Blockchain-Lab

V0.4

AUSTRIAPRO
Dr. Christian Baumann

25.10.2018

Inhalt

- Phase 1 „classic“
- Phase 2 „Ethereum“ – smart contracts
- Phase 3 „MultiChain“
- Phase 4 …

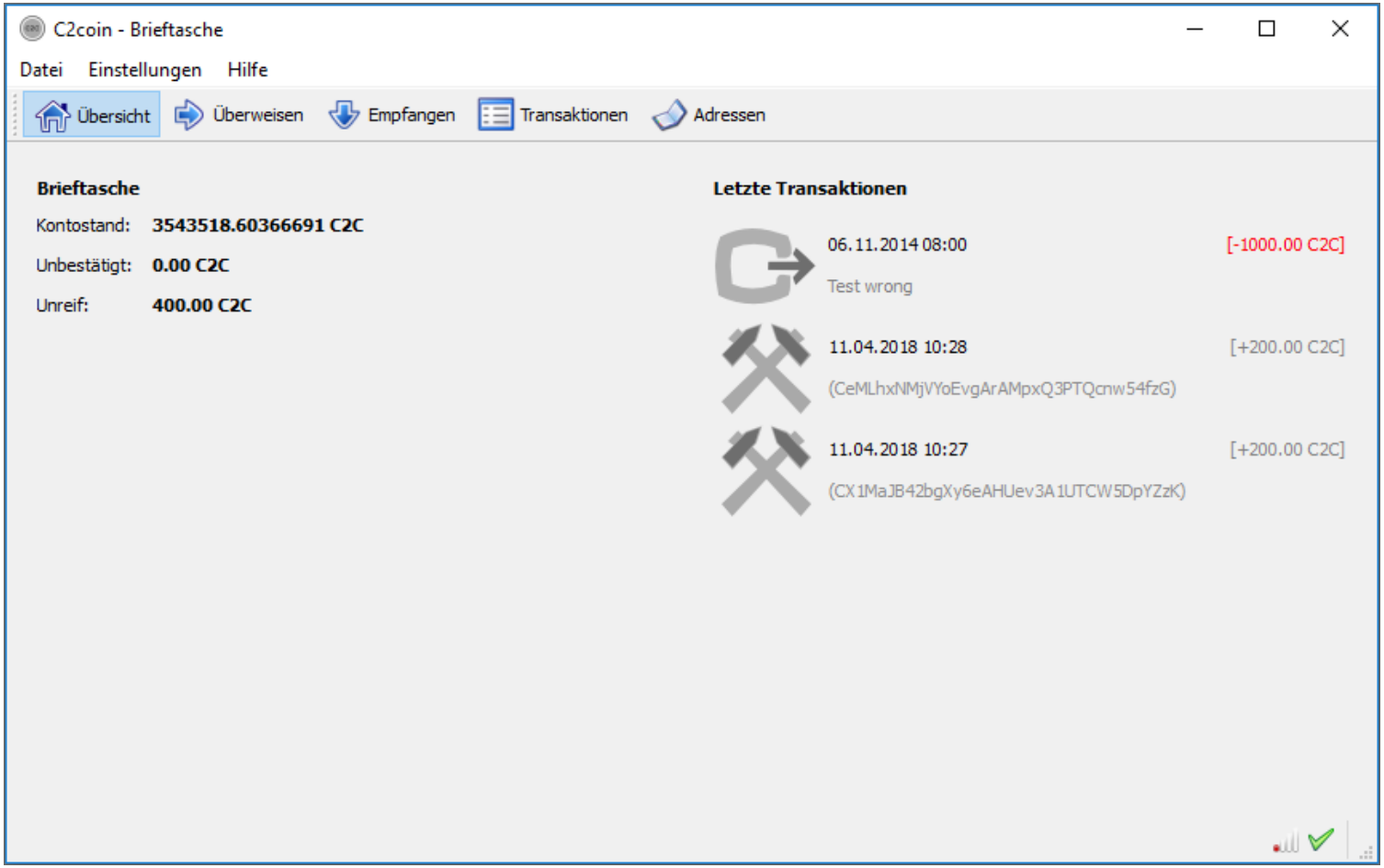
Phase 1

- „classic“ (crypto coin based) blockchains
  - Look & Feel wie Bitcoin, Litecoin … Client
  - „Hands on“
    - Installation & Betrieb Wallet
    - “Werte” transferieren (senden, empfangen)
    - Nachrichten signieren
  - Mining ausprobieren
    - Standalone, CPU, GPU
    - Über Miningpool
  - Weitere Tools kennenlernen
    - Blockexplorer
    - Paper-, Brain-Wallets
  - Unterschied „CryptoCurrency – Blockchain“

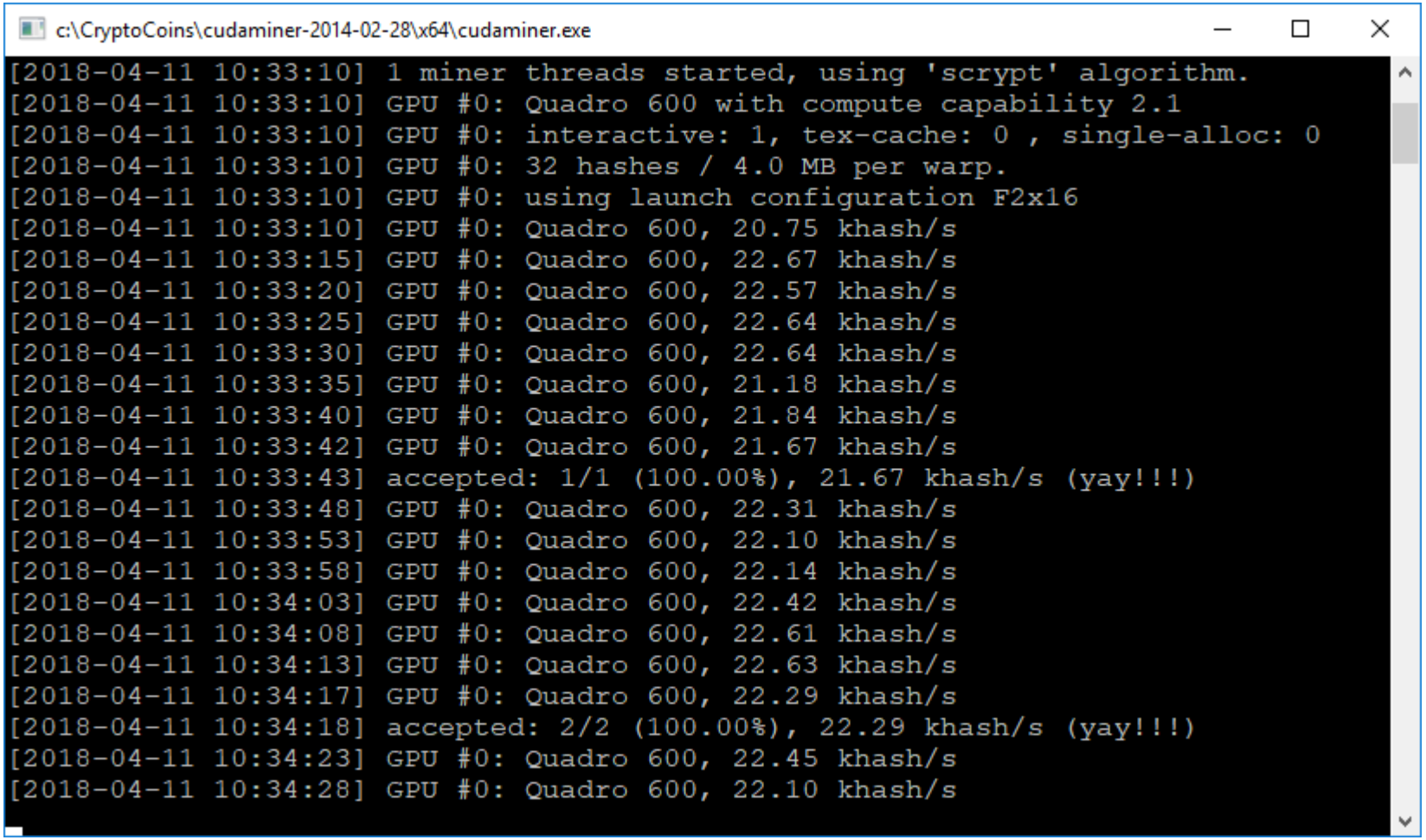
Classic crypto coin (am Beispiel C2coin)

- Wallet
  - Wallet für Windows: http://www4.baumann.at/downloads/c2coin_Wallet_Windows-20141107.zip
  - Kurzanleitung dazu: http://www4.baumann.at/downloads/C2coin-Readme.txt
- Mining
  - Mining mit GPUs: http://www4.baumann.at/downloads/Mining-with-GPUs.txt
  - Miningportal: http://coinz.at:81/
- Tools
  - Faucet (coins senden lassen) http://coinz.at/c2coin/send.php
  - Infoseite zum C2coin Netz: http://coinz.at/c2coin/
  - Einfacher Blockexplorer: http://coinz.at/c2coin/be.php
  - Walletgenerator: http://coinz.at/walletgenerator/

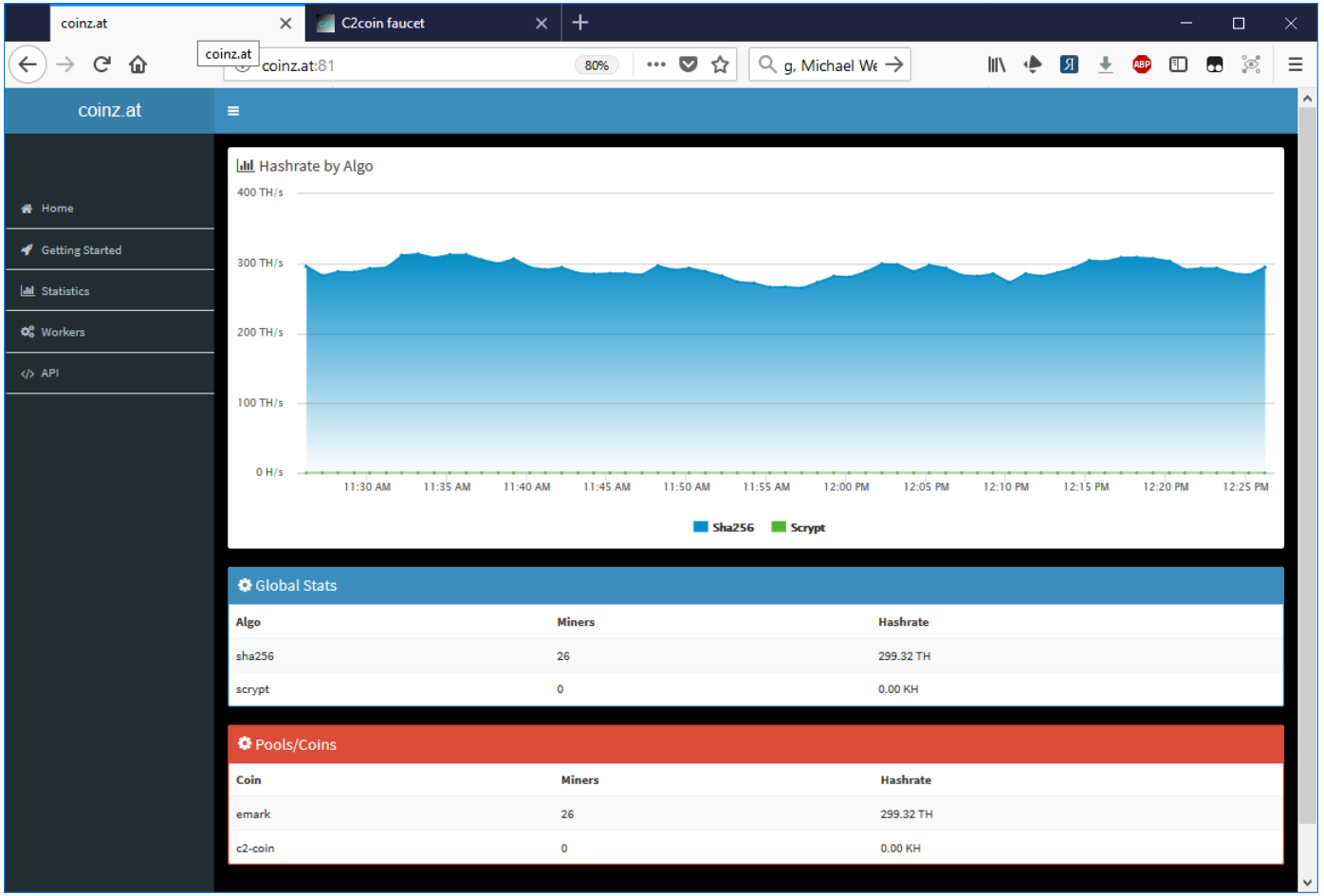
Beispiel: C2coin - Wallet



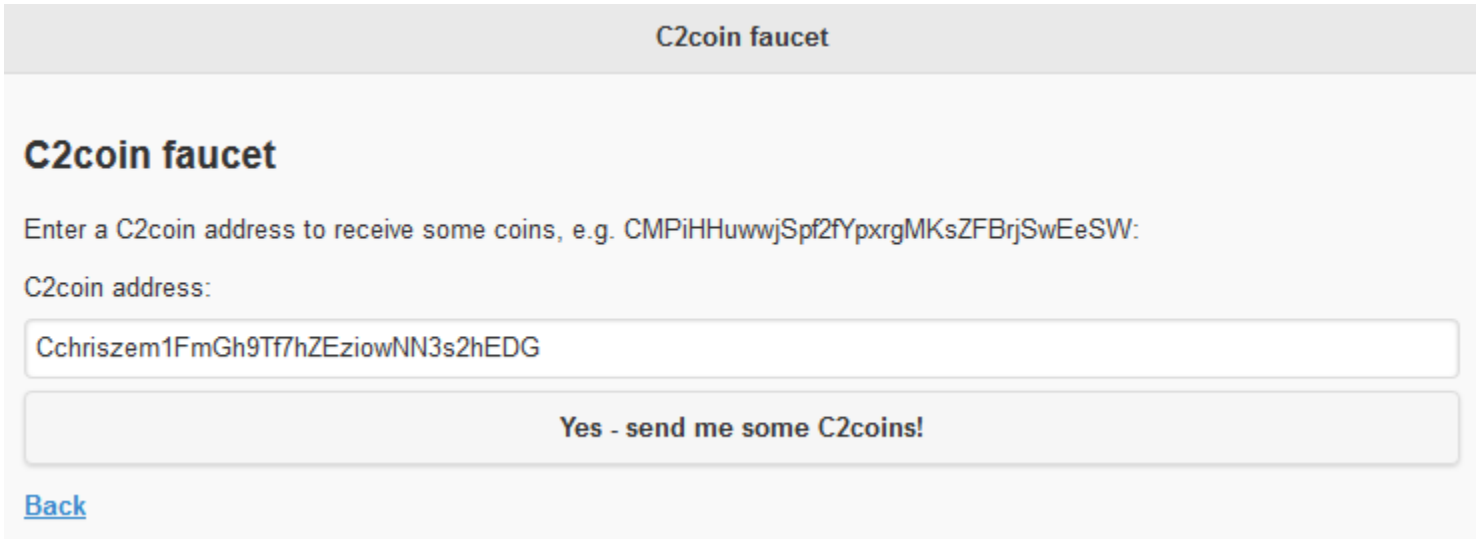
Beispiel: C2coin – GPU Mining



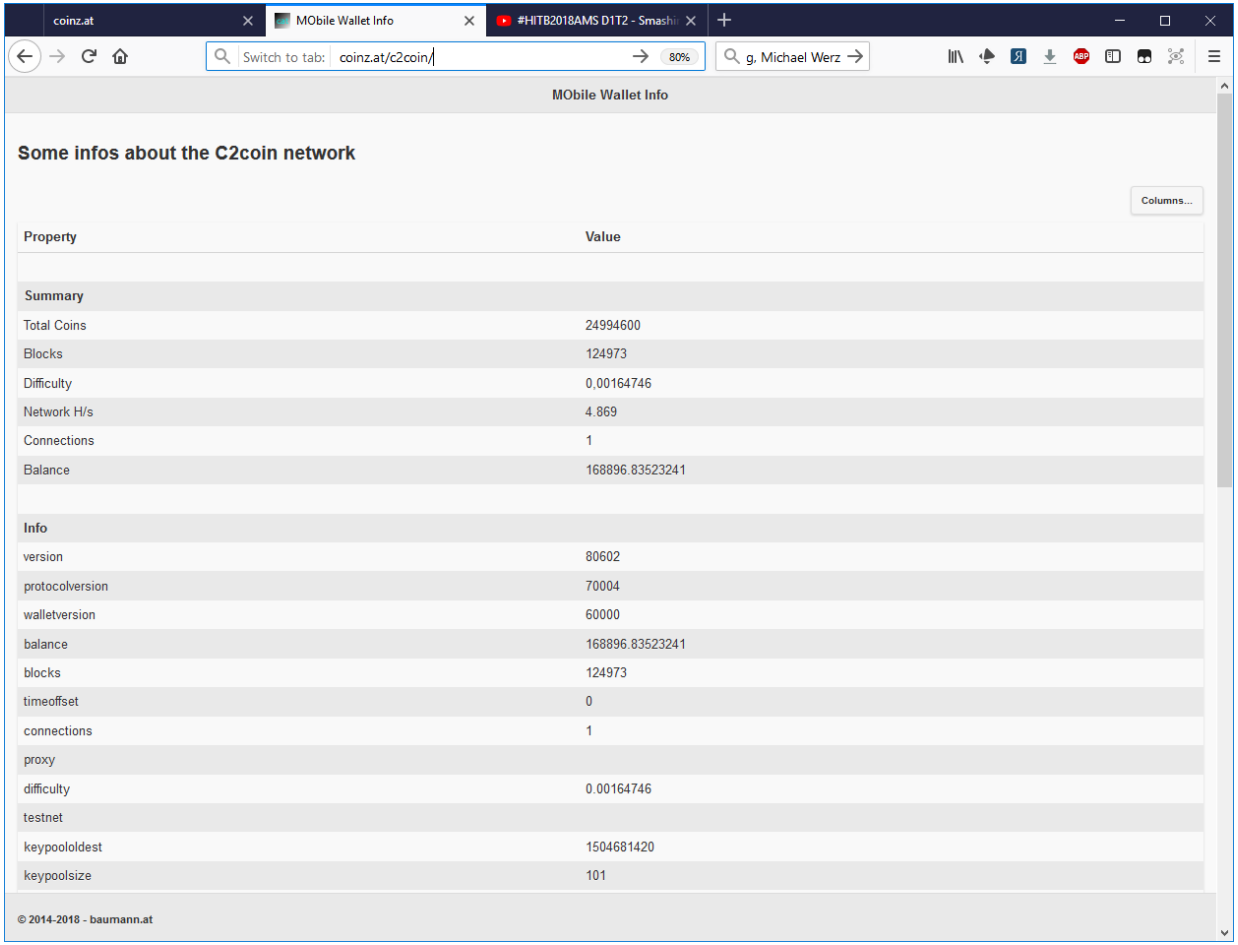
Beispiel: Miningportal coinz.at



Beispiel: C2coin – „Faucet“



Beispiel: C2coin – Network Info



Beispiel: C2coin – Block Explorer

C2coin block explorer
Connections: 1

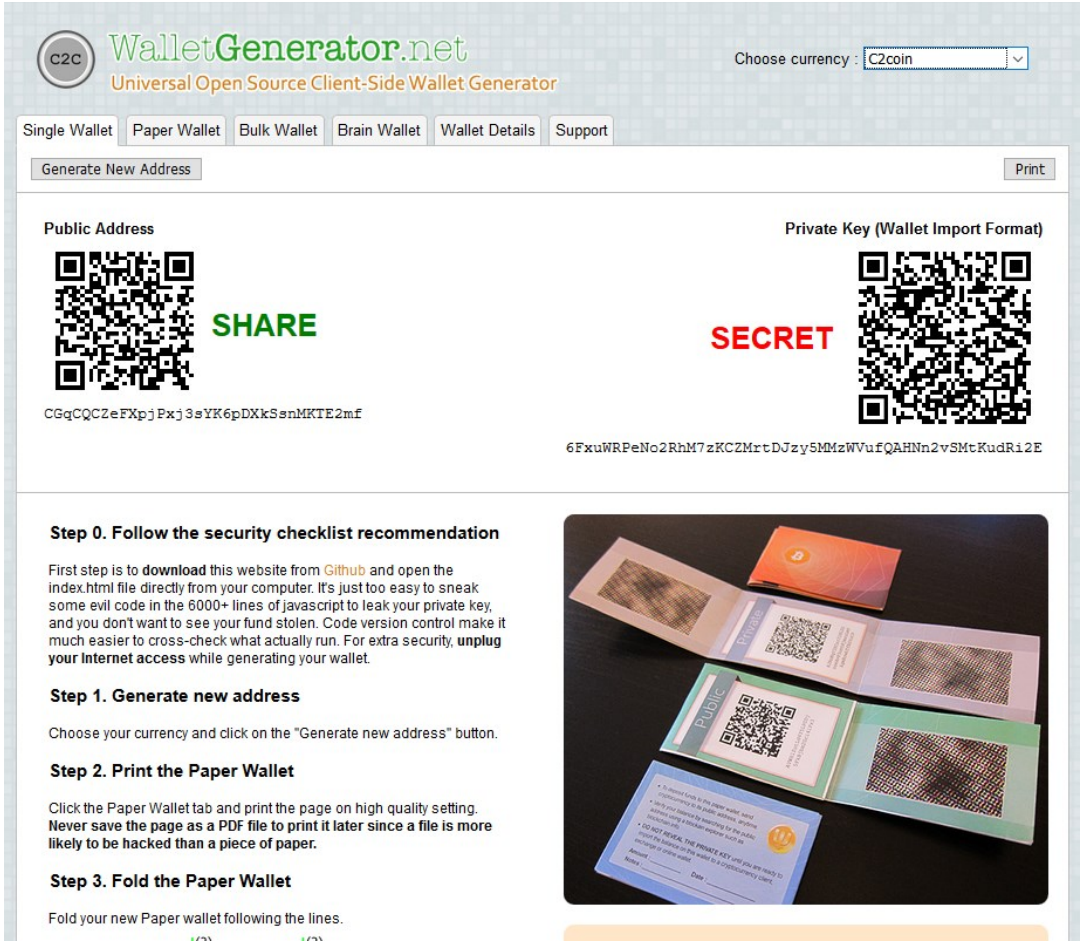
Based on RPC Ace v0.6.7

Blocks: 124581
Difficulty: 0.00024414 (= 0.00699 MH/s)
Net hashrate: 0.00018 MH/s (last 10 Blocks)
Net hashrate: 0.00009 MH/s (last 100 Blocks)

Block	Hash	Difficulty	Time (UTC)	Tx# · Value out
124581	39687ae93816239f ...	0.000244 (16)	08:34:13 11-Apr-2018	1 · 200
124580	8e64e92f50f9515d ...	0.000244 (16)	08:33:40 11-Apr-2018	2 · 1600
124579	83eacb3d35a05e4d ...	0.000244 (16)	08:28:07 11-Apr-2018	1 · 200
124578	f5919c1fbbad84a9 ...	0.000244 (16)	08:27:52 11-Apr-2018	1 · 200
124577	82a7e682d9b6948a ...	0.000244 (16)	08:26:13 11-Apr-2018	1 · 200
124576	5257148bc23a5a43 ...	0.000244 (16)	08:25:48 11-Apr-2018	1 · 200
124575	9424957414d3afb9 ...	0.000244 (16)	08:24:46 11-Apr-2018	1 · 200
124574	0b1ec7c761362250 ...	0.000244 (16)	08:24:22 11-Apr-2018	1 · 200
124573	29cb0a1281644d7a ...	0.000244 (16)	17:06:14 10-Apr-2018	2 · 800
124572	de0a3e49aea0e06d ...	0.000244 (16)	16:09:52 10-Apr-2018	1 · 200
124571	e97a4b7d395b3df1 ...	0.000244 (16)	16:07:06 10-Apr-2018	2 · 1400
124570	edfca9e2f7553be9 ...	0.000244 (16)	15:58:39 10-Apr-2018	1 · 200

< Newer Older >

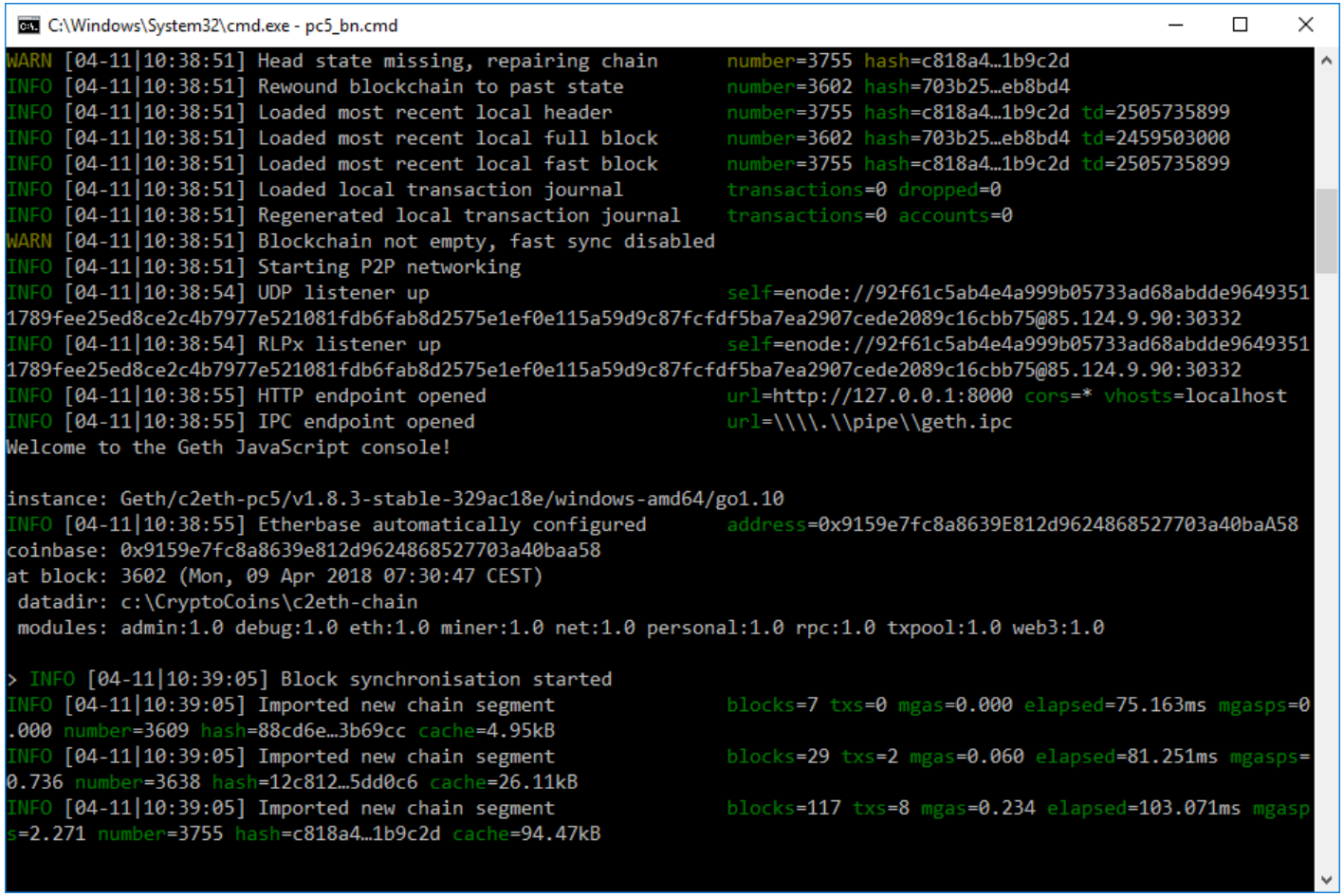
Beispiel: WalletGenerator



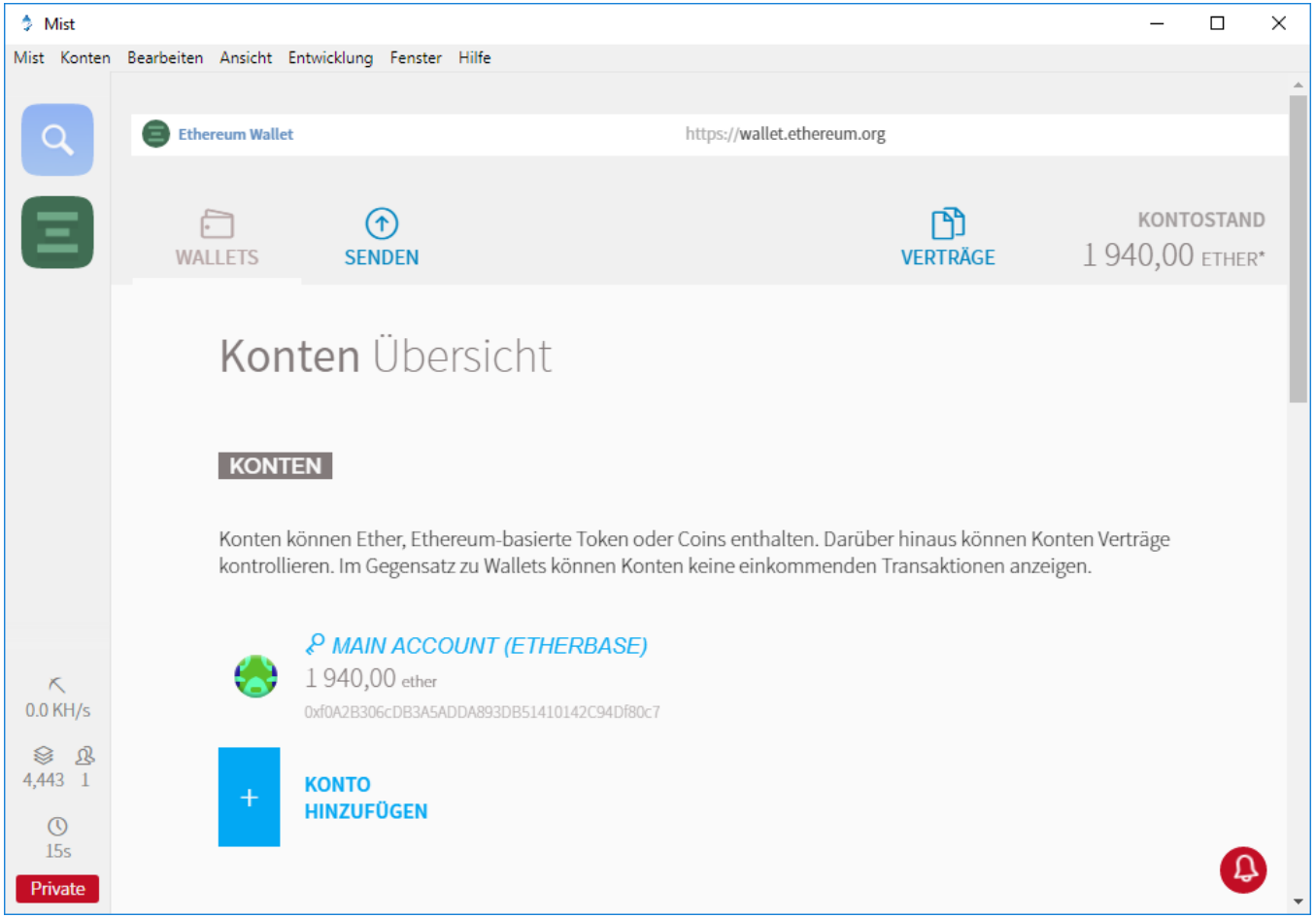
Phase 2

- Ethereum based
  - Smart Contracts
  - Oracles
  - Tokens (vgl. ICOs)
- Lab: Ethereum Test-Chain (Private)
  - Bootnode
  - Node (mit On Demand Mining)
    - `CPU Mining`
- => Setup eigener Node
  - Anleitung siehe https://blockchains.web-lab.at/austriapro/Ethereum-Testnet_20180528.pdf

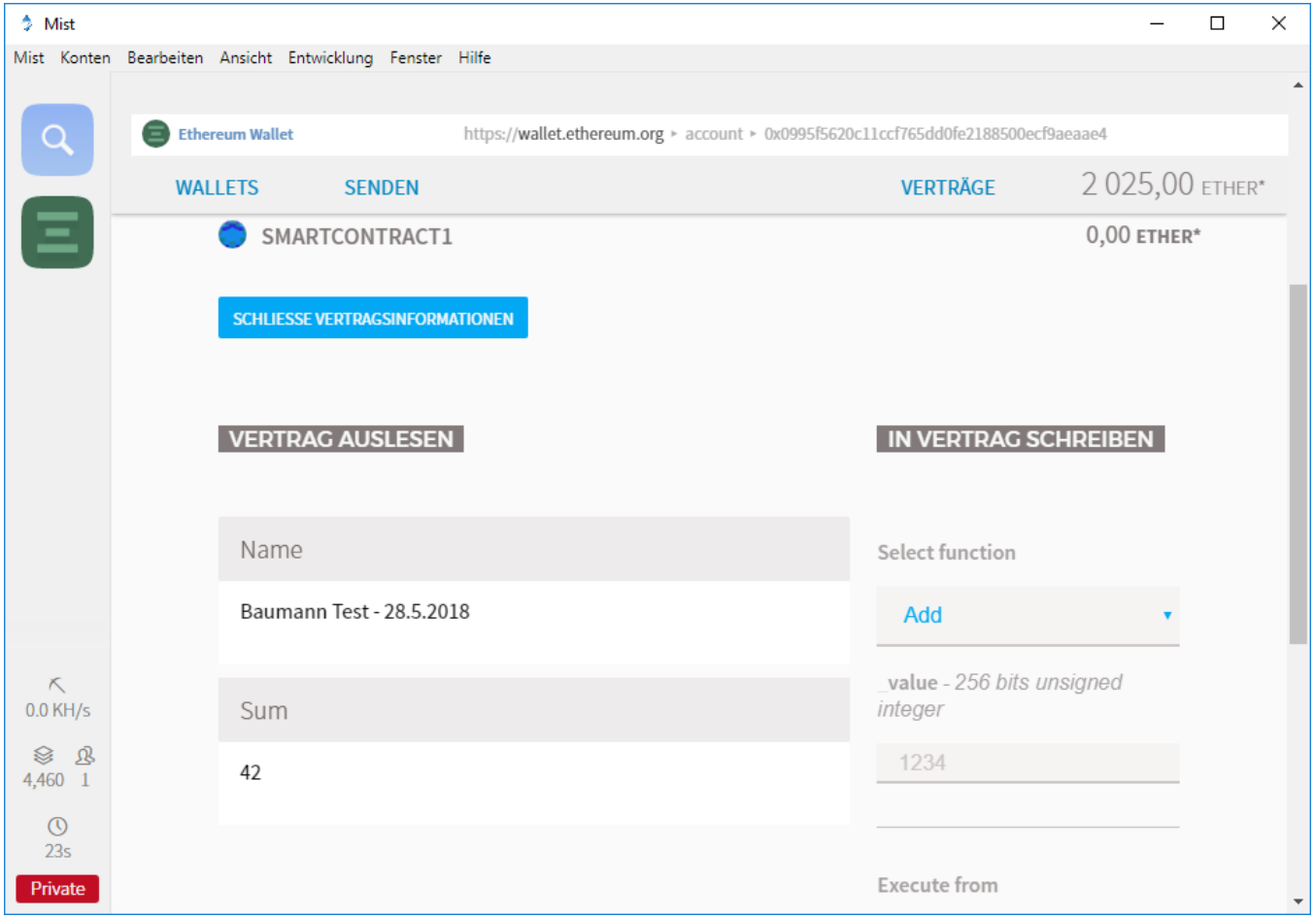
Ethereum Test-Chain - console



Ethereum Test-Chain - „Mist“ - Wallet



Ethereum Test-Chain - Smart Contract



News

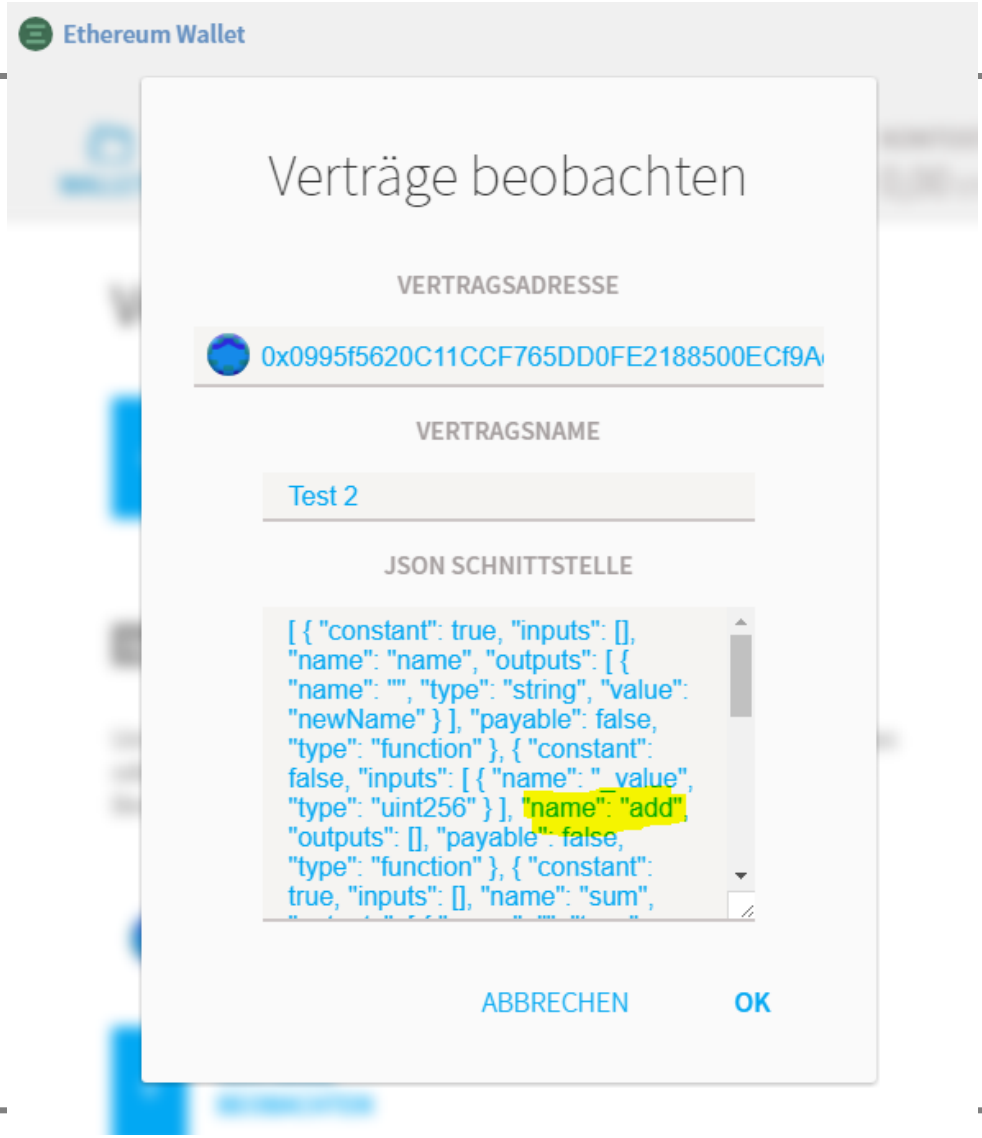
- => 19.9.2018

Smart Contract - Code

```
pragma solidity ^0.4.18;

contract MyContract {
    string public name;
    uint256 public sum;

    constructor MyContract(uint256 psum, string pname) {
        sum = psum;
        name = pname;
    }

    function add(uint256 _value) {
        sum += _value;
    }

    function setName(string _name) {
        name = _name;
    }

}
```

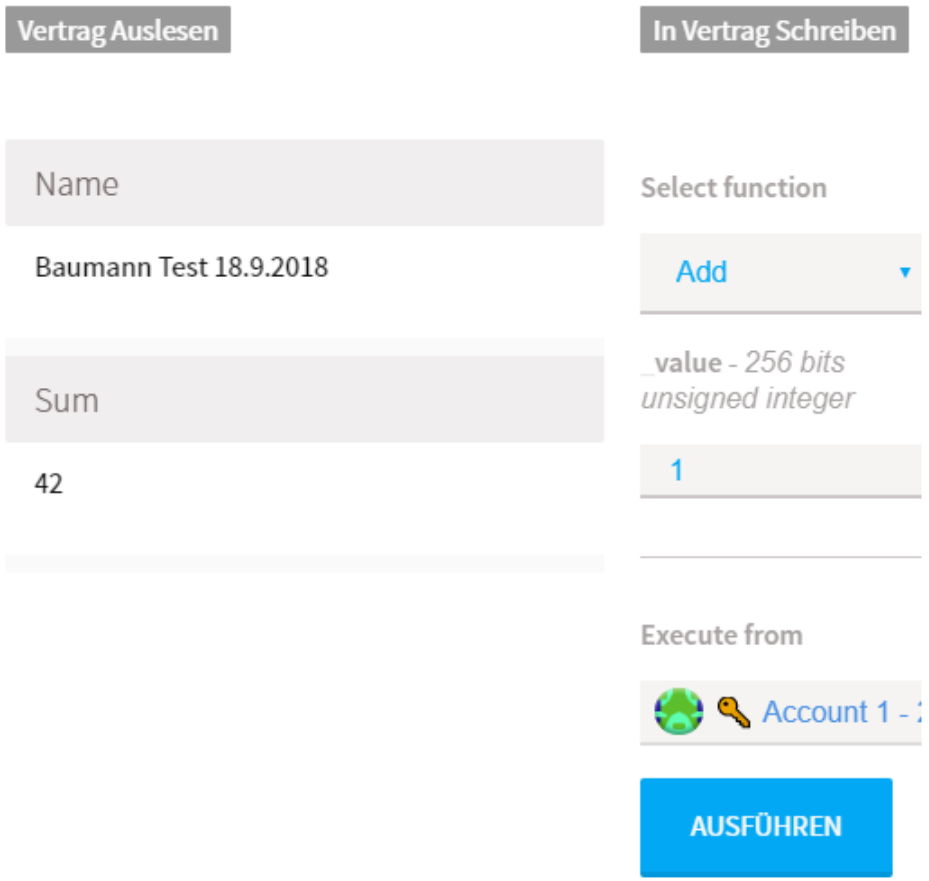
Smart Contract – „Beobachten“

- „Installieren“ in eigener Umgebung (Wallet)
- Adresse und Schnittstelle müssen bekannt sein



Smart Contract - Nutzung

- Aufrufen von definierten Funktionen
- Übergabe von Parameter/n
- Bezahlen der Gebühr ("Gas")



- http://blockchains.web-lab.at/austriapro/MyContract1.js

Phase 3 - MultiChain

- MultiChain - Node
  - Installiert im Lab
  - Web-GUI
- Demo
- Setup eigener Node
- Next Steps

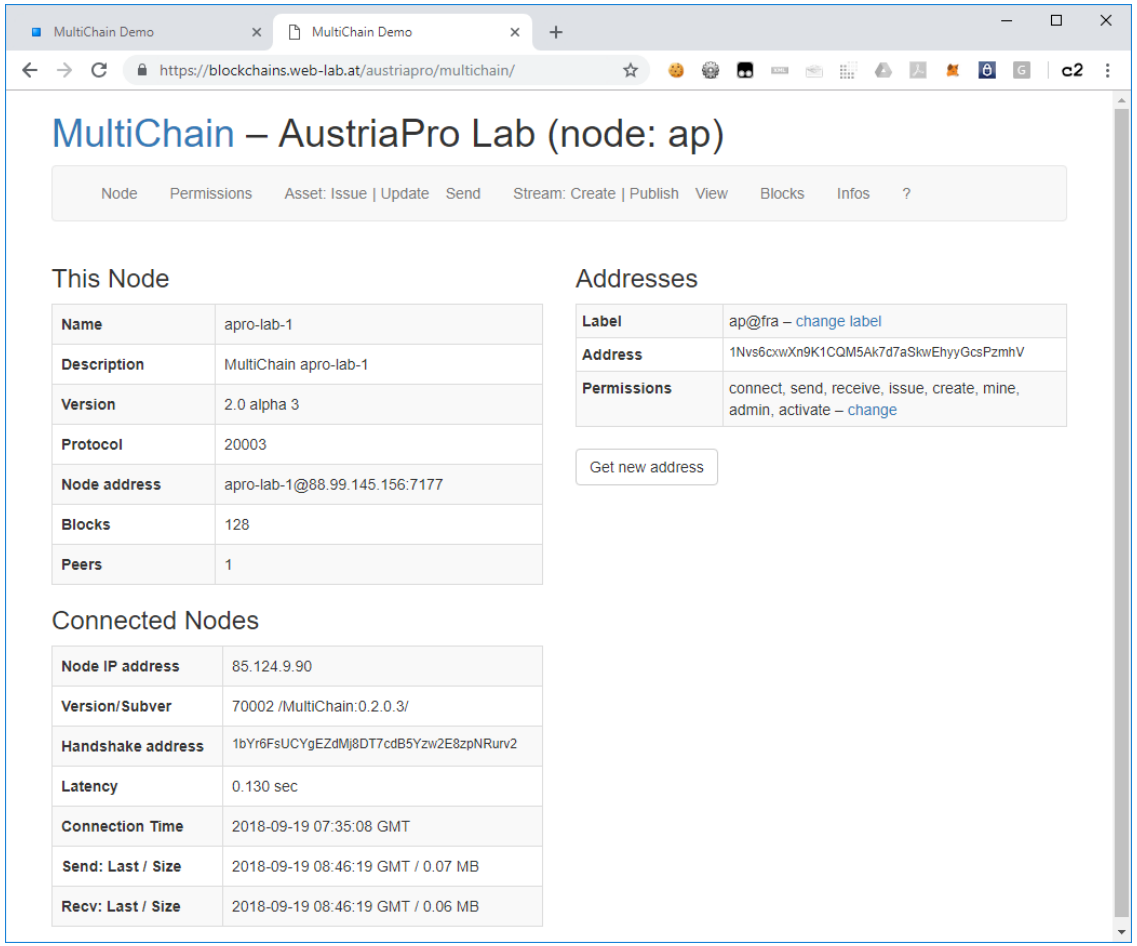
MultiChain Web-GUI

- Node hat kein GUI
  - API Schnittstelle (RPC über https/JSON)
  - => Web-GUI

- https://blockchains.web-lab.at/austriapro/multichain/

- Credentials (s.a. Mailing)

MultiChain Web-GUI



- Infos
  - Node, Permissions, Infos, Help
- **Assets**
  - Issue
  - Update
  - Send
- **Streams**
  - Create
  - Publish
  - View
- Blocks

MultiChain Setup Node

- Download, Infos, Tutorials …
  - https://www.multichain.com/
  - Aktuell Version 2.0 alpha 4
- In Verzeichnis entpacken
  - oder selbst compilieren ;-)
- Erster Start
  - **`multichaind apro-lab-1@88.99.145.156:7177`**
  - public key wird angezeigt
  - => an uns senden => Freigabe
- Start
  - **`multichaind apro-lab-1`**

MultiChain Next Steps

- Sie
  - Node installieren
  - Eigene Entwicklungen?
    - `Web-GUI`
    - `API`
  - Basis: https://github.com/MultiChain
- Wir
  - Weitere Demos: Wünsche/Vorschläge?
    - `(Notarization, Messdaten, Zertifikate …)`
  - Sourcecode auf Labs-Homepage und/oder
  - https://github.com/austriapro

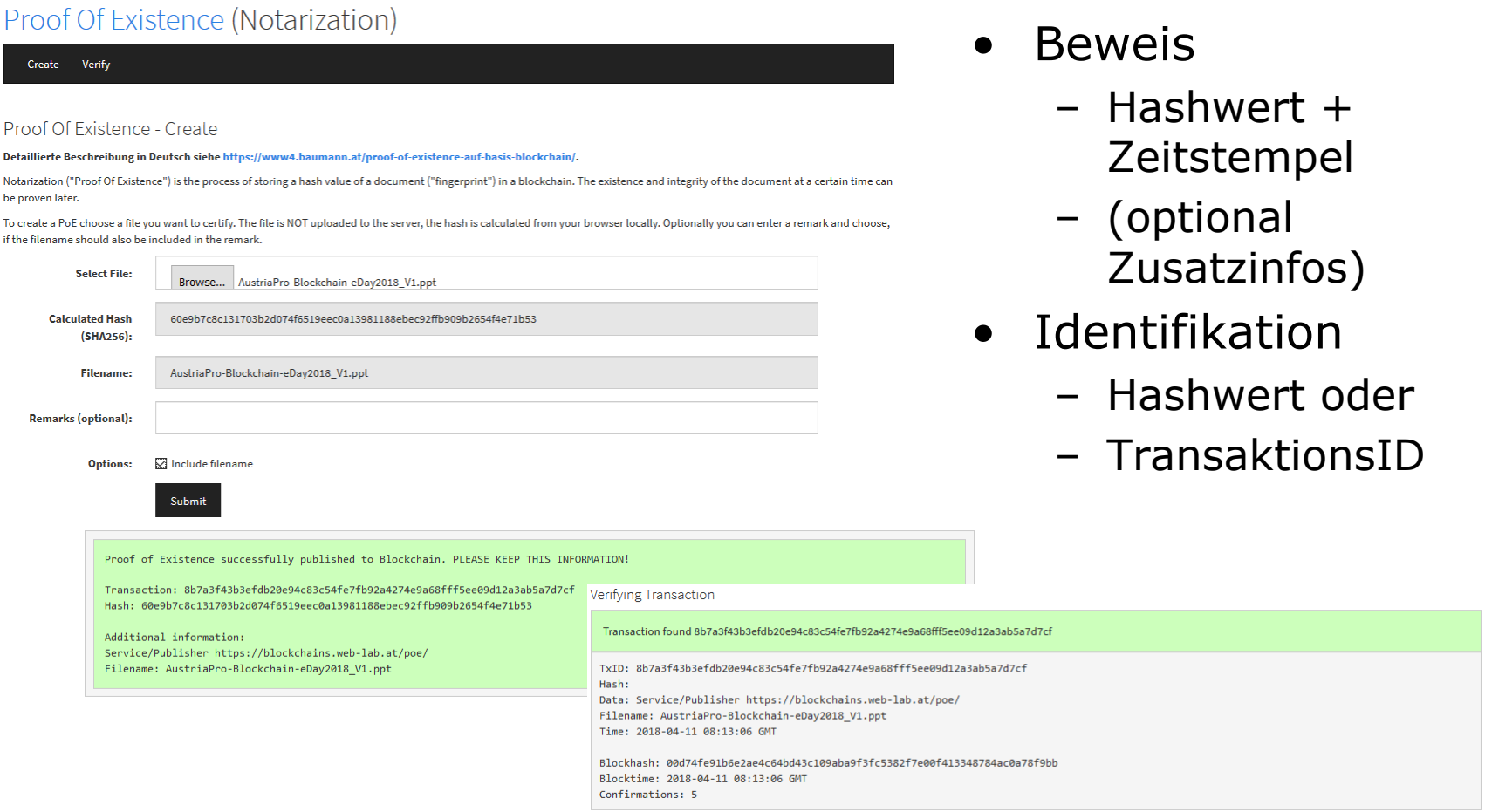
News - 24.10.2018

- Notarization (Proof Of Existence)
  - Demo unter Nutzung der „apro-lab-1“ MultiChain
- Demos (Anders Brownworth)
  - Blockchain Demo
  - Public/Private Keys & Signing
- Ausblick / Phase 4
  - “etwas weniger technisch”
  - Blockchain 3.0?

Usecase - Proof Of Existence

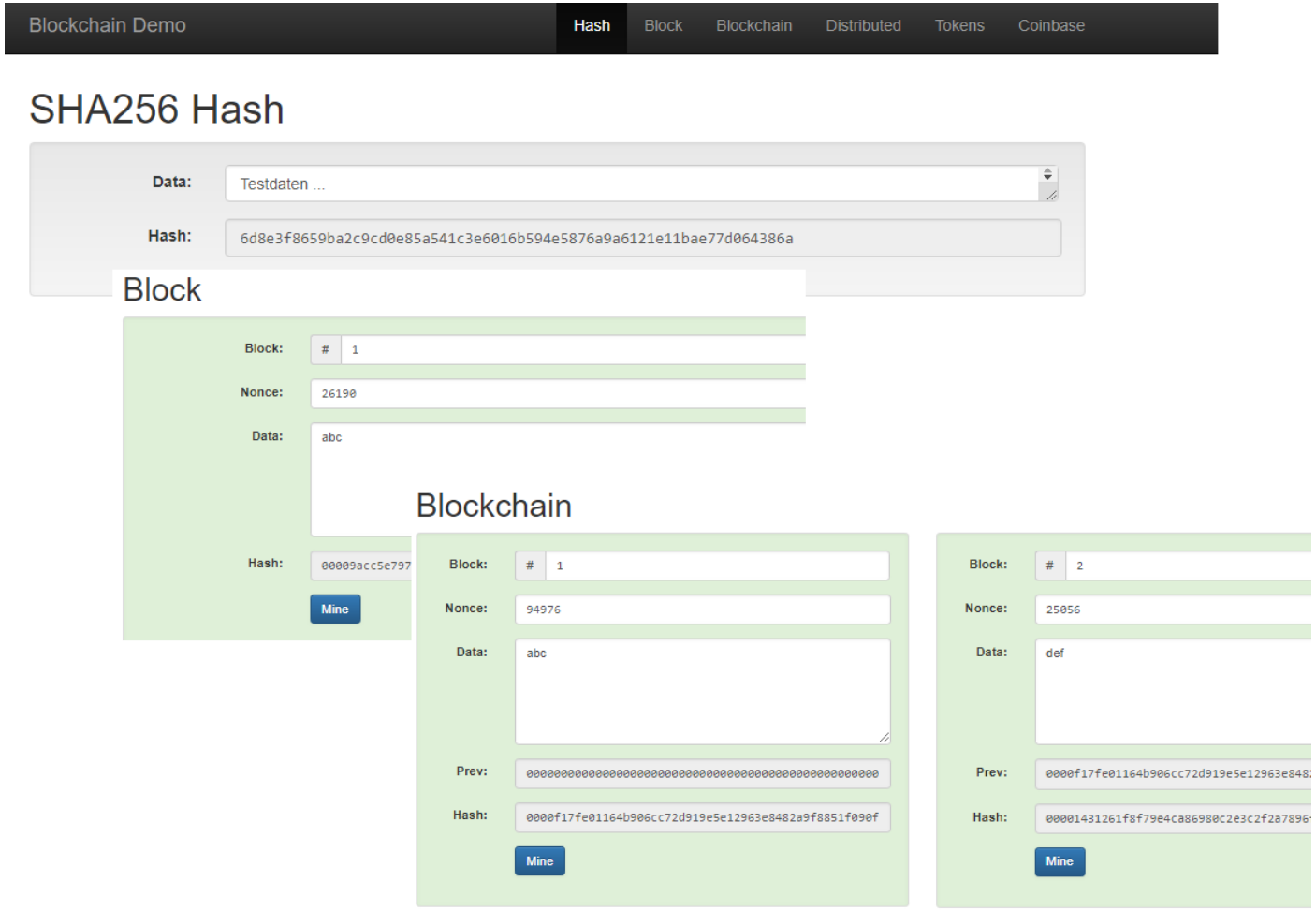
- Elektronische Dokumente
  - kopierbar, veränderbar
  - Beweis für Authentizität in realen Welt aufwändig & teuer
- => Notarization („Proof of existence“)
- Beweis, dass ein (elektronisches) Dokument existiert (hat)
  - zu einem bestimmten Zeitpunkt
  - in einer bestimmten Form

Usecase - Proof Of Existence



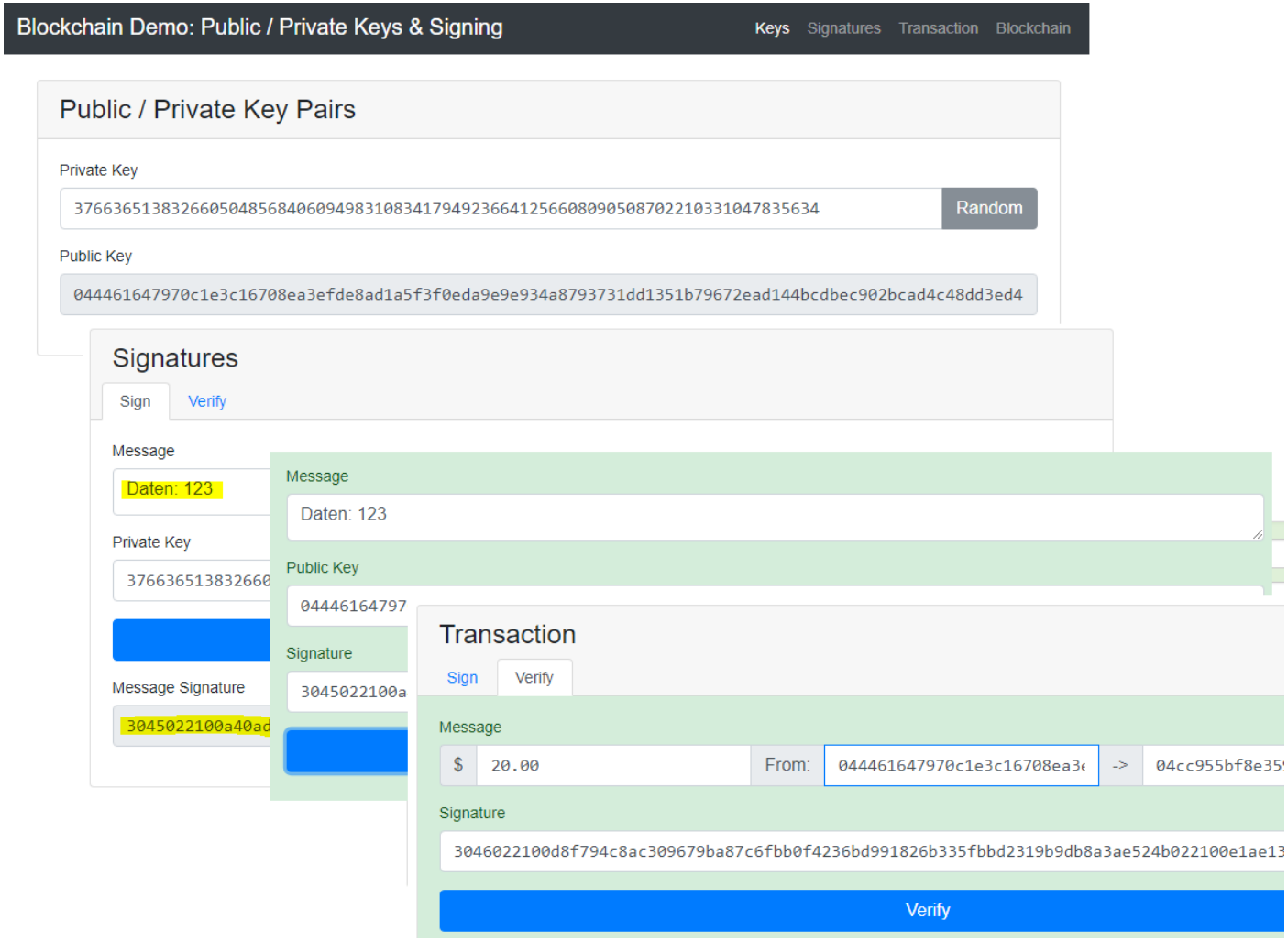
- Beweis
  - Hashwert + Zeitstempel
  - (optional Zusatzinfos)
- Identifikation
  - Hashwert oder
  - TransaktionsID

Blockchain Demo



https://github.com/anders94/blockchain-demo (A. Brownworth)

Keys & Signing Demo



https://github.com/anders94/public-private-key-demo (A. Brownworth)

Blockchain 3.0?

- 3.0:
  - Schneller, skalierbarer …
  - Ökonomischer …
  - Smart contracts …
- Digital Assets „integriert“
- Waves Platform
  - „Blockchain for the people“
  - https://wavesplatform.com/
- => 0bsnetwork
  - „Blockchain for the real world“
  - https://0bsnetwork.com/

Waves / 0bsnetwork

- Plattform für digitale Geschäftsmodelle
  - Fund Raising
  - Loyality
  - Tracking/Tracing
  - Supply Chain
  - …
- Digital Assets („Tokens“) integriert
  - issue, store, manage, trade

- Decentralized Exchange
- Gateways zu Krypto und Fiat-Währungen

Waves / 0bsnetwork – im Lab

- Testnet in AustriaPro Lab
  - Client: tbd
  - Node für API Tests: tbd
- Testnet 0bs
  - https://client.testnet-0bsnetwork.com
  - https://node1.testnet-0bsnetwork.com
  - https://explorer.testnet-0bsnetwork.com
- Waves
  - https://wavesplatform.com/

Startseite Lab

- https://blockchains.web-lab.at/austriapro/

Phase 2: Ethereum based (smart contracts)

Privates Ethereum Test-Netz

- Setup-Anleitung
- Smart Contracts - Beispiel 1

Phase 3: Multichain

Node AustriaPro Lab

- Web-GUI
- Proof Of Existence - Demo

Demos

- Blockchain Demo - By Anders Brownworth
- Public/Private Keys & Signing - By Anders Brownworth

Kontakt

AUSTRIAPRO

http://www.austriapro.at
austriapro@wko.at

DI Dr. Christian Baumann
c.baumann@baumann.at
+43 664 43 24 243