



Verifiable Credentials in a Decentralizing World

SCALING THE TRUST LAYER OF THE INTERNET


Natalie Smolenski

Head of Business Development, Hyland Innovation

Community **LIVE**



AGENDA

- 
- Bitcoin ION Network
 - Verifiable Credentials
 - Demo



BITCOIN ION NETWORK



Decentralized digital identity (DDID) is not just a technology buzzword: It promises a complete restructuring of the currently centralized physical and digital identity ecosystem into a decentralized and democratized architecture.



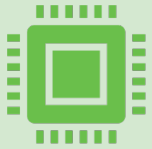
- Forrester

Prepare For Decentralized Digital Identity: Security SWOT, 2020

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ION = IDENTITY OVERLAY NETWORK



ION is a public, permissionless, decentralized DID overlay network that runs on Bitcoin and leverages a deterministic DPKI protocol called Sidetree.



Enables scale: tens of thousands of DID/PKI operations per second.

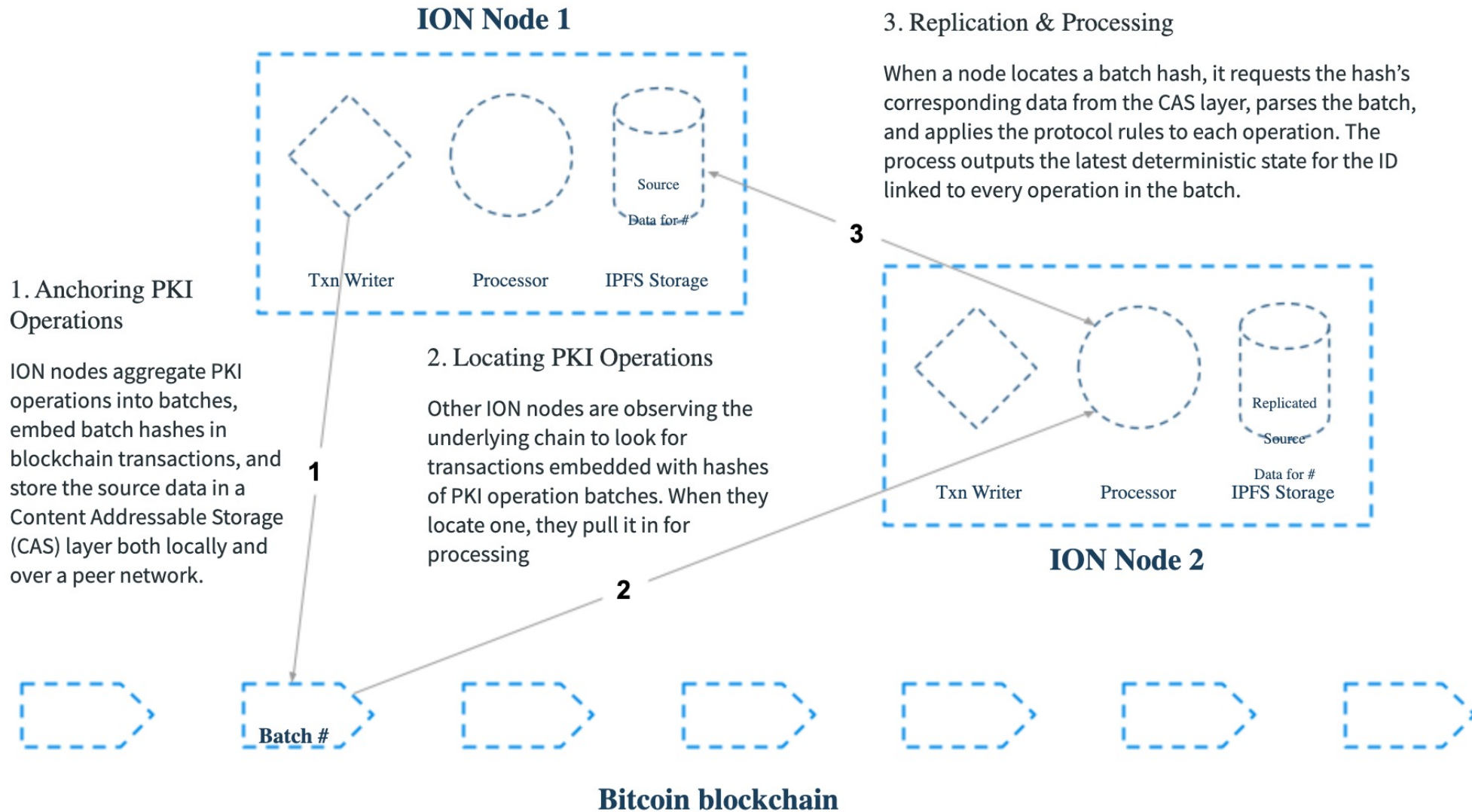


No additional consensus schemes, validator lists, or special protocol tokens.

HOW DOES IT WORK?

Layer 2

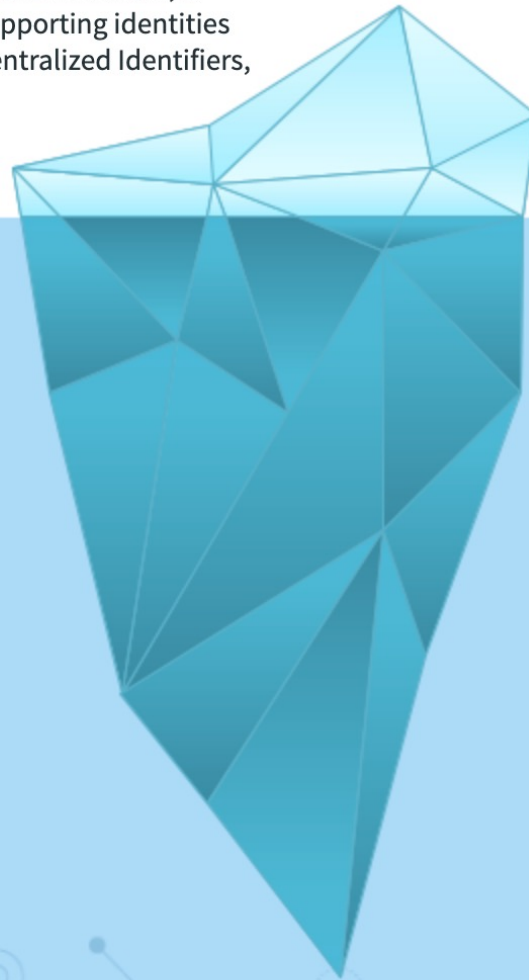
Layer 1



HUMAN IDENTITY IS JUST THE BEGINNING

Human Identity

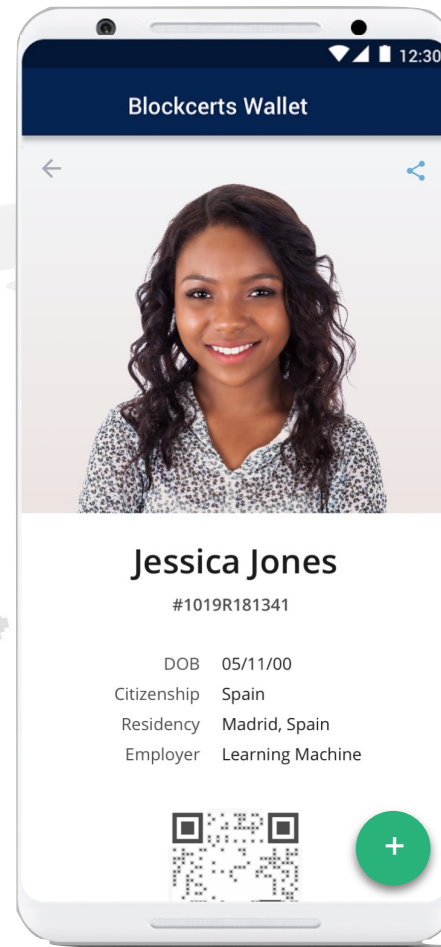
There are 7.5 billion humans on Earth currently. At bare minimum, a decentralized identity system must be capable of supporting identities for all of them. Each person may have multiple Decentralized Identifiers, each requiring their own PKI lineage.



Identity of All Things.

Human identity is just the tip of the iceberg – there is an entire world containing hundreds of billions of devices, machines, apps, and other entities, both tangible and virtual.

IDENTITY YOU OWN AND TAKE ANYWHERE





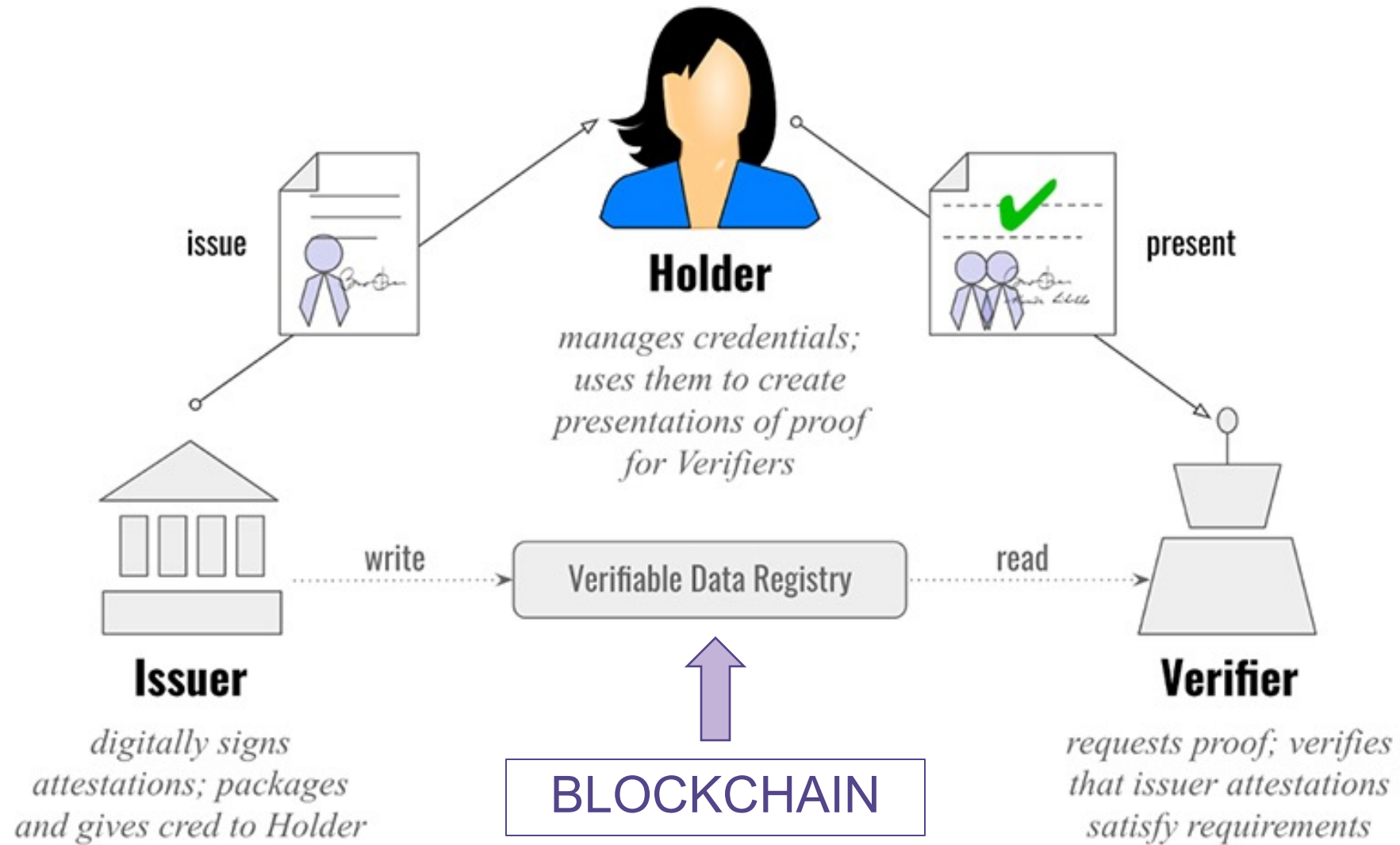
VERIFIABLE CREDENTIALS

VALIDATING CLAIMS ON THE WEB

- A Verifiable Credential is a tamper evident, digital credential with authorship that can be cryptographically verified.
- Verifiable Credentials is a technical standard for expressing credentials on the Web in a way that is cryptographically secure, privacy respecting, and machine-verifiable.



ROLE OF BLOCKCHAIN



ADVANTAGES OVER DIGITAL SIGNATURES

DIGITALLY-SIGNED PDFS

File Format	PDF - Fixed layout. Optimized for human readability.	
Data Flexibility	Open	✓
Recipient Ownership	No - Recipients do not control cryptographic keys	
Tamper Evidence	Yes	✓
Time Stamping	Yes	✓
Integrated Data/Display	Yes	✓
Shareable	Yes	✓
Revokable	Yes, by Certificate Authority only	✓
Expireable	Yes, by Certificate Authority only	✓
Vendor-Independent Verification	No	
Legal Enforcement	Yes	✓

W3C VERIFIABLE CREDENTIALS

File Format	JSON - Human and machine-readable, generates any display	✓
Data Flexibility	Open	✓
Recipient Control	Yes	✓
Tamper Evidence	Yes	✓
Independent Time Stamping	Yes	✓
Integrated Data/Display	Yes - lightweight envelope open to any schema	✓
Shareable	Yes	✓
Revokable	Yes	✓
Expireable	Yes	✓
Vendor-Independent Verification	Yes	✓
Legal Enforcement	Yes	✓

DEMO



QUESTIONS?



THANK YOU



Name: Natalie Smolenski

Email: natalie.smolenski@hyland.com

Phone: (972) 358-5542

Twitter: [@NSmolenski](https://twitter.com/NSmolenski)

www.hyland.com

