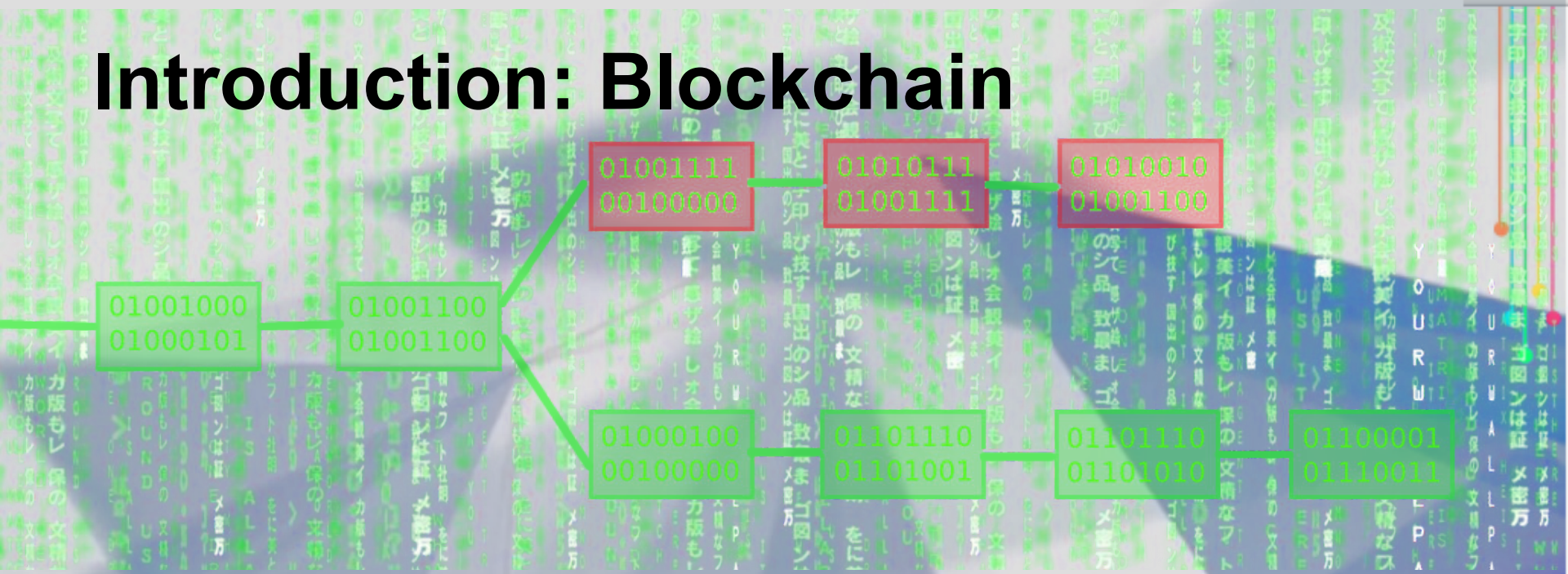

O’Reilly 2015
Ethereum

Introduction: Blockchain



- Distributed consensus
- Bitcoin, Namecoin, Colored coins

Ethereum

- Idea: blockchain + programming language
- Before: special-purpose blockchains
  - eg. calculator
- Now: general purpose blockchain
  - eg. Android - calculator is an app

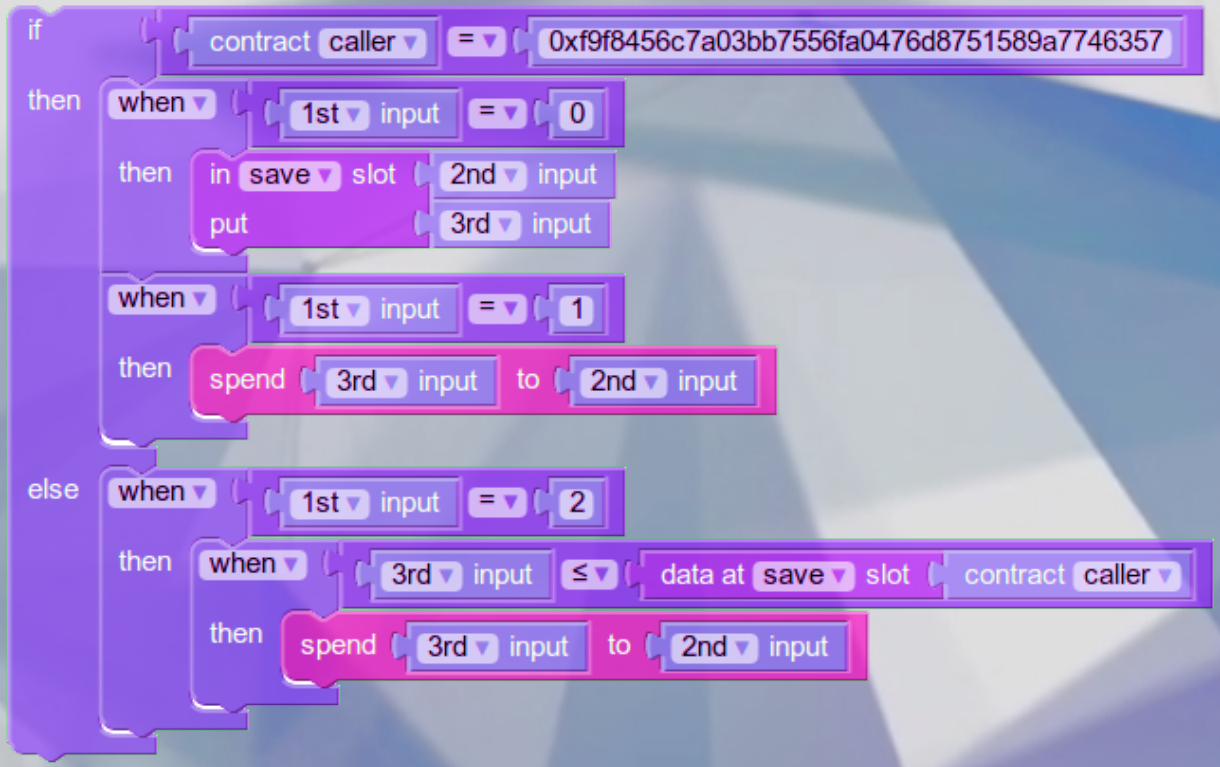
Contracts

- Scripts that run in the cloud
- Contracts can:
  - Send money
  - Read/write to an internal database
  - Talk to other contracts

Contracts

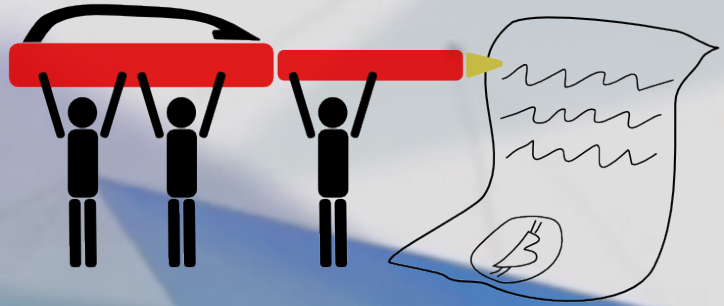
- Contracts are:
  - Fully transparent/auditable
  - Guaranteed to execute
  - 10000x slower
- Excellent for business logic, not for heavy computing

The Lego of Crypto-Finance



http://etherscripter.com

Use cases



- Organizational
  - Contracts (B2B)
  - Asset permissions
  - Blockchain-based governance
    - Shareholder agreements
    - Prediction markets

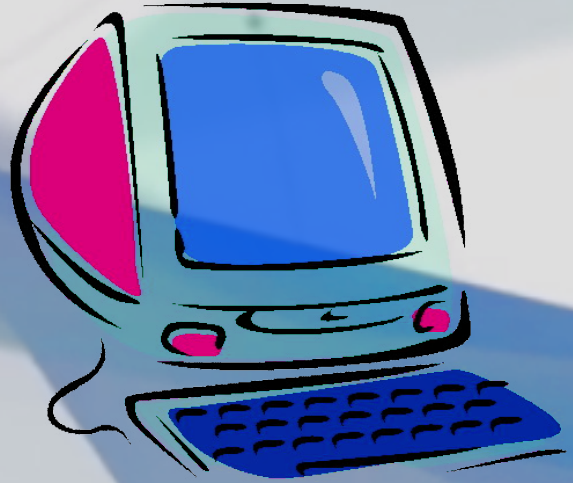
Use cases

- Peer-to-peer Finance
  - Crowdfunding
  - Derivatives, hedging
  - Insurance
    - Mutual aid style: http://bit.ly/econeng

Use cases

- Consumer
  - Escrow
  - Personal asset storage
  - Smart property

Use cases



- Computational resources
  - Cloud storage
    - “Permanent Web”
  - Cloud computing
  - Mesh networking
    - Solution to net neutrality?

Beyond finance

- Name registries
- Non-currency tokens
- Whisper (messaging)
- Decentralized applications (DApps)

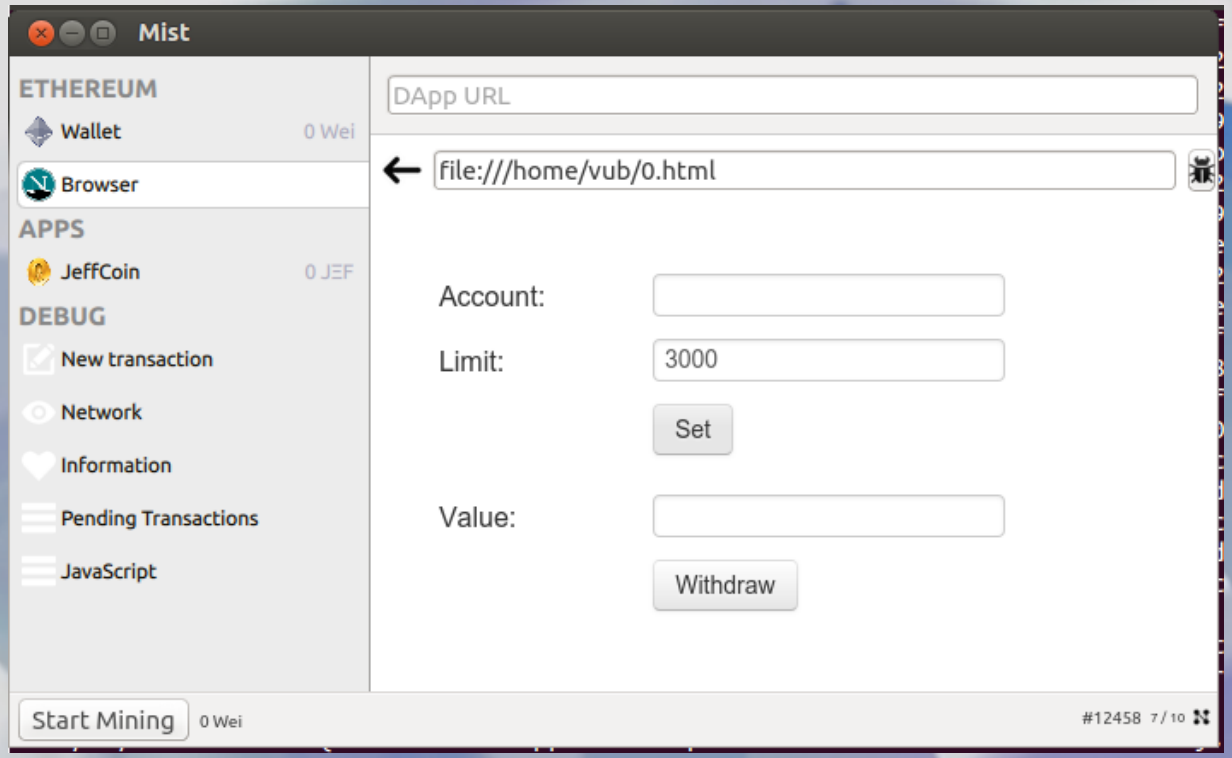
Decentralized Applications

- A DApp is:
  - Decentralized
  - Provides value to people
- “Server-side”: blockchain
  - Ethereum = “decentralized operating system”
- Client-side: Web

Building a DApp

1. Write contract code
    - Languages exist similar to Python, Go, JS, Lisp
    - EtherScripter (graphical environment)
2. Write in-browser code
    - HTML / CSS / JS, just like the “old web”
3. Release

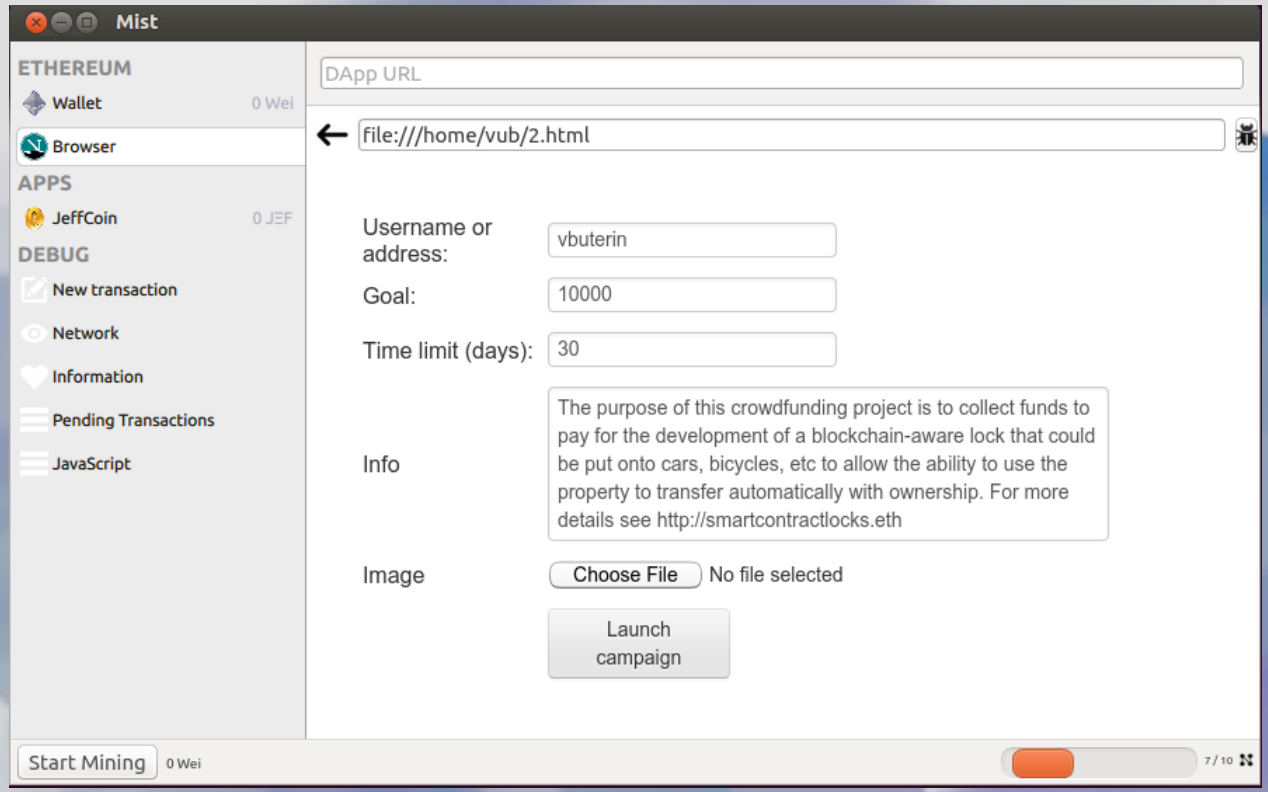
Example DApp



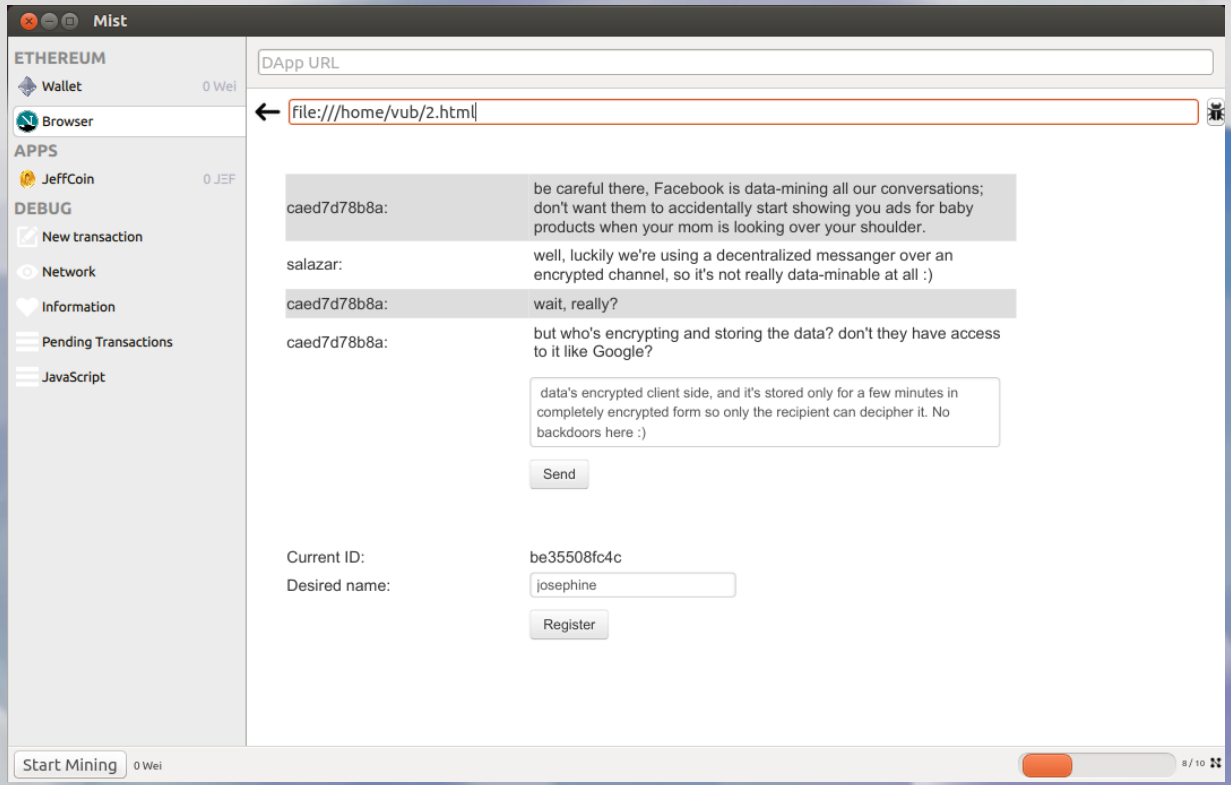
Benefits

1. Easy to write
2. Trustworthy
    - No need to trust you, can inspect the code
3. Transparent
4. No maintenance required
    - Even if you disappear, app lives on as long as it has users

Crowdfund


Mist
ETHEREUM
Wallet
0 Wei
Browser
APPS
JeffCoin
0 JEF
DEBUG
New transaction
Network
Information
Pending Transactions
JavaScript
DApp URL
file:///home/vub/2.html
Username or address:
vbuterin
Goal:
10000
Time limit (days):
30
Info
The purpose of this crowdfunding project is to collect funds to pay for the development of a blockchain-aware lock that could be put onto cars, bicycles, etc to allow the ability to use the property to transfer automatically with ownership. For more details see http://smartcontractlocks.eth
Image
Choose File
No file selected
Launch campaign
Start Mining
0 Wei
7 / 10

Messaging


Mist
ETHEREUM
Wallet
0 Wei
Browser
APPS
JeffCoin
0 JEF
DEBUG
New transaction
Network
Information
Pending Transactions
JavaScript
DApp URL
file:///home/vub/2.html
caed7d78b8a:
be careful there, Facebook is data-mining all our conversations; don't want them to accidentally start showing you ads for baby products when your mom is looking over your shoulder.
salazar:
well, luckily we're using a decentralized messanger over an encrypted channel, so it's not really data-minable at all :)
caed7d78b8a:
wait, really?
caed7d78b8a:
but who's encrypting and storing the data? don't they have access to it like Google?
data's encrypted client side, and it's stored only for a few minutes in completely encrypted form so only the recipient can decipher it. No backdoors here :)
Send
Current ID:
be35508fc4c
Desired name:
josephine
Register
Start Mining
0 Wei
8 / 10

Conclusion

- Build: http://bit.ly/ethdapp
- Learn: http://ethereum.org
- Contact: v@buterin.com

What will you do on Ethereum?