



Open source data on Ceramic
Why the future of the web is self-certifying

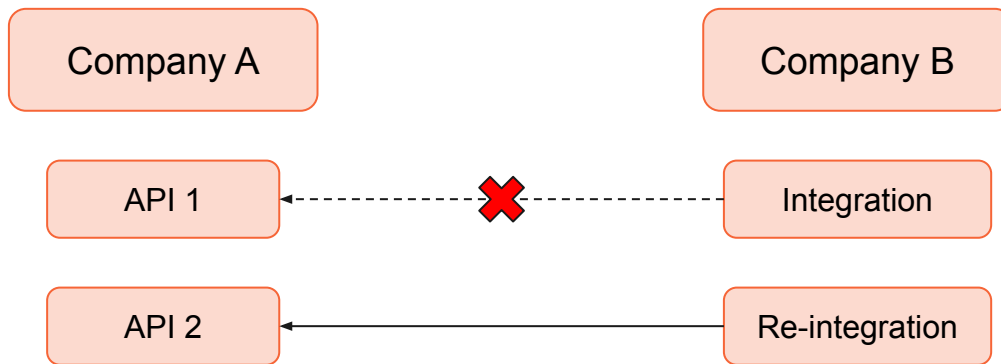




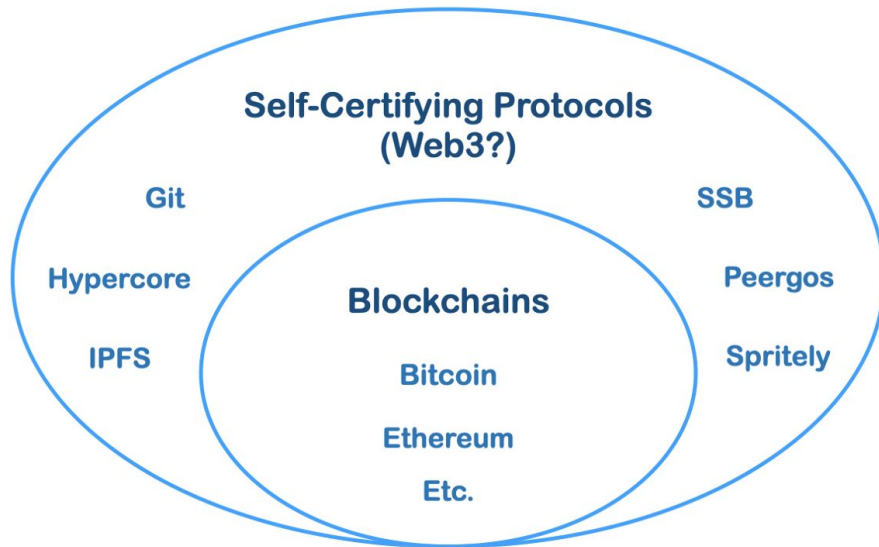
Regulation to force data interoperability



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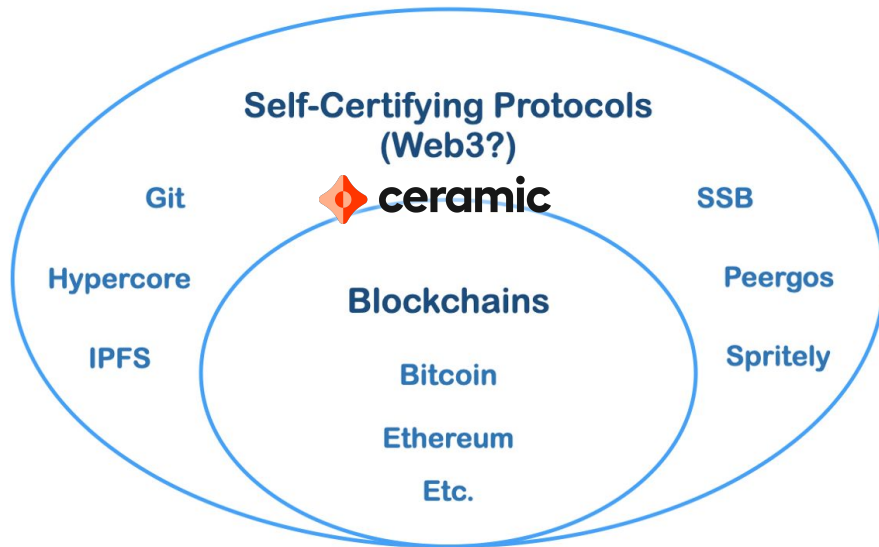
Self-Certifying protocols provides an alternative



1. Cryptographic user keys
2. Content-addressed data

Image credit:
Web3 is Self-Certifying - Jay Graber

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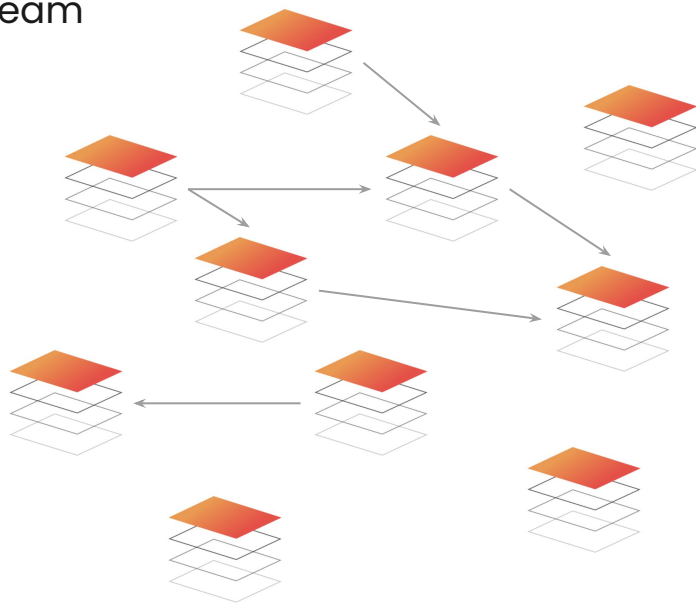
Ceramic is a network of self-certifying data objects

Verifiable history: each object is represented as a stream of events, where each event is signed and includes a pointer to the previous event

Location agnostic: each object is accessed globally by StreamID, and anyone can make them available on their Ceramic node

Open data: an object in Ceramic can link to any other object creating a global information graph

Shared network effects: objects are owned and controlled by users, and thus doesn't create app silos



Self-Certifying Objects in Ceramic

1

Stream of signed updates

- Linked events
- Any IPLD dag

2

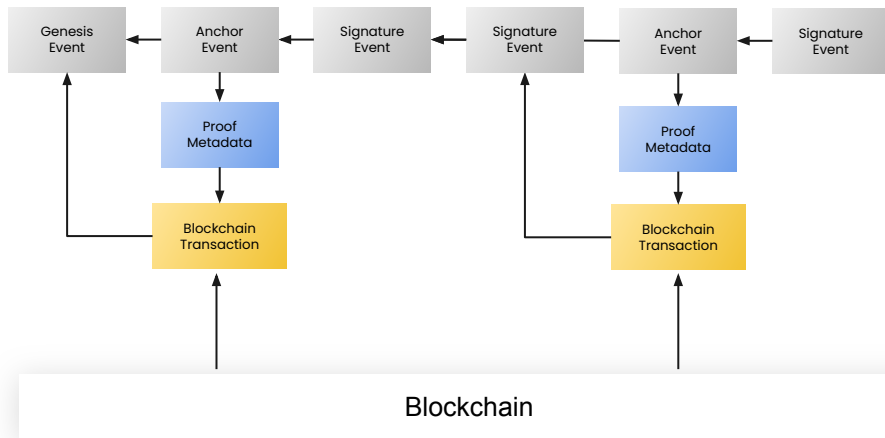
Immutable StreamID

- Created from hash of genesis event
- Global namespace

3

Signed by DID

- Cross-network, key-agnostic, future-proof
- Key rotation & revocation built-in



4

Events are processed by local node

- Validate signature and StreamType
- Update & track state
- Share with network via libp2p

5

Updates anchored onto a blockchain

- Provides proof-of-existence
- Enables secure key rotation

6

Configurable state transition logic

- StreamTypes define custom logic for how to process events

Identity on Ceramic

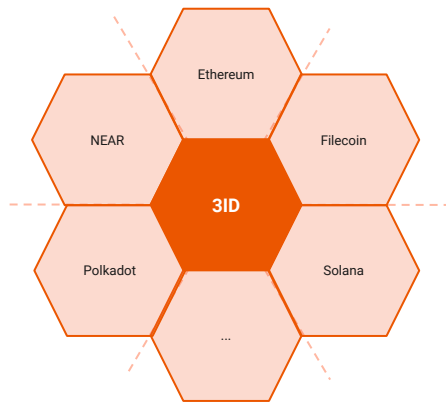
DIDs: a w3c standard for Decentralized Identifiers

PKH DID: Makes any account on any blockchain into a Decentralized Identifier

3ID DID: Ceramic native identities that aggregate accounts across different blockchains

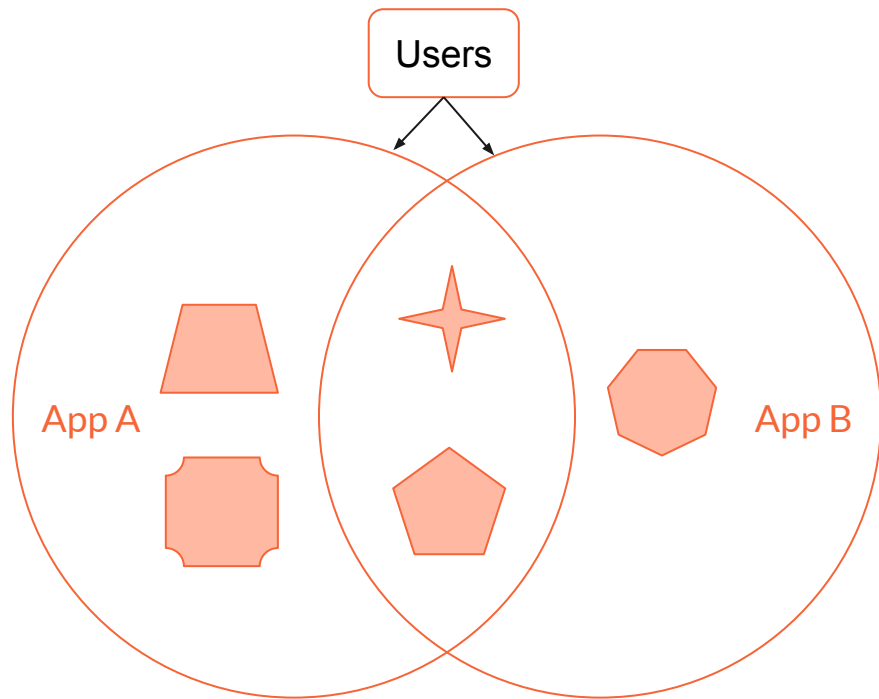
NFT DID: all NFTs can be used to facilitate write access to data objects, or be used as identities

Other DID methods: Ceramic can easily be extended to support various types of DIDs



How do can we use this to build apps?

DataModels – templates for user data



<https://github.com/ceramicstudio/datamodels/>

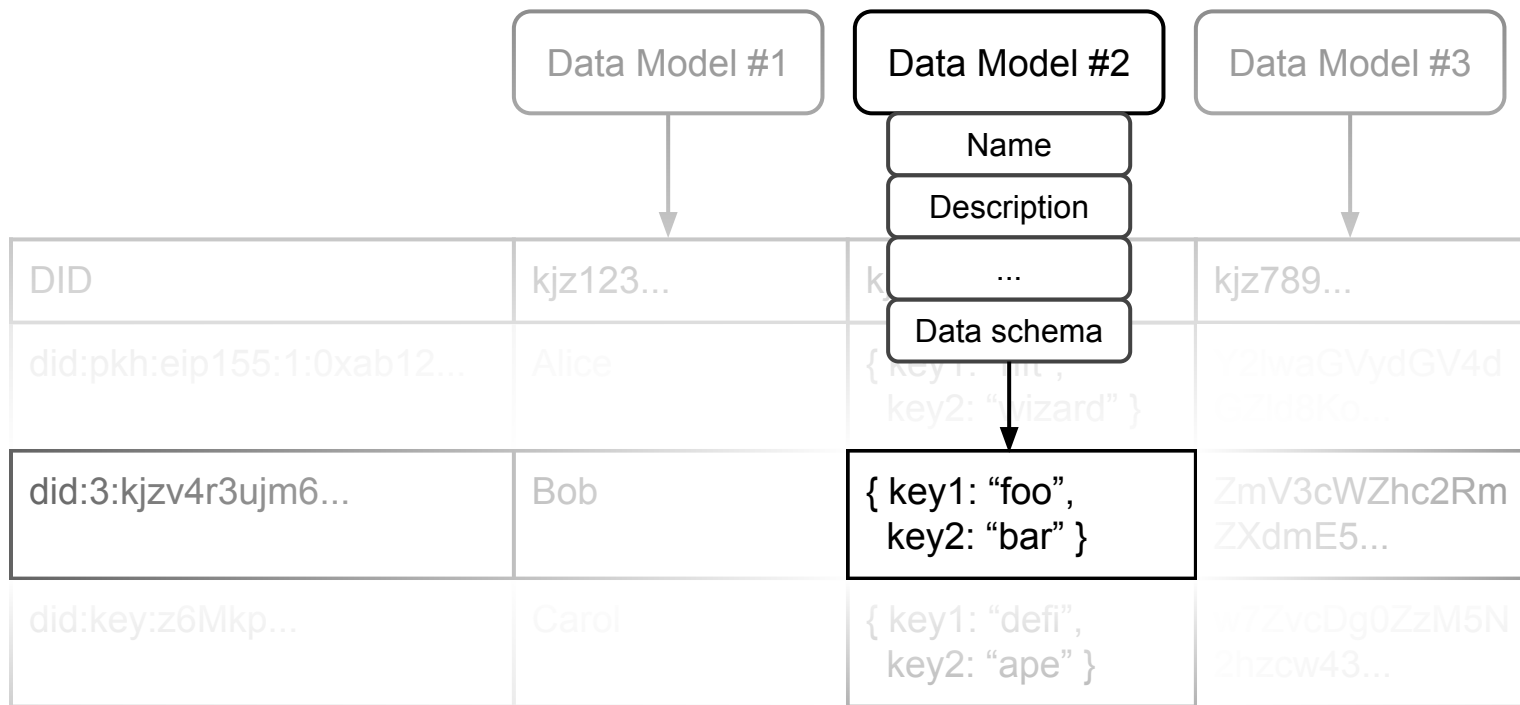
Human centric data using Self.ID

	Data Model #1	Data Model #2	Data Model #3
DID	kjz123...	kjz456...	kjz789...
did:pkh:eip155:1:0xab12...	Alice	{ key1: "nft", key2: "wizard" }	Y2lwaGVydGV4d GZld8Ko...
did:3:kjzv4r3ujm6...	Bob	{ key1: "foo", key2: "bar" }	ZmV3cWZhc2Rm ZXdmE5...
did:nft:eip155:1:0xcd34...	Carol	{ key1: "defi", key2: "ape" }	w7ZvcDg0ZzM5N 2hzcw43...

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Human centric data using Self.ID





Human data commons



Upcoming changes

New Docsite: A new documentation site for developers to learn about Ceramic!

Go-IPFS: Support for DagJOSE (IETF standard for signing & encryption) released in IPFS 0.11

Object Capabilities: Secure session keys for dapps, using Sign-in with Ethereum + CACAO

TipSync: Using the libp2p DHT to query streams in Ceramic. Will enable greater scalability and resilience of the network

Glaze CLI: A comprehensive CLI for interacting with Ceramic and DataModels

Research topics

Stream privacy: Easy to encrypt content, hard to encrypt metadata while maintaining public verifiability

CRDTs: In a multiple writer scenario conflicts in the even log will occur, CRDTs in combination with IPLD can solve this

Recursive ZKPs: By proving each state transition of a stream with a recursive ZKP we can verify the integrity of the entire event log with just one proof (excluding key rotations)

Validator network: Users should be able to pay validators to keep their data available in the network



Documentation:

<https://developers.ceramic.network>

Self.ID:

<https://self.id>

Chat with us:

<https://chat.ceramic.network>