Understanding Decentralized Identifiers

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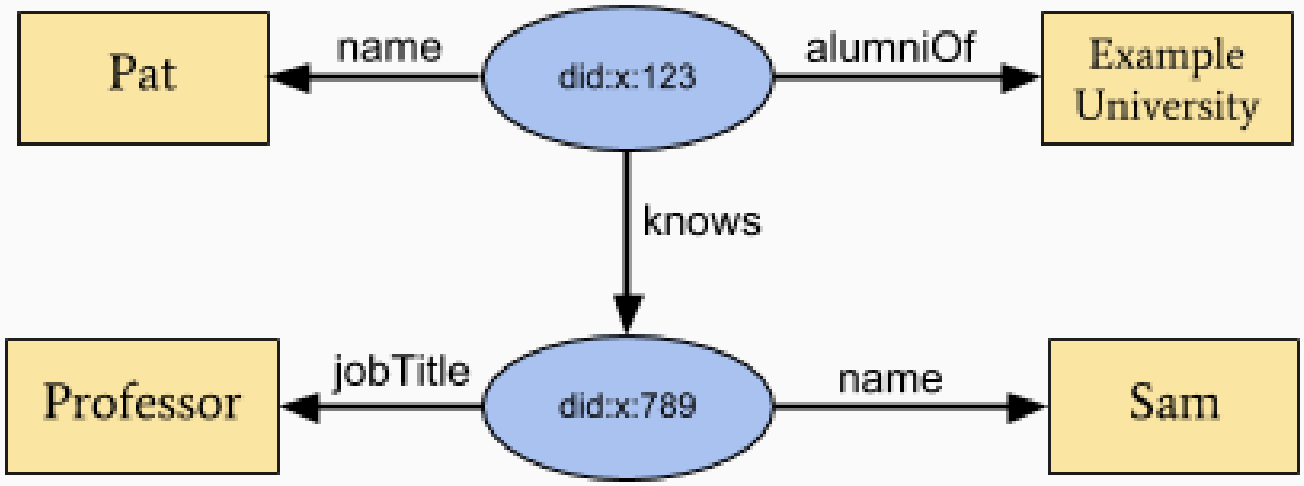
What is a Decentralized Identifier?

A new type of URL that is:

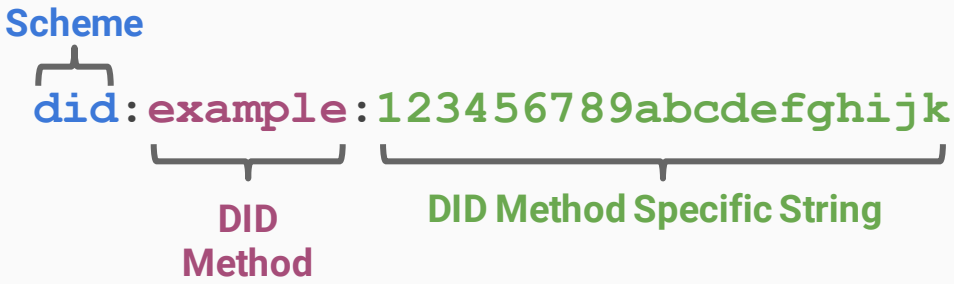
- globally unique,
- highly available,
- persistent
- cryptographically verifiable, and
- does not require a central admin

did:btcr:txtest1:8kyt-fzzq-qqqq-ase0-d8

We use DIDs in Verifiable Credentials



DID Implementations (Methods)



Examples:

```
did:v1:nym:BcNkgGmGEpCGSJSMPB4BvWvwVM6YeTR52BSWcZTbzU23
did:btcr:txtest1:8kyt-fzzq-qqqq-ase0-d8
```

DIDs Resolve to DID Documents

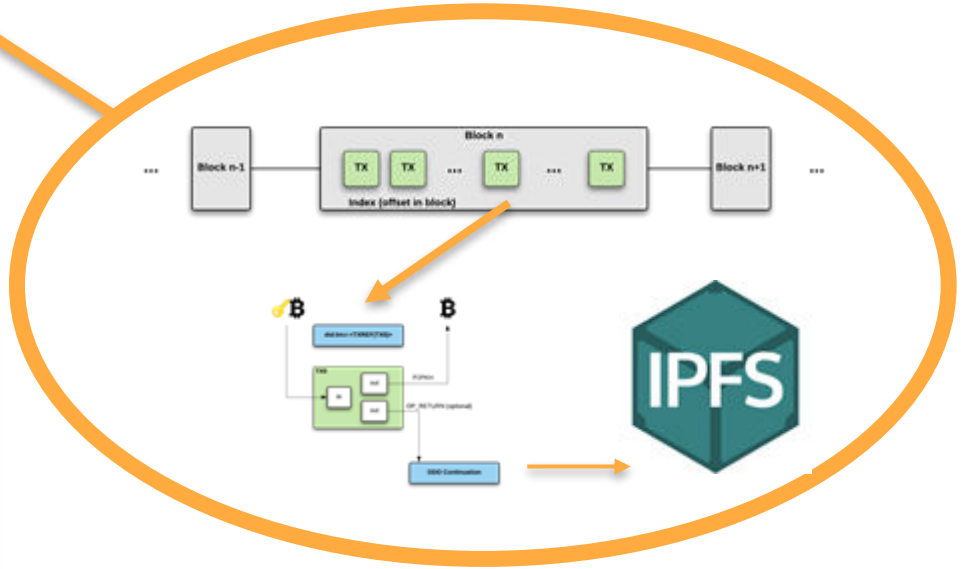
DID RESOLUTION

DID did:btcr:xkyt-fzgq-qq87-xnhn

Universal Resolver

DID Document

DID Method Spec



DID DOCUMENT

1. DID (for self-description)
2. Public keys (for verification)
3. Auth methods (for authentication)
4. Service endpoints (for interaction)
5. Timestamp (for audit history)
6. Signature (for integrity)

Status

- Incubated at RWOT, IIW
- Currently:
  - Draft report in W3C Credentials Community Group
  - Protocols and prototypes at DIF
  - DID Method Registry
  - DID Auth, DID Resolver
- To Discuss: DID Working Group

DID & VC Architecture Roadmap 2018+

Christopher Allen
Principal Architect & Founder — Blockchain Commons
W3C Credentials CG Chair

Current W3C Standards Track Efforts

- Verifiable Claims WG, Verifiable Credentials
  - Anyone can verifiably say anything about anyone.
  - Identity emerges from evaluating multiple sources of information, across multiple interactions
- Decentralized Identifiers (DIDs), draft WG
  - Anyone can publicly manage provable identifiers without administrative interference
  - Move beyond centrally administered IDs
  - Provide for a plurality of authorities

Decentralized Identity Stack

- DIDs – Root Identifiers
  - DID Universal Resolvers — support interoperability between multiple DID methods.
  - DID Methods – Specific approaches using different blockchains
  - DID Documents – Proof of Control & Service References

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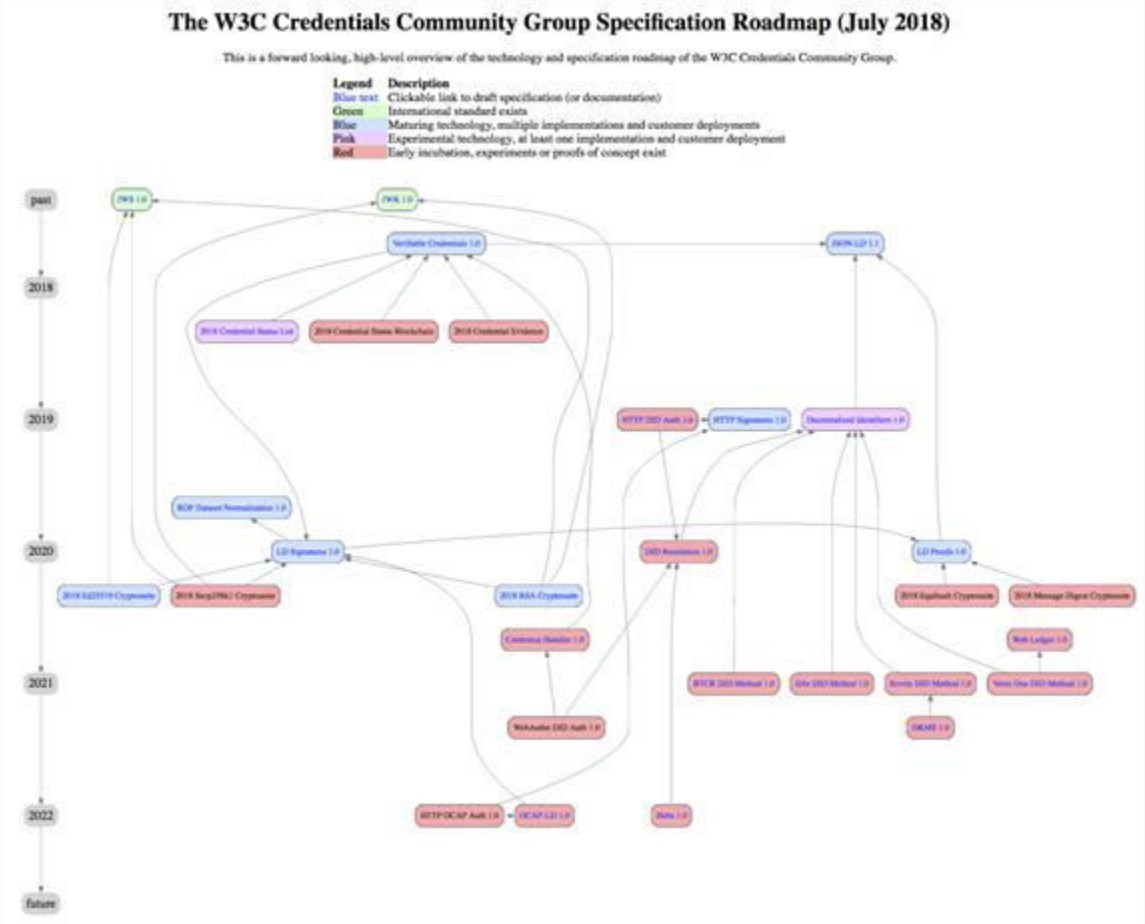
Decentralized Identity Stack

- DIDs – Root Identifiers …
- Raw Data – Observed facts & transactions
- Verifiable Credentials – Assertions by knowable authorities
- Profiles / Presentations / Persona – Representations of individuals
- Consent – Records of authorization
- Reasoning – Interpretation & Analysis
- Evaluation – Risk Analysis & Reputation
- Understanding – Internal knowledge representation
- Services – Interactions of value

Potential Standards for Future Work

- DID-Auth (Authn/Authz)
- OCAP (Authz through Object Capabilities)
- Credential Requests & Exchange
- Data Minimization & Selective Disclosure
- Consent & Consent Receipts
- Storage (Identity Hubs) & Internal Representations
- Analytics & Algorithms for Evaluation
- Cryptographic Proofs
  - Signature, Encryption, Signcryption Suites
  - Time-stamping
  - Zero-knowledge proofs



https://w3c-ccg.github.io/roadmap/diagram.html