

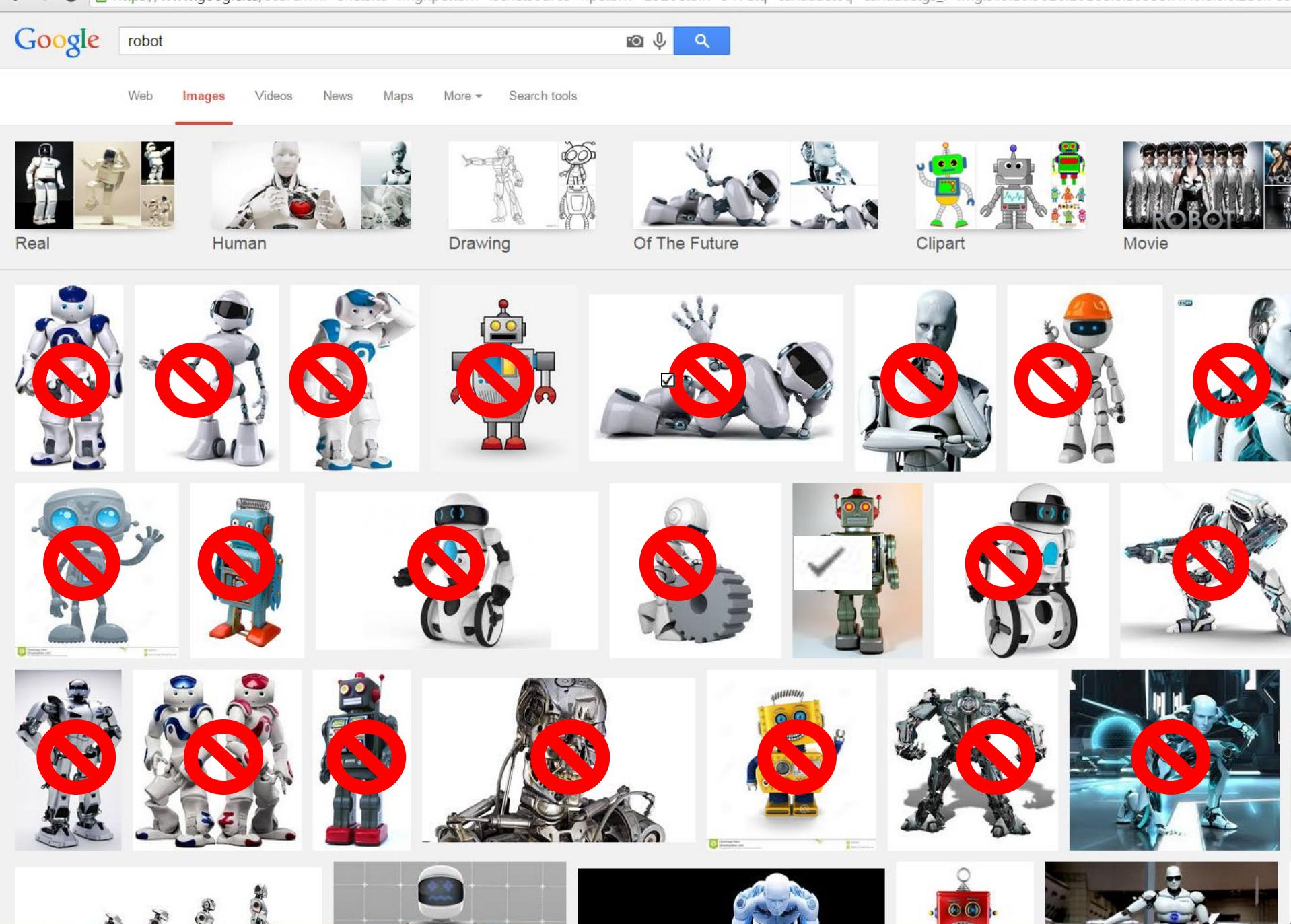
Copyright, the Internet and the Blockchain

Trent McConaghy

Founder & CTO

ascrⁱbe

Problems



Fun with rootkits







This video is not available in your country.

Sorry about that.

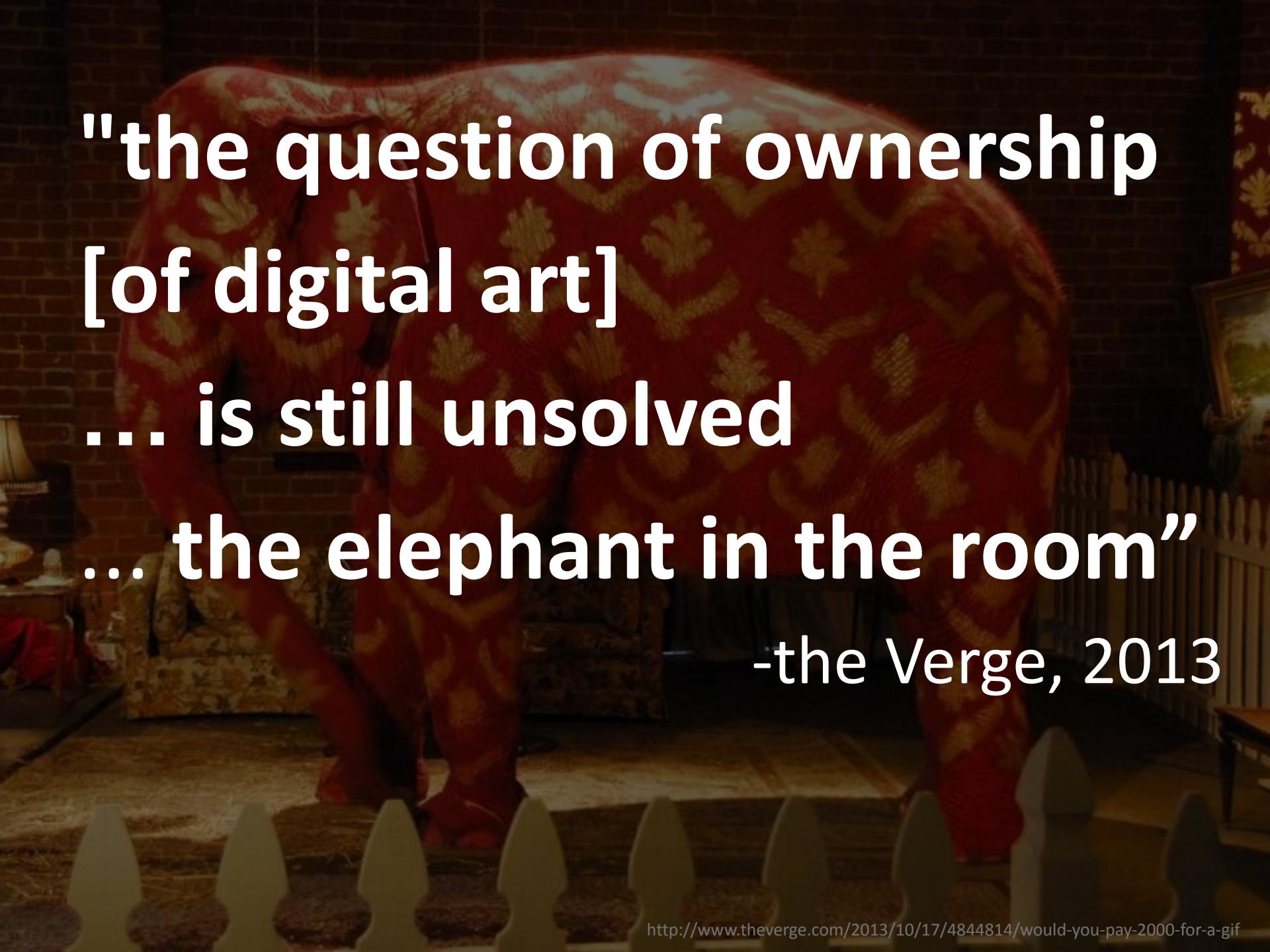
How do you collect digital art?



?



Jonathan Monaghan
Escape Pod
2015, 3 editions

A large, reddish-brown elephant stands behind a row of white wooden pews in a church. The elephant is positioned centrally, its body filling most of the frame. It appears to be looking towards the right side of the image. The church interior has dark brick walls and a patterned rug on the floor.

**"the question of ownership
[of digital art]**

... is still unsolved

... the elephant in the room"

-the Verge, 2013

How do you share 3d-printing designs?

“my conclusion is that **whatever you put on the internet you lose it**. Maybe keep the rights, but lose the power over it.”

-user on Shapeways blog

RESTRICTED
and DIFFICULT
RE-use.

COPYRIGHT
ZONE
(FORTIFIED)

WORLD OF CONVENTIONAL PAPER PUBLISHING

UNRESTRICTED RE-USE:

PUBLIC DOMAIN ZONE

(with much material
inferior and outdated)



Ownership on the Internet (and digital in general) is a mess

- **Creators** – hard to get compensated. Sharing = losing control.
- **Collectors / audience** – no secondary markets
- **Connectors** – distracted by legals

Where's my stuff?

- For almost every digital media vertical: digital art, photography, 3d, music, videos, ...

**Ownership on the Internet
(and digital in general) is a mess**

Why?

Some WWW history...

WORLD WIDE WEB

The WorldWideWeb (W3) is a wide-area hypermedia[1] information retrieval initiative aiming to give universal access to a large universe of documents.

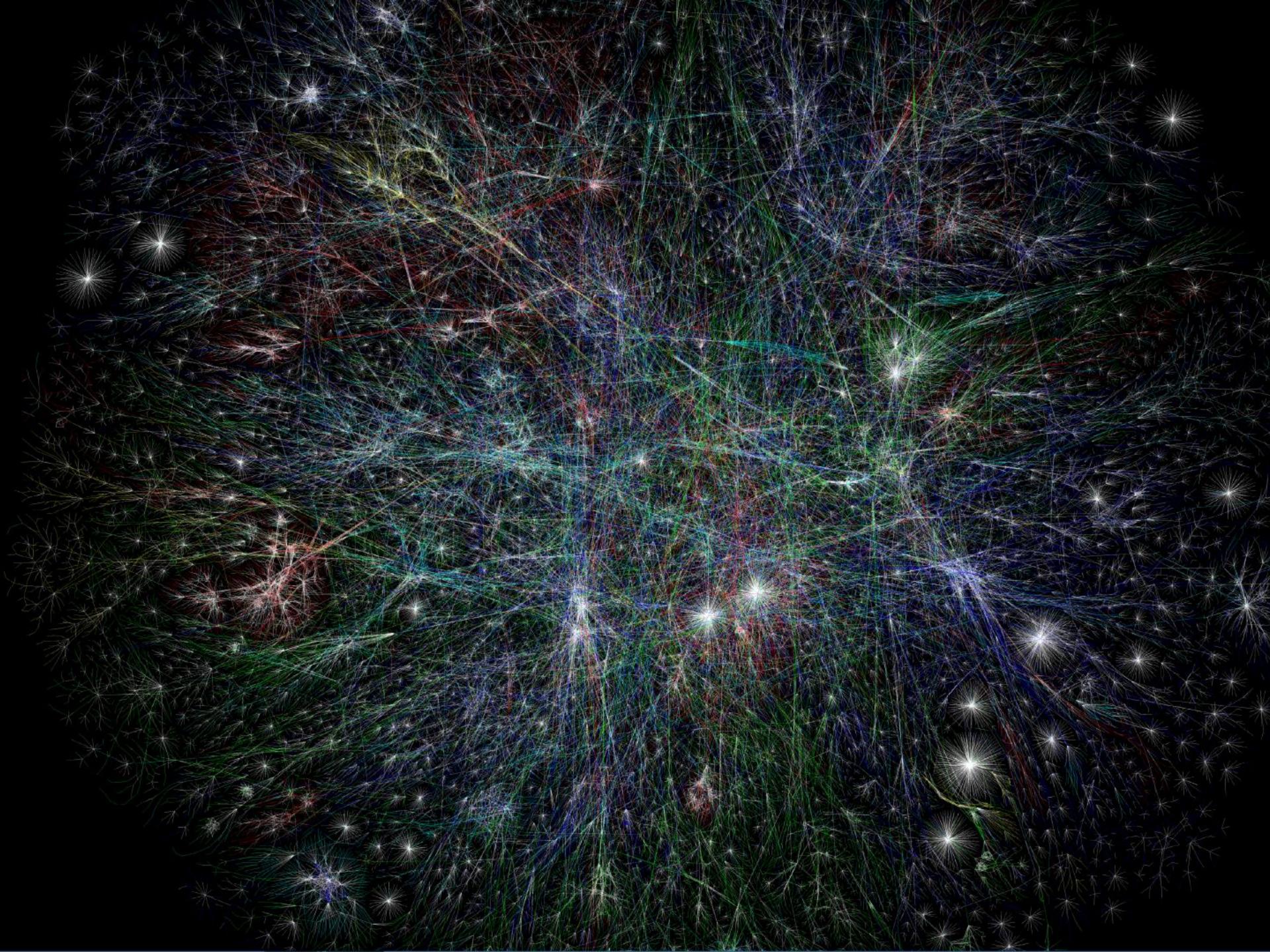
Everything there is online about W3 is linked directly or indirectly to this document, including an executive summary[2] of the project, Mailing lists[3] , Policy[4] , November's W3 news[5] , Frequently Asked Questions[6] .

What's out there?[7]Pointers to the world's online information, subjects[8] , W3 servers[9], etc.

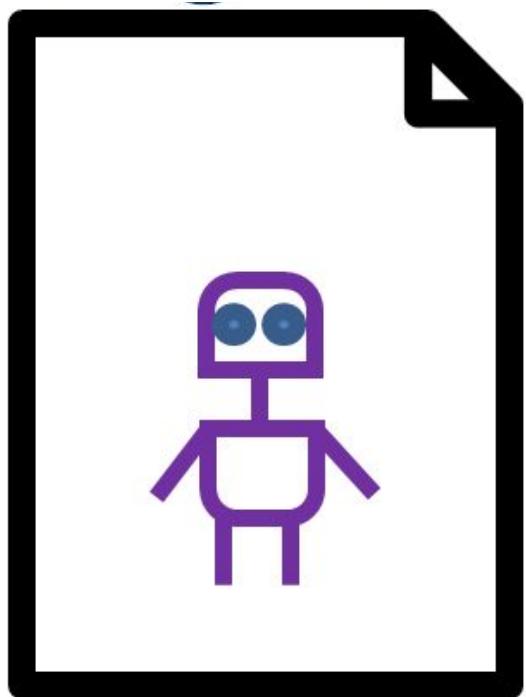
Help[10] on the browser you are using

Software Products[11] A list of W3 project components and their current state. (e.g. Line Mode[12] ,X11 Viola[13] , NeXTStep[14] , Servers[15] , Tools[16] , Mail robot[17] , Library[18])

Technical[19] Details of protocols, formats, program internals etc



**Create some art,
and put it on the net.**



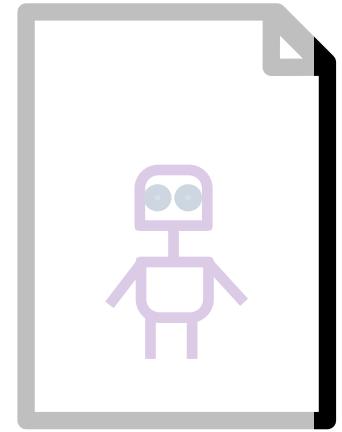
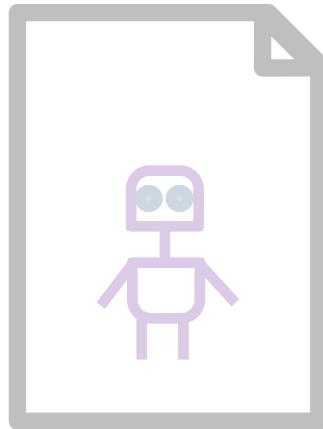
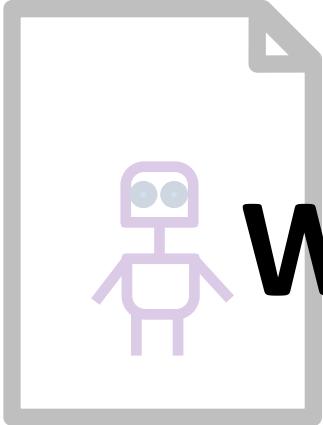
Trent's
(obviously great)
work of art

The www

Zero links:

Copy with no attribution

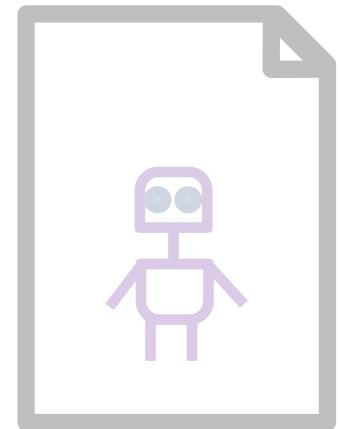
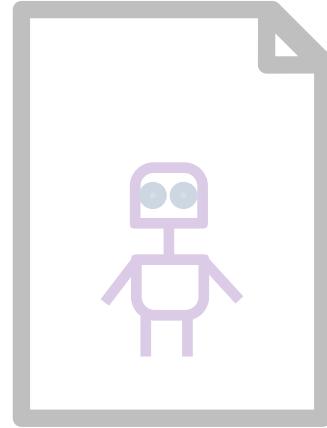
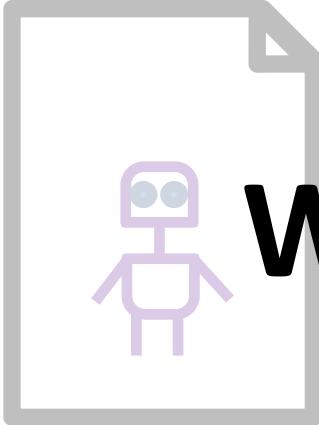
original



Where's my stuff?

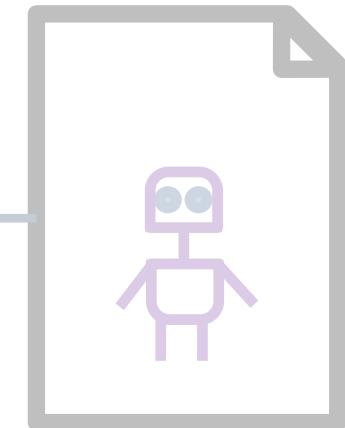
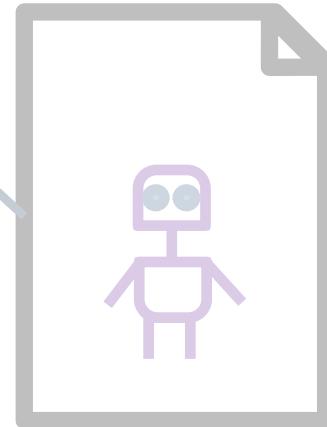
The WWW

original



Where's my stuff?

↳ bidirectional link:
Attribution but **no ownership control**
or mis-attribution



“The current world wide web does basically *one* thing: simple, stupid, mindless hyperlinks.

But even that alone was enough to build a functional and useful internet for the world.

..the most fundamental building block of the web, the hyperlink, *barely works at all*.

..fraught with peril and pitfalls even under the best of conditions.”

-Jeff Atwood, Coding Horror Blog

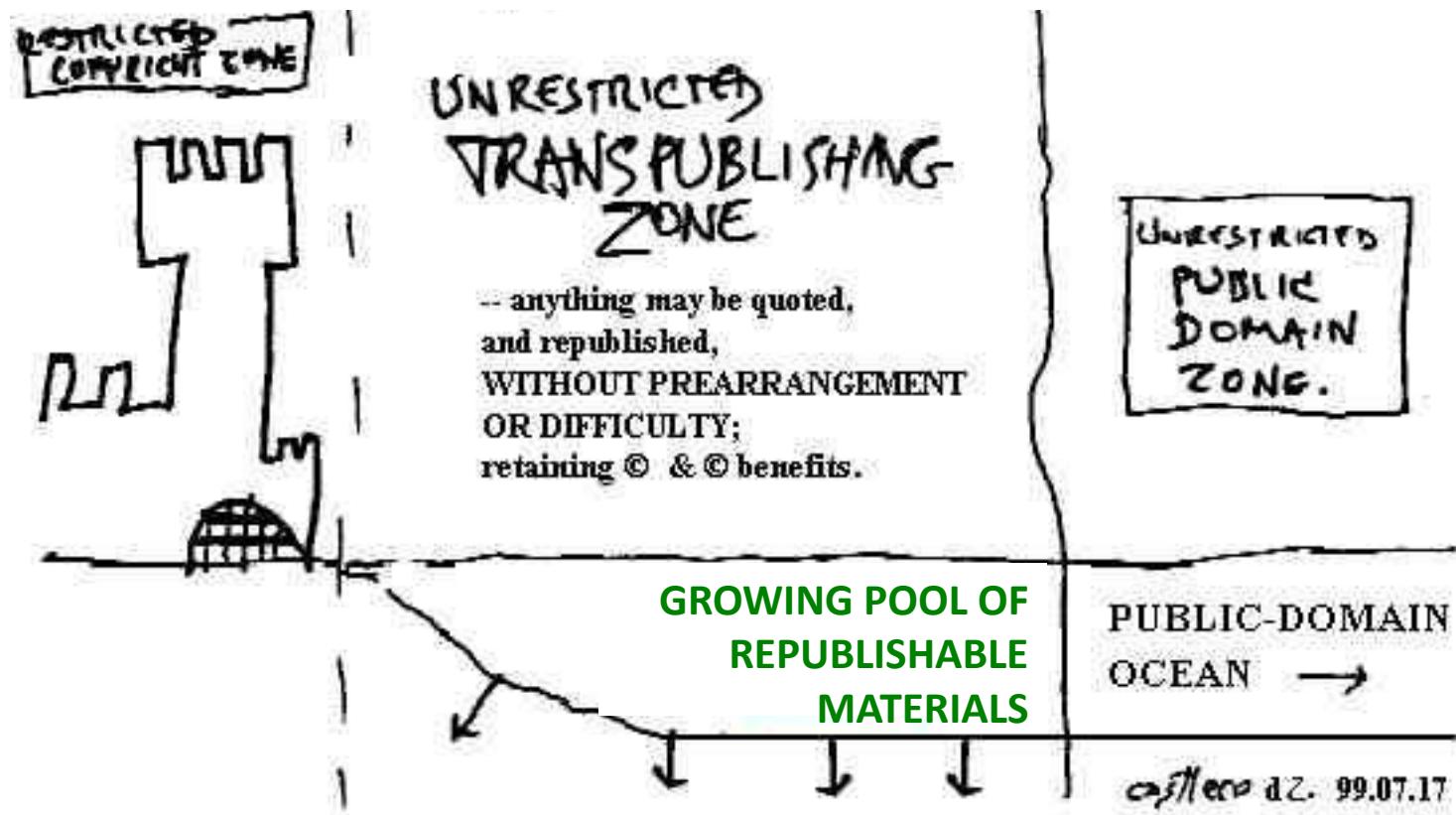
**Does it need to be this way?
Some pre-WWW history...**

“[Consider] a unified .. service that would provide storage and publication services, and manage .. royalty payment on a .. fair basis that would facilitate unrestricted virtual republishing”

-Ted Nelson
-on a vision from 1965

The Xanadu Vision (from 1965)

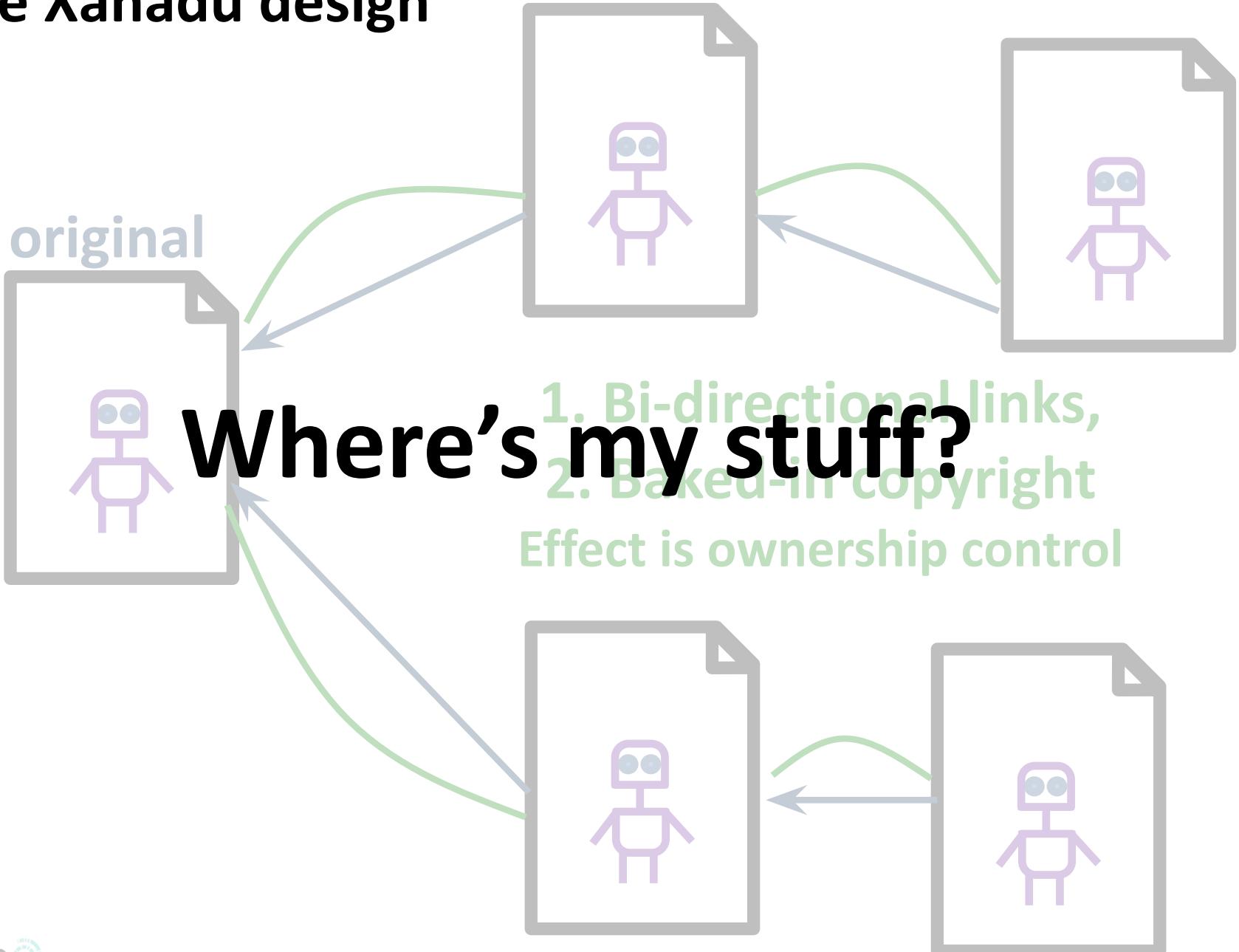
“The original hypertext project”



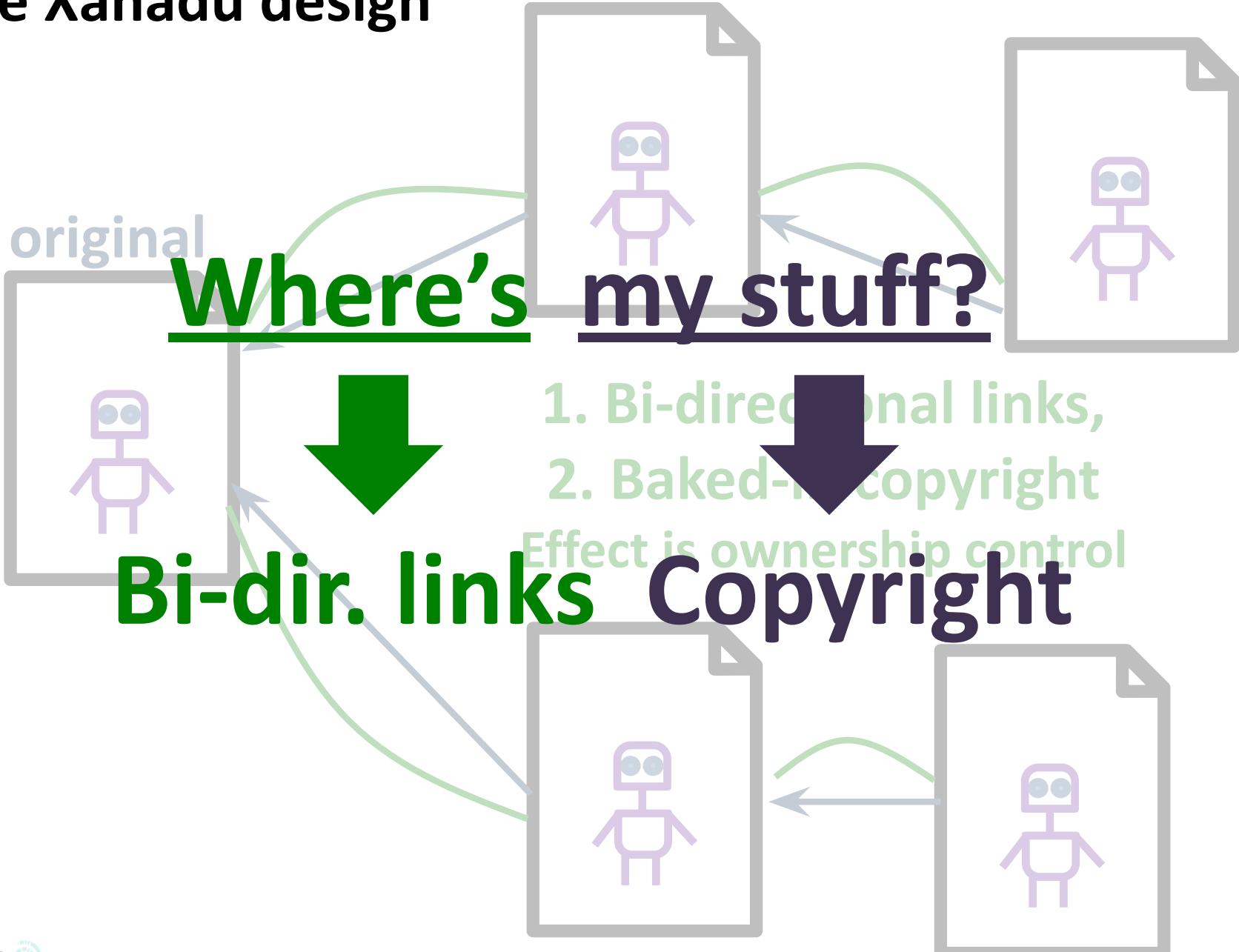
.. a **new middle realm**, one which renders copyright benign and flexible .. a **win-win system, as it is beneficial both to rights holders and to users**, in a way that other copyright systems are not beneficial to users.

1. Theodor H. Nelson, "A File Structure for the Complex, the Changing and the indeterminate." Proceedings of the ACM National Conference, 1965.
2. <http://xanadu.net/NOWMORETHANEVER/XuSum99.html>

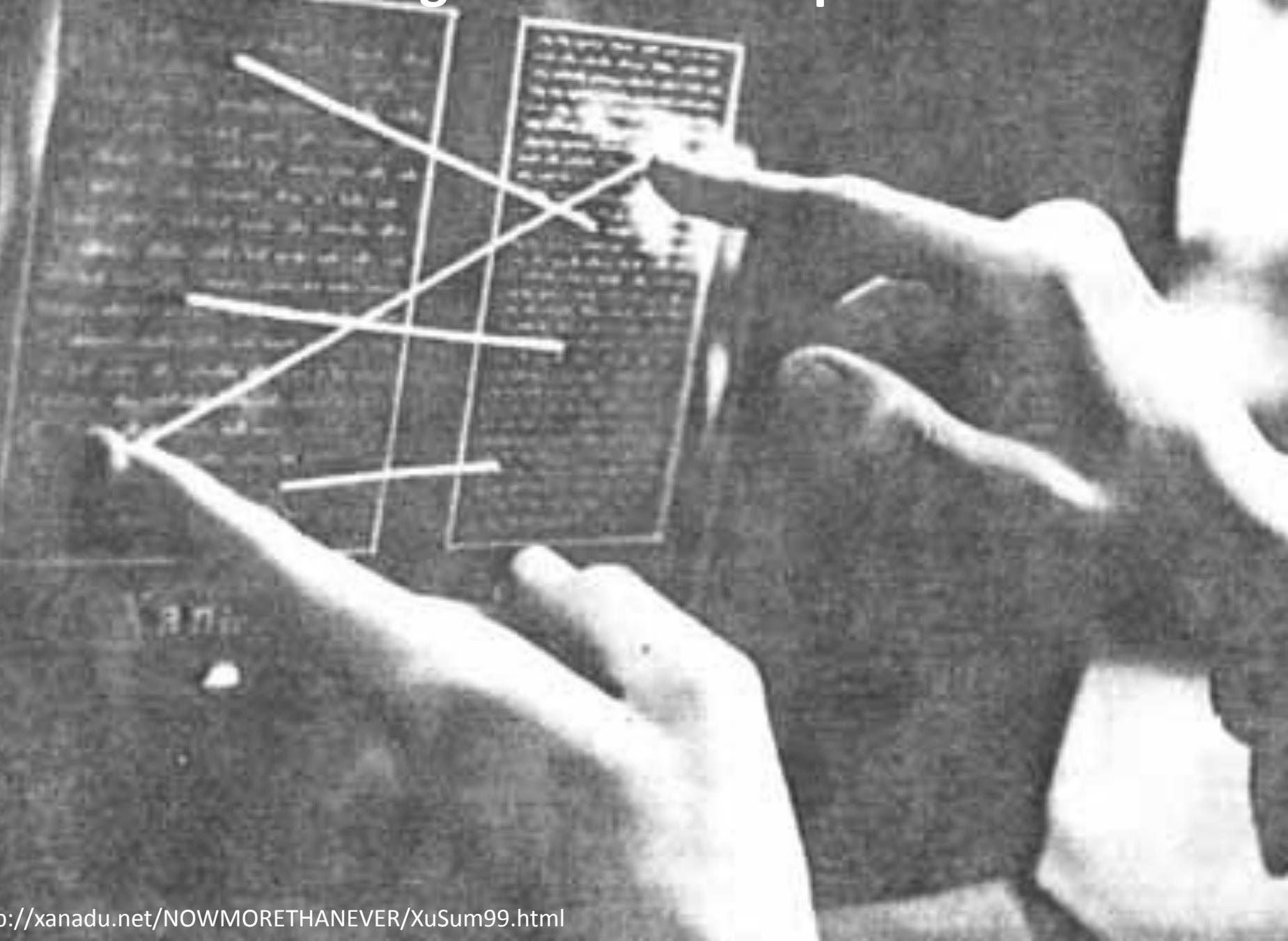
The Xanadu design



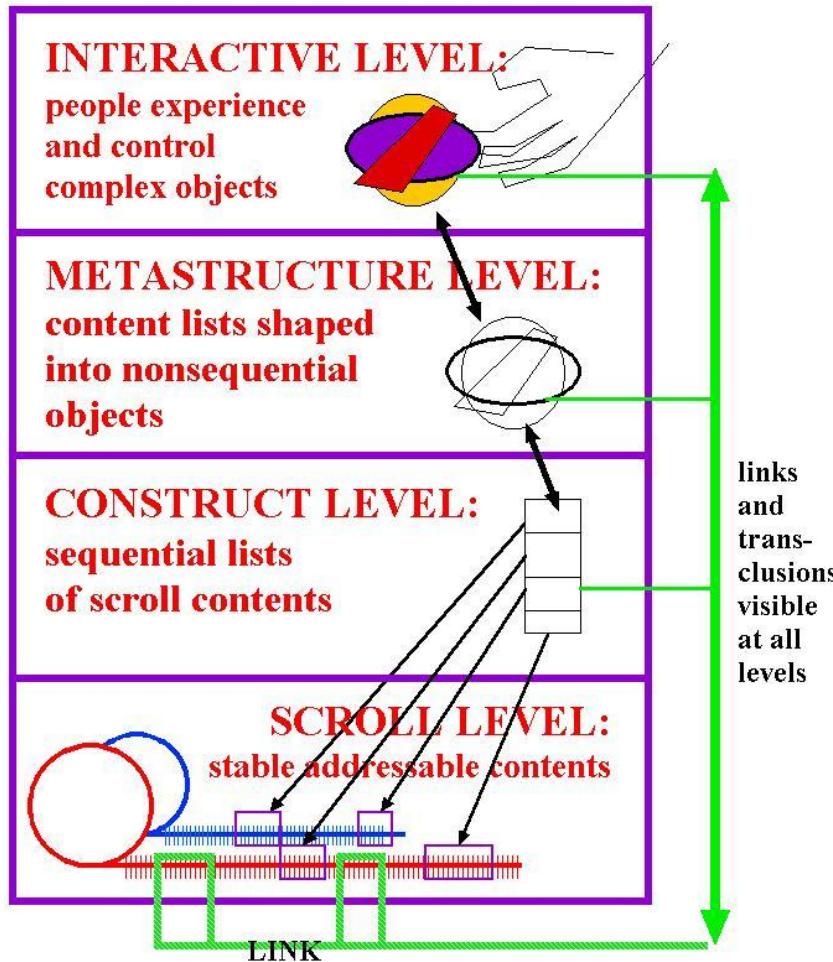
The Xanadu design



The Xanadu design: 1972 mockup



The Xanadu design was actually “a little” more complicated (1968)



Xanadu

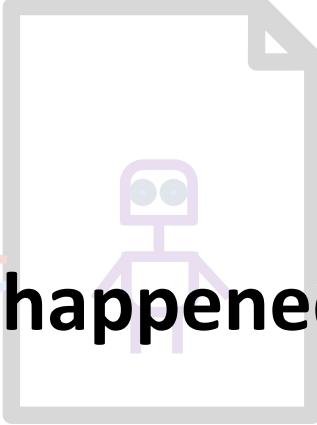
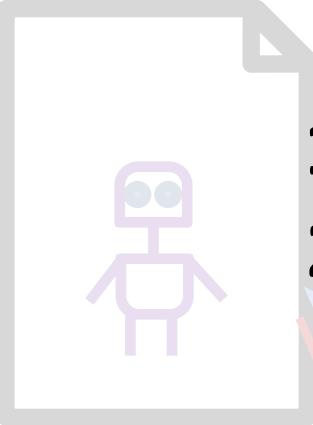
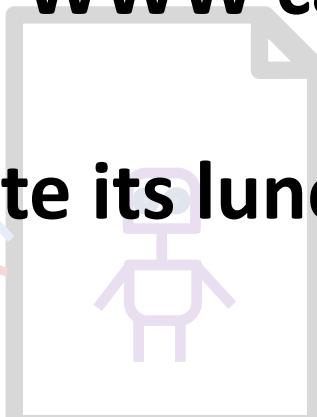
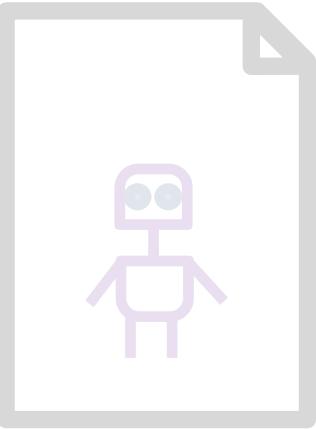
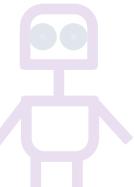
original

What happened?

1. Complex → hard to build
25+ year effort - vaporware

2. The simpler WWW came along

3. And ate its lunch...

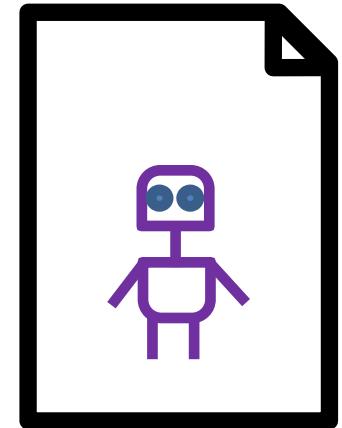
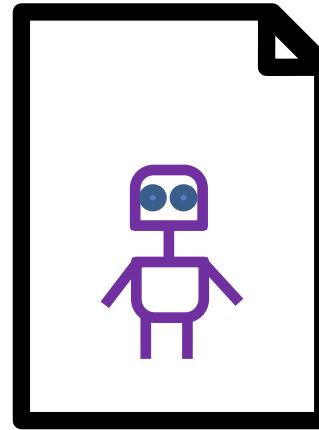
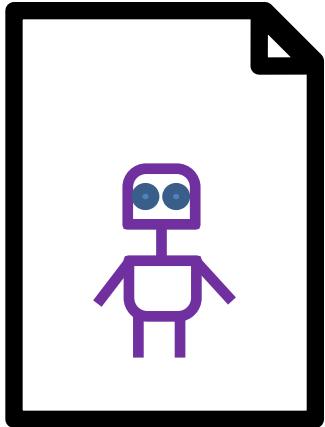


So now we have
the WWW,
warts and all

Zero links:

Copy with **no attribution**

original



Uni-directional link:
Attribution but **no ownership control**
or mis-attribution

“HTML is precisely what we were trying
to *prevent* -- ever-breaking links ... no rights
management.” –Ted Nelson

Summary so far

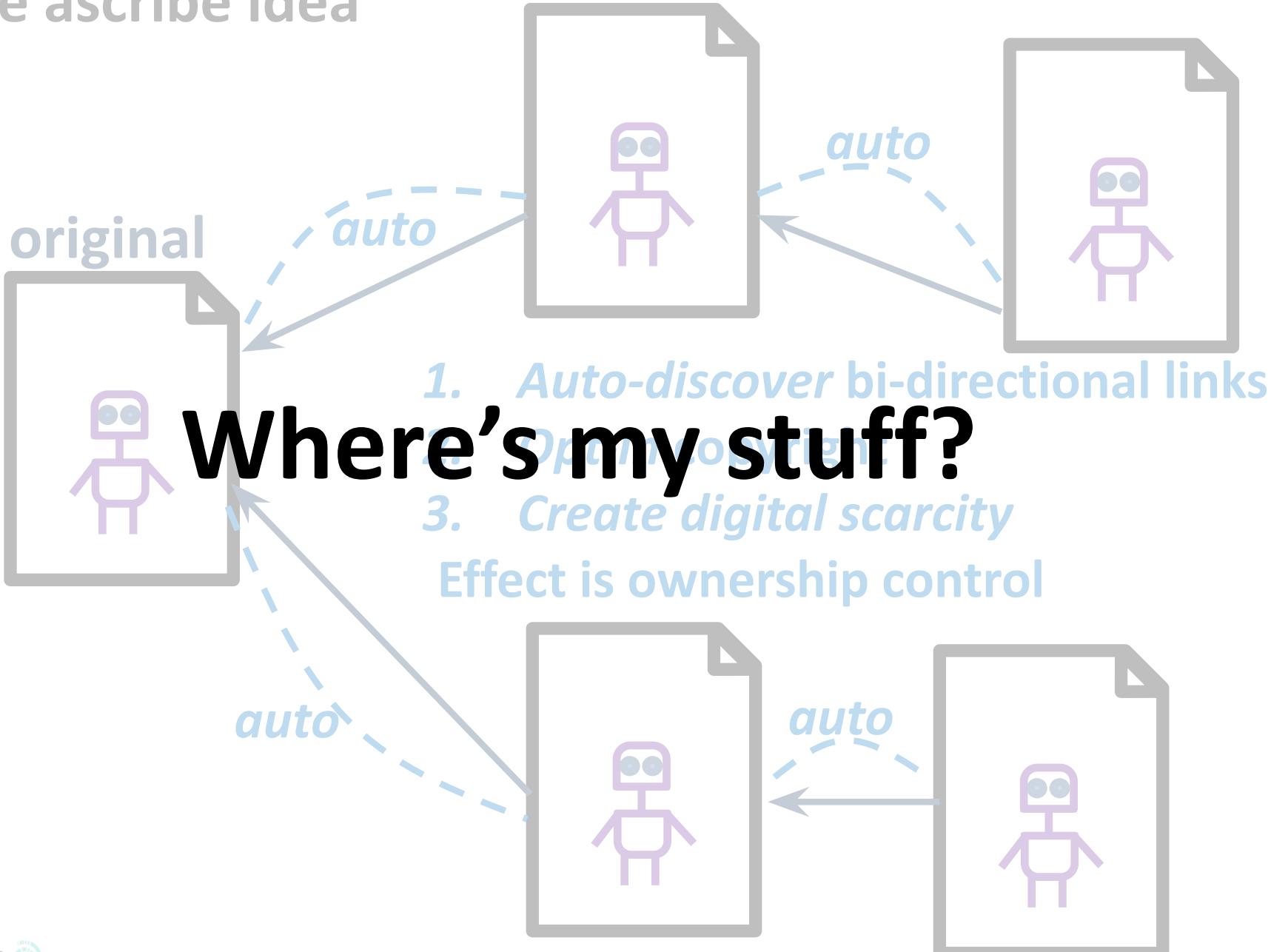
- Ownership on the Internet is a mess
- Despite being anticipated since the 60s
- And designed for
- But simplicity of www won out
- Leaving “where’s my stuff?” unsolved

A new Q:

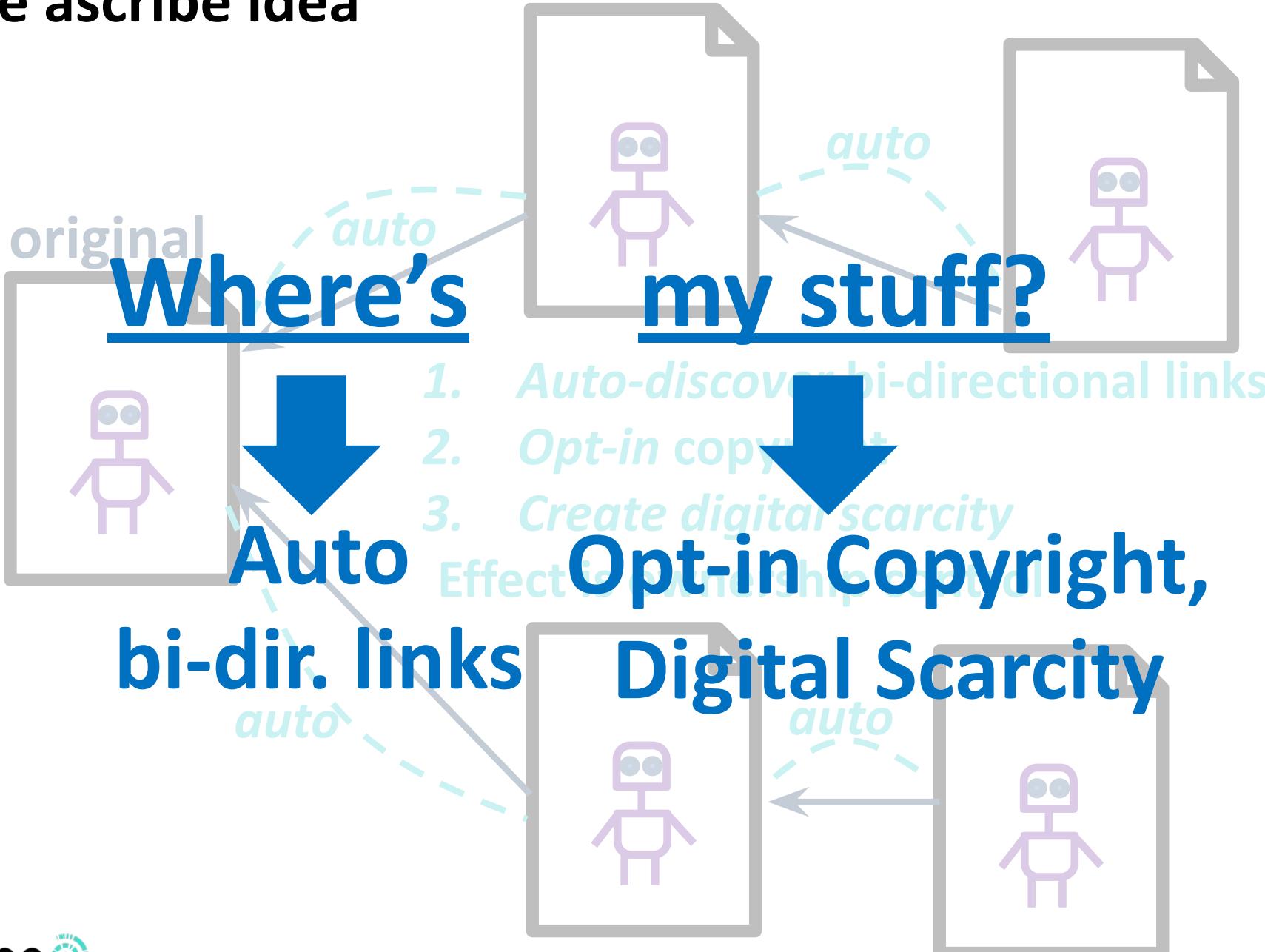
**Can we *retrofit*
the Internet for ownership?**

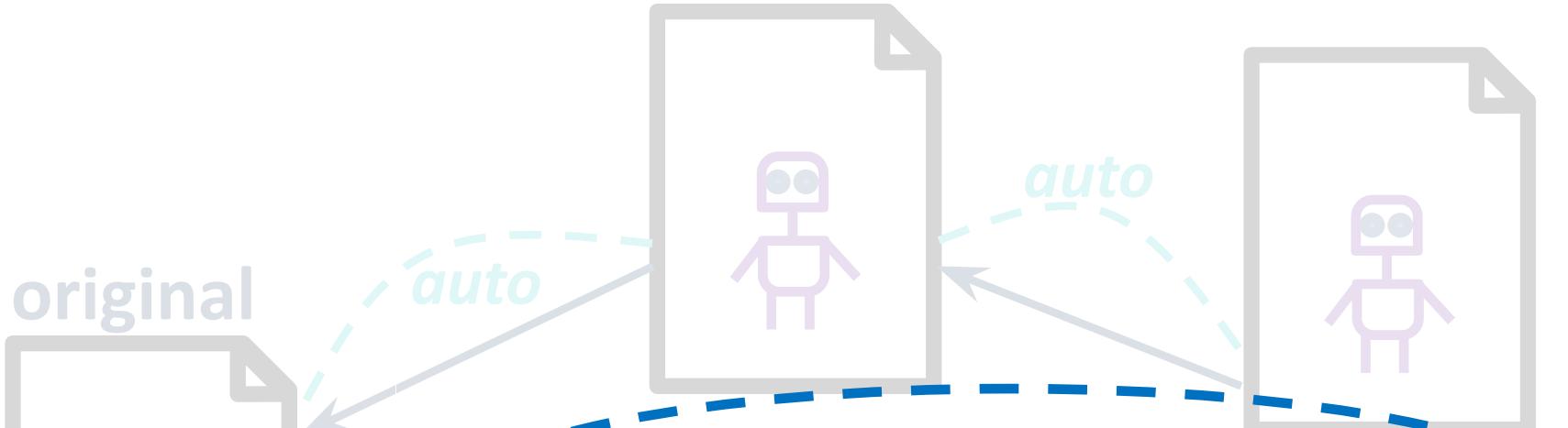
(and realize the Xanadu aims
in the process)

The ascribe idea



The ascribe idea



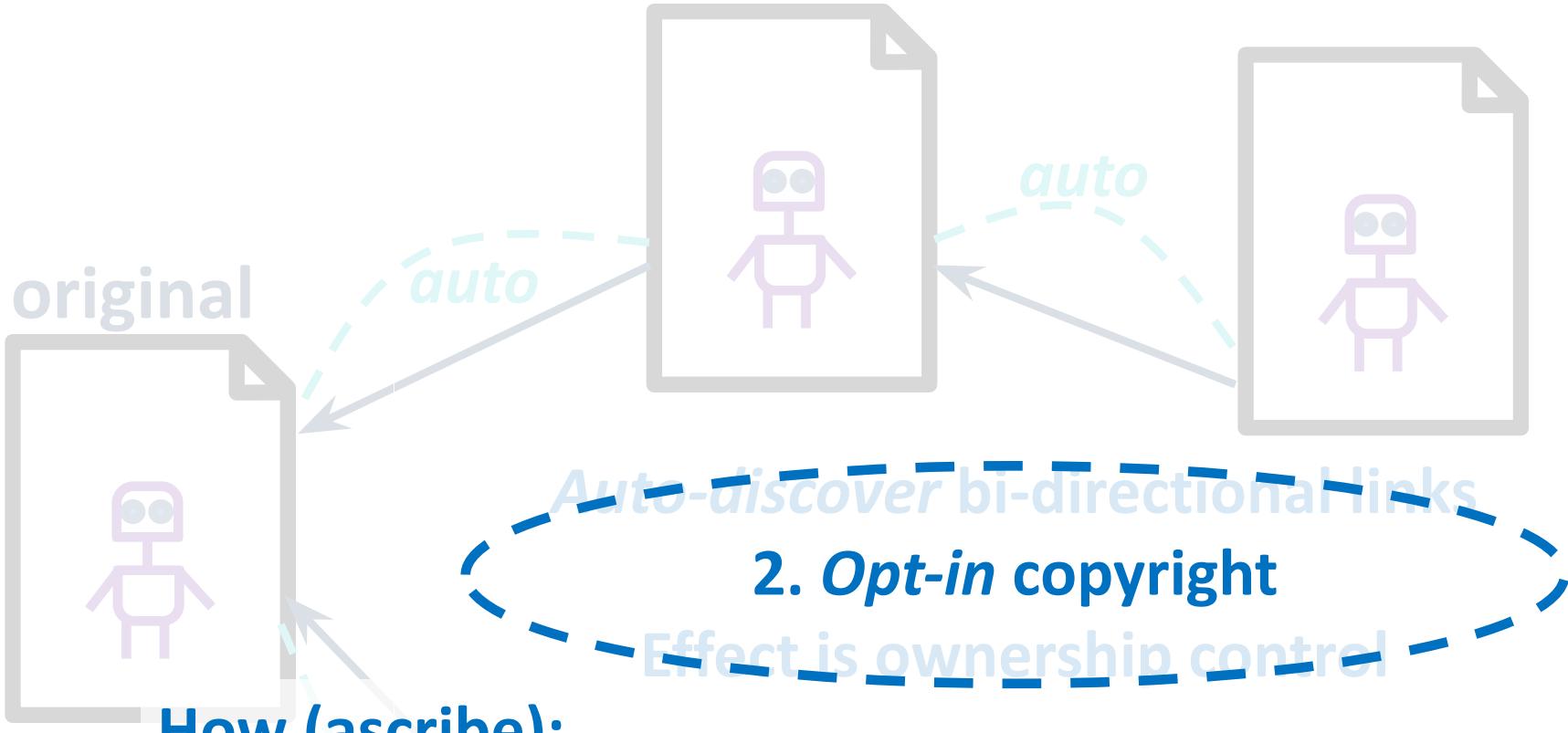


1. Auto-discover bi-directional links

How (scribe):

- Crawl the entire internet (**220 Tb text**)
- Similarity match against creator's content (**40G+ images, 3d designs, ..**)
- This is a machine learning problem (at Internet scale)
- ***To know when someone's using your work***

Effect is ownership control



2. *Opt-in* copyright

Effect is ownership control

How (ascrIbe):

- Creator or owner chooses to use ascrIbe to register his work, or transfer ownership
- Terms of service: “I have the copyright rights”

Ascribe terms of service - snippet

amounts (e.g. 1 cent) as a means to record transactions on the SPOOL / Bitcoin Blockchain.

ascribe is not a bank. It does not provide a means to store fiat currency in an account, to transfer fiat currency in or out of that account, or any other services one might expect from a bank.

Art Work Ownership

This document elaborates various aspects of Art Work Ownership in ascribe.

Secure Ownership Registration

To register an art work, you must be the rightful owner of the copyright in the art work.

When you register ownership of the copyright in an art work using ascribe, ascribe updates the SPOOL with a record of that ownership. Recall that the SPOOL is a Secure, Public, Online Ownership Ledger.

More specifically, recall that SPOOL sits on top of the Bitcoin Blockchain. ascribe associates a Bitcoin wallet with your account. When you register an art work, ascribe creates a new address inside that wallet. ascribe performs a transaction on the Bitcoin network to do this (detailed below). This new address becomes the ID of the art work. ascribe does not store the wallet's private keys. Rather, the private keys are computed from your account password. ascribe does not store your account password either.

The transaction on the Bitcoin network is recorded on the Bitcoin Blockchain. The transaction's input Bitcoin address is known to be part of ascribe. The transaction has the following outputs, in the following order:

- An ID signifying registration of the copyright in the art work (hereafter, "copyright ID"). This is a hash of the art work. A hash is an alphanumeric string that is generated by passing the art work through a special function (a "hashing function"). This hash is powerful information, because it can be identified with the art work through the hash function.
- All licences pertaining to the art work (hereafter, "licence ID"). One ID is generated for each licence pertaining to the art work. All licence IDs can be traced back to the original copyright ID.
- A Bitcoin address for change, i.e. where all the change from the transaction goes back to. The need to specify a change address, rather than just passing the correct amount to start with, is a quirk in how Bitcoin works.

Secure Licence Transfer

When you transfer the licence pertaining to an art work, ascribe updates the SPOOL with a record of that transfer. Because the SPOOL uses the Bitcoin Blockchain, the security of the licence transfer inherits all the world-class security attributes of Bitcoin.

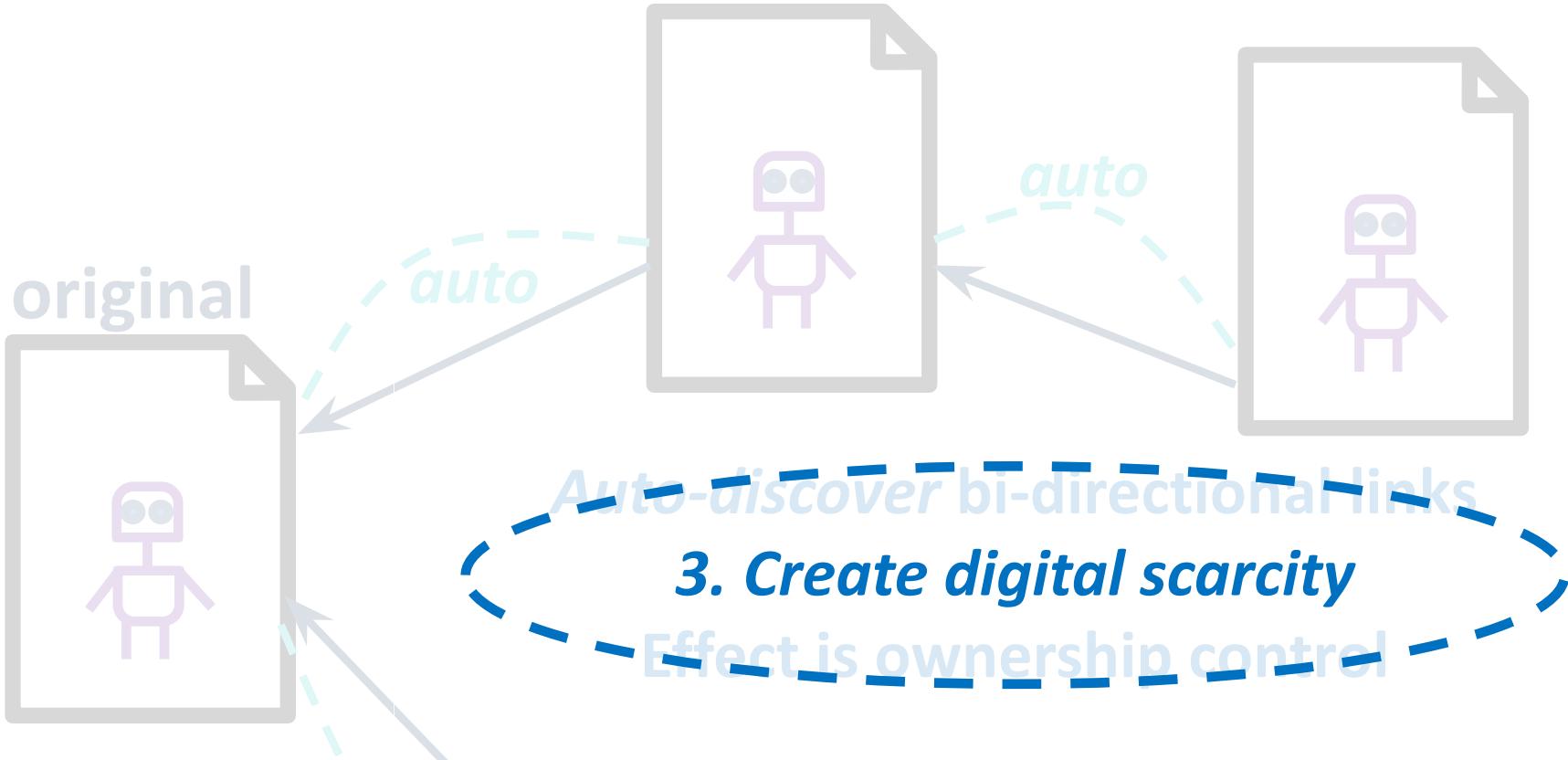
More specifically, during a sale from a seller to a buyer, the following steps occur "under the hood".

(1) Money is transferred from the buyer (e.g. from a credit card) to the seller (e.g. the seller's bank account). In addition, service fees may be transferred from the buyer to ascribe and third party service providers (such as the payment processor). The ascribe Pricing Terms document has more information.

(2) The SPOOL ownership is updated, using the Bitcoin Blockchain, as follows. The buyer gets a new Bitcoin wallet address, and a new private key associated with that wallet. Then, a tiny amount of Bitcoin is sent from the seller's wallet address associated with that art work, to the buyer's new wallet address. This transfer uses the Bitcoin protocol and network to do this. This action, **by definition**, transfers the licence to the buyer. ascribe securely stores the private key associated with the buyer's new wallet address.

Licence

The buyer of the licence pertaining to the art work grants the buyer the right to make copies of the work for personal or commercial use. Commercial use includes, but is not exclusive to, private or public display of the work by the buyer or a third-party acting on behalf of the buyer. The buyer is allowed to transfer the licence to a third-party, for valuable consideration or otherwise, if the transfer is made through ascribe. The right of the author to be identified as the author of the art work and the right of the author to object to derogatory treatment of the work (hereafter, "moral rights" of the author) are not affected by the transfer of licence, initially and on subsequent transfers. The buyer is allowed to



- Via a trusted ledger: bitcoin blockchain
- Use a special protocol for ownership:
 - For unique editions, consignment, loans, etc.
 - Time-stamp = evidence for a court of law, in case of ownership dispute (thank you Silk Road)

How: high level

1. Auto-discover bi-directional links
2. Opt-in copyright (legals)
3. Create digital scarcity

How: full ascribe tech stack

marketplaces

ascr^{be} web app

ascr^{be} ownership REST API

ascr^{be} ownership servers

ascr^{be} crawl,
machine learning

the Internet
(crawl me)

ascr^{be} TOS
(+ legal counsel)

ascr^{be} ownership
bitcoin overlay

bitcoin protocol

bitcoin blockchain

**1. Auto-discover
bi-directional links**

**2. Opt-in
copyright**

**3. Digital
scarcity**

Interfaces on the ascribe stack



For individual creators (artists, graphic designers, photographers, writers, ..) who want to register, consign, and archive their work directly.

**And for individual galleries.
And for collectors.**

WEB

btc.png 15.1kB

DELETE

Step one: lock down title

Artist's Name

Artwork Title

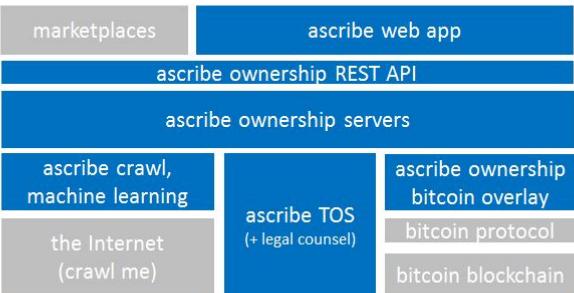
Year Created

Number of Editions

This input is final and cannot be edited later.
Additional details can be added after registration.

REGISTER CANCEL

Interfaces on the ascribe stack



For marketplaces of digital goods (art, photography, 3d, ..) to answer “where’s my stuff” for their users, and themselves

REST

Format (mandatory)
API
POST https://www.ascribe.io/3d/api/0.1/piece

Headers:

Authorisation: Bearer <token id>

Body:

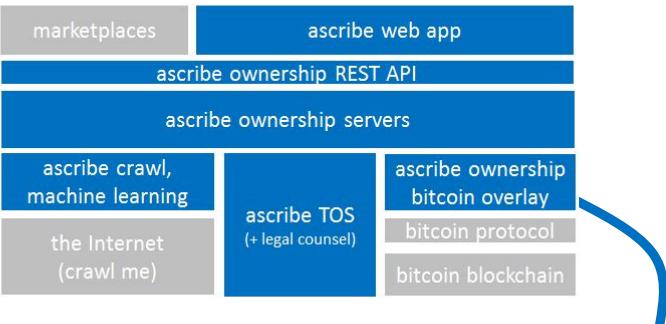
&user_email=<email of a Makx user>
&file_url=<points to a url where the f
&asc-hash-md5=<hash of the file, e.g.
&asc-sig-foo=<a digital fingerprint us
&asc-sig-bar=<a digital fingerprint us
&asc-sig-...=<a digital fingerprint us
&title=<title for the piece>
&artist_name=<name of artist for the p

Example:

POST

https://www.ascribe.io/3d/api/0.1/pieces \
?user_email=user32%40makx.com \
&file_url=https%3A%2F%2Fmakx.s3.amazonaws.co
&asc-hash-md5=BECA1234809CFE4789729837C \
&asc-sig-bar=37829473fjio3r0934hknfsdliu3840
0-----

Interfaces on the ascribe stack



BITCOIN OVERLAY (SPOOL*)

REGISTER:

- MAPPING: 1-to-many
- SPOOL: piece_hash -> edition(s)
- BTC:
TX = [(1jtt... : 20000+num_editions)] -> [(piece_hash:10000), (OP_RETURN=SPOOLREGISTER:0), (fee:10000)]
> balance of piece_hash = 10000 satoshi
> balance of edition(s) = 1 satoshi

TRANSFER:

- MAPPING: 1-to-1
- SPOOL: edition -> transferred_edition [transferred_edition is]
- BTC:
* first transfer
> balance of edition = 1 satoshi
TX = [(1jtt...:29999)] -> [(edition_hash:19999), (OP_RETURN=SPOOLTRANSFER:0), (fee:1000)]
TX = [(edition_hash:20000)] -> transferred_edition_hash [(transferred_edition)]
(OP_RETURN=SPOOLTRANSFER:0), (fee:1000)
> balance of edition = 0 satoshi
> balance of transferred_edition = 10000 satoshi

* next transfers

> balance of transferred_edition = 10000 satoshi

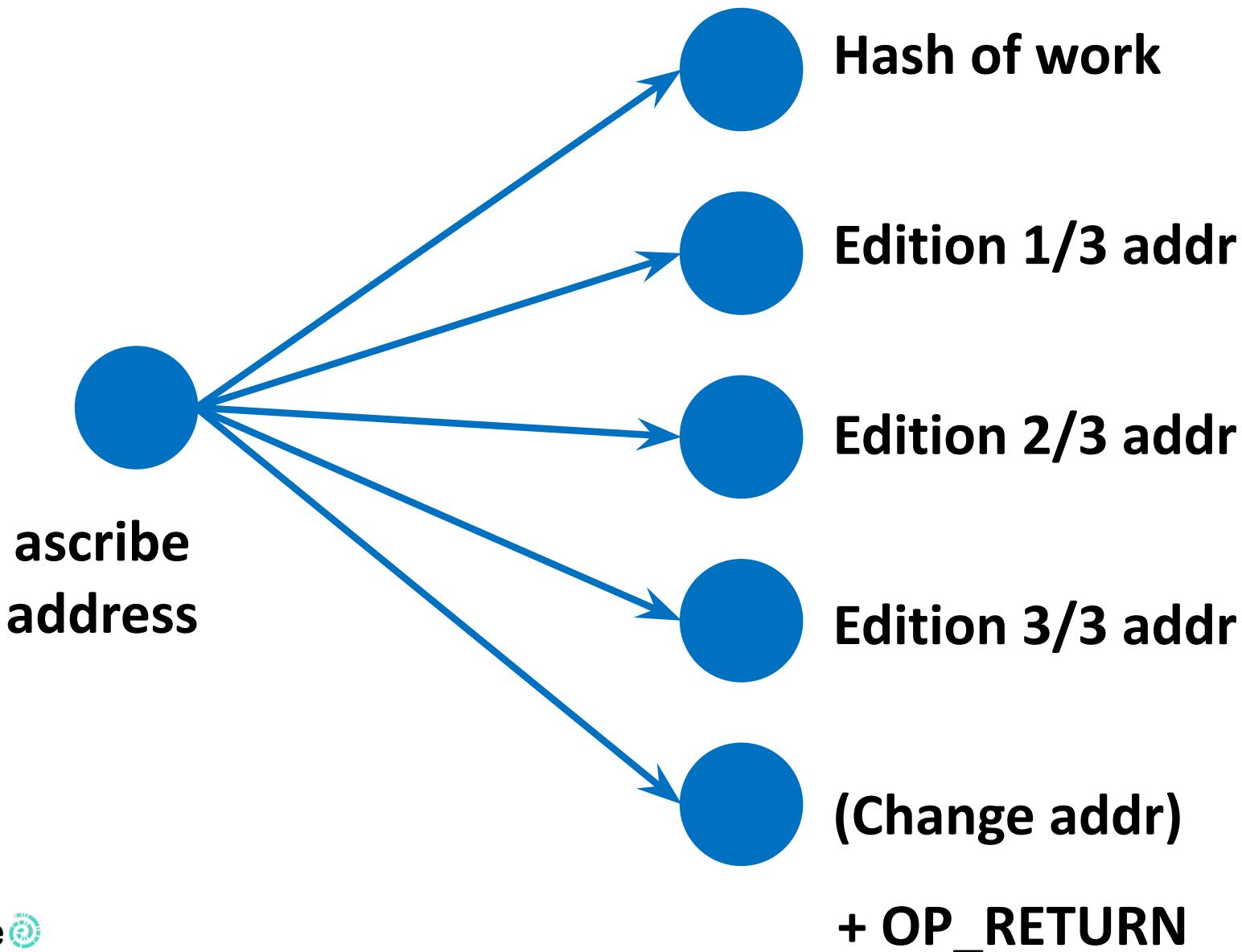
TX = [(1jtt...:20000)] -> [(:10000), (OP_RETURN=SPOOLRE

For adventurous
BTC hackers 😊

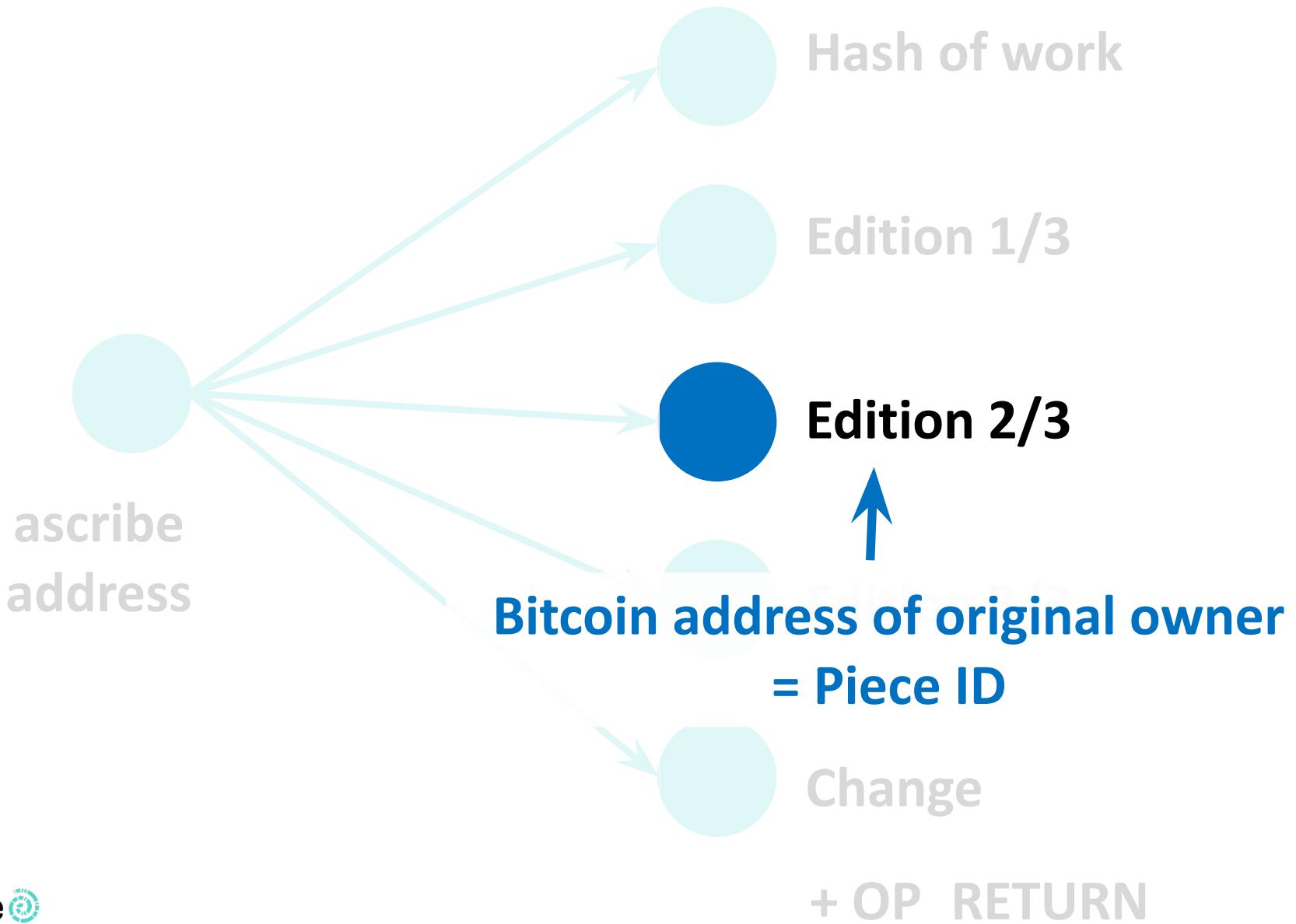
***SPOOL = Secure Public
Online Ownership Ledger**

Bitcoin overlay (SPOOL): register tx

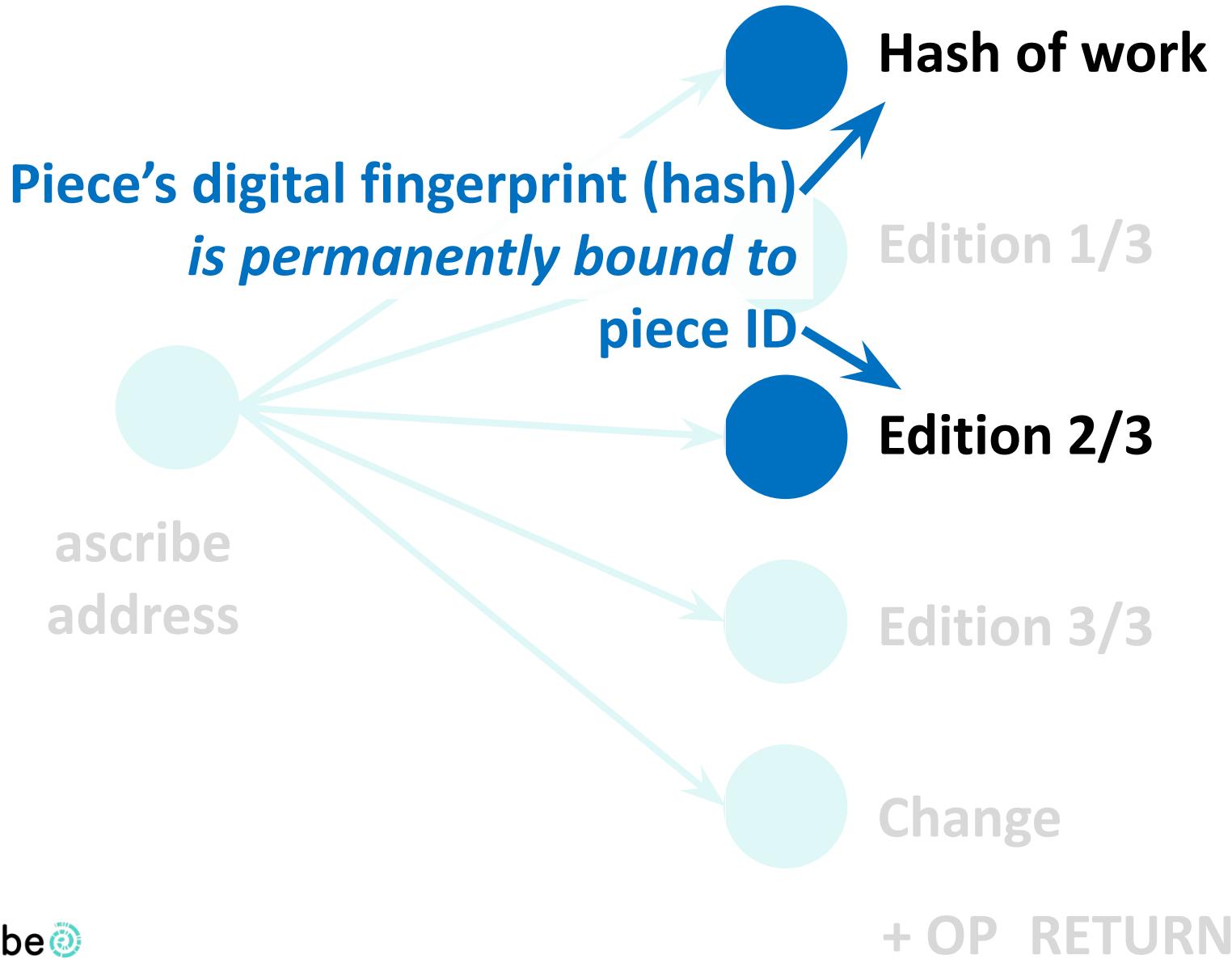
Example on 3 editions



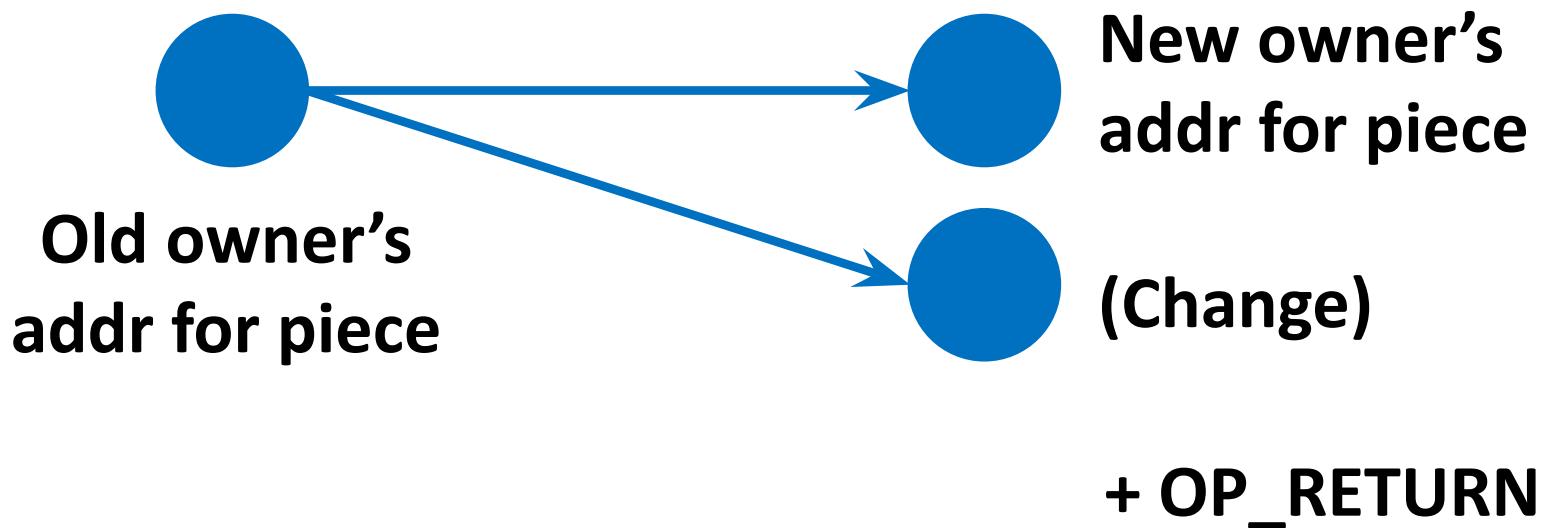
Bitcoin overlay (SPOOL): register tx



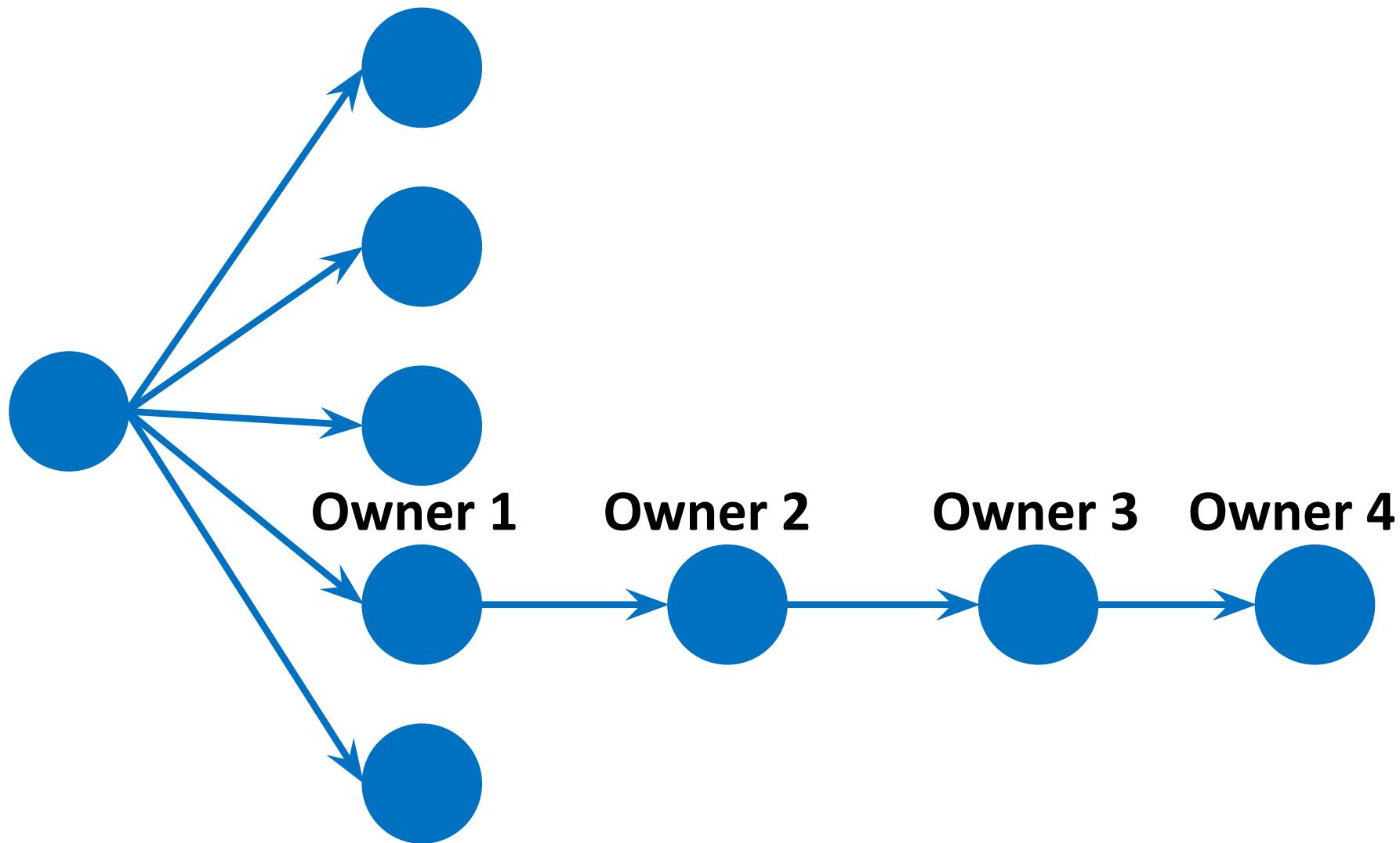
Bitcoin overlay (SPOOL): register tx



Bitcoin overlay (SPOOL): transfer ownership tx



Bitcoin overlay (SPOOL): Provenance emerges naturally



Bitcoin overlay (SPOOL): specification

SPOOL = Secure Public Online Ownership Ledger

Features: unique editions, consignment, transfer, ..

REGISTER:

- MAPPING: 1-to-many
- SPOOL: piece_hash -> edition(s)
- BTC:
TX = [(1jtt... : 20000+num_editions)] -> [(piece_hash:10000), (edition1_hash:1), ..., (editionx_hash:1),
(OP_RETURN=SPOOLREGISTER:0), (fee:10000)]
> balance of piece_hash = 10000 satoshi
> balance of edition(s) = 1 satoshi

github.com/ascibe/spool

TRANSFER:

- MAPPING: 1-to-1
- SPOOL: edition -> transferred_edition [transferred_edition is on a HD wallet owned by the transferee]
- BTC:
* first transfer
> balance of edition = 1 satoshi
TX = [(1jtt...:29999)] -> [(edition_hash:19999), (OP_RETURN=SPOOLREPLENISH:0), (fee:10000)]
TX = [(edition_hash:20000)] -> transferred_edition_hash [(transferred_edition_hash:10000),
(OP_RETURN=SPOOLTRANSFER:0), (fee:1000)]
> balance of edition = 0 satoshi
> balance of transferred_edition = 10000 satoshi

* next transfers

- > balance of transferred_edition = 10000 satoshi
TX = [(1jtt...:20000)] -> [(:10000), (OP_RETURN=SPOOLREPLENISH:0), (fee:10000)]
TX = [(transferred_edition_hash:20000)] -> [(transferred_edition_next_hash:10000),
(OP_RETURN=SPOOLTRANSFER:0), (fee:1000)]
> balance of transferred_edition = 0 satoshi
> balance of transferred_edition_next = 10000 satoshi

CONSIGN:

- MAPPING: 1-to many
- SPOOL: edition -> consigned_edition(s) [consigned_editionx is on a HD wallet owned by consignee x]

ascribe & the bitcoin stack

USER
FACING

Webapp & Marketplaces

DIGITAL ART

3D PRINTING

STOCK
PHOTOS

MUSIC

PUBLISHING

...

OWNERSHIP PROTOCOL

OWNERSHIP ENGINE

- Auto-discover links (web crawl, ML)
- Copyright (TOS/legal)
- Digital scarcity (via ledger, using notary -> smart property)



NOTARY PROTOCOL

↓ HASH OF PROPERTY

↑ CERTIFICATE OF AUTHENTICITY

NOTARY ENGINE

- Proof of Existence & Transfer



Proof of Existence

MONEGRAPH_
ART COA

SMART CONTRACTS

↓ SCRIPT ↑ (EXECUTES)

SMART CONTRACTS ENGINE

- Ethereum, Codius, Counterparty, Eris



SMART PROPERTY
PROTOCOL

- Counterparty
- Open Assets
- NXT, OT, ..



BITCOIN PROTOCOL

↓ TRANSACTION

↑ (UPDATED LEDGER)

LEDGER INFRASTRUCTURE

- Write once, read forever, delete never
- Decentralized control



BITCOIN 1.0

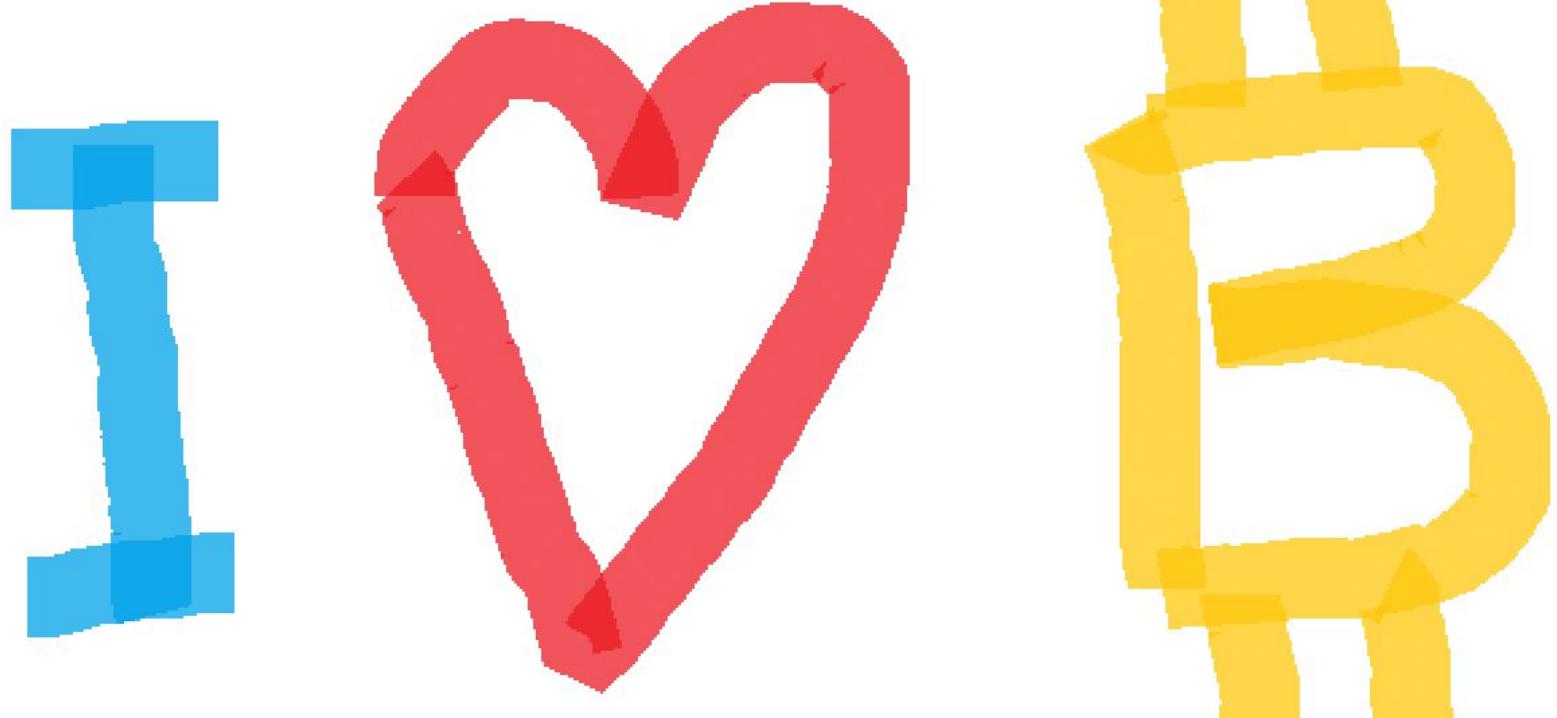
How ascribe tech helps ownership

- **Creators** – Can claim & protect ownership. Cryptographic Certificate of Authenticity (CCOA). Can share without losing control.
- **Collectors / audience** – digital provenance enables secondary markets.
- **Connectors** – mitigate friction on legal side
- For digital art, 3d, photography, ..

Demo

Trent's

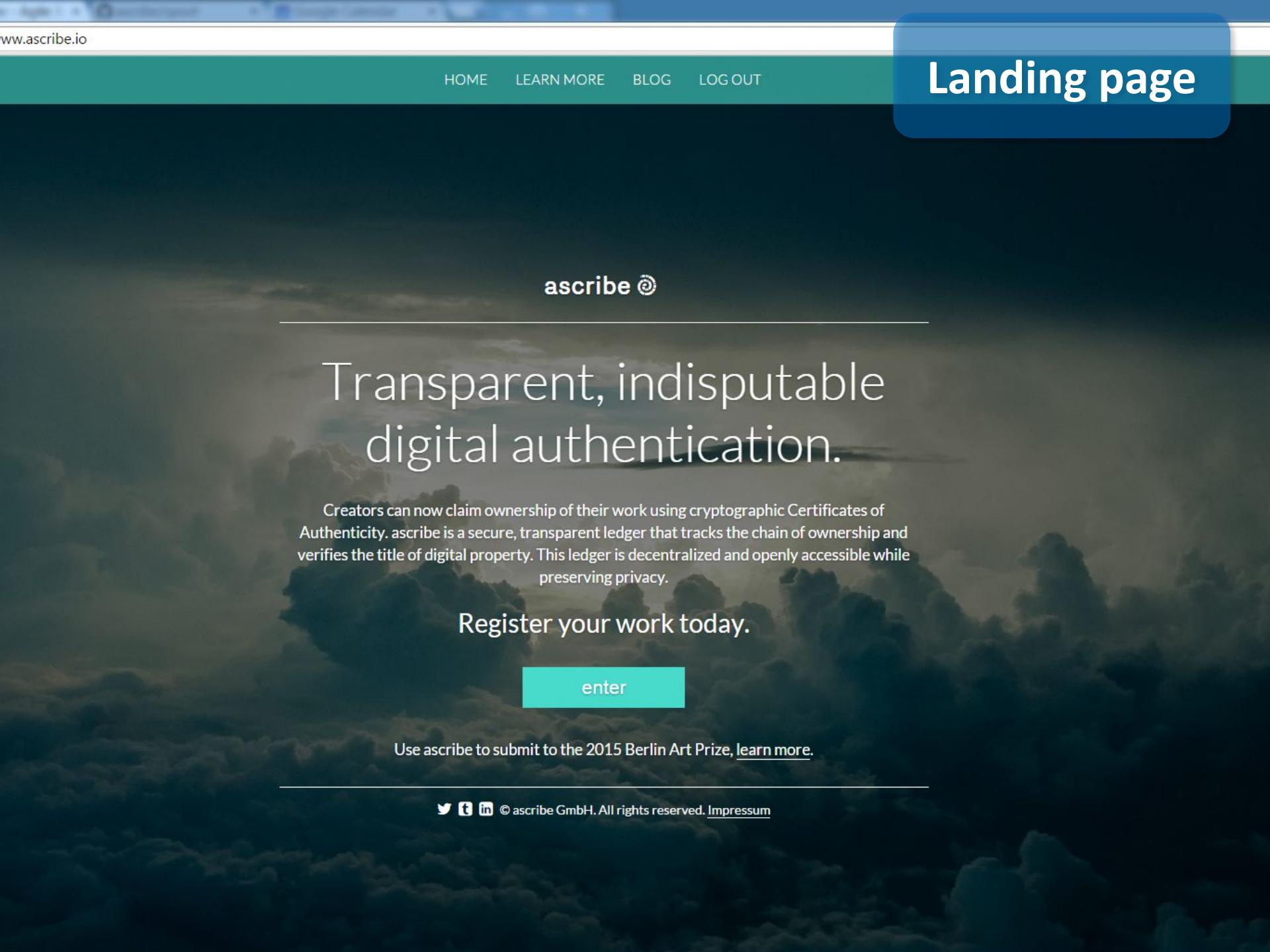
(obviously great)
work of art #2



603 x 349px

Size: 14.7KB





ascribe ©

Transparent, indisputable digital authentication.

Creators can now claim ownership of their work using cryptographic Certificates of Authenticity. ascribe is a secure, transparent ledger that tracks the chain of ownership and verifies the title of digital property. This ledger is decentralized and openly accessible while preserving privacy.

Register your work today.

enter

Use ascribe to submit to the 2015 Berlin Art Prize, [learn more](#).

Sign up to claim and transfer digital art X

Your password must be at least 10 characters. This password is securing your digital property like a bank account. Store it in a safe place!

I agree to the [Terms of Service](#)

[JOIN US](#)[CLOSE](#)

Creators

Authenticity. Ascribe is a secure, transparent ledger that tracks the chain of ownership and verifies the title of digital property. This ledger is decentralized and openly accessible while preserving privacy.

Register your work today.

[sign up](#)

Use ascribe to submit to the 2015 Berlin Art Prize, [learn more](#).



© ascribe GmbH. All rights reserved. [impressum](#)

[Signup](#)

Welcome to ascribe!

Click or drop artwork

Step one: lock down title

Artist's Name

Artwork Title

Year Created



Number of Editions

[About / Impressum](#)

Welcome to ascribe!



btc.png 15.1kB

DELETE

Step one: lock down title

Trent McConaghyl

Bitcoin Love

2015

3



This input is final and cannot be edited later.
Additional details can be added after registration.

REGISTER

CANCEL

About / Impressum

Welcome to ascribe!



btc.png 15.1kB

DELETE

Step one: lock down title

Trent McConaghy



Bitcoin Love

2015

3

This input is final and cannot be edited later.
Additional details can be added after registration.

REGISTER

CANCEL

CONSIGN

TRANSFER



Trent McConaghy

BITCOIN LOVE

2015, edition: 1/3

ID: 16XcLp6mEuujWng6w6LqPNprRYbj9eUcT4

Status: Can Transfer/Consign

Owner: iheartbtc@mailinator.com

Certificate of Authenticity

CREATE

 Personal Note Show/Hide

Provenance/Ownership History Show/Hide

Consignment Show/Hide

Further Details Show/Hide

[+ Add Display instructions](#)[+ Add Technology details](#)[+ Add Artist contact info](#)[+ Add Optional data files](#)

SPOOL Details Show/Hide

Delete Actions Show/Hide

Piece detail

All works =archive =wallet

ascrIbe 

iheartbtc@mailinator.com 

+ ARTWORK



Search...



Artist	Title	Edition	Action
 Trent McConaghy	Bitcoin Love <small>ID: 16XcLp6mEuujWng6w6LqPNprRYbj9eU...</small>	2015, 1/3	Can Transfer/Consign
 Trent McConaghy	Bitcoin Love <small>ID: 16fvIVhXK2gVE1hpgxpBfzdDxEnCa7M...</small>	2015, 2/3	Can Transfer/Consign
 Trent McConaghy	Bitcoin Love <small>ID: 1LPjuoXom5B5E6DQkj7Pux4QLBiWZXj...</small>	2015, 3/3	Can Transfer/Consign

[About / Impressum](#)

ascrIbe 

Transfer artwork 

Transferee email

Hi,

I transfer ownership of "Bitcoin Love" to you.

Truly yours,
iheartbtc@mailinator.com

Make sure that display instructions and technology details are correct.

They cannot be edited after the transfer.

Password

SPOOL Details

Artwork ID: 16XcLp6mEuujWng6w6LqPNprRYbj9eUcT4 [Blockchain] [Raw]

Hash of artwork, title, etc: 13ewcT3FxfmiNAaNcpMyiRqkr3TK9nYq61 [Blockchain] [Raw]

Owned by SPOOL address: 16XcLp6mEuujWng6w6LqPNprRYbj9eUcT4 [Blockchain] [Raw]

Transfer ownership

Interesting aside:

While this is a *bitcoin* app,
you don't have to know bitcoin at all.
Though if you do, you can cross-check...

Further Details

Show/Hide

+ Add Display instructions

+ Add Technology details

+ Add Artist contact info

+ Add Optional data files

SPOOL Details

Show/Hide

Artwork ID: 16XcLp6mEuujWng6w6LqPNprRYbj9eUcT4 [Blockchain] [Raw]

Hash of artwork, title, etc: 13ewcT3FxfmiNAaNcpMyiRqkr3TK9nYq61 [Blockchain] [Raw]

Owned by SPOOL address: 16XcLp6mEuujWng6w6LqPNprRYbj9eUcT4 [Blockchain] [Raw]

Easily cross-ref
blockchain 1/2

Easily cross-ref blockchain 2/2

<https://blockchain.info/tx/c451dd9f6984c9870d925ca88067114dbc0bc4d8c843f96503b94eaf4a5fad4>

 **BLOCKCHAIN**
info

Home Charts Stats Markets API Wallet

Search 

Transaction View information about a bitcoin transaction

c451dd9f6984c9870d925ca88067114dbc0bc4d8c843f96503b94eaf4a5fad4

1JttRRdtAi6cDNM23Uq4BEU61R8kJeANJs		13ewcT3FxfmiNAaNcpMyiRqkr3TK9nYq61 16XcLp6mEuujWng6w6LqPNprRYbj9eUcT4 16fv1VhXK2gVE1hpgxpBfzdDxEnCa7MpYn 1LPjuoXom5B5E6DQkj7Pux4QLBiWZXic7N 1JttRRdtAi6cDNM23Uq4BEU61R8kJeANJs Unable to decode output address	0.0001 BTC 0.000006 BTC 0.000006 BTC 0.000006 BTC 0.000182 BTC 0 BTC
------------------------------------	---	---	---

7 Confirmations **0.0003 BTC**

Summary	
Size	359 (bytes)
Received Time	2015-03-22 13:50:30
Included In Blocks	348695 (2015-03-22 13:50:30 + 0 minutes)
Confirmations	7 Confirmations
Relayed by IP 	144.76.13.207 (whois)
Visualize	View Tree Chart

Inputs and Outputs	
Total Input	0.0004 BTC
Total Output	0.0003 BTC
Fees	0.0001 BTC
Estimated BTC Transacted	0 BTC
Scripts	Show scripts & coinbase

ascribe status

For sale as we
speak, at
bitforms gallery
in NYC



Jonathan Monaghan
Escape Pod
2015, 3 editions

Berlin Art Prize tech

Until April 16, 2016 all of Berlin artists who live in t

YOU'RE
ART

Berlin Art
Prize

On 13
awardee
with a

APPLY NOW!

DEADLINE
01.04.2016

Other ascribe users

Digital artists

Photographers

Other creatives

3d design
marketplaces

Art marketplaces

Photography
marketplaces

tech status / near term roadmap

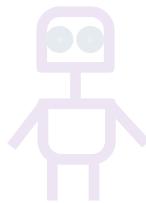
- Webapp – alpha – Mar 2014
- Webapp – beta – Sep 2014
- Tracking/ML – 20M images – Dec 2014
- REST API – alpha – Feb 2015
- Webapp – v1 – now
- Tracking/ML – Internet scale alpha – now
- REST API + tracking/ML – v1 – May 2015
- Webapp + tracking/ML – June 2015

Conclusion:

Let's Revive Ownership on the Internet

original

Where's



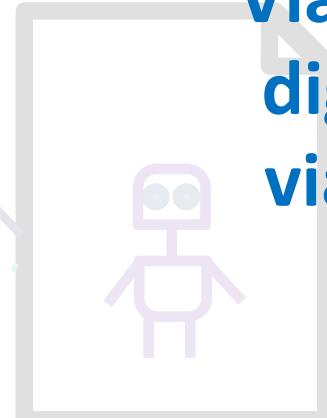
Auto
bi-dir. links

via Internet-scale
machine learning

1. *Auto-discovery of bi-directional links*
2. *Opt-in copyright*
3. *Create digital scarcity*

Effect is ownership control

Opt-in copyright
Via TOS & legal,
digital scarcity
via blockchain



Extras

scribe team

- Bruce – banking, org building
- Greg – copyright / legal
- Masha – art
- Jaz – art
- Trent – large scale ML, btc
- Dimi – large scale ML, btc
- Ryan – large scale ML
- Tim – large scale ML, full stack
- Alberto – full stack
- Rodolphe – distributed protocols
- Andreas – big data, distributed protocols
- Sarah – btc

More info on common crawl

- Common Crawl makes a copy of the Web and gives it away for free with no additional IP restrictions
- Petabytes of data
 - raw data
 - plain text
 - meta data
- 1MB cutoff for all pages. So, images are out. But TinEye uses their data for reverse image search.
- Example research : dirt cheap Web scale parallel text from the Common Crawl
- 3G Web pages, Monthly releases
- 220 TB uncompressed, 60 TB compressed. Free to download from AWS. (ie don't download and just use AWS)
- They do crawling with nutch. (largest public user). Avoids link farms, spider traps, but is skewed towards dot com.
- Files are simply gzipped. Wrappers exist for many languages, including python.
- Derived datasets include : hyperlink graph (at Web data Commons), n gram counts, global vectors for word representation.
- One project points to all links, and reports link type (eg if an img link)
- To generate full hyperlink graph would cost about 30 USD on AWS. Using AWS spot instances. Results in about 10 GB of data.
- flashgraph
- Python starter kit with mrjob
- They treat possible IP issues as legal gray area. You have data, not content. Did legal studies with uc Berkeley. "If common crawl gets sued but sets case law, that's success".
- About 2k USD per crawl. They've highly optimized to minimize cost. (eg use AWS spot instances)
- Slides: <http://slides.com/smerity/experiments-in-web-scale-data#/>

User flow



user uploads
original work



ascribe verifies
authenticity
via ML-based
prior art
screening

ascribe
registers a hash
of the file on
the blockchain
& issues crypto
Certificate of
Authenticity



marketplace
places original
work for sale

buyers of
digital property
can verify
authenticity



owner can
transfer
ownership,
consign, loan,
and license
original work

Problems of Any Digital Asset

It's the Physics, Silly!



COPIED
perfectly



STORED
for free



SHARED
with anyone



CREATOR
wants compensation & security



MARKET
wants original inventory



BUYER
want authenticity & provenance



Solution

A PERMANENT, PUBLIC OWNERSHIP REGISTRY



 COPIED
perfectly
~~SOLOVED~~


 STORED
for free
~~SOLOVED~~


 SHARED
with anyone
~~SOLOVED~~


BTC transactions from late 2013 app screenshot

The screenshot shows a web browser window with the URL 37.139.11.99:81/registerart. The page title is "Register Artwork". The top navigation bar includes links for "KEIDOM", "My Art", "Register Art", "Transfer Ownership", and "Transactions". The user's email address, "thegallerist1@mailinator.com", is visible on the right.

Files

Artwork File

Thumbnail File

About the Artwork

Artist

Title

Editions

Date of Creation

New custom field ...

I agree with the Keidom terms of service.

The artwork information will be hashed, and inserted onto the SPOOL.

At the bottom, there is a navigation menu with links: Manifesto, How It Works, Pricing, Terms of Service, Company ▾. The status bar shows system icons and the time: 9:50 PM, 11/17/2013.

BTC transactions from late 2013 app screenshot

The screenshot shows a web-based application interface for managing digital art. At the top, there's a navigation bar with tabs for 'Keidom' (selected), 'My Art', 'Register Art', 'Transfer Ownership', and 'Transactions'. A user email 'thegallerstt@mailinator.com' is visible on the right.

Art I Own

Thumbnail	Artist	Work	Edition	ID	more...	Consignment
	t-man	pipes	3 of 4	1DActjLgQCVtb2GgQe2g61P8fkPq4himdX.2	Details	Consign...

Consignment

Thumbnail	Artist	Work	Edition	ID	more...	
	t-man	pipes	4 of 4	1DActjLgQCVtb2GgQe2g61P8fkPq4himdX.3	Details	Return to Owner

At the bottom, there's a footer with links for 'Manifesto', 'How It Works', 'Pricing', 'Terms of Service', and 'Company'. Below the footer is a taskbar with icons for various applications like Windows, File Explorer, Google Chrome, and others. The system tray shows the date '11/17/2013' and time '9:49 PM'.

BTC transactions from late 2013 on blockchain

Screenshot of a web browser showing a Bitcoin transaction details page on blockchain.info.

The URL is <https://blockchain.info/tx/13b5828c281bb2c8a9448bd3cbebdae9a592ba4a6b55ec4aad79b4625cb85e4c>

Transaction View information about a bitcoin transaction

13b5828c281bb2c8a9448bd3cbebdae9a592ba4a6b55ec4aad79b4625cb85e4c

1DActjLgQCVtb2GgQe2g61P8fkPq4himxD
15egQU6Zm'yiD1CRWqgws4W492JF1Kq1N1

→ 19aRPFxJ6j9E4w6dUJA2YcUFJi7F1fDnh
15egQU6Zm'yiD1CRWqgws4W492JF1Kq1N1

0.0001 BTC
0.00024155 BTC
0.00034155 BTC

Summary	
Size	436 (bytes)
Received Time	2013-11-18 05:49:02
Included In Blocks	270249 (2013-11-18 05:50:46 + 2 minutes)
Confirmations	78453 Confirmations
Relayed by IP	Blockchain.info
Visualize	View Tree Chart

Inputs and Outputs	
Total Input	0.00044155 BTC
Total Output	0.00034155 BTC
Fees	0.0001 BTC
Estimated BTC Transacted	0.0001 BTC
Scripts	Show scripts & coinbase

Network Propagation (Click to view)


PIA privateInternetAccess™
Anonymous VPN Starting At \$3.33/Mo.
[REGISTER TODAY!](#)

About Us & Contact - Privacy Policy - Terms of Service - Ok (1780 Nodes Connected) - Advanced: Bitcoin

snapshots.zip Bitcoin_Block_D....s... Show all downloads...
Windows Taskbar icons: Internet Explorer, Google Chrome, File Explorer, OneDrive, Microsoft Edge, File History, and Paint.

Frequently Asked Questions (FAQ)

FAQ

Q: Why do I need a stamp of ownership on my work ?

A: ascribe gives you an irrefutable claim to ownership of your original work that helps to give galleries and collectors the confidence that they are buying authentic work. By registering with ascribe, you start the chain of ownership (provenance) that will stay with the work as it is transferred from one collector to the next.

Q: What does "ownership" mean for digital work?

A: It's about copyright. Owning a digital work basically means having copyright rights related to the work.

Q: How does registering on ascribe actually help "stamp" ownership?

A (short): It gives evidence towards your claim of copyright, which is especially useful if there is a dispute over ownership. It's the same effect as putting your art work onto a DVD and mailing it to yourself. But it's more secure than that, not to mention more convenient.

A (long):

- By law, a creator automatically gets copyright rights for the work as soon as they create it. But if there's a dispute over who created it, then evidence is key to resolving the dispute; the challenge is how do you establish that evidence? And if you sell the work, what happens then?
- ascribe allows you to "etch evidence into stone" that you had the file at a specific point in time. This evidence is used in two key places: registering the work, and transferring ownership. ascribe's terms of service reconciles the legals: you are claiming copyright rights on it.
- Three things are required to "stamp" ownership: identification of the creator, a unique identifier for the work, and an undisputable time stamp. ascribe ensures that all three requirements are met. ascribe "hashes" the file, that is, we create a short string that looks random but is actually unique to the file. ascribe time-stamps that hash by putting it on the Bitcoin blockchain. Think of the blockchain as a database that anyone can add to, anyone can read, but once it's written it cannot be deleted.

Q: Is the file changed somehow, like an invisible watermark or something?

A: The file is untouched. Hashing and time stamping gives you the protection.

Q: Who can register a work?

A: The current owner. This may be the creator of the work or the collector who currently owns the work.

Q: Can I have more than one edition for my work? Are those editions unique?

A: Yes. Each edition is unique, that is, edition 3/10 is different than edition 7/10. Each has its own owner, its own provenance, and so on. ascribe technology and legal makes it all easy for you.

Q: How can I sell a piece of work?

A: Simply register the work on ascribe. When you have a collector and they've paid you, go to ascribe to transfer the ownership of the work or edition. The provenance of the work is updated with the new owner.

Q: Does a consignee have to be a gallery or can it be anyone?

A: A consignee can be anyone that you trust to sell your work.

Q: How is the file stored?

A: The files registered on ascribe are in our secure and private cloud. This means that ascribe also functions as an archival tool for the artist / gallery / collector.

Q: When I register a work, who can see that I've registered it?

A: Only you. But then you can share a unique link to the work to individuals privately or via your favorite social network - Twitter, Facebook, tumblr, vimeo, or MyCatSpace (why not?). Anyone with the link can view your work.