Storage, Simplified

Storing and managing your data takes time and resources, with the costs always growing. How and where you manage data significantly impacts company operations, and more importantly, business productivity, growth and performance. A dependable and flexible storage infrastructure is crucial.

A Challenging Environment

As data becomes more complex and users become more geographically distributed, potential issues related to data availability, reliability and seamless redundancy become more common and critical. Deploying and managing multiple physical data centers to address these issues is an expensive and time-consuming proposition, including:

Premium pricing and increased complexity to host and replicate data in multiple geographic regions

Managing data consistency – files exactly synchronized across regions for the most accurate, current file version download/share

Increased security costs at multiple data centers

Possibility of power failure, outage or accident that can take the data center offline

Data on the Move

More and more companies are migrating their data to the cloud, which, on the surface, is more scalable and less costly per gigabyte than traditional data centers. However, most leading cloud providers impose additional data transfer fees, capacity limits, inflexible technology and expensive long-term contracts – all of which impact your operational budget and resources.

A Better Solution

Storj Decentralized Cloud Storage (DCS) takes a different approach – by simplifying the most sophisticated technology for developers and IT departments – in the most cost-effective manner. We're able to do this by featuring:

An open-source and developer-friendly solution, with a vibrant user community

Choice of upload methods – browser, CLI, or S3 compatible gateway - all with tuturials, docs and libraries
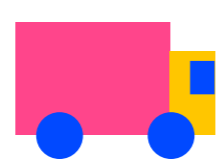
Automatic file encryption so you don't have to devise or manage those time-consuming tasks

Simple access management with client-side credentials that grant permission to specific paths

Affordable and predictable pricing helps you manage your IT budget

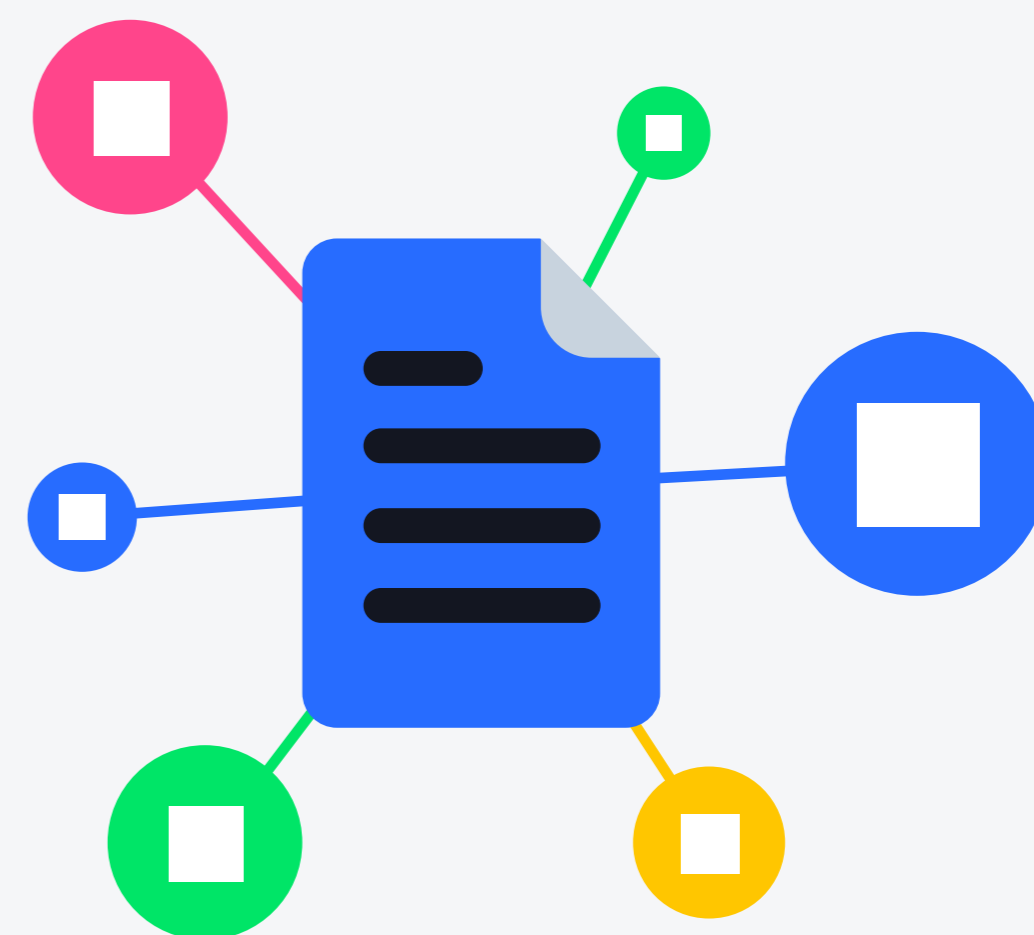The flexibility to take your data at any time, at no additional cost

In short, we abstract the complexity of storing, managing and moving data to a few simple and familiar commands. All of these tools are bundled into the Storj DCS solution at no additional cost to customers – for the most secure, private, dependable and durable cloud storage.

The Advantage of Erasure Coding

Our redundancy strategy stores data in a way that provides high availability and durability. As an alternative to simple data replication, we employ automated erasure coding for a much more efficient method to achieve redundancy. In erasure coding, data is broken into fragments, expanded and encoded with redundant data pieces and stored across our Nodes around the world. The redundancy from erasure coding is far more efficient than just replicating files and is technology used by most data storage systems.

How It's Built

There are three main components, or peer classes, on the Storj DCS network – storage Nodes (how we crowd-source capacity - enabling people to share excess hard drive capacity and bandwidth with the network), Uplink clients (a choice of upload methods and developer tools – sometimes hosted – to upload and download data), and finally, the Satellites (a hosted set of services that handles things like access management, metadata management, storage Node reputation, and data repair, as well as billing and payment).

On our network, every component is multi-region by default. In addition, when a file is uploaded, it is split up into 80 or more pieces and distributed over a range of 13,500+ diverse Storj Nodes worldwide. Through erasure coding, these pieces are replicated to ensure data availability, integrity and durability.

Storj DCS is also scalable – additional Nodes are added/ employed any time, and located anywhere for physical redundancy without the costs of adding data centers.

Follow The Data

When uploading and downloading files, a developer or app issues a simple cp command - the Uplink client does the rest, abstracting all of the complexity of encryption, erasure coding, and distributing pieces on storage nodes to the Storj software in the background.
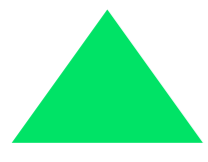
Upload

When a file is uploaded, it's first encrypted by the Uplink client using an encryption key held by that client. Next, it's erasure-coded, meaning it's split up into at least 80 pieces, of which only 29 (any 29) are required to reconstitute a file.

The Uplink client then contacts the Satellite to get a list of storage Nodes on which to store the pieces. The Satellite returns more than 80 storage Node addresses. The Uplink client uploads pieces peer-to-peer, in parallel, directly to the Nodes. The Uplink client stops attempting to upload pieces once 80 pieces have been successfully uploaded to at least 80 storage Nodes.
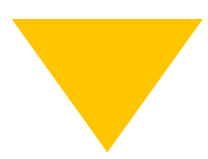
Download

When the Uplink client downloads a file, it's essentially the same process as an upload but in reverse. The Uplink client requests a file from the Satellite and the Satellite returns a list of 35 storage Nodes from which the Uplink client can retrieve the pieces of the file. The Uplink client starts attempting to download pieces from all 35 storage Nodes, again, stopping once it has retrieved the 29 pieces needed to reconstitute the file after eliminating latency from the long-tail effect. The pieces are re-encoded and then decrypted by the Uplink client as only it has the encryption key.

Share

When you go to share an asset, you just type share "<name of file>", and it generates an access grant. This access grant has everything you need to download and decrypt the file.

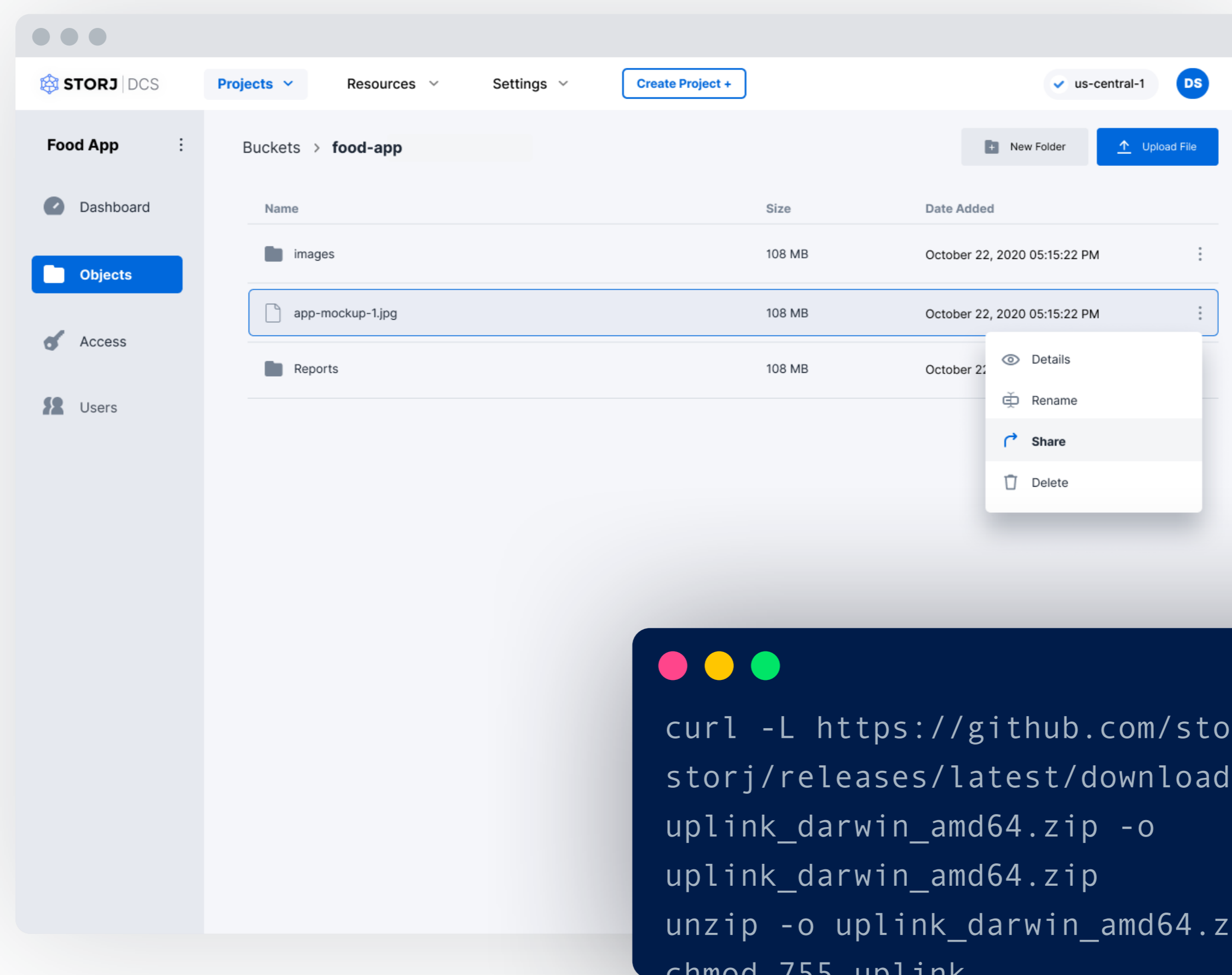## We've Simplified Access Management

Storj DCS handles all of your file encryption and access management tasks automatically – unlike other providers, which require development work to enable encryption and designated file sharing. Our edge-based security model with delegated authorization provides flexible and ultra-secure capabilities for access management.

Within easy-to-use tools that provide granular levels of access control, you can create access credentials that are extremely flexible. You can set access limits on buckets or path prefixes or individual objects with an API key. You can make data read only, or you can make it so that it can read and list, but not upload or delete, and even set time limits on API keys that are good for specific dates and times. As a result, you can continuously rotate your API keys easily and programmatically, preventing credential leakage and guarding against ransomware attacks.

To ensure privacy, data and metadata stored on Storj DCS is encrypted and the Satellite never has access to encryption keys.

The Benefits Add Up

Isn't it time you simplified your data storage, management, and security? Storj DCS includes all the intuitive tools you need to take charge of your data in a simple, cost-effective way. Head over to www.storj.io and see how the "built-in" features of Storj DCS can start benefiting your project, organization and bottom line today.


```
curl -L https://github.com/storj/
storj/releases/latest/download/
uplink_darwin_amd64.zip -o
uplink_darwin_amd64.zip
unzip -o uplink_darwin_amd64.zip
chmod 755 uplink
```

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