STORJ

Our mission

To be the world's largest cloud storage provider without operating a data center by building a decentralized cloud storage solution that's accessible by anyone, anywhere.

Overview

Cloud storage has come to rely heavily on large storage providers acting as trusted third parties to transfer and store data. This system suffers from the inherent weaknesses of a trust-based model. Because client-side encryption is nonstandard, the traditional cloud is vulnerable to a variety of security threats, including man-in-the-middle attacks, malware, and application flaws that expose private consumer and corporate data. Moreover, because many storage devices rely on the same infrastructure, failures are correlated across files and systems.

A decentralized cloud storage network offers many advantages compared to datacenter-based cloud storage. Data security can be maintained using client-side encryption, while data integrity can be maintained via a proof of retrievability. In the decentralized model, the impact of infrastructure failures and security breaches can be greatly reduced. An open market for data storage may drive down costs for various storage services by enabling more parties to compete using existing devices. Data on the network is expected to be significantly more resistant to censorship, tampering, unauthorized access, and data failures.

Storj's core technology is an enforceable, peer-to-peer, storage contract. It's a way for two people (or computers) to agree to exchange some amount of storage for money without knowing each other. We call the computer selling storage space the "farmer," and the computer purchasing space the "renter." The renter and farmer meet, negotiate an agreement, and move data from the renter to the farmer for safekeeping.

This peer-to-peer network is more secure, up to 10 times faster and up to 50% less expensive than traditional datacenter-based cloud storage solutions. Storj is a platform, and suite of decentralized applications, which allows users to store data in a secure and decentralized manner. It uses blockchain features like a transaction ledger, public/private key encryption, and cryptographic hash functions for security to substantially lessen the risk of censorship or hacking as compared to data centers.

Since our founding in 2014, we have solidified our business and have experienced significant growth:

- **Channel partnerships:** We've partnered with Microsoft Azure and Heroku to offer Storj integrations with PaaS providers our community already uses.

- **Enterprise ready:** We signed our first service agreement with a Fortune 500 company in 2016 and doubled our developer team.

- **Free software:** As a company, we believe in maintaining a free and open-source software model. Our community is constantly developing new solutions, which easily integrate with the Storj ecosystem.

- **Rapid growth:** We have over 25,000 API users and almost 19,000 farmers on the Storj network, with steady growth each month in the last year.

Our goal as a company is to provide a cloud storage solution that is substantially faster and up to 50% less expensive than traditional datacenter-based cloud storage solutions provided by Amazon, Google and Microsoft.

Industry Background

Cloud Storage

Cloud storage is a way of safekeeping data in an outsourced manner: instead of being kept on a local, in-house device (personal computer or server) it is stored on centralized servers which are sometimes

made redundant across several locations. At the moment, cloud storage providers typically manage the locations of the hardware and it is the provider's responsibility to keep the data safe, available and accessible for the users.

The demand for cloud storage arose from developers and enterprises seeking scalability and flexibility of storage, with a lower total cost of ownership. Many developers have the ability to orchestrate, design and build great user interfaces and experiences. However, engineering reliable data storage at scale is a much more difficult task - and as applications gain new functionality, the demands for advanced data storage and management increase. In today's content rich world, developers can't afford to let storage boundaries hinder their next innovation. This has been an important driver for developers to increasingly adopt cloud storage solutions. The alternative - seeking storage space on the device itself, competing against a myriad of other apps for limited space while also limiting the accessibility of data for users, is unattractive. The advantages of shifting app data to the cloud are obvious. We believe it is a significantly better way to ensure a consistent high quality experience for app users, safeguard their data and enable them to access it from any device, and removes the issue of running out of storage space.

Mass adoption of cloud storage solutions and hybrid cloud storage models is thus quickly becoming a reality. According to analysts' estimates, North America is expected to hold the largest market share and dominate the cloud storage market from 2016 to 2021 owing partially to large investments in cloud-based solutions (source: Cloud Storage Market report by MarketsandMarkets). The APAC region is in the initial growth phase; however, it is the fastest-growing region for the global cloud storage market. The key reasons for the high growth rate in APAC are growing demand for hybrid cloud storage, increasing need for enterprise data storage, and rising cloud-based applications.

However, as cloud storage grows in popularity, problems within this market are becoming more and more apparent:

- **High prices:** Despite media cost reductions, major cloud suppliers have not significantly lowered storage prices in over a year. This strongly implies that cloud service prices are not linked to media prices, but rather to non-media operating costs.

- **Consolidated market:** The cloud storage market is currently consolidated with the so-called Big Three (AWS, Microsoft Azure, and Google Cloud Platforms). This causes concern for many users, since their data is in fact consolidated on the servers of multinational corporations, becoming susceptible to tampering, falling operational speeds and higher costs.

- **Security concerns:** A recent AWS outage brought about Internet chaos, with a number of popular websites rendered inaccessible and causing panic among users. This demonstrates a crisis in cloud storage: on the one hand, companies and developers are keen to outsource data storage, since keeping storage capacities in-house is no longer financially viable. On the other hand, it does not mean that the third-party provider will keep data secure, private and accessible at all times.

Bitcoin and Blockchain Technology

Created in the wake of the 2008 global financial crisis, Bitcoin and its underlying blockchain technology have sparked a wave of innovation that we believe has the potential to impact many sectors and industries. Blockchain technology has the capacity to facilitate the secure, rapid exchange of value, in a way that could be considered similar to how the Internet enables the secure, rapid exchange of information. Initially, much of the technology and investment focus was on blockchain's role as the backbone of Bitcoin but, since then, we have seen the utilization of blockchain technology evolve from peer-to-peer cryptocurrency applications to a trading and settlement system for traditional financial instruments to an infrastructure technology, with potential application across many sectors of the global economy.

Fundamentally, blockchain is a disintermediating technology that has the potential to facilitate trust and commerce between economic actors (individuals and companies). Published in 2008, the Bitcoin white paper describes a payment system that allows individuals to confidently transact with one another without knowing or trusting one another and without involving a trusted third party. Bitcoin was designed

to be without a central point of failure, and secured by cryptography and mathematics, rather than trust in a centralized third party, for example.

This concept of a decentralized architecture is highly novel and intended to allow individuals to freely and rapidly transact with one another regardless of geographic constraints. This is especially relevant in the cloud storage market, which is currently consolidated with the so-called Big Three (AWS, Microsoft Azure, and Google Cloud Platforms), with user data consolidated on their servers, becoming susceptible to security breaches and misuse. On a bigger, non industry specific scale, people place trust in large central authorities, such as governments and multinational corporations. At its core, the trend towards decentralization, which is characteristic of blockchain technologies, does not place trust in a single authority. Since trust is dispersed over an innumerable number of entities, a single security breach or a system malfunction should not compromise the whole system.

Since its inception, Bitcoin has inspired a host of similar "altcoin" crypto currencies from Litecoin to Ethereum that attempt to improve upon Bitcoin or tackle alternative use cases of its underlying technology. However, it is only in recent years that Silicon Valley and Wall Street have indicated interest in Bitcoin's underlying blockchain technology. There is an increased focus on the opportunities of blockchain technology and its most salient attribute as a robust decentralized architecture with the ability to facilitate transparency, immutability and the frictionless transfer of assets of all types. In particular, Ethereum emerged as a blockchain purpose-built with the flexibility required to help blockchain technology address multiple industries and diverse use cases.

Originally proposed with a goal of building decentralized applications, the rise of Ethereum was to a large extent driven by its focus on smart contract functionality. Among other potential applications, smart contracts can represent the digitized execution of a binding agreement, transparent on a blockchain. Smart contracts aim to provide security superior to traditional contractual mechanisms and to reduce other transaction costs associated with flow of value. Key use cases for smart contracts in the near future are likely to include, cloud storage, digital identity, record keeping, securities, trade finance, derivatives and land title data recording, among others.

Large corporations have most recently demonstrated their increased interest in Ethereum by organizing the Enterprise Ethereum Alliance (the "EE Alliance"). Announced in February 2017, the EE Alliance aims to develop an Ethereum platform for enterprise business-logic solutions. Notably, the EE Alliance is comprised not only of large banks and fintech startups but also includes non-banking enterprises across many sectors such as Microsoft, Thomson Reuters, Intel and British Petroleum.

The flexibility of Ethereum-based smart contracts in turn inspired the advent of digital tokens. In the Ethereum ecosystem, tokens can represent any fungible tradable asset and can be used for a variety of non-financial applications. As such, digital tokens have emerged as a way to facilitate decentralized and distributed applications within an Ethereum-based network that the token seller establishes and develops, including the provision and receipt of services within such networks. The creation of digital tokens as a mechanism to support development of, gate access to, and provide additional functionality to such networks is commonly referred to as a Token Sale.

Our Solution

Analyst predictions estimate the cloud storage market could surpass $65 billion by 2020 (source: Cloud Storage Market report by MarketsandMarkets). We have a fully functional distributed and decentralized cloud storage platform, and we believe this will give us the means to tackle this massive market head-on by building more tools and integrations.

Because Storj doesn't host infrastructure, but instead uses a distributed and decentralized network of devices, we offer a special value proposition that we believe no other traditional storage service can offer:

- **Security:** decentralized, zero knowledge structure, vs. easily targeted infrastructure of centralized cloud storage providers

- **Availability:** aiming for down time of only 3 seconds per year, vs. 52 minutes per year for centralized cloud storage

- **Speed:** P2P architecture benefits from faster uploads and downloads vs. centralized cloud storage
- **Cost:** price per gigabyte of only $0.015, approximately half of what centralized cloud storage providers charge

Should our object storage service fail completely, users would still be able to retrieve their data as long as the application keeps copies of network locations and authorization keys. We are working on building this into our various tools and libraries by default, so every application will have this functionality without requiring any additional developer/user effort. For extra safety, the encrypted shards of data are distributed redundantly on different types of hardware and networks located in many different countries, keeping singular failure events from disrupting functionality.

Data centers serve as cloud storage hubs for web service giants like Amazon, Microsoft, and Google. But data centers come with a high price tag for developers, providers and users, and an even higher cost associated with data failures and security breaches. From physical servers and networking equipment to other infrastructure demands like electricity, cloud service providers spend billions of dollars every quarter just to maintain or grow their service offerings.

Storj aims to disrupt traditional cloud storage by offering faster speeds, heightened security, better performance, and a more cost effective storage solution. Storj provides easy to use tools so that any developer can use the Storj network, without having to be an expert in distributed networking or encryption. Ease of use allows us to get the Storj network into as many hands as possible without compromising the distributed and decentralized nature of the network.

We have surpassed 25,000 API users who leverage the Storj network for secure and decentralized data storage and we are very thankful for the continued support of the community that allowed us to achieve this milestone.

We operate on a very simple model: farmers with unused disk space agree to sell to the Storj network. They then download StorjShare and tell it how much disk space they are willing to provide to the network. Specialized renter nodes then contract many farmers to host their data. A digital contract is created, with digitally enforced execution and payments. Renters make micropayments for in exchange for storage as long as the contract is in place.

The data then goes through four steps:
- **Encrypt:** data is uniquely encrypted with the user's private key before uploading to the network
- **Shred:** files are first shredded, i.e. split into many shards on the user's computer. Additional shards, called parity shards, are created. Parity shards can be used to rebuild damaged or missing shards.
- **Spread:** encrypted shards and parity shards are stored redundantly on hundreds of disks across the network
- **Audit:** Storj's uses an interactive proof of storage to ensure data integrity and availability over time

Key benefits of our solution include:
1. Storj provides the first decentralized, end-to-end encrypted cloud storage solution to use blockchain technology and cryptography to secure files.
2. We are an open source community, which means we're all about transparency and innovation.
3. We believe that privacy and security shouldn't have to be asked for and that users have a right to control the way they operate their devices and manage their data.
4. Storj is a shared community of farmers which creates a network that is more secure, up to 10x faster and up to 50% less expensive than data center-based cloud storage solutions you might be buying from Amazon, Google or Microsoft.

5. Storj is decentralized. That means that there are no central servers that can be compromised. No "oops we may have exposed your data." All data is encrypted client-side, so only YOU have access to your unencrypted files and encryption keys.

6. We have a strong channel partnership with Heroku, because we believe in joining forces with organizations and technologies that can heighten our users experience. We don't need to recreate the wheel when something great is already out there.

7. Reuse and recycle. There's no need to spend billions of dollars on physical servers and network equipment that data centers require when there is so much spare disk space and bandwidth unused in homes and offices around the world.

8. We listen. Technology is a fast moving target. We are constantly listening to user and community feedback, learning, and aiming to do better. This token sale illustrates just that. It will allow us to innovate, build and deliver on our promise: being the world's largest cloud storage solution without operating a single data center.

9. Storj tokens can be used natively within our ecosystem to provide and receive storage services, benefitting from network effects.

10. Support matters. We're thankful to our early backers who have helped us raise $3m in seed funding which allowed Storj to get out of beta testing. Storj is also one of 20 grant recipients selected by the Utah Governor's Office of Economic Development (GOED) to get funding and mentorship opportunities that will ensure our startup is a success.

From the legal structure point of view, we are undertaking future development and operation of the Network and Services through Storj Labs (BVI) Ltd. ("Company"), a business company incorporated in the British Virgin Islands. Until recently, the Network and Services (as defined in the Terms of Token Sale) were developed and operated principally from Company's affiliate, Storj Labs Inc. ("Storj U.S"). As we developed an ambitious international growth strategy, as described more fully below and in Exhibit B of the Terms of Token Sale, we decided that it would be in our best interest to undertake future development and operation of the Network and Services from Company rather than Storj U.S. As part of this international growth strategy and reorganization, it is anticipated that Storj U.S. will provide certain administrative, technical and development services to Company.

Our Market Opportunity

The "digital universe", the data that the world creates and copies annually, is projected to grow to 44 zettabytes in 2020 from 4.4 zettabytes in 2013, more than doubling every two years (source: IDG Research, 2014). As the amount of data continues to grow exponentially, cloud storage will become essential to enhancing storage capacity and data accessibility for the next generation of applications.

The digital universe is expanding to include not only the increasing number of people and enterprises doing everything online, but also smart devices connected to the Internet, unleashing a new wave of opportunities for businesses and people around the world. The digital universe is created and defined by software. As more of the world goes online, including the physical world, the more opportunity there is for enterprises (and consumers) to use data in new ways – to learn about customers, speed business cycles, flatten organizational structures, and transform themselves into companies built upon a foundation of cloud storage, mobility, social networking, and Big Data.

In 2013, less than 20% of the data in the digital universe was "touched" by the cloud, either stored, perhaps temporarily, or processed in some way. By 2020, that percentage is expected to double to 40% (source: IDG Research, 2014).

Specifically, the Cloud Content Delivery Network market size is estimated to grow from $1.81 Billion in 2016 to $6.23 Billion by 2021, at an estimated Compound Annual Growth Rate (CAGR) of 28.0%. Major factors contributing to the growth of the cloud CDN market are growing rich media file contents, video content, increasing use of connected and smart devices, and proliferation of rich media over social sites. The cloud CDN market type is primarily dominated by video CDN, and is expected to be among the fastest growing trends in the coming years. This dominance is mainly attributed to proliferation of high

quality video contents over the websites and live online videos influencing more and more number of users.

Our Growth Strategy

Since winning a hackathon over three years ago, we've accomplished much of our original vision. Supported by our community, we've built a decentralized storage network of thousands of farmers, expanding further every day. We've grown to employ over a dozen people, opened a second office, and learned a lot of hard lessons along the way to building the world's largest distributed cloud storage platform. Now, we can take a deep breath and consider the future of Storj over the next three years.

Cloud storage is broken. Excessive centralization has created systemic problems and a large portion of the world's data is now subject to the risk of the "Big Three" (AWS, Microsoft Azure, and Google Cloud Platforms). Cloud storage is not private. The "cloud" is just a collection of other people's computers and more often than not, the data stored on these services is not encrypted and is routinely hacked.

We are passionate about decentralization, and we love free and open-source software. Our mission is to rethink cloud storage, to provide the security, privacy, and transparency it's missing. That's why we have built an open-source, distributed cloud platform that aims to fundamentally change the way people and devices own data.

Storj aims to be among the largest cloud storage providers in the world without owning or operating a data center by buying extra hard drive space for developers to use in their applications. Data should not be stored and delivered from data centers; it should be stored and delivered from everywhere.

In line with our vision, we are focusing on the following for the future of Storj:

- **Dead Simple File Storage** - Hundreds of people have requested this, and we're excited to make this dream come true. For the past several months we've been working with a partner with a large install base to create a graphical user interface for Storj. We expect to announce this partnership very soon.

- **More User and Developer Tools** - We started off planning to build a decentralized Dropbox, but since then our ambitions have grown. Instead of targeting a specific application, we decided to construct the foundation layer beneath them all. The result is a production-ready cloud object store. We've already created native and in-browser tools to store and retrieve files. As we continue to build more tools to support more use cases, we plan to reach the goal of thousands of intercompatible file storage apps interacting as equals in the Storj network.

- **Smart Contract Integrations** - When we started building Storj, smart contracts were just an idea. They are now a powerful tool for the management of distributed systems but present us with a number of difficult performance tradeoffs. Blockchain-based smart contracts cannot manage distributed storage at scale by themselves, but used in conjunction with the Bridge model they become quite compelling. In the future, Storj will add smart-contract layers for audit verification. We're also exploring on-chain structures that will allow the next generation of applications on Ethereum to use Storj as a native data layer, as well as smart-contract enabled economic reputation and bonding systems.

- **Federated Bridges** - Storj Bridges provide a set of decentralized access points to the network. Each Bridge helps manage the state of files that are uploaded. This binds clients to specific Bridges. To alleviate this drawback, in the future Storj will take advantage of audit-verification smart contracts to create a federated file management system distributed across a group of Bridges. This will allow clients and applications to use any Bridge rather than relying on a specific one.

- **Micropayments** - As the number of transactions to farmers increase on the network, we will need to implement real-time payments with micropayment channels. The Raiden Network is leading the charge in the Ethereum ecosystem, and we plan to work closely with this project to create practical payment channels that will benefit the entire community.

- **Community Collaboration** - As part of the upcoming migration plan, we want to create a better balance between the Storj Community and Storj Labs. First, we will be releasing a solution to

solve the token supply imbalance. Second, over the next few months we will be working with community leaders to build processes and tools that will help the community self-organize and have more direct access to resources to build cool and useful things like documentation and apps.

An integral part of Storj's go to market strategy is to scale by partnering with leading developer ecosystems via revenue sharing channel partnerships.

An example of Storj's channel partnership strategy includes the recently announced partnership with Heroku (a Salesforce owned company). Heroku is a cloud platform that enables app developers to spend their time on application code rather than managing backend infrastructure, and it's one of the largest developer ecosystems in the world. Storj and Heroku collaborated in order to make it easy for Heroku's developers to use Storj's distributed object storage and for Heroku to generate a portion of the revenues from using Storj.

Storj's integration on Heroku provides the following benefits to developers:

- **Effortless Encryption:** Files uploaded to Storj are encrypted by default, so data is always safe and secure.

- **Built-in Speed:** The Storj network is designed for speed. When retrieving your files, you can download multiple pieces at the same time (similar to a torrent).

- **Easy Implementation:** Using the Storj platform is simple and straightforward. With detailed documentation and examples, a developer can get started in no time.

Our Management

James Prestwich: Chief Executive Officer and Co-founder. Mr. Prestwich is responsible for managing and executing the Company's plans for growth and development. Mr. Prestwich assumed this role in May 2017 as part of a managerial reorganization in advance of the Token sale. Prior to May 2017, Shawn Wilkinson held both the CEO and Chief Technical Officer roles, but in light of the Company's ambitious growth and development plans following the Token sale, Mr. Wilkinson suggested that he hand over CEO responsibilities to Mr. Prestwich in order to focus solely on his CTO responsibilities, as discussed further below. The Company determined this change to be in the Company's best interest given the respective backgrounds, attributes and anticipated responsibilities of both Mr. Prestwich and Mr. Wilkinson.

Shawn Wilkinson: Chief Technical Officer and Co-founder. Mr. Wilkinson created the Storj project in his dorm room in 2014 and has been the driving force behind it since its creation. As noted above, Mr. Wilkinson served as CEO of Storj U.S. until May 2017, but is now focusing entirely on his CTO responsibilities, which are integral to the Company's plans for development of Storj and the Network. In particular, Mr. Wilkinson's role as CTO will center on enhancing the codebase for Storj and the Network and working with the community to advance the state of open source distributed storage.

Tome Boshevski: Chief Design Officer and Co-founder. Mr. Boshevski joined the Storj project in 2014 and focuses on all design elements as well as UI/UX. Mr. Boshevski directs user interface and user experience design, as well as manages marketing, media, and branding operations. Mr. Boshevski works closely with the development team to ensure that products are built with world-class design and usability in mind.

John Quinn: Chief Business Development Officer and Co-founder. Mr. Quinn spent close to 10 years as a technology focused investment banker at Credit Suisse, Elbrus Captal and Deutsche Bank. In addition, Mr. Quinn was a Managing Director of a $200 million private equity firm, Alfa Capital Partners, in addition to being an active seed investor.