

Blockstack Overview

October, 2017

By Blockstack Token LLC
token@blockstack.com

What is Blockstack?

Blockstack is a new internet for decentralized applications.

The internet was designed to be decentralized but as time went on, it fell under the control of a few large corporations.

This has threatened:

- data ownership
- freedom of speech
- open markets

The architects of the internet got many things right, but they also missed out on focusing on security in the original design.

As a result, internet users everywhere have been much less safe and have had their data placed in much greater risk.

Blockstack is a way to put users back in control of their digital lives.

The Internet has Big Problems

The cloud makes our data vulnerable

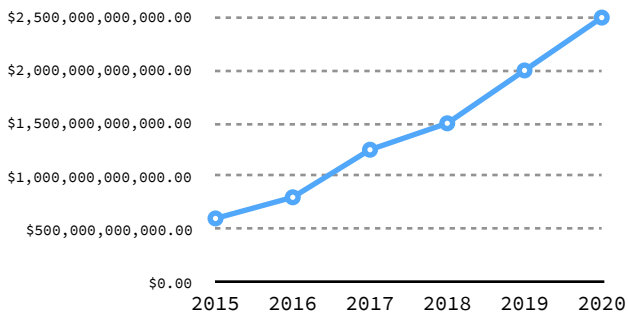
The internet has become much more important in our daily lives. At the same time it's much more dangerous to be online. The frequency and the severity of attacks has increased to an alarming number.

In fact, today, the world's biggest data breaches are measured in terms of billions of people, not just millions. The cost of data breaches is projected to reach ~2.5 trillion range by 2020.

The traditional model for applications requires us to take our data and put it up in "data banks" in the cloud and blindly trust a few companies.

A new model is must emerge.

Projected costs of data breaches



The Internet has Big Problems

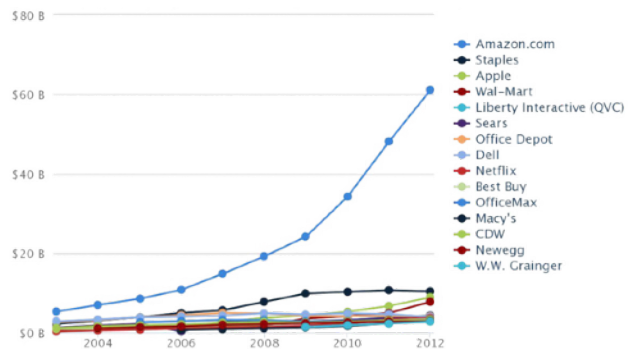
Centralized platforms threaten freedom and innovation

The internet began as an open platform where anyone could publish content and anyone could communicate with anyone else.

Over time, unfortunately, certain companies started accumulating a shockingly large amount of power over people's experiences on the internet, locking in users and exerting control.

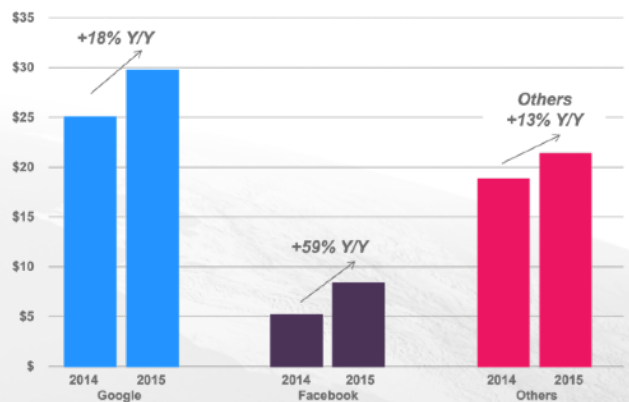
The internet needs to remain a platform for freedom and innovation. The way forward requires a system that has no centralized points of failure and control.

Internet Retailers



Source: The Wall Street Journal

Advertising revenue (\$B)



Source: Internet trends 2016, Mary Meeker of KPCB

The Next Wave of Computing

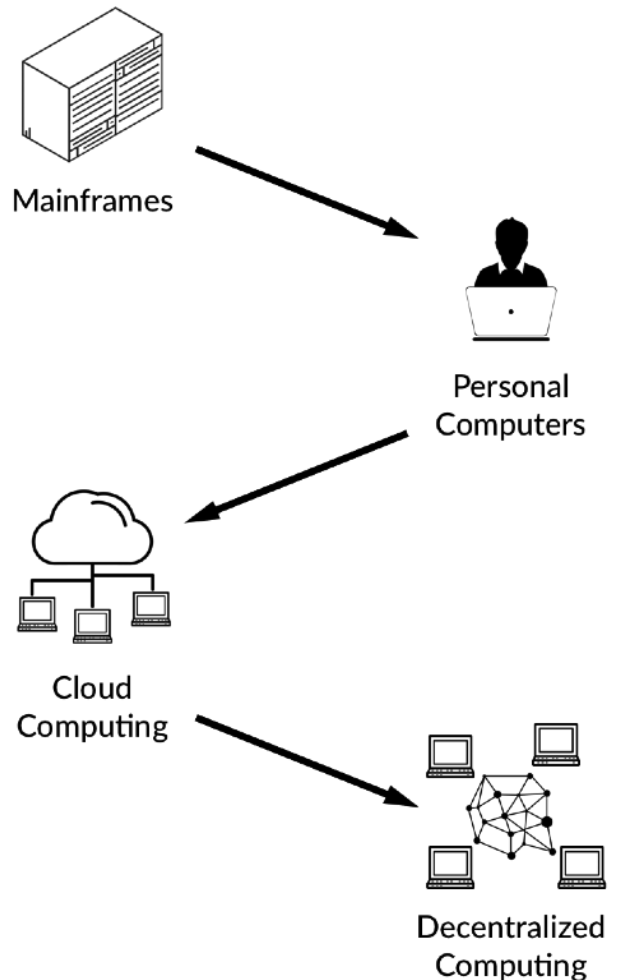
Computing systems have followed a swing of a pendulum, with centralized computing on one end and decentralized computing on the other.

The mainframes of the 60s and 70s had a “centralized” computing model where a single mainframe would serve an entire office building.

The desktop revolution of the 1980s and 1990s was a massive shift away from mainframes and people had computers in their homes.

In the 2000s and 2010’s we saw a shift towards cloud computing. Our laptops are just screens and all of our compute-jobs go to the cloud.

The next wave of computing is going to be a shift away from cloud computing towards decentralized computing. Blockstack aims to accelerate and facilitate this new age of decentralized computing.



The History of Blockstack

Blockstack was started by Ryan Shea and Muneeb Ali in 2013. They met at the CS department at Princeton University.



Muneeb and Ryan went through Y Combinator in the Summer of 2014. Union Square Ventures (USV) led the Seed round.



In 2016, the developer community grew to over 1000 people, development began on the Blockstack Browser, and the core team raised \$4M in a Series A funding round led by Union



Blockstack Inc. was transformed to Blockstack PBC in September 2017

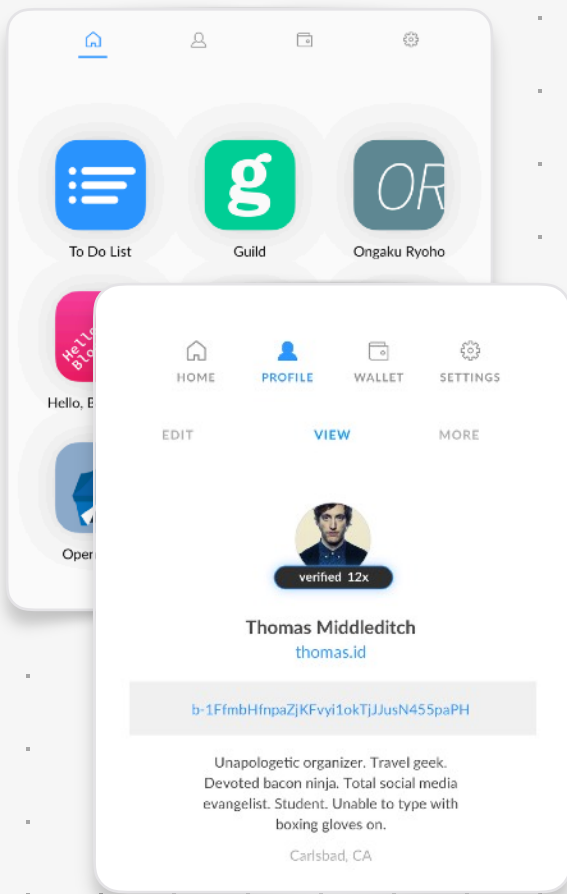
The first component of Blockstack, a decentralized identity system, launched in March 2014; one of the first non-financial applications utilizing blockchain technology.

In 2015, the team grew to 4 people, built a decentralized domain name system and introduced blockchain virtualization tech.

In 2016, three peer-reviewed research publications come out of the work.



In 2017, the Blockstack developer platform was launched with a developer-release of Blockstack Browser and a decentralized storage system. The developer community grew to 8000 people around the world.



How Blockstack Works

Users download Blockstack and it installs everything they need to gain access to the new internet for decentralized apps.

Users create an account and a keychain is created on user devices. This keychain lets them sign and encrypt their files locally before it is synced and backed up to the cloud, enabling true data ownership.

Users create and verify the first identity they truly own, a Blockstack ID. This means strong protection against account hijacking and impersonation. Users can rest easy knowing they're talking to the right people and signing in to the right apps.

Blockstack Infrastructure

The Blockstack Blockchain & P2P Network

The Blockstack blockchain and peer-to-peer network form the secure backbone of the Blockstack network. Name operations are embedded in the blockchain and additional data is stored in the peer-to-peer network, known as the Atlas network.

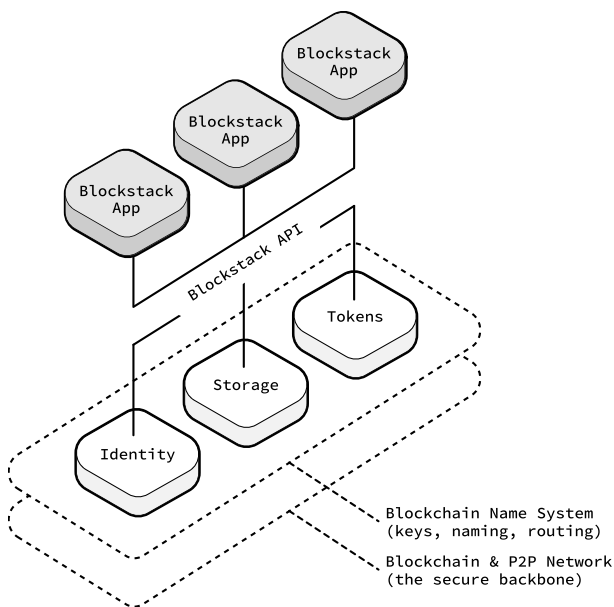
The Blockchain Name System

The BNS (or Blockchain Name System) is a replacement for DNS and is meant to provide similar functionality without any central root servers. In BNS, names are owned by cryptographic addresses of the underlying blockchain and their associated private keys.

One can execute name operations (registrations, transfers, zone file updates, etc.) by embedding them in the underlying blockchain. All Blockstack nodes then pick up these operations and process them in order as a state machine. From this, they are able to independently reconstruct the namespace in the exact same way.

The Blockstack API

The Blockstack API provides methods for identity, storage and tokens. You can read more about this in the next section.



Peer-reviewed Research

The Blockstack network and token are described in their respective whitepapers.

In addition, to the main whitepapers several subparts of the system were earlier published in peer-reviewed conferences, and research publications:



- M. Ali, J. Nelson, R. Shea and M. J. Freedman, “Blockstack: A Global Naming and Storage System Secured by Blockchains”, 2016 USENIX Annual Technical Conference, Denver, CO, June 2016.
- J. Nelson, M. Ali, R. Shea and M. J. Freedman, “Extending Existing Blockchains with Virtualchain”, Workshop on Distributed Cryptocurrencies and Consensus Ledgers, Chicago, IL, July 2016.
- M. Ali, J. Nelson, R. Shea and M. J. Freedman, “Bootstrapping Trust in Distributed Systems with Blockchains”, USENIX ;login: Issue: Vol. 41, No. 3, Pages 52-58, Fall 2016
- M. Ali, *Trust-to-Trust Design of a New Internet*. PhD thesis, Princeton University, June 2017

Blockstack for Developers

Blockstack's overarching developer philosophy for decentralized applications is:

- 1 Reuse existing infrastructure wherever possible
- 2 Blockchains should be used as minimally as possible
- 3 Developers shouldn't have to program on blockchains directly

Instead, developers should be provided with simple libraries that abstract away the core functionality.

One of the most incredible aspects of Blockstack is its ability to simplify application development and make it easier to build decentralized applications than traditional applications

Identity

(Available today)

```
1 blockstack.redirectUserToSignIn()
2 blockstack.signUserIn(user) => {}
```

Storage

(Available today)

```
1 blockstack.putFile("settings.txt", {})
2   .then(success => {})
3 blockstack.getFile("settings.txt")
4   .then(data => {})
```

Tokens

(Coming soon)

```
1 blockstack.createToken("stacks", 1000000)
2   .then(data => {})
3 blockstack.sendPayment('stacks', 'werner.id', 50)
4   .then(success => {})
```

Blockstack by the Numbers

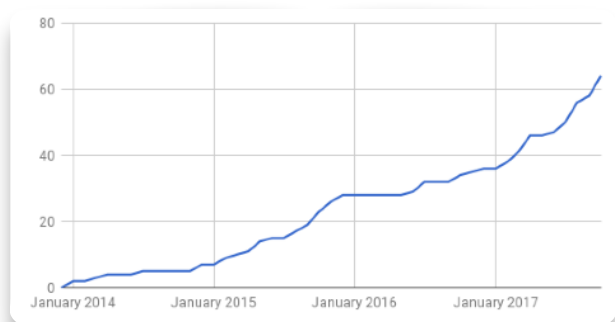
Blockstack is an open source community with thousands of app developers, infrastructure contributors, meetup organizers, and general community members from around the world.

App Growth

Since the launch of the Blockstack Developer Platform in Summer 2017 and the launch of the Signature Fund in Fall 2017, hundreds of teams have started building applications on Blockstack. In fact, the first Signature Fund Bounty for an encrypted token portfolio manager brought in 50 application submissions alone.



Teams building on Blockstack



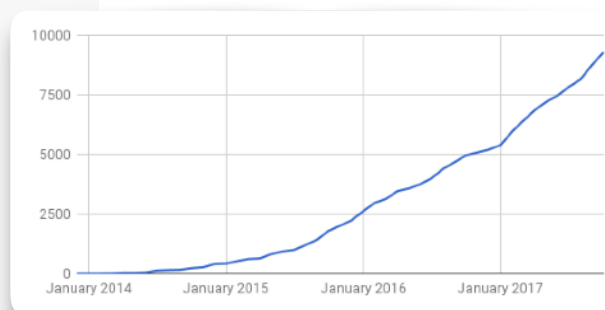
Committers over time

Code Contributor Growth

The Blockstack code revolves around Blockstack Core and the Blockstack Browser. Dozens of developers from the community and Blockstack PBC alike contribute code commits each and every day. Communication around development happens in open channels that anyone can join and weekly development meetings are open for anyone in the public to join.

Community Member Growth

The Blockstack community is filled with enthusiastic members across the forums, the mailing list, the Slack group, the subreddit, and the meetup groups. Developer evangelists congregate in their own Slack channel and coordinate about events and best practices on weekly conference calls.



Comments over time

Who Makes up Blockstack

Blockstack is an ecosystem comprised of both an open source project and a Public Benefit Corporation.

Blockstack PBC has historically taken the lead on Blockstack protocol development, but that has been changing over time. More and more independent parties are taking on greater roles in the protocol's development and that is expected to greatly expand in the coming years.

The Blockstack PBC team is made up of experts in distributed systems, computer security, and product design. Team members live around the world from New York to Toronto to Hong Kong. They include 5 PhDs from Princeton, Stanford and MIT as well as several entrepreneurial engineers, designers and marketers with experience running companies since their inception.

Blockstack PBC works with hundreds of community contributors and is business with some of the top investors in the world like Union Square Ventures, Y Combinator, and Naval Ravikant.

Team



Muneeb Ali
Co-Founder



Ryan Shea
Co-Founder



Jude Nelson
Engineering Partner



Aaron Blankstein
Engineering Partner



Larry Salibra
Engineering Partner



Gina Abrams
People Ops Partner



Guy Lepage
Design Partner



Patrick Stanley
Growth Partner



Jack Zampolin
Engineering Partner



Ken Liao
Engineering Partner



Michael Freedman
Technical Advisor



JP Singh
Technical Advisor

Existing Investors



Union Square Ventures



LUX Capital



Y Combinator



SV Angel



Shana Fisher



Naval Ravikant



Kal Vepuri



Mike Yavonditte



Digital Currency Group



Version One Ventures



Rising Tide Fund



CompoundVC