Verifiable Credentials 101 for SSI

An intro and technical explanation

September 18, 2018

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SSIMeetup.org

SSIMeetup objectives

1. Empower global SSI communities
2. Open to everyone interested in SSI
3. All content is shared with CC BY SA

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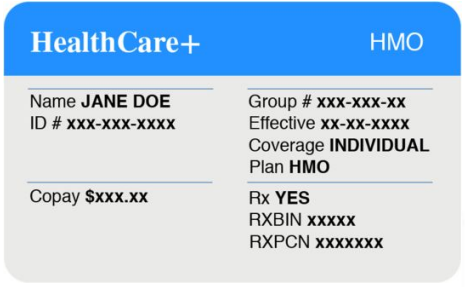
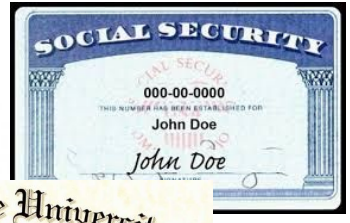
Coordinating Node SSIMeetup.org

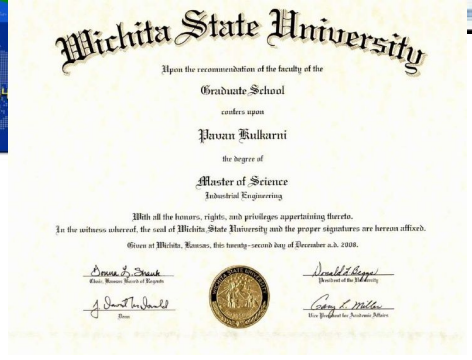
What is a Credential?

Today, usually just “proof” of something about ourselves

Most credentials are physical







Problems with today's credentials

- Easy to fake / forge
- Easy to impersonate the true owner
- Can be lost or damaged
- Expensive to create and issue
- Can't scale
- Can't be easily verified online
- Disclose more than is needed

What are Verifiable Credentials?

A digital attestation of one Identity Owner about another

Also called Attestations or Claims

What is an Identity Owner?

A person or organization which has digital control over it’s things

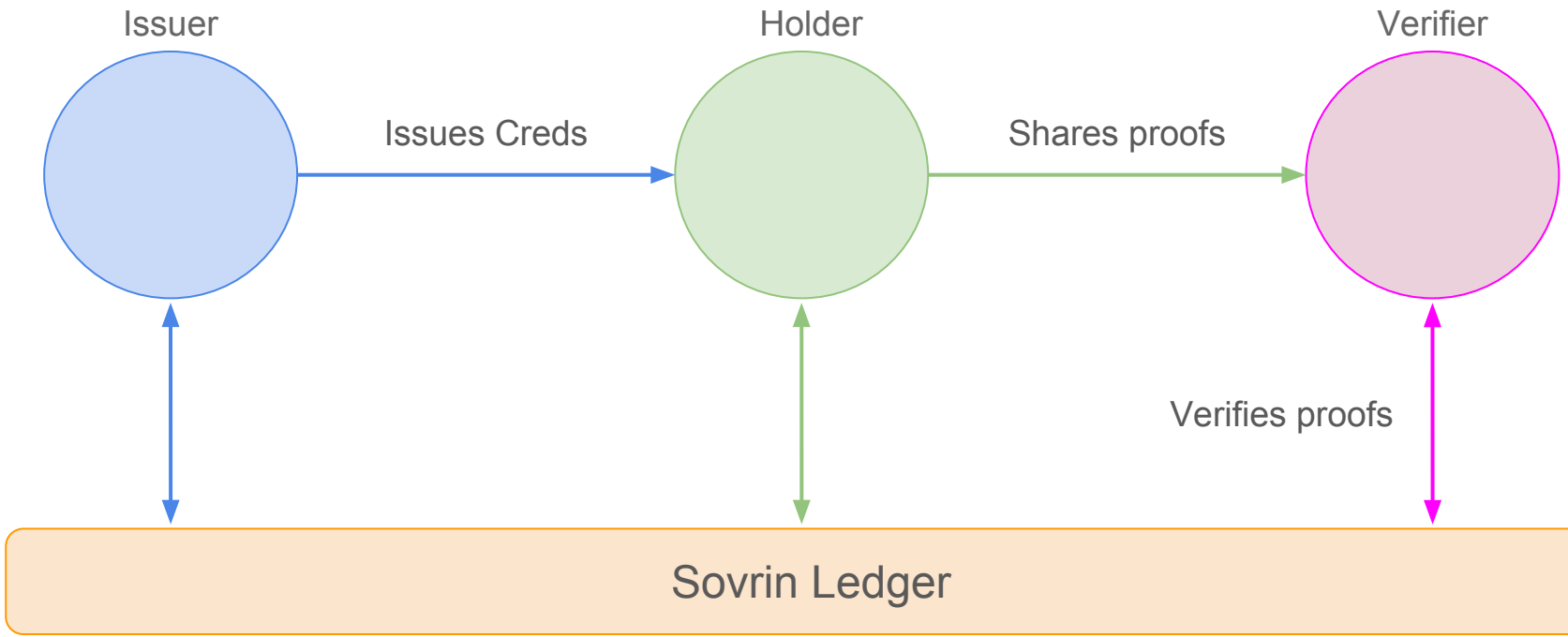
Verifiable Credentials are:

- All digital, under the true owner's control
- High scalability
- Much harder to fake
- Much harder to impersonate true owner
- Eliminates need for treasure troves of data
- Enables minimum disclosure
- Enables Zero-Knowledge Proofs
- Data by itself becomes useless to thieves

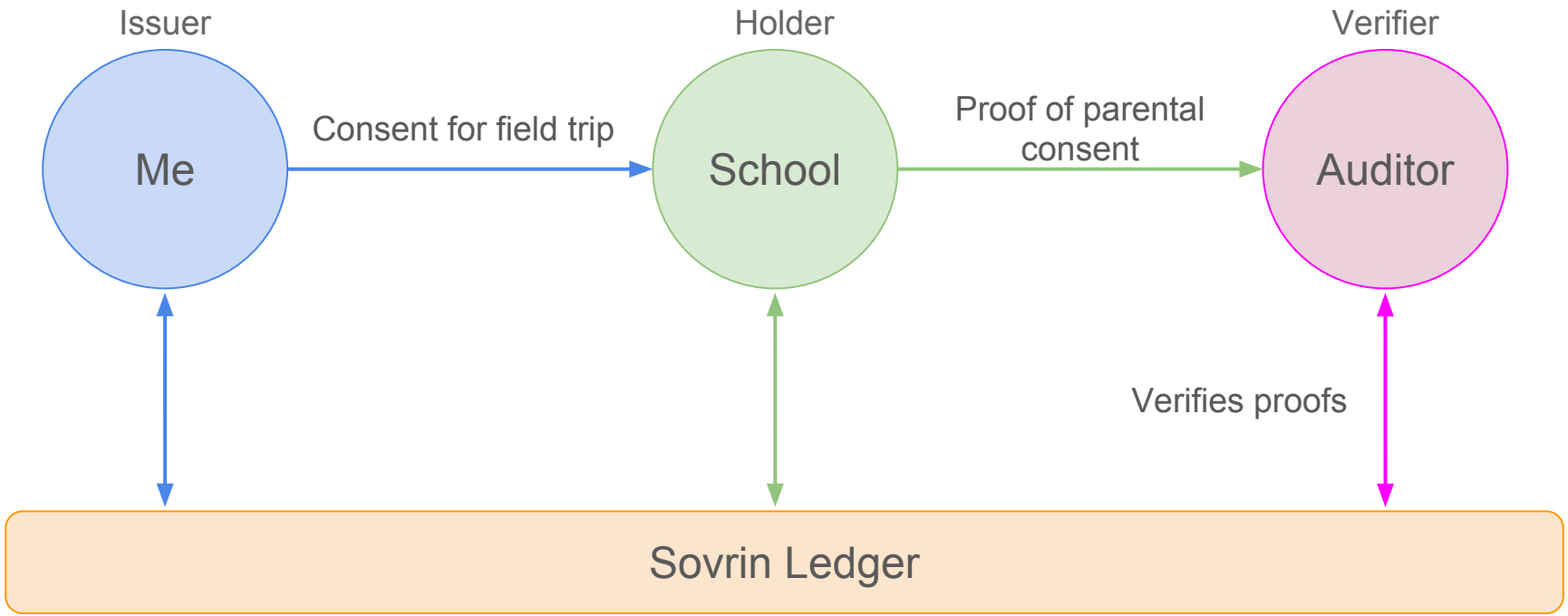
How do you get a Verifiable Credential?

Three roles

- Issuer: They create and issue credentials
- Holder: They receive, hold and share credentials with Verifiers
- Verifier: They receive and verify proofs (a digital sharing of all or part of a credential) from Holders


Issuer
Holder
Verifier
Issues Creds
Shares proofs
Verifies proofs
Sovrin Ledger

An Identity Owner can be all three



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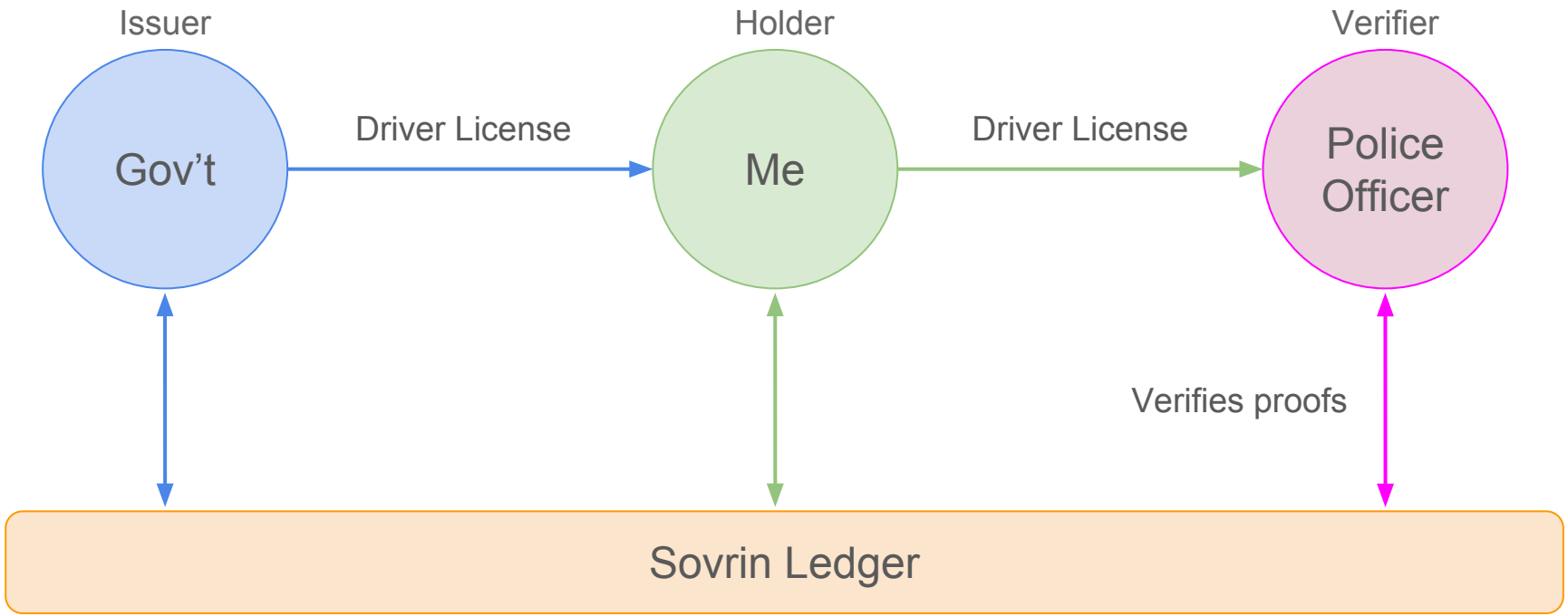

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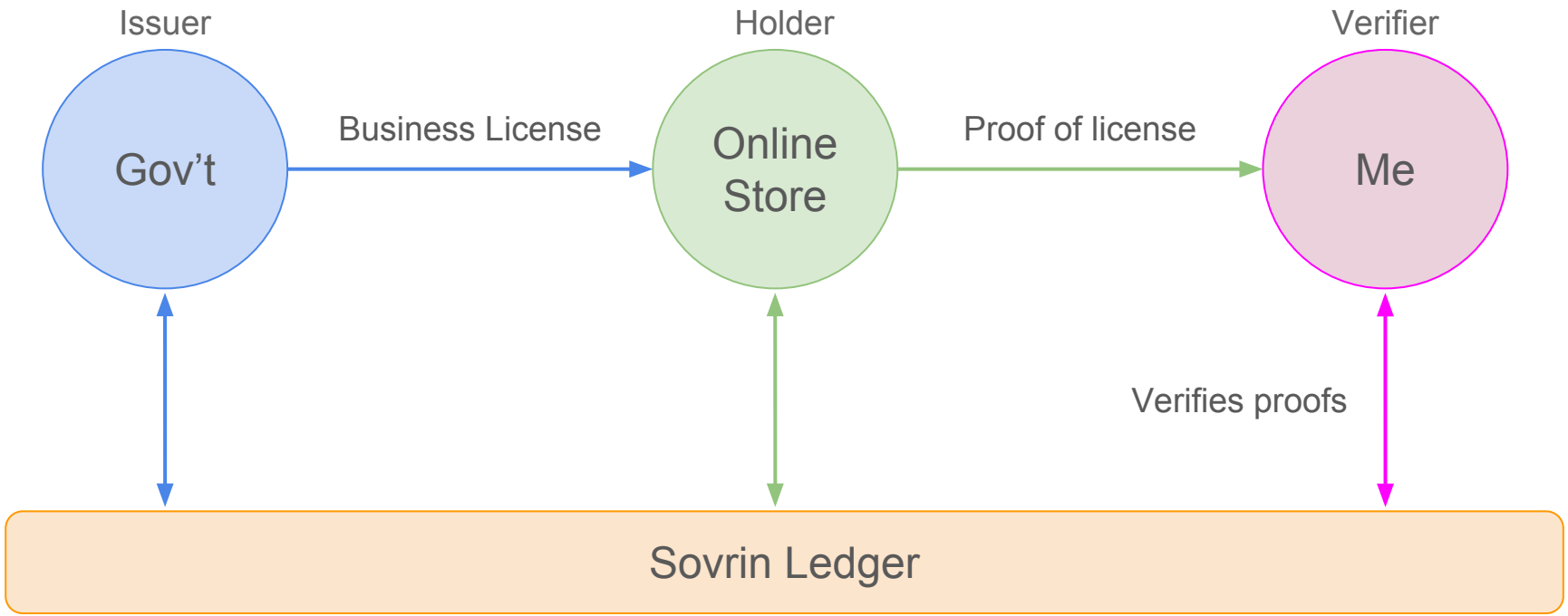
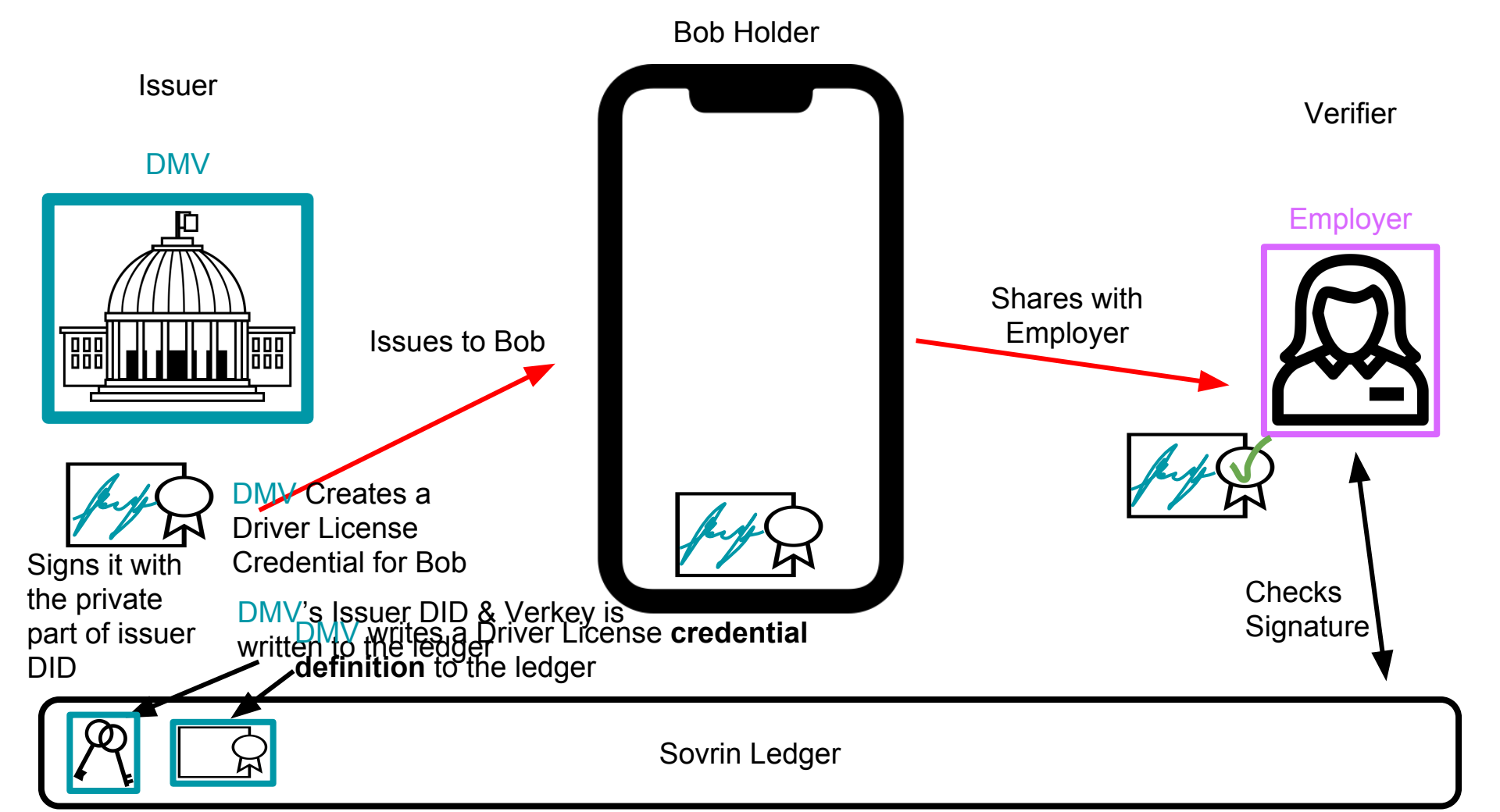


VCs use decentralized public key infrastructure

(DPKI)


Bob Holder
Issuer
Verifier
DMV
Employer
Issues to Bob
Shares with Employer
DMV Creates a Driver License Credential for Bob
Signs it with the private part of issuer DID
DMV's Issuer DID & Verkey is written to the ledger
DMV writes a Driver License credential definition to the ledger
Checks Signature
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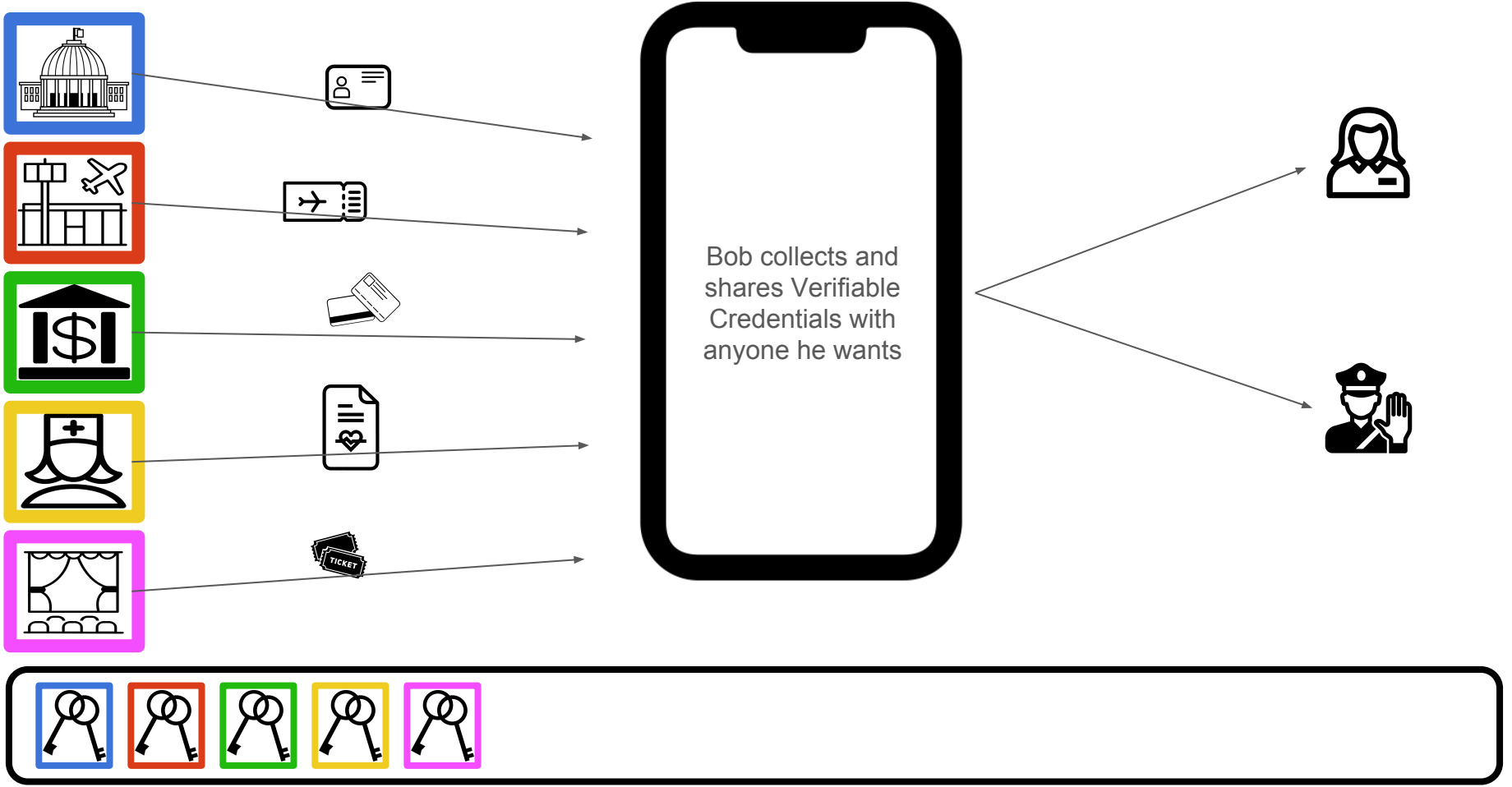
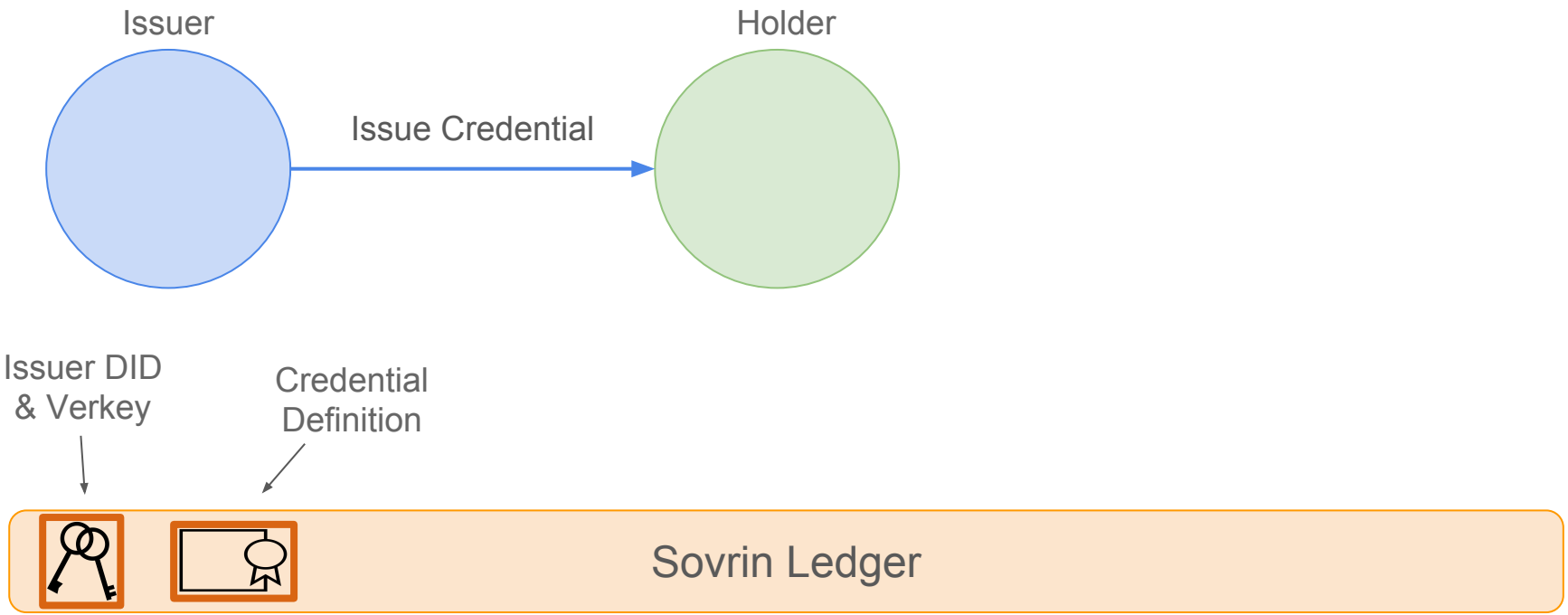

Bob collects and shares Verifiable Credentials with anyone he wants
TICKET

But how does a Verifier know a credential I share was *actually issued to me?*

What stops me from copying my credentials and sharing with all my friends?

Blinded Link Secrets


Issuer
Holder
Issue Credential
Issuer DID
& Verkey
Credential
Definition
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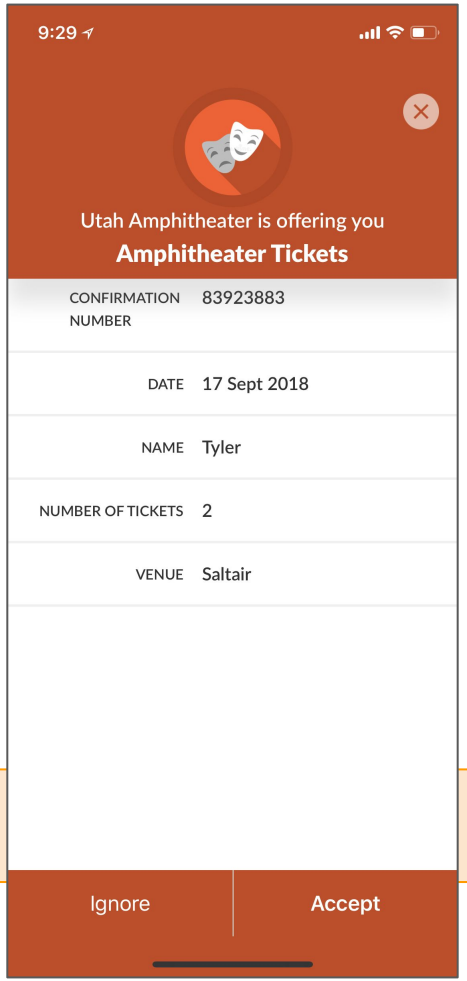

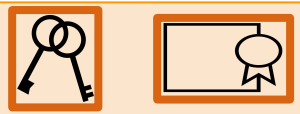

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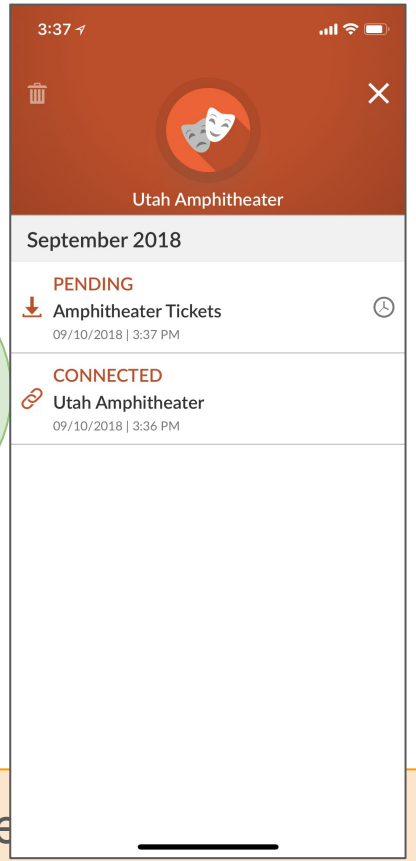

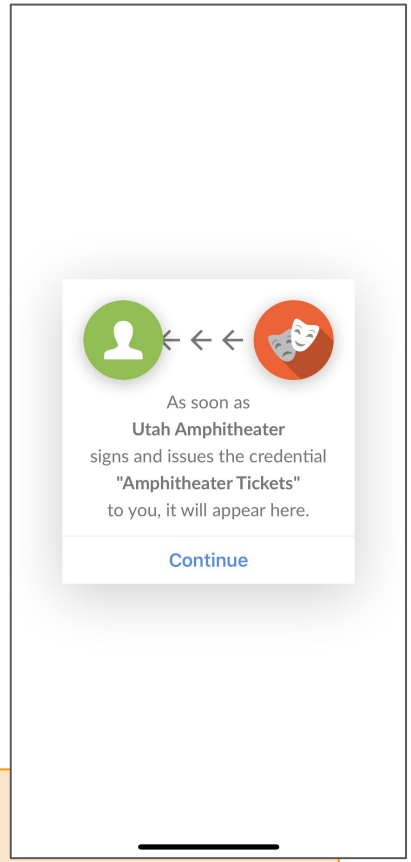

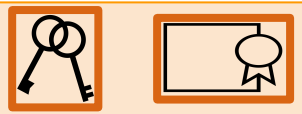

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SSIMEETUP Self-Sovereign Identity

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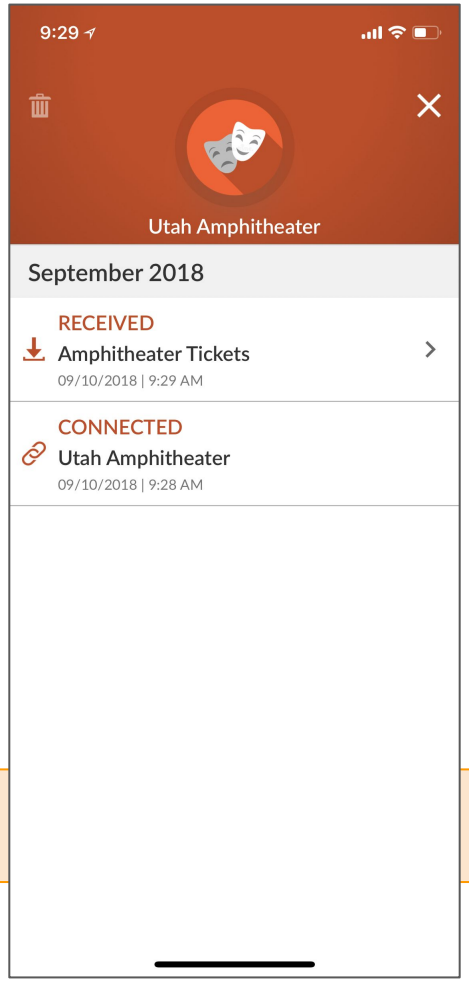
Issuer

Binds blinded link secret to credential

3. Issuance

Holder



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IMEETUP Self-Sovereign Identity

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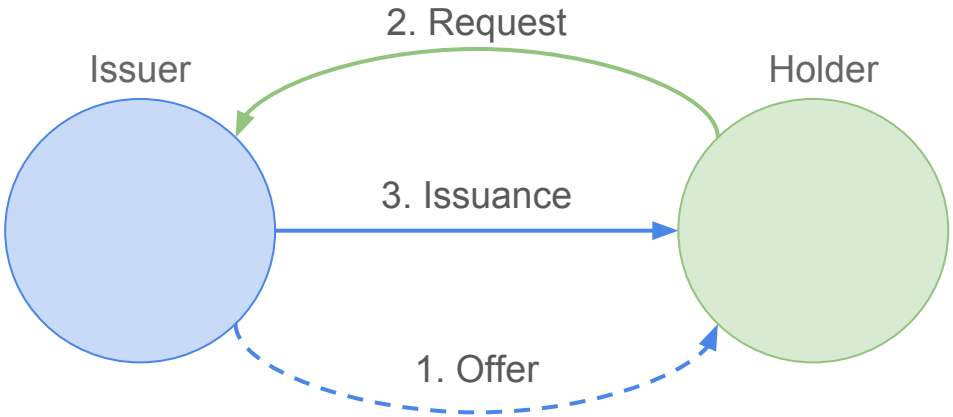

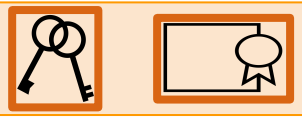

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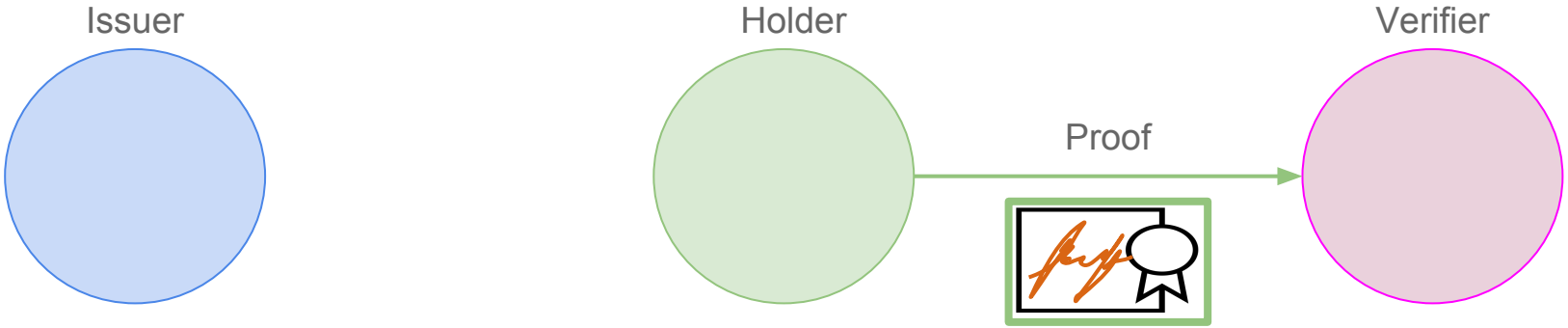

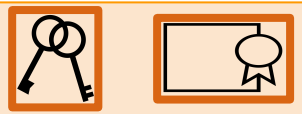

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Issuer

Holder

Verifier

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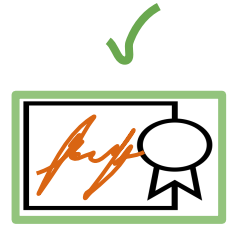
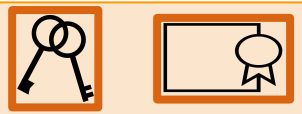
Issuer

Holder



Verifier



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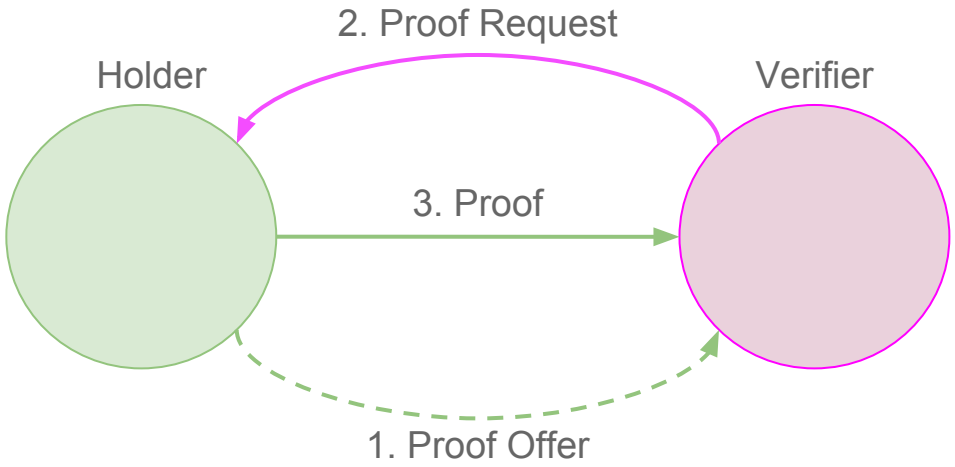

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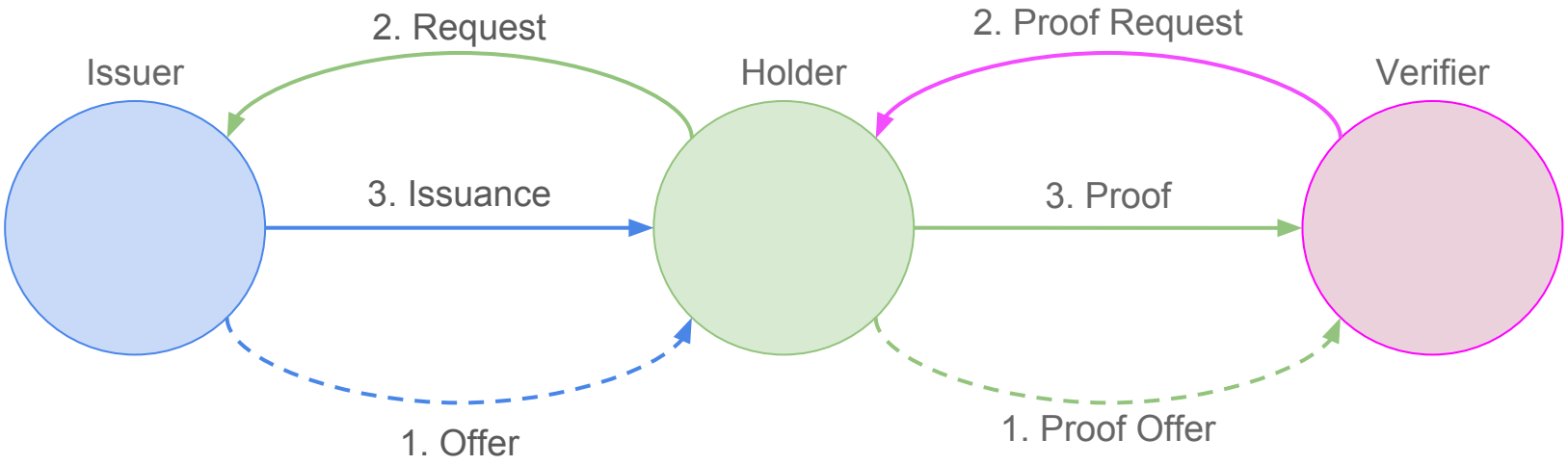

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