and unvote for their delegates on-demand. Vote weight is factored as long as SXP remains in the wallet.

Timelock:

A transaction of this type acts as a simple logic function that restricts the spending of an amount of SXP at a specified address until a predefined future time or block height is met. This is useful for hash-based contracts and payment channels.

Multipayments

This type is designed to reduce the payload on the blockchain by enabling multiple payments to be combined and broadcast to the network as a single transaction. This benefits the end user and delegates by lowering transaction fees per payment and reducing congestion. Initially and depending on testing, the ARK Core will allow 400-500 payments to be combined within a single transaction. Eventually, the number of payments per transaction will be able to scale as needed.

IPFS.

IPFS. This transaction type utilizes a special data field similar to the vendor field to store Interplanetary File System data on the blockchain. This provides an easy way to timestamp and optionally encrypt and verify files. This implementation of the IPFS transaction type won't allow storing data on the blockchain - for that, special IPFS nodes are needed.

Business Registration.

This transaction type enables users and businesses to register on the ARK mainchain. For more information, see section 11.5.

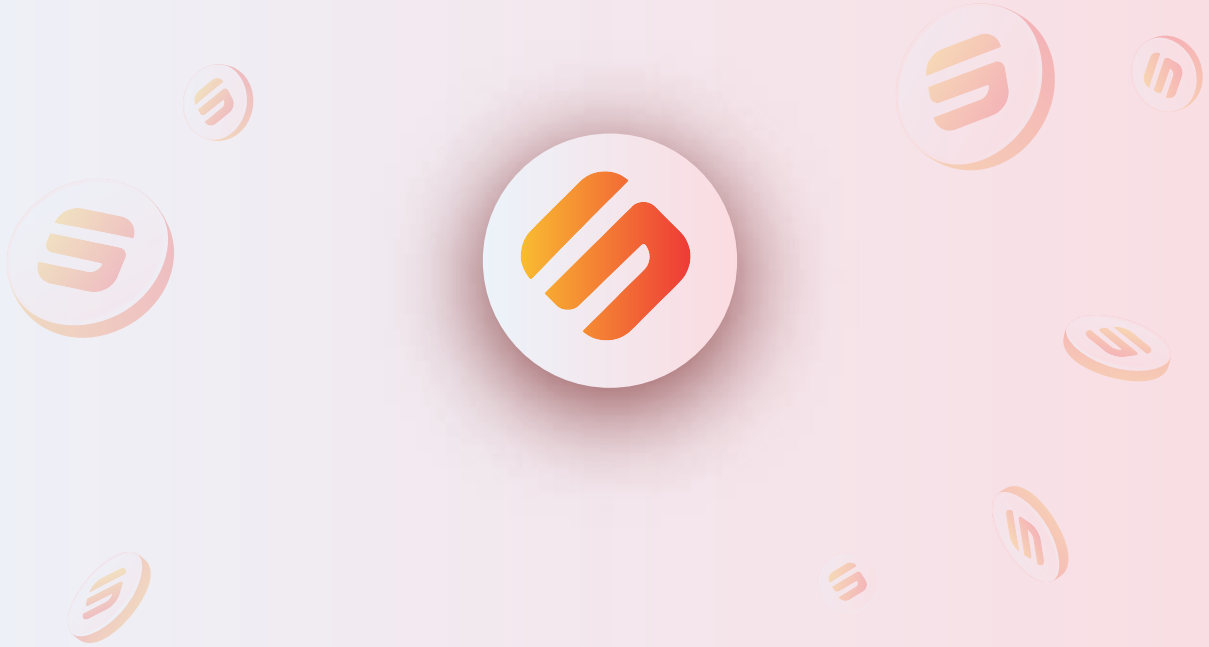
Bridgechain Registration.

This transaction type, which requires business registration, grants users and businesses access to the ARK Deployer suite for bridgechain launching.

SXP

SXP is the native cryptocurrency powering the entire Solar network and Solar ecosystem. SXP is utilized for payments within the Swipe ecosystem, peer-to-peer transfers, paying for transaction fees, voting, and to distribute economic incentives to delegates securing and validating transactions. SXP delegates will control the blockchain and make any necessary governance based changes to upgrade these parameters with consensus.

SXP is currently available in many cryptocurrency exchanges with a global diversification. SXP is deployed currently on Ethereum and Binance Chain/Smart Chain. Upon the launch of the main network both ERC20 & BEP2 SXP will be swapped for native SXP. BEP20 (Binance Smart Chain) can be swapped by unwrapping back to BEP2 (Binance Chain) prior to the swap or after the swap through Binance.com. All SXP units will be accounted for and users will have until 6 months after the mainnet to upgrade. Thereafter we will end transactional support for the swap.



Core Products

Desktop Clients

Solar users will have access to open source desktop wallets available on:

Windows MacOSX Linux

Mobile Wallet

Solar will deploy a open-source mobile wallet available for:

iOS Android

Solar SDK & API

Building on Solar becomes developer friendly to build plugins and applications through many different programming languages utilizing our extensive SDK library. The Solar API is built into the node architecture to offer lightweight access to features for users.

Explorer

View Solar and all the blockchain data in a user friendly open-source interface.

Conclusion

Solar is the base layer for the SXP community to diversify and disrupt payments globally. With a high speed and decentralized architecture users and developers can enjoy building the next series of upgrades on Solar. Solar has architecture that plans to create interoperability with other chains through Smart Bridges to perform atomic swaps at the Layer 1 level through Solar Swap. We welcome developers to build applications and protocols that center around Swipechain and SXP. For more technical and additional information visit docs.solar.network

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