

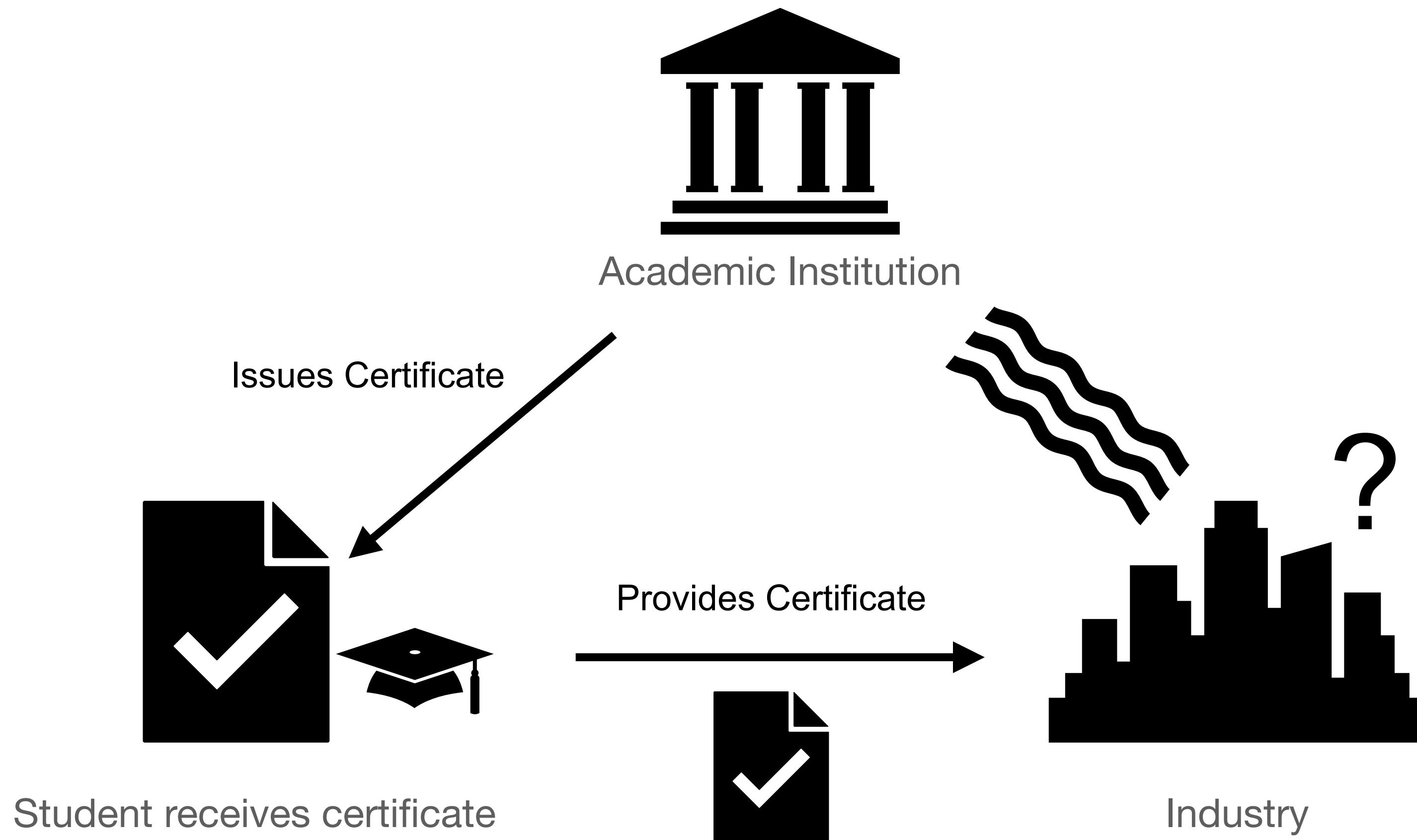
aCERT

Blockchain-based records for academic credentials

Kuber Shahi and Abhinav Nakarmi

Problem Statement

Issuing & Verifying Academic Certificates



What if?

Issuing & Verifying Academic Certificates

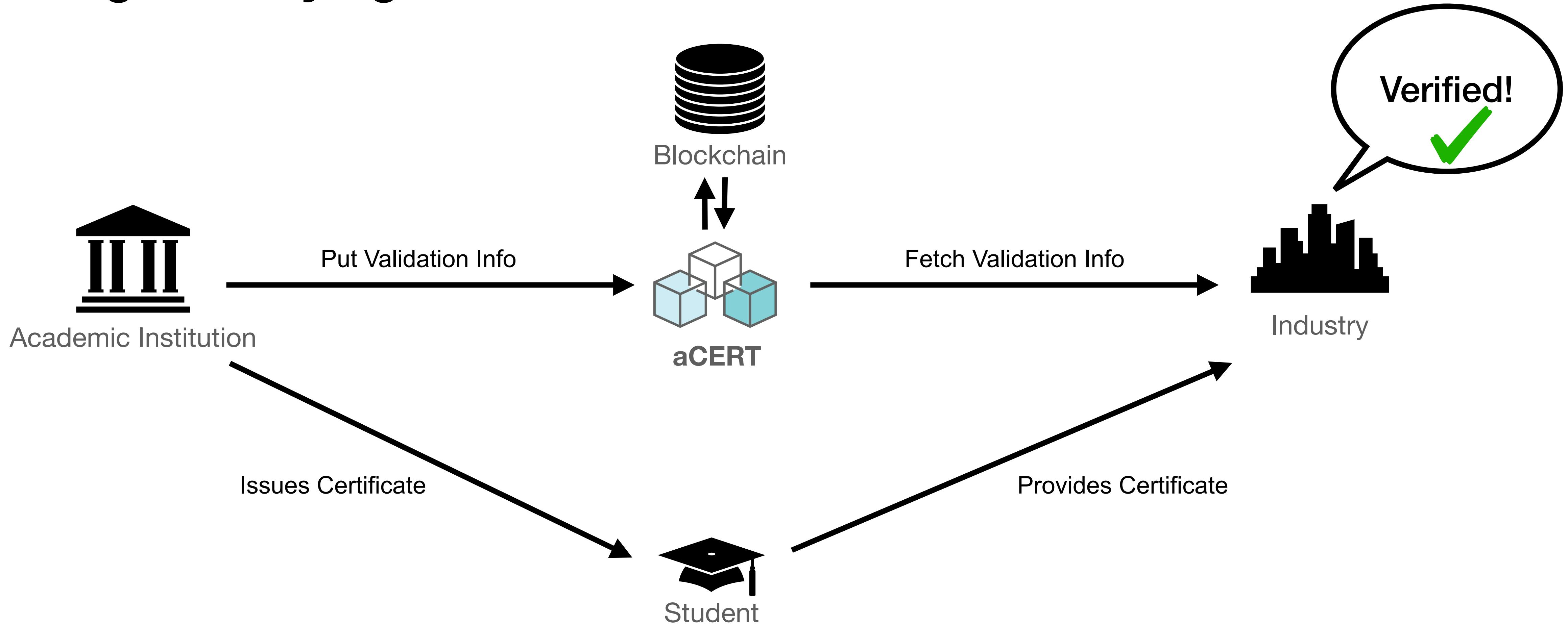
We have access to a public (but secure) database.

We are able to store (some) certificate information.

Anyone can access this database to verify the authenticity and integrity of the credentials.

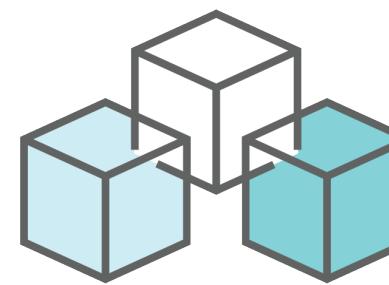
What if? Blockchain

Issuing & Verifying Academic Certificates



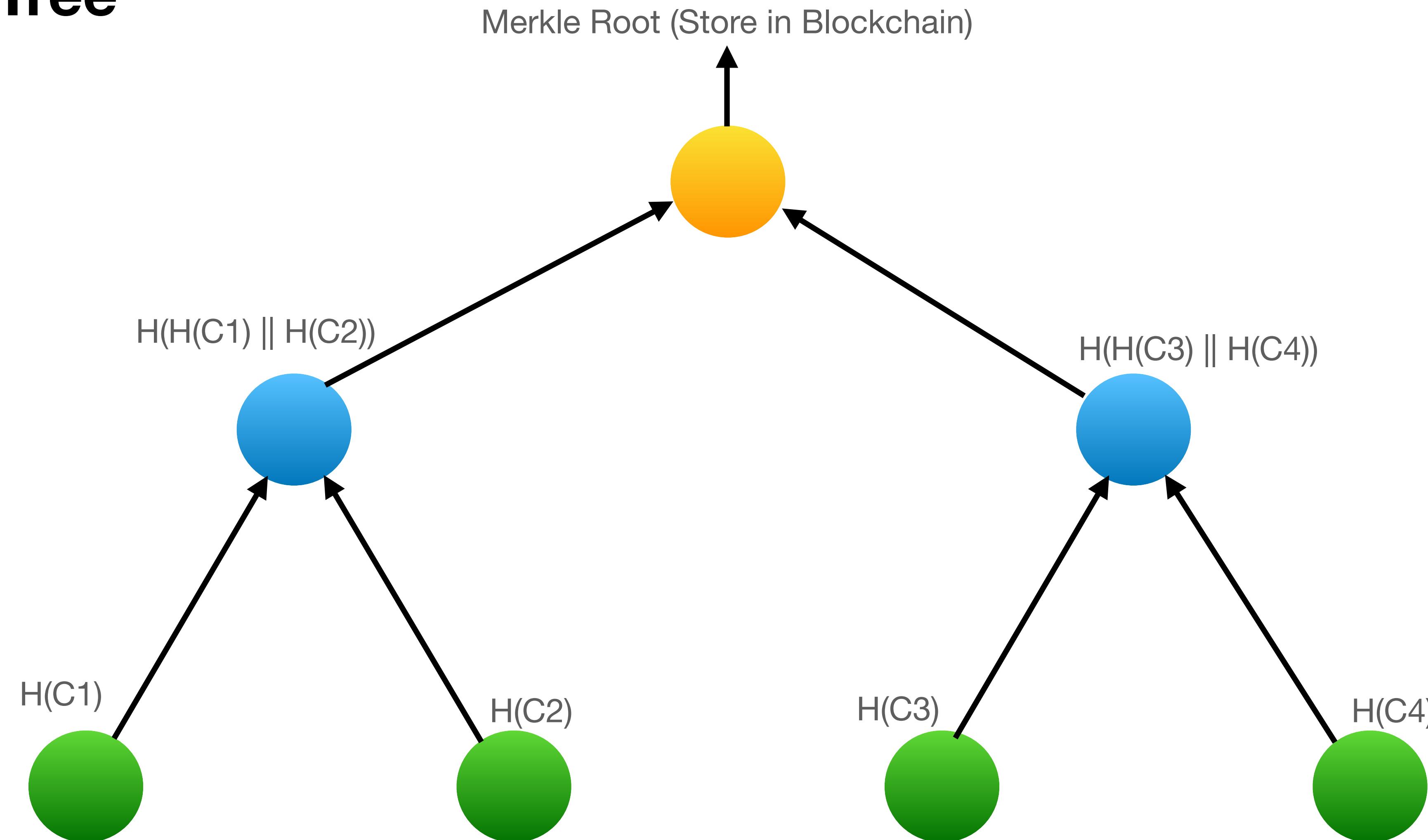


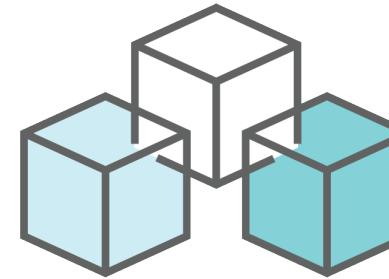
- Universities need to issue a lot of certificates.
- Issuing each certificate info on the blockchain is expensive and inconvenient.
- Merkle Tree can help.



aCERT

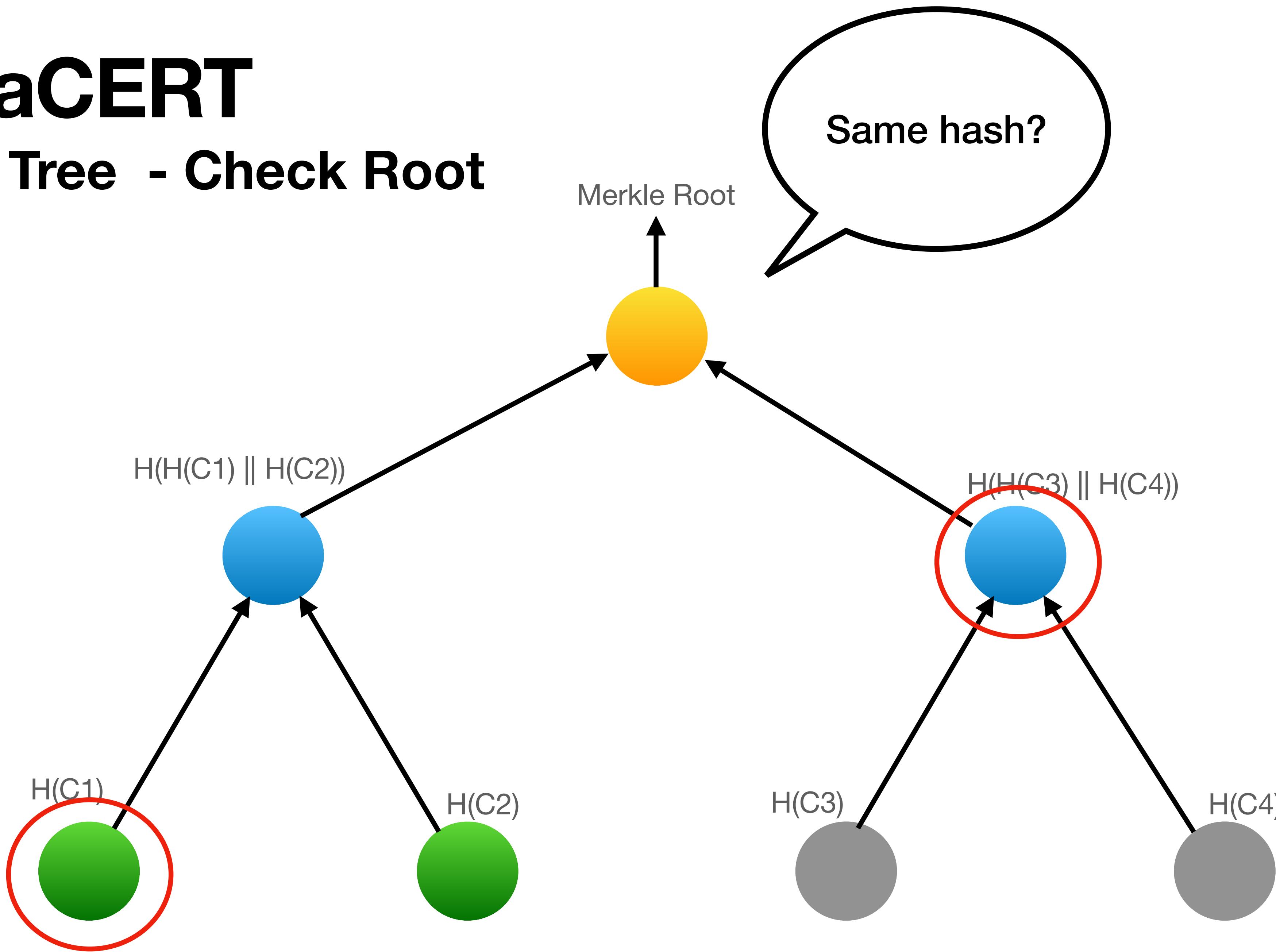
Merkle Tree



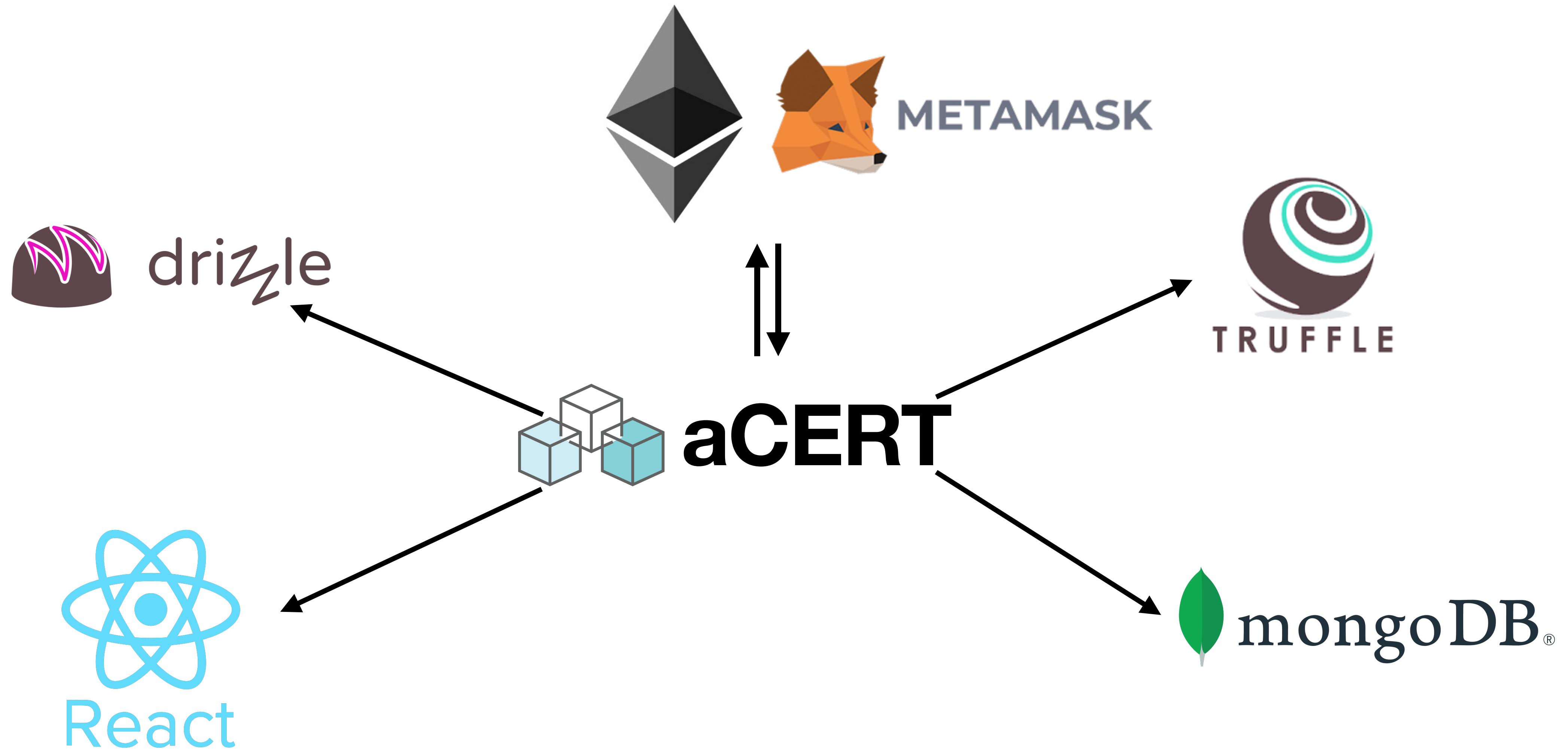


aCERT

Merkle Tree - Check Root



Implementation Overview





Deploy Contract

```
2_deploy_contracts.js
=====

Deploying 'Certificate'
-----
> transaction hash: 0xa7fad19d40bd8e4042d48a6bca90f94d5a17753e58a47bd9fe0502bf488f6316
> Blocks: 3 Seconds: 309
> contract address: 0xc6a5f5815Ac496D89fAb3c8df805E4013e54989D
> block number: 12225613
> block timestamp: 1651176910
> account: 0x53A459b80b67eAD4b77D53aF48833Ce2a78e1903
> balance: 0.297996944914300449
> gas used: 505137 (0x7b531)
> gas price: 2.500049942 gwei
> value sent: 0 ETH
> total cost: 0.001262867727552054 ETH

Pausing for 2 confirmations...
-----
> confirmation number: 1 (block: 12225615)
> confirmation number: 2 (block: 12225616)
> Saving migration to chain.
> Saving artifacts
-----
> Total cost: 0.001262867727552054 ETH

Summary
=====
> Total deployments: 1
> Final cost: 0.001262867727552054 ETH
```



Contract in Ropsten testnet

The screenshot shows the Etherscan interface for a smart contract on the Ropsten testnet. The contract address is 0xc6a5f5815Ac496D89fAb3c8df805E4013e54989D. The 'Contract Overview' section indicates a balance of 0 Ether. The 'More Info' section shows 'My Name Tag: Not Available' and 'Creator: 0x53a459b80b67ead4b7... at txn 0xa7fad19d40bd8e4042...'. The 'Transactions' tab is selected, displaying the latest 3 transactions from a total of 3. The table shows the following details:

Txn Hash	Method	Block	Age	From	To	Value	Txn Fee
0x0614bf6fef3e2c3a618...	0x538b4a6c	12225696	21 mins ago	0x6066e48947790b52ce...	IN 0xc6a5f5815ac496d89fa...	0 Ether	0.000234678557 \$
0xe7d13efdc6805ef0a20...	0x538b4a6c	12225632	1 hr 11 mins ago	0x6066e48947790b52ce...	IN 0xc6a5f5815ac496d89fa...	0 Ether	0.000234678112 \$
0xa7fad19d40bd8e4042...	0x60806040	12225613	1 hr 34 mins ago	0x53a459b80b67ead4b7...	IN Contract Creation	0 Ether	0.001262867727 \$

[Download CSV Export]

Contract address – 0xc6a5f5815Ac496D89fAb3c8df805E4013e54989D

Link – <https://ropsten.etherscan.io/address/0xc6a5f5815ac496d89fab3c8df805e4013e54989d>



Home

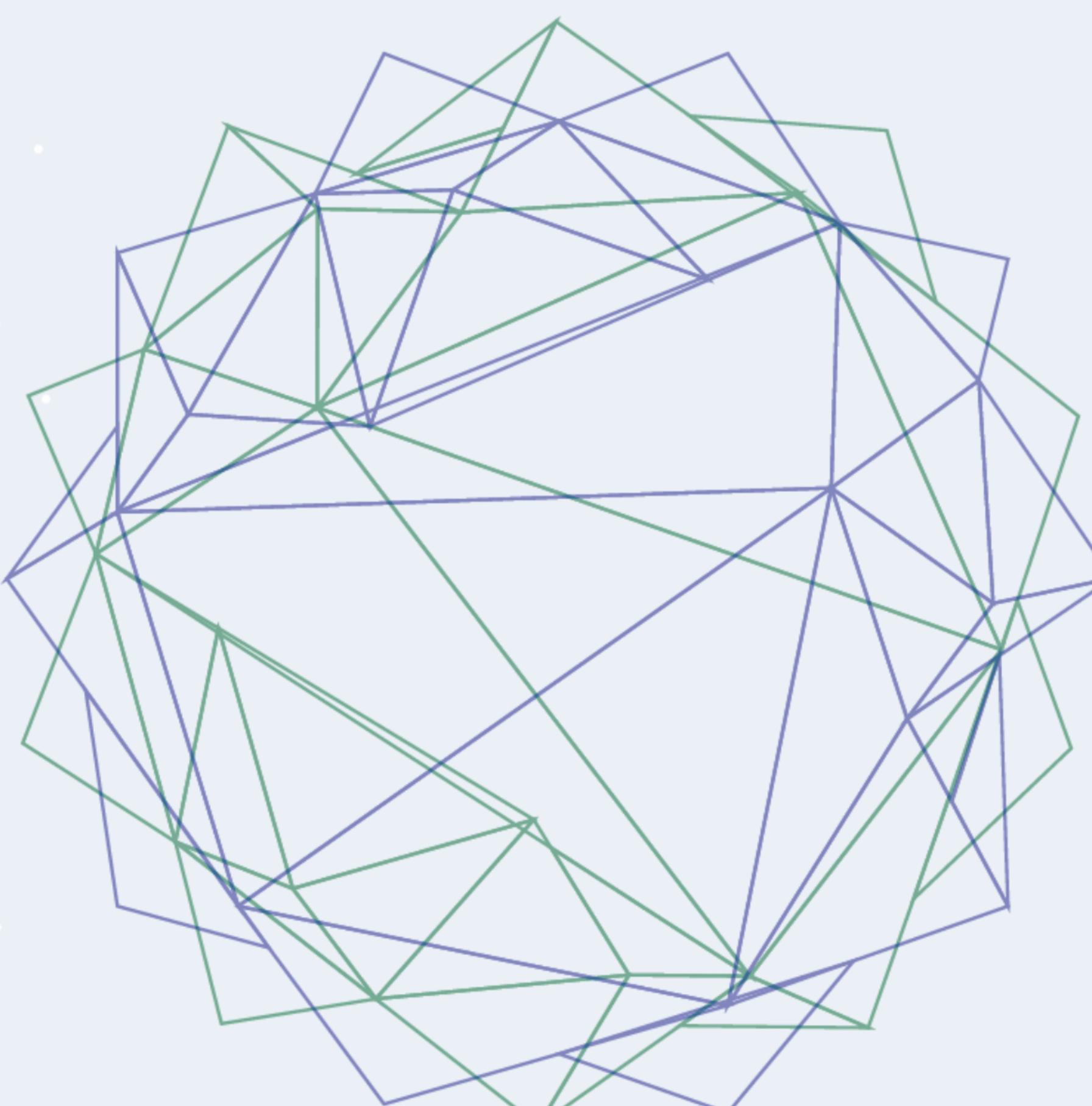
 aCERT

HOME UPLOAD VERIFY ABOUT

Certificate Authentication

We make it possible!

SEE BELOW





Upload

Save you credentials forever.

Upload them here!

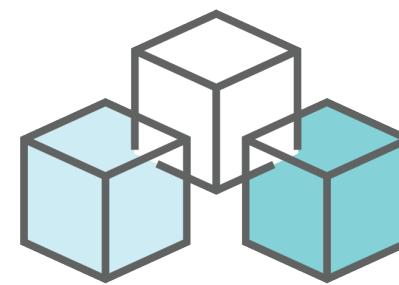
Name Batch

Upload your certificates JSON file:

No file selected.



HOME UPLOAD VERIFY ABOUT



aCERT

Verify

The screenshot shows the 'VERIFY' section of the aCERT application. At the top, there is a navigation bar with the aCERT logo and links for HOME, UPLOAD, VERIFY, and ABOUT. The main area features a large blue circle containing a white checkmark. To the left, a white callout box contains the text 'Prove authenticity' and 'Verify Certificate!'. Below this, there are two input fields labeled 'Name' and 'Batch'. A section titled 'Choose your certificate (pdf):' includes a 'Browse...' button and a message stating 'No file selected.' At the bottom left is a 'SUBMIT' button.



Project Links:

- Project Video - <https://drive.google.com/file/d/1Xmu4ZYmS4Af-V9ACE2b4DcbouhzPZpD/view?usp=sharing>
- GitHub - <https://github.com/abhinav-256/certificate-verification>
- Ropsten Contract - <https://ropsten.etherscan.io/address/0xc6a5f5815ac496d89fab3c8df805e4013e54989d>

Thank You