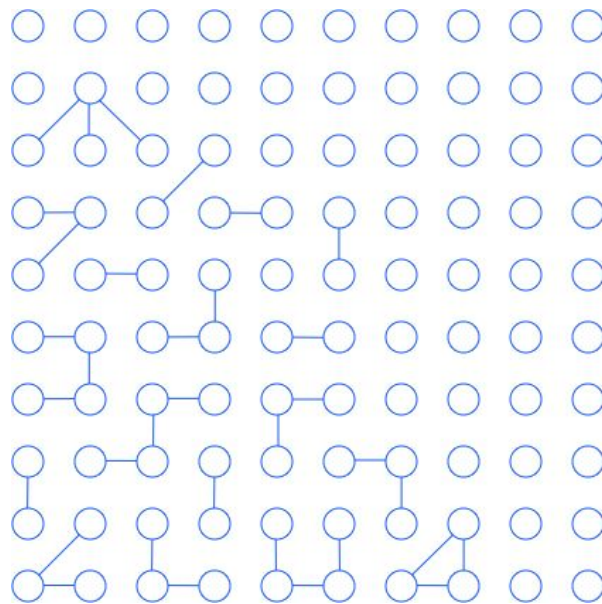# ceramic.

The dataweb for open applications

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W3C Credentials Community Group (CCG)
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A document-based data storage network

Ceramic is a global, general purpose, document-based data storage network for securely publishing, linking, and querying verifiable information on the public internet.

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Manage data beyond the cloud

The internet wasn't built with a native data layer. Instead, the web of today relies on HTTP to communicate between clients and servers. While fine for certain use cases, this design has led to a centralization of information and power amongst a few Big Tech institutions and resulted in a web of silos rather than a web of data.

From decentralized identity to censorship-resistant social media and cross-platform collaboration, there are a wave of new use cases that require a solution for managing dynamic data on the open internet, beyond the control of any single entity or server.

Using DIDs, IPFS, blockchain, and p2p networking, Ceramic combines state-of-the-art Web3 technologies to provide a secure, collaborative, global network for managing user and app data beyond the cloud.

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Smart documents.

The most powerful way to manage information on the open web.

Rich JSON documents

- Store data as JSON documents like a NoSQL document DB

- Define metadata such as owners, JSON schemas, and tags

- Reference other documents to create relationships and construct a graph, or server endpoints to integrate with your existing databases and systems.

Programmable smart logic

- Write custom programs to define rules for document state transitions and version control. This allows the protocol to enforce who, how, and when your document is updated without centralized servers.

- Add hooks to invoke code or business logic running elsewhere

- Manage access controls

Strong security & verifiability

- Documents are immutable append-only logs of linked records

- Records are signed by the owner(s) DIDs for verifiability

- Records are timestamped in a blockchain for strict ordering

- Encryption and access control permissions are managed by the document owner(s)

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Ceramic Network.

Enabling collaboration on a global scale.

Ceramic provides a web of verifiable data that brings integrity, discoverability, and composability to the world's information. Any application or service can openly join the network to publish information and access a vast amount of public data resources to use when building their product.

Global Discoverability

Flexible Identity

Data Auditability

Horizontal Scalability

Content Composability

Decentralized Network

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Technology.

DID

Decentralized Identity standard provides interoperability.

Documents in Ceramic can represent DIDs.

Documents in Ceramic can be owned by DIDs.

IPLD

InterPlanetary Linked Data, structured content addressable data.

Can be used to represent any linked data structure.

Content addressing provides native integrity checking.

Libp2p

Peer-to-peer stack used by many decentralized systems.

Peer discovery and message propagation.
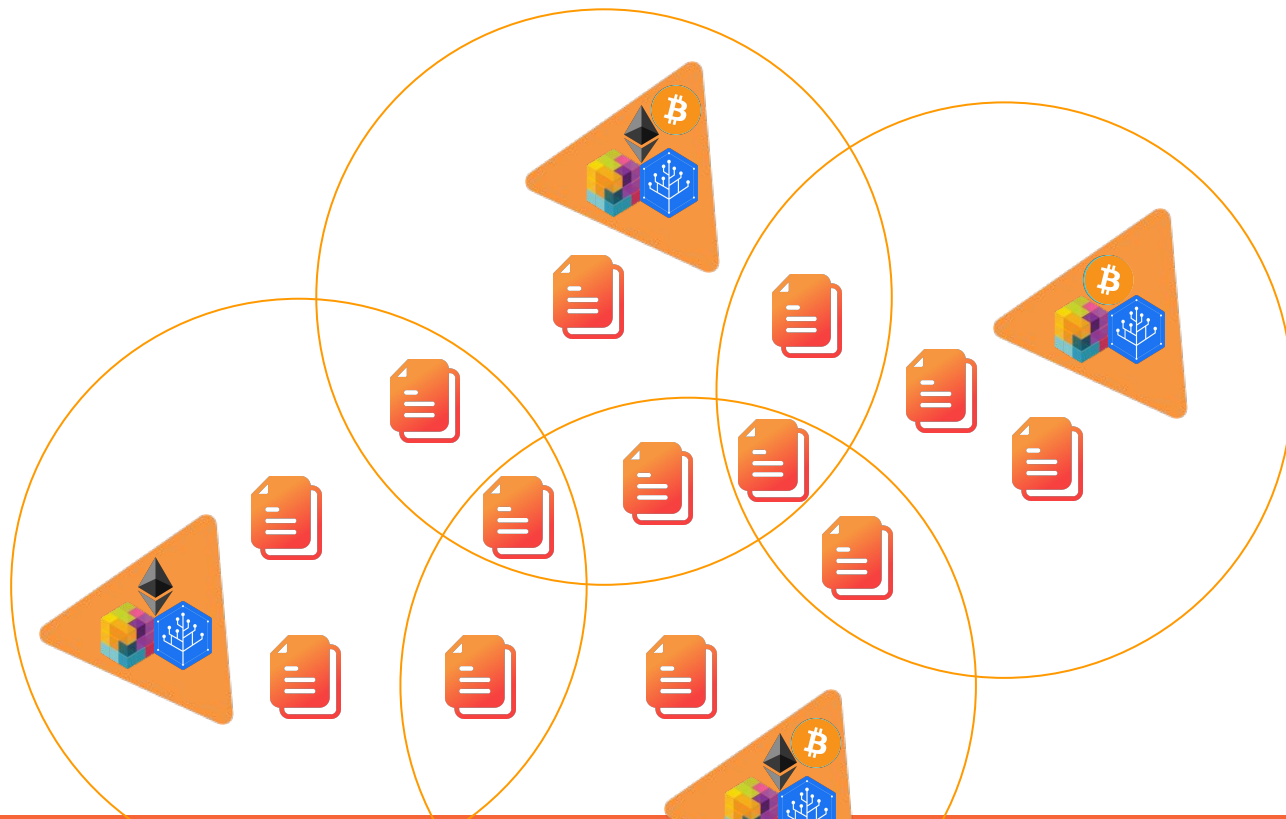
Works across many languages and environments.

Blockchain

Blockchain agnostic. Ethereum first.

Used to determine ordering in Ceramic.

Anchoring can be performed by a service or an individual.

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Network.

ONE NETWORK

- No global state, instead "doc state"
- Updates over libp2p
- IPFS used to sync data
- Only replicate relevant documents
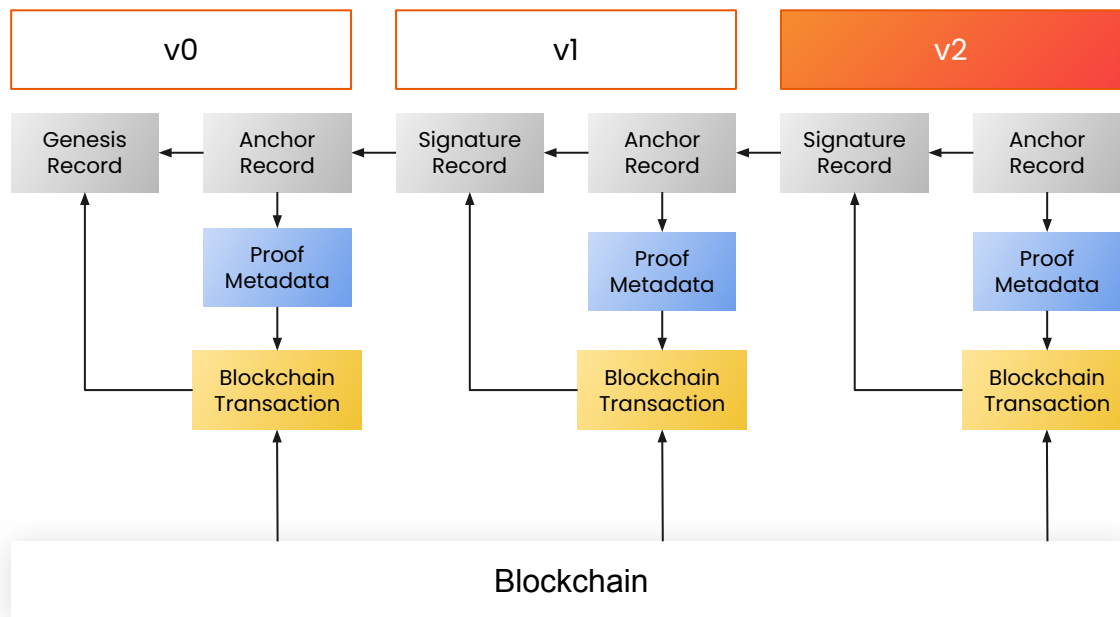
BLOCKCHAIN ANCHORS

- Nodes decide which blockchain to trust

DATA PERSISTENCE

- No built in persistence (similar to ipfs)
- Configurable backup

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Documents.

DOCUMENT BASICS

- DocId: ceramic://bafy...
- Owned by DID
- Replication over libp2p

DOCUMENT VERSIONS

- CID of Anchor Record
- Immutable references

CONFLICT RESOLUTION

- Ordering with anchors
- Earliest anchor wins

OTHER RECORD TYPES

- Contract / DAO records

Doctypes.

Tiles

Generic doctype for JSON storage.

Owned by one or multiple DIDs.

Great for: Schemas, Policies, Profiles, Metadata, anything...

3ID

DID method built on Ceramic.

Lightweight & scalable.

Secure key revocation.

Account Links

Used to link a blockchain account to a DID.

Allows you to associate your accounts across blockchains to one common identifier

Write your own!

A doctype defines the state transition logic used to validate if an update to a Ceramic document is valid.

E.g. Verifiable Credential, Dynamic ruleset, etc...

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Clients.

JavaScript
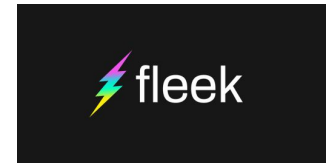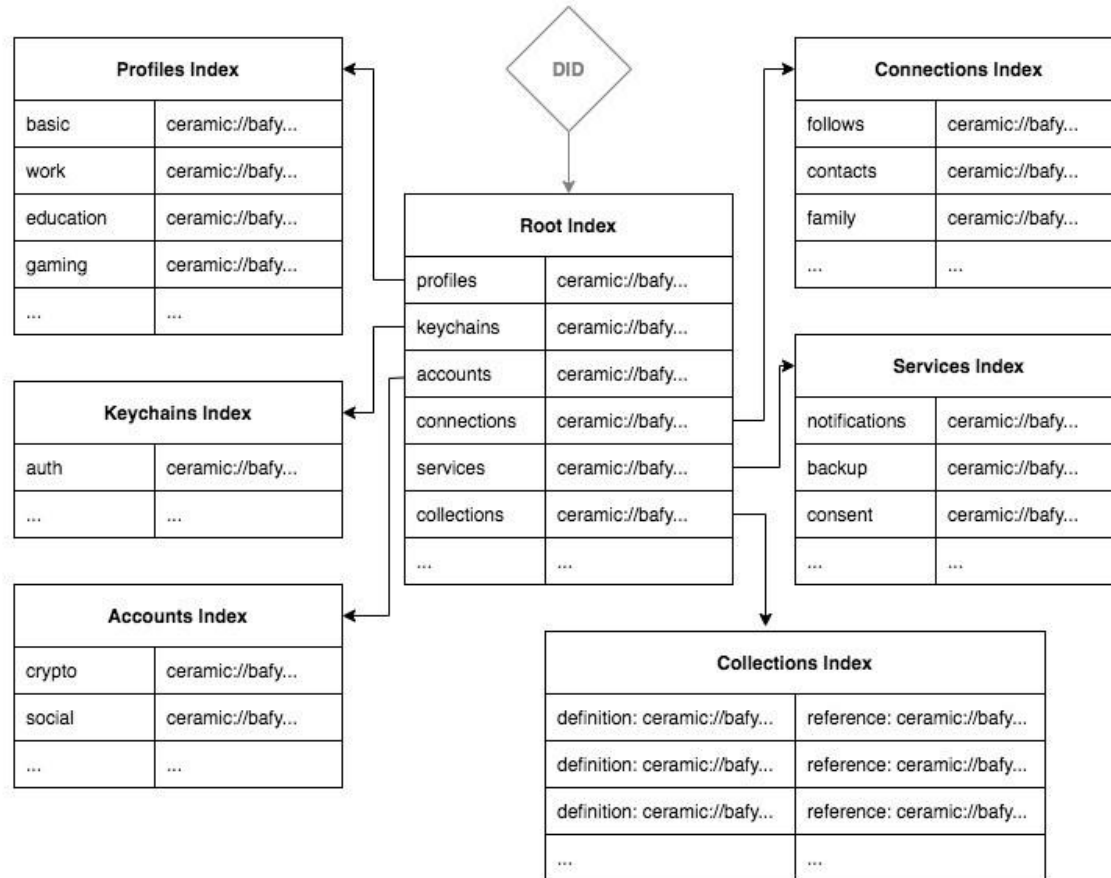
HTTP

HTTP API

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CIP-11

Identity Index (IDX)

A standard for decentralized identity management, IDX allows you to construct a unified, identity-centric index of resources. A solution to decentralized discoverability.

▟ IDX

Identity Index (IDX)
Architecture Diagram

Profiles Index

basic	ceramic://bafy...
work	ceramic://bafy...
education	ceramic://bafy...
gaming	ceramic://bafy...
...	...

Keychains Index

| auth | ceramic://bafy... |
| ... | ... |

Accounts Index

crypto	ceramic://bafy...
social	ceramic://bafy...
...	...

DID

Root Index

profiles	ceramic://bafy...
keychains	ceramic://bafy...
accounts	ceramic://bafy...
connections	ceramic://bafy...
services	ceramic://bafy...
collections	ceramic://bafy...
...	...

Connections Index

follows	ceramic://bafy...
contacts	ceramic://bafy...
family	ceramic://bafy...
...	...

Services Index

notifications	ceramic://bafy...
backup	ceramic://bafy...
consent	ceramic://bafy...
...	...

Collections Index

definition: ceramic://bafy...	reference: ceramic://bafy...
definition: ceramic://bafy...	reference: ceramic://bafy...
definition: ceramic://bafy...	reference: ceramic://bafy...
...	...

textile

fleek

OW2

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More Use Cases

- Websites & CMS
- Metadata
- Schemas
- Social networks
- Media files
- Blogs

- Dapps
- Agreements
- Data indexes
- Collaborative data
- Verifiable claims
- Access control

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Timeline

Slip
Alpha Devnet
Available now

Clay
Beta Devnet
~ 1 month

Fire 🔥
Mainnet
~ Mid Q4

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Resources

Discord: bit.ly/2W7y164

Twitter: @ceramicnetwork

Code: github.com/ceramicnetwork/js-ceramic

Standards: github.com/ceramicnetwork/cip

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