Blockstack

Internet and browser for decentralized applications

MESSARI

Blockstack provides infrastructure and tools to power an internet for decentralized applications.

The network aims to give users full control over their personal data by removing the need for applications to store these details on centralized servers. Users are able to store their own data and set custom read/write permissions when interacting with applications on the Blockstack browser. Blockstack has created decentralized identity, discovery, and storage systems to run these programs.

Project Overview

Name	Blockstack
Issuer	Blockstack Token LLC
Category	Utility
Sector	DApps
Sale Start	11/13/2017
Sale End	11/20/2017

Token Overview

Name	Stack
Symbol	N/A
Type	Native
Initial Distribution	1,320,000,000
Current Supply	N/A
Max Supply	N/A
Emission Type	Ongoing

Resource Links

- Website
- GitHub
- Twitter
- Blog
- Reddit
- Whitepaper

Project Background

Blockstack is an open source project that is attempting to build a more decentralized internet. The project is an evolution of the Onename registry service that offered distributed identity for the .id namespace. Co-founders Ryan Shea and Muneeb Ali launched Onename in March 2014 and were accepted into that summer's Y Combinator program. Blockstack was built on the underlying registry service and expanded to include an application ("app") marketplace which functions like a decentralized version of Apple's app store.

The platform aims to allow users to manage and retain ownership of their personal data by removing the need for centralized hosting used in existing systems. Users can access applications through the Blockstack browser, which serves as a developer tool to handle authentication requests and as an application discovery tool for new and existing users.

Blockstack is both an open-source project and a Public Benefit Corp (PBC). The mission of the Blockstack PBC is to enable an open, decentralized internet. To date, Blockstack PBC team members have lead and developed the Blockstack protocol, but with the future goal to create a decentralized community of developers outside of the Blockstack PBC team.

Currently, users can establish an identity through the Blockstack browser and access a handful of decentralized applications. While the network currently relies on bitcoin for payment the team is working to integrate the native "Stack" token for future use

Technology

Blockstack does not rely on its own proprietary blockchain, but instead uses what is termed a 'virtual chain', which operates on top of an existing blockchain. The virtual chain is responsible for performing operations related to running applications on the network while using the underlying blockchain to store records of operations and provide consensus on the order in which operations were written. Nodes on the underlying network will see raw transactions where operations were written, but the logic to process virtual chain operations remains at the second layer.

Using a virtual chain is intended to give Blockstack the optionality to choose the most secure blockchain available and the flexibility to easily migrate between blockchains if the underlying chain is compromised. The Blockstack team has already migrated the virtual chain once from the original underlying blockchain, Namecoin, to the current underlying blockchain, Bitcoin.

Applications on Blockstack are built using JavaScript and existing web frameworks. When a user runs an app they provide access to an application programing interface (API) which runs at the user level. This removes the need for developers to run centralized servers and allows users to control their own data, only allowing access to applications when needed.

The core of the platform utilizes the existing lower layers of today's internet architecture like TCP or UDP and focuses on removing centralization at the application layer. This means rethinking many existing structures like the domain name system (DNS), public-key infrastructure, and storage backends. Blockstack offers developers alternatives to these systems with its decentralized solutions for discovery, identity, and storage. The Blockstack architecture addresses these needs through a combination of existing and decentralized infrastructures.

Identity

Identity is managed at the blockchain layer. Blockstack uses a unique blockchain naming service (BNS) to replace the traditional DNS that maps human readable names, like twitter.com, to IP addresses. The ability to use human readable names was important for the team as it creates a more user-friendly experience. Domain names in the BNS are embedded on the underlying blockchain and controlled by an owner's private keys.

The end product is meant to resemble current internet structures while reducing the potential for denial of service attacks on centralized domain servers and protecting an application's ownership of a specific domain.

Users of the platform create a Blockstack ID, denoted with the .id domain, which stores personal data and allows users to permission applications to access this data.

Discovery

The discovery of resources, including domain to IP mapping, is managed at the peer layer through a custom-built network called Atlas. Similar to the existing DNS, the discovery layer is built using zone files, which map the details of a domain in a single file without containing the actual resource data. This allows Blockstack to store larger files in a variety of cloud solutions such as Amazon Web Services (AWS), Microsoft Azure, or Dropbox, saving space on the blockchain.

Atlas operates as a peer-to-peer network where nodes are responsible for storing the zone files. Using a blockchain based peer-to-peer network helps to ensure data integrity by allowing users to check the hashes of records.

Storage

Storage takes place outside of the blockchain allowing for arbitrarily sized data. Removing the storage layer from the blockchain enables application users to choose a storage solution that works for them, including distributed systems like Filecoin or legacy providers like Dropbox and AWS. The Atlas network facilitates the mapping of resources to these outside storage systems.

All stored data, regardless of where it is stored, is encrypted to prevent providers from accessing personal data which can be especially important for more centralized services. Again, data integrity can be checked using the hash records stored through Atlas and the underlying blockchain.

Distribution

In November 2017, Blockstack raised approximately $50M through a token sale using the CoinList platform. Participants in the sale received distributions based on a price of $0.12 per Blockstack token (Stack), with a total of 1.32 billion created through a genesis block. These tokens were allocated through a main sale, user sale, and creator allocation, with each group receiving 440 million tokens. [1]

The main sale was restricted to accredited investors with additional checks to comply with know your customer (KYC) and anti money laundering (AML) regulations. Investors deemed as "qualified" exceeded the criteria for this category with a minimum of $5 million in outside investments for individuals or $25 million for entities. Qualified investors were required to invest in a fund created specifically for investing in Stack tokens. Investors will receive tokens only if the network goes live. Those that met the accredited investor requirements, but were not deemed qualified, were required to invest in either a second fund or through a simple agreement for future tokens (SAFT). Again, no tokens will be distributed until the network is live, at which point they will vest monthly over a two year period.

Non-accredited investors were able to participate in the user sale which allowed them to sign up for a voucher system giving them the right to purchase $3,000 worth of Stack tokens once the network launches and only if the Blockstack team determines definitively that the tokens are not securities. While the majority of tokens in the user sale will be distributed using vouchers up to 20% have been reserved for giveaways.

Stack tokens set aside for the Creator allocation will be distributed to two separate groups. The first group, Blockstack PBC Shareholders, received 75% of the allocated tokens (330 million) with a three year vesting period. The remaining 25% (110 million) of tokens are allocated to Blockstack's treasury with a vesting period of seven years.

Proceeds from the token sale will be distributed to the Blockstack team based on milestones. The team immediately received 20% of the proceeds with the remaining 80% to be issued in two equal installments, subject to meeting two separate milestones. The first milestone is launching the network on or before Jan. 30, 2019 and the second is achieving one million verified users on or before Jan. 30, 2020.

Currently, Blockstack uses bitcoin as the network token. When the new network launches, Blockstack will use 'proof-of-burn' mining where participants burn bitcoin, by sending it to an address not controlled by anyone, to release new Stack tokens into the network. Miners will use this system to verify data entries and identify the longest blockchain. New Stack tokens are released at a rate of 8,000 tokens per block during the first year with a decrease of 500 tokens per block every following year until the block reward hits 2,000. Blockstack forecasts a total supply of 4.70 billion tokens after ten years with long term inflation of 2%.

In addition to block rewards the Stack token will be used as reward for the development of quality applications and as an incentive mechanism to get users to join the platform. Over the long term Blockstack envisions tokens acting as a governance mechanism though details of how this will work are unclear.

Roadmap

Blockstack has built a majority of the Blockstack Core protocol. To date, the Blockstack team has created a platform for developers to build applications and users to create Blockstack IDs that allow them to use Blockstack applications. While the platform currently uses bitcoin, the goal is to integrate the Stack token.

Through the Blockstack browser, there are several functioning applications. Blockstack has over 70,000 domains registered through their Blockchain Naming System (BNS) and over 7,000 members in their application development community.

The two major milestones for the team relate to the allocation of token sale funds and include releasing the main network, with Stack integration, on or before Jan. 30, 2019 and reaching 1 million users by Jan. 30, 2020.

New features can be requested through a wishlist though there are no defined timelines for integrations. Developers can build a feature and submit it directly to the Blockstack team.

[1] Source: https://blockstack.com/distribution.pdf

Team

Muneeb Ali
Co-founder

- Received a Ph.D. in distributed engineering from Princeton

- Recipient of a J. William Fulbright Fellowship

Ryan Shea
Co-founder

- Studied engineering at Princeton

- Inducted into Forbes 30 under 30

Advisors

Michael Freedman

- Distributed systems professor at Princeton University

JP Singh

- Director of Princeton CTO program

Investors[2]

Winklevoss Capital

Union Square Ventures

Qasar Younis

Michael Arrington

Lux Capital

June Fund

Foundation Capital

Digital Currency Group

Blockchain Capital

Alumni Ventures Group

AVG Blockchain Fund

[2]Source: https://www.crunchbase.com/organization/blockstack-inc#section-locked-charts

AdditionalResources

- Blockstack - A New Internet for Decentralized Apps

- Ryan Shea of Blockstack: "Web 3 and Decentralized Apps"

- Token Economy: Breaking Down Blockstack

- CoinDesk: Blockstack Releases Blockchain-Powered, Tokenized Internet Browser