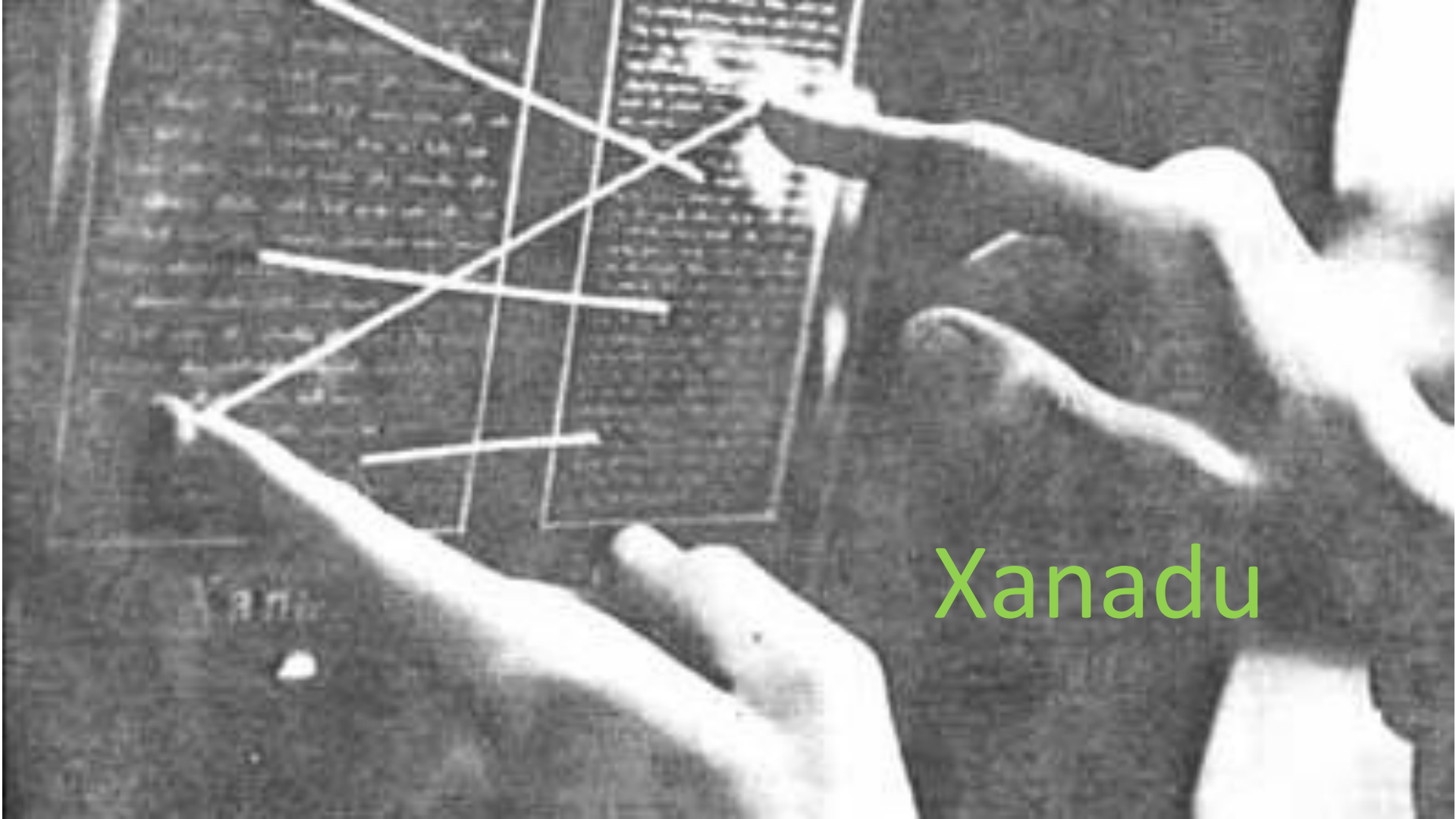


The background of the slide features a complex network graph visualization. It consists of numerous green nodes of varying sizes, interconnected by a dense web of thin black lines. The nodes are clustered into several distinct groups, with some clusters being more densely packed than others. The overall structure is roughly circular, with the nodes and lines filling most of the frame.

# Blockchains and Open Data

Trent McConaghy  
@trentmc0

**BIGCHAIN<sup>DB</sup>** ascribe<sup>®</sup>



Xanadu

# ARPAnet



TCP/IP

## CERN

The European Laboratory for Particle Physics, located near Geneva[1] in Switzerland[2] and France[3]. Also the birthplace of the World-Wide Web[4].

This is the CERN laboratory main server. The support team provides a set of Services[5] to the physics experiments and the lab. For questions and suggestions, see WWW Support Contacts[6] at CERN

---

About the Laboratory[7] - Hot News[8] - Activities[9] - About Physics[10] - Other Subjects[11] - Search[12]

---

## About the Laboratory

Help[13] and General information[14], divisions, groups and activities[15] (structure), Scientific committees[16]

Directories[17] (phone & email, services & people), Scientific Information Service[18] (library, archives or Alice), Preprint[19] Server

1-45, Back, Up, <RETURN> for more, Quit, or Help: █



# Blockchain: A Special “Spreadsheet in the Sky”

What's special:

- no one owns it
  - anyone can add to it
  - no one can delete from it
- 
- Writing to a blockchain is like etching in stone.
  - Which allows us to issue assets, and transfer them
  - Which can include art!



The question we've been asking:

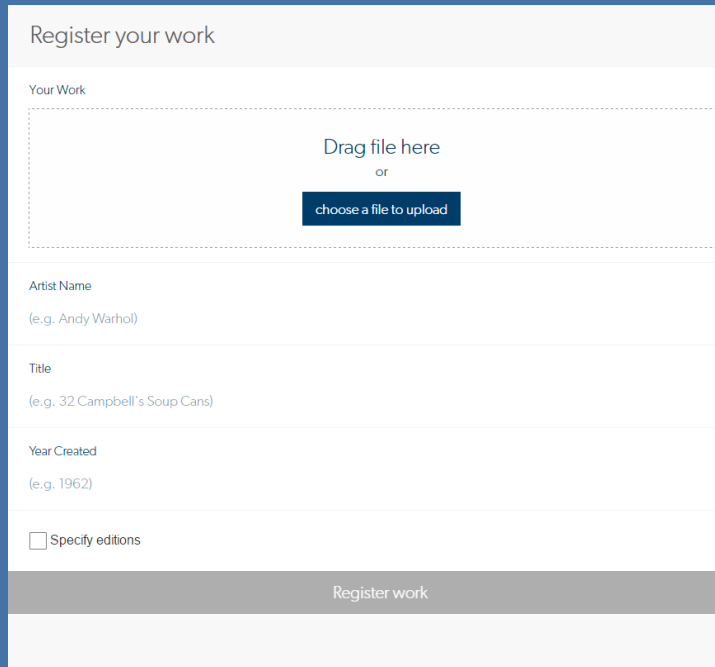
With the help of blockchain tech,

**Can we upgrade the Internet,  
for creators?**

(and realize the aims of Xanadu in the process?)

# Register a work

Like uploading to Dropbox  
“Claim authorship”



Register your work

Your Work

Drag file here  
or  
[choose a file to upload](#)

Artist Name  
(e.g. Andy Warhol)

Title  
(e.g. 32 Campbell's Soup Cans)

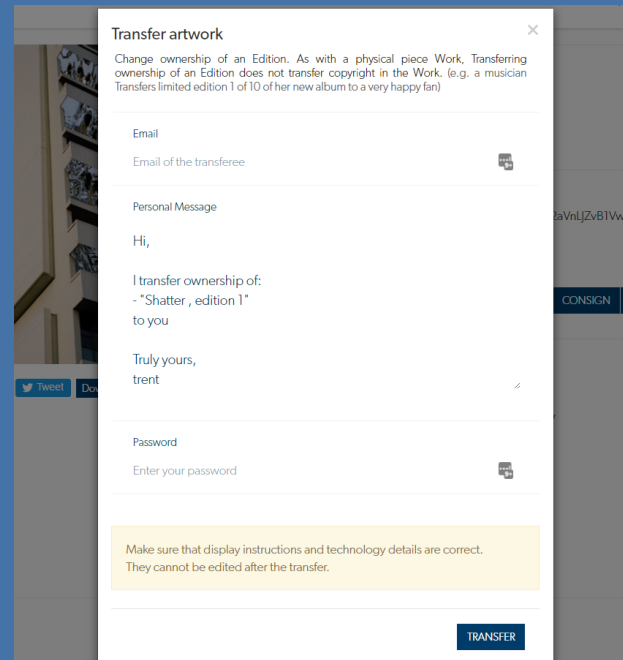
Year Created  
(e.g. 1962)

☐ Specify editions

[Register work](#)

# Transfer a work

Like sending an email  
“Bequeath rights”



Transfer artwork

Change ownership of an Edition. As with a physical piece Work, Transferring ownership of an Edition does not transfer copyright in the Work. (e.g. a musician Transfers limited edition 1 of 10 of her new album to a very happy fan)

Email  
Email of the transferee

Personal Message  
Hi,  
  
I transfer ownership of:  
- "Shatter , edition 1"  
to you  
  
Truly yours,  
trent

Password  
Enter your password

Make sure that display instructions and technology details are correct.  
They cannot be edited after the transfer.

[TRANSFER](#)

# Certificate Of Authenticity

As of 30 November 2015, 17:36:00 GMT, Masha (Maria) McConaghy is the owner.  
To verify current owner, please visit <http://ascr.be/1luAQpo>



DOLLAR  
EURO  
SWISS FRANCS  
JEFF KOONS  
BITCOIN

## Currency

Date: 2014  
Edition: 3 of 100  
Created by: Dan Perjovschi  
Owner: maria.mcconaghy@yahoo.com

## ARTWORK DETAILS

Artwork ID: 17uZBwSbLG8Xy3vRRMWzF5PMjFVNc1tkQ2  
File: currency-2014.jpg (499 KB)

## PROVENANCE/OWNERSHIP HISTORY

Apr. 30, 2015, 12:36:19 - Registered by mail@cocontemporary.com  
May. 01, 2015, 09:46:08 - Transferred to admin  
May. 08, 2015, 13:04:59 - Transferred to trent  
Nov. 27, 2015, 19:35:14 - Transferred to maria.mcconaghy@yahoo.com

## CRYPTOGRAPHIC STAMP

Use the summary and signature below to authenticate this certificate:  
<http://ascr.be/1Sr45Q>

Summary: Dan Perjovschi\*Currency\*3/100\*2014\*2015Apr30-12:36:19

Signature: 438B24CE06182FA3AA82BC285F867D03FB73F3BCC0F73FDBA6  
EC2BFF7088E011E60355B7DC75D5745A9D5CA2A8115512FF835  
C4ABEF6869BF6A991668A820F3FB03A48C6A9E05834716F6500  
68E8E07E5266620BA815948DC265605D23FAF016CB46ACD4BC  
BE75F08D0DEBD7AF55E4CB085B9A0A14583F135D8B399121B24  
ED1L

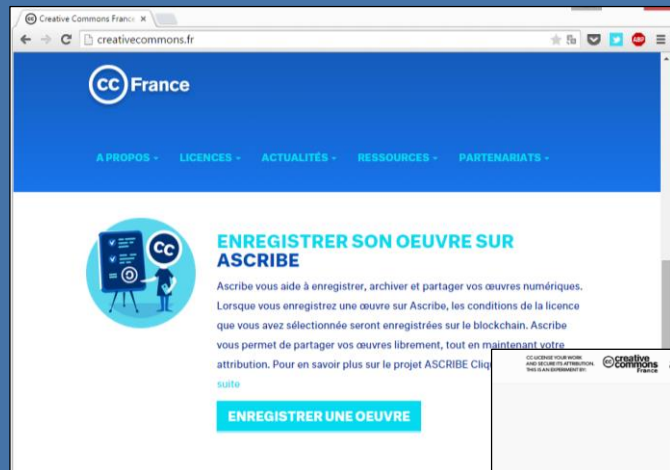
Blockchain-backed,  
digitally signed COA

scribe®

THE WORK DISPLAYED IN THE VIENNA BIENNALE  
IS PROVIDED BY THE THIRD PARTY INDICATED  
AS THE ARTISTS. ULRICH NAUSNER DOES NOT  
CREATE THIS WORK, VOUCH FOR ITS ACCURACY,  
OR GUARANTEE THAT IT IS THE MOST RECENT  
WORK AVAILABLE FROM THE ARTISTS. THE MAK  
(A) EXPRESSLY DISCLAIMS THE ACCURACY,  
ADEQUACY, OR COMPLETENESS OF ANY EXHIBITION  
AND (B) SHALL NOT BE LIABLE FOR ANY CHANGE  
IN THE WORK, OR FOR ANY ACTION TAKEN IN  
RELIANCE THEREON. NEITHER ULRICH NAUSNER  
NOR ANY OF THE ARTISTS WILL BE LIABLE FOR  
ANY DAMAGES RELATING TO YOUR PERCEPTION  
OF THE WORK PROVIDED HEREIN.

MAK Vienna





Creative  
Commons FR  
cc.ascribe.io

A screenshot of the Ascribe registration form. The form is titled 'Register under a Creative Commons license'. It includes a section for 'Your Work' with a dashed box for a file upload and a 'choose a file to upload' button. Below this are input fields for 'Artist Name' (with an example: 'e.g. Andy Warhol'), 'Title' (with an example: 'e.g. 32 Campbell's Soup Cans'), and 'Year Created' (with an example: 'e.g. 1962'). A dropdown menu for 'Copyright license...' is set to 'CC-BY-NC-ND-4.0: Attribution-NonCommercial-NoDerivs 4.0 International', with a link to 'learn more about cc-by-nc-nd-4.0 (ascribe.io)'. There is a checkbox for 'Specify editions' and a 'Submit' button at the bottom.

# ascribe API: docs.ascribe.apiary.io

ascribe ownership REST API

docs.ascribe.apiary.io/#reference/ownership/pieces/register-a-piece



ascribe ownership REST API

Anonymous • ascribe

Documentation

Inspector



Apiary Power

Sign in



Fork on GitHub

ascribe/REST-main

## INTRODUCTION

Overview

Get an Access Token for  
Your App

Webhooks

## REFERENCE

Ownership

Pieces

Editions

Registrations

Transfers

Consignments

## Ownership

### Pieces

#### Register a Piece

When creating a piece with our API, the piece is automatically registered on the blockchain.

For marketplaces that act as a middle-man for registering pieces on ascribe.io, it is possible to register the piece as a consignee (someone that has the right to sell the piece on the owner's behalf).

**Note:** If you don't specify `num_editions` there will be no editions associated with the piece. You can specify the number of editions for the piece later (see Register number of editions).



Switch

Ownership / Pieces / Register a Piece

**POST** <https://www.ascribe.io/api/pieces/>

### Request

#### ATTRIBUTES

**file\_url** ● The url of the digital file  
string

**title** ● The title of the artwork  
string

**artist\_name** ● The artist name

1.5 tx/s

50GB

How to serve the all the creators  
on the planet with limits like this?

Yet, traditional databases *do* scale

Q: Can we bring those ideas to blockchain?

A: Yes. BigchainDB.

Best of both worlds:  
Blockchain - decentralized  
Databases - scale

# Quick Start Guide

---

## Install and Run

BigchainDB provides a rich API to create, query and transfer digital assets.

[DOCUMENTATION](#) [GITHUB](#)

```
$ Dependencies: Loaded
$ (See bigchaindb.readthedocs.org)
$ Python: Python 3.4+
$ RethinkDB: Running
$ -----

# install bigchaindb
$ pip install bigchaindb

# start bigchaindb
$ bigchaindb start
```

## Install and Run

BigchainDB provides a rich API to create, query and transfer digital assets.

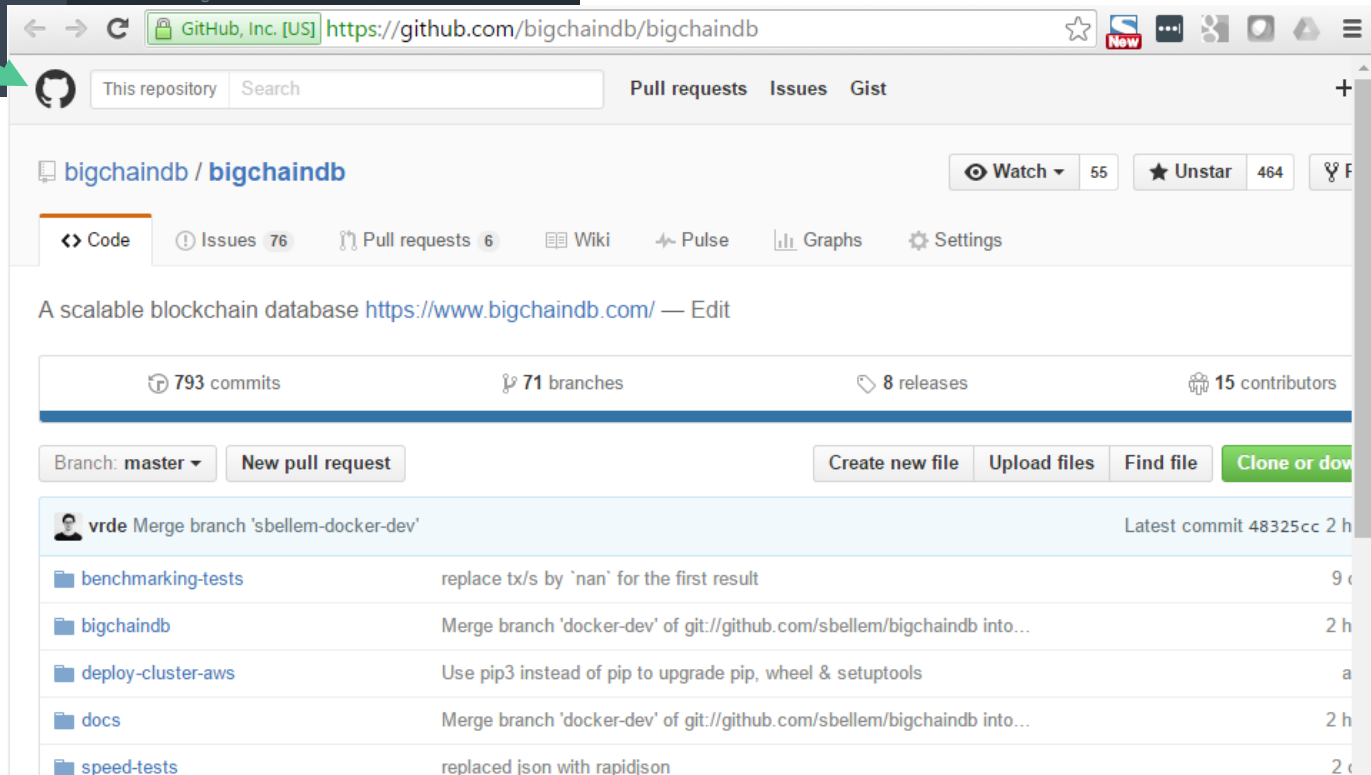
DOCUMENTATION

GITHUB

```
Dependencies: Loaded
(See bigchaindb.readthedocs.org)
Python: Python 3.4+
RethinkDB: Running
-----

# install bigchaindb
$ pip install bigchaindb

# start bigchaindb
```



GitHub, Inc. [US] <https://github.com/bigchaindb/bigchaindb>

This repository Search Pull requests Issues Gist

bigchaindb / bigchaindb Watch 55 Unstar 464 Forks

Code Issues 76 Pull requests 6 Wiki Pulse Graphs Settings

A scalable blockchain database <https://www.bigchaindb.com/> — Edit

793 commits 71 branches 8 releases 15 contributors

Branch: master New pull request Create new file Upload files Find file Clone or download

vrde Merge branch 'sbellem-docker-dev' Latest commit 48325cc 2 h

benchmarking-tests	replace tx/s by `nan` for the first result	9 c
bigchaindb	Merge branch 'docker-dev' of git://github.com/sbellem/bigchaindb into ...	2 h
deploy-cluster-aws	Use pip3 instead of pip to upgrade pip, wheel & setuptools	a
docs	Merge branch 'docker-dev' of git://github.com/sbellem/bigchaindb into ...	2 h
speed-tests	replaced json with rapidjson	2

## Install and Run

BigchainDB provides a rich API to create, query and transfer digital assets.

DOCUMENTATION


GITHUB

```
$ Dependencies: Loaded
$ (See bigchaindb.readthedocs.org)
$ Python: Python 3.4+
$ RethinkDB: Running
$ -----

# install bigchaindb
$ pip install bigchaindb

# start bigchaindb
```

← → ↻ 🔒 <https://bigchaindb.readthedocs.io/en/latest/> ☆ 📄 ⋮ 👤 🏠 ☰

 **BigchainDB**  
latest

Search docs

1. Introduction
2. Installing and Running BigchainDB Server
3. Running Unit Tests
4. Configuring a BigchainDB Node
5. The Python Server API by Example
6. The BigchainDB Command Line Interface (CLI)
7. The HTTP Client-Server API
8. The Python Driver API by Example
9. Deploying a Local Multi-Node RethinkDB Cluster
10. Deploy a Cluster on AWS
11. JSON Serialization

Docs » BigchainDB Documentation [Edit on GitHub](#)

## BigchainDB Documentation

### Table of Contents

- 1. Introduction
- 2. Installing and Running BigchainDB Server
  - 2.1. Install and Run RethinkDB Server
  - 2.2. Install Python 3.4+
  - 2.3. Install BigchainDB Server
    - 2.3.1. How to Install BigchainDB with pip
    - 2.3.2. How to Install BigchainDB from Source
    - 2.3.3. How to Install BigchainDB on a VM with Vagrant
  - 2.4. Run BigchainDB Server
  - 2.5. Run BigchainDB with Docker
    - 2.5.1. Pull and Run the Image from Docker Hub
      - 2.5.1.1. Load Testing with Docker

# Run

Provides a rich API to create, query and  
assets.

INSTALLATION



GITHUB

```
$ Dependencies: Loaded  
$ (See bigchaindb.readthedocs.org for more details)  
$ Python: Python 3.4+  
$ RethinkDB: Running  
$ -----
```

```
# install bigchaindb  
$ pip install bigchaindb  
  
# start bigchaindb  
$ bigchaindb start
```

## 5.2. Create a Digital Asset

```
from bigchaindb import crypto

# Create a test user
testuser1_priv, testuser1_pub = crypto.generate_key_pair()

# Define a digital asset data payload
digital_asset_payload = {'msg': 'Hello BigchainDB!'}

# A create transaction uses the operation `CREATE` and has no inputs
tx = b.create_transaction(b.me, testuser1_pub, None, 'CREATE', payload=digital_

# All transactions need to be signed by the user creating the transaction
tx_signed = b.sign_transaction(tx, b.me_private)

# Write the transaction to the bigchain.
# The transaction will be stored in a backlog where it will be validated,
# included in a block, and written to the bigchain
b.write_transaction(tx_signed)
```

## 5.4. Transfer the Digital Asset

```
# Create a second testuser
```

```
testuser2_priv, testuser2_pub = crypto.generate_key_pair()
```

```
# Create a transfer transaction
```

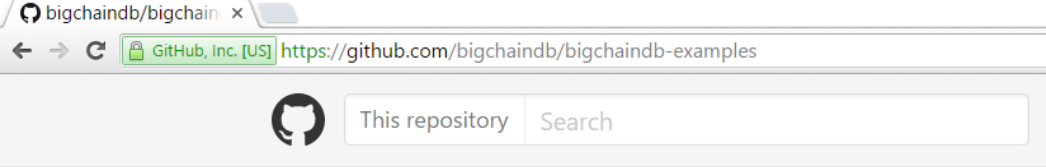
```
tx_transfer = b.create_transaction(testuser1_pub, testuser2_pub, tx_r
```

```
# Sign the transaction
```

```
tx_transfer_signed = b.sign_transaction(tx_transfer, testuser1_priv)
```

```
# Write the transaction
```

```
b.write_transaction(tx_transfer_signed)
```



## bigchaindb / bigchaindb-examples

Search...

Q

ACCOUNT\_0

9GSAHMBF9A3Y6A7I7QXTZTTKERMW7UZPY...

ACCOUNT\_1

9R6A5H84MCUORNHZOTLC4S5QTVCP5ATE...

ACCOUNT\_2

C8K6VBWR3PRQVKZ2UEIWRCHXCNUW7WK...

ACCOUNT\_3

48NHAFNAZQWRE4FH9G7FGRWLCUHG...

ACCOUNT\_4

B337O4BWD7R2JJFDKBHGR3HF6HAEIRRW...

ACCOUNT\_5

2RWVYPHDAWVSPKJ9UENXBDS1KEYBAJ7...

ACCOUNT\_6

D8YUJ1UHM7UDEJEXB9E6VNDU7OXNV12KV...

ACCOUNT\_7

9JMTFNK5TS9MN3FS289MA8W3CX4HRZGVA...

ACCOUNT\_8

G06WXXAZMFELNNF8JATASKYJARGVWMM...

ACCOUNT\_9

CHSU4R7DDAJ8BA50BUPH3A5L6NNUHKL...

## "On the Record"

ID: 767760BF2087A2FA898E8193C074571A3CC79E0803AEA0F80702D8673A4410C5  
Hello BigchainDB  
TIMESTAMP: 1461926390.241000

ID: E0B13E3DE4231C46198C90BFCCDC19AF4CF1A71FF7587205CA4AAAF973871B4C  
This is me recording my stuff  
TIMESTAMP: 1461926402.935754

ID: F9F3667134E63A65C4B2187F695A8696070297C8305F9B98B24D84520B39FE8A  
Can you make it immutable for me?  
TIMESTAMP: 1461926411.839164

ID: 1FF18DD95DB22B1E813D00B85FF8957730B66C68BE6435A165BA2CCAE2A8D4A9  
Because I wouldn't appreciate anyone tampering with it...  
TIMESTAMP: 1461926442.036669

ID: 61E88686C8085532BCC0B59C20D5263A547B1231C31AE41E5287512ED23710E7  
Hopefully my statements will be around for the next decades  
TIMESTAMP: 1461926455.866758

ID: 3FBD8208C88793EC25717599572D37C476FD37F5C3C63725FA3171F68FF97E69  
Guess I can log and notarize anything I want with this?  
TIMESTAMP: 1461926482.680386

ID: 9937CD38CE281BD39245614B3A8DD830B140DCC24DE588E31B78DCBE87D6D7DF  
What about emails, text, JSON, or any other type of digital communication  
TIMESTAMP: 1461926515.945236

Type what you want to share on the blockchain

## Share Trader

Search...

Select All

**ACCOUNT 0**  
FUS459313U0BTYREC1KVPDQXQ0SGDQZQ...

**ACCOUNT 1**  
C6WQ798MFC3NKAWZDDTZQVJHG1MTIIFV...

**ACCOUNT 2**  
AAMMXRHNSBQLCABUDMIAPTC4NZDXJML...

**ACCOUNT 3**  
ZDTFYSTNY6DPBOKDJ03ZCOT2N2Y8Y9UN...

**ACCOUNT 4**  
7RTFNRGPMZH3NU80BMZWDZJCUAE3AN...

**ACCOUNT 5**  
132MC9BYTKRAM8BPWGZVARSJESWNF3N...

**ACCOUNT 6**  
3WWXLQC7NJPVH2JSS11JUHPTROKYZNYE...

**ACCOUNT 7**  
8DUSRDTRCOVJZVW62BEEZGSQJ8RR3FB...

**ACCOUNT 8**  
2N1RBAEVIMSJNLOKGIOUONPZ6S7O6Y1SP...

**ACCOUNT 9**  
7CRMKBK6CECEK2GLIZVHSES GMG7F7BNA...

87BF158D6111EA82D7AA3973E7BB24D968...

Row: 1, Col: 1  
TUE, 03 MAY 2016 10:39:23 GMT ✓

FF2C95E0E171A4CA079BDE565CAF042160...

Row: 2, Col: 1  
TUE, 03 MAY 2016 10:39:23 GMT ✓

FF0FD97C3A03FBF9989DEAC2C6214E69ED...

Row: 3, Col: 1  
TUE, 03 MAY 2016 10:39:23 GMT ✓

9CA1775857E329C3361DDAFE2F87D8F00A...

Row: 4, Col: 1  
TUE, 03 MAY 2016 10:39:23 GMT ✓

8D1A4D8BF9B7A2B2A8240C2759EDB5F41...

Row: 5, Col: 1  
TUE, 03 MAY 2016 10:39:23 GMT ✓

1CDA12899FD83C627EE672B40FC112F763...

Row: 6, Col: 1  
TUE, 03 MAY 2016 10:39:23 GMT ✓

1C0E4FAEE7C4FC87F4E50A4A539FB8410...

Row: 7, Col: 1  
TUE, 03 MAY 2016 10:39:23 GMT ✓

73AAC1DEAD7F914A7C4587720C04B1553D...

Row: 8, Col: 1  
TUE, 03 MAY 2016 10:39:23 GMT ✓

DFA142013025A7C88E4A4379F3DFB6CC2A...

# Blockchains and open data

## Aims

- Creators are fairly compensated
- The cultural commons is protected

## New blockchain infrastructure

- Frontend for artists: [ascribe.io](https://ascribe.io),  
[cc.ascribe.io](https://cc.ascribe.io)
- API for IP: [docs.ascribe.apiary.io](https://docs.ascribe.apiary.io)
- Decentralized DB:  
[github.com/bigchaindb](https://github.com/bigchaindb)
- End-to-end app examples:  
[github.com/bigchaindb/bigchaindb-examples](https://github.com/bigchaindb/bigchaindb-examples)

Trent McConaghy  
@trentmc0

**BIGCHAIN**<sup>DB</sup>

ascribe<sup>®</sup>