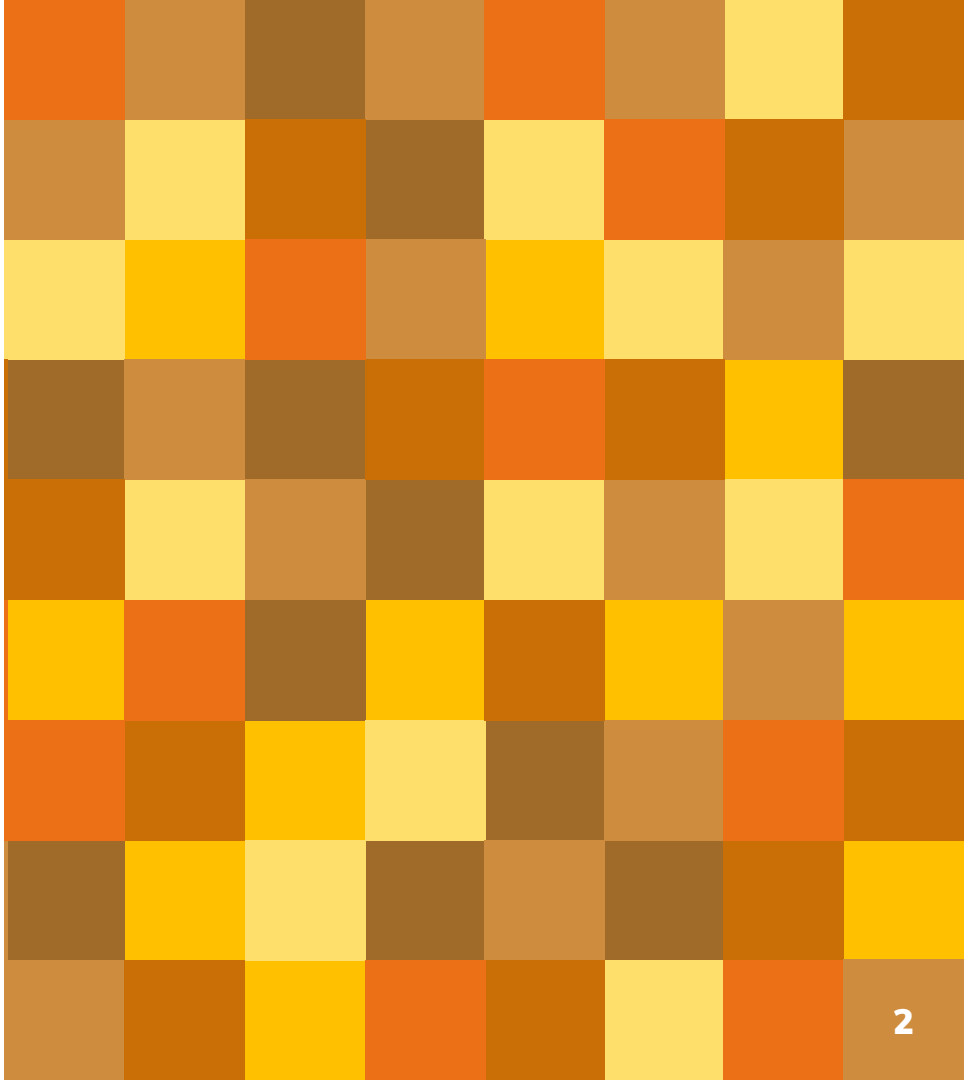
Using the DNS as a directory for identities

Vittorio Bertola, FOSDEM 2019

1.

The problem



We have too many accounts…

We already have unified online identities…

…but we do not control them!

Our online identity, today

The big Internet platforms already create an «online identity» for us

They track us across multiple services and sell us for targeted advertising

Meanwhile, we are stuck with a thousand accounts

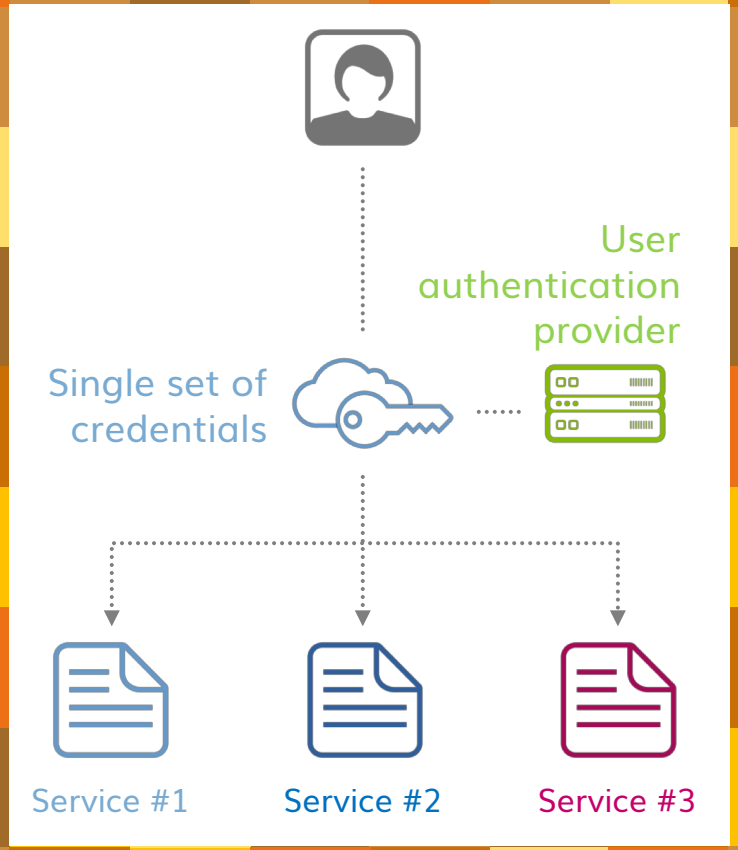
- Insecure, inconvenient etc.

The solution: Single sign-on

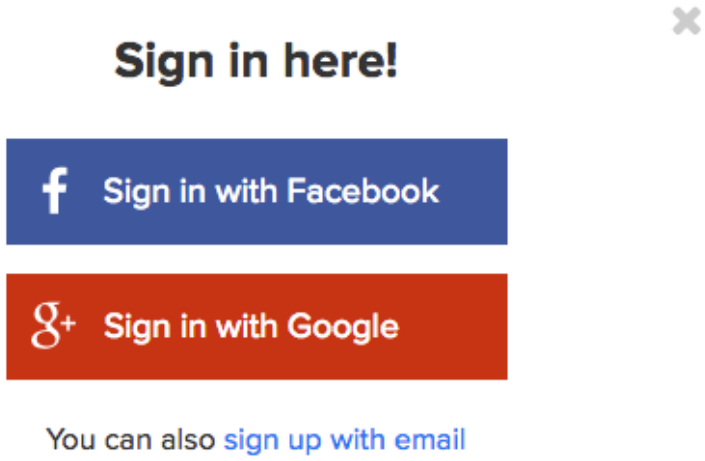
SSO = A single set of credentials that can be used on all existing online services

Requires an online service acting as user authentication provider

(must be trusted by everyone)



But of course, the big OTTs already thought of this!



Proprietary SSO gaining ground

Very convenient and ubiquitous

Average Internet users like it a lot

But

No interoperability + fragmentation => concentration

Clients have to implement each of them

Users cannot choose their provider

Makes tracking straightforward

GRAND HOTEL
TRENTO

Accedi gratuitamente, con uno dei tuoi profili social. Se non ne possiedi uno, scorri la pagina fino in fondo ed usa il pulsante "Registrati"

Facebook Login

Google+ Login

Twitter Login

Instagram Login

Yahoo! Login

Linkedin Login

Foursquare Login

Windows Live Login

*We need **openness** and **federation!***

Advantages of public federated SSO

- Why can't your online identity work like your email address?
- You only need one account to interoperate with everyone
- You get to choose and even change your provider
- You can keep your identifier if it is in your own domain name

Advantages of public federated SSO (2)

- You only need to remember and secure one set of credentials
- Any additional security mechanisms can be implemented just once by a specialized party
- You have an easy way to control the sharing of your information and to keep it updated
- You don't need to register for new websites, just identify yourself

*But **federation** needs a*
discovery mechanism…

What do we miss?

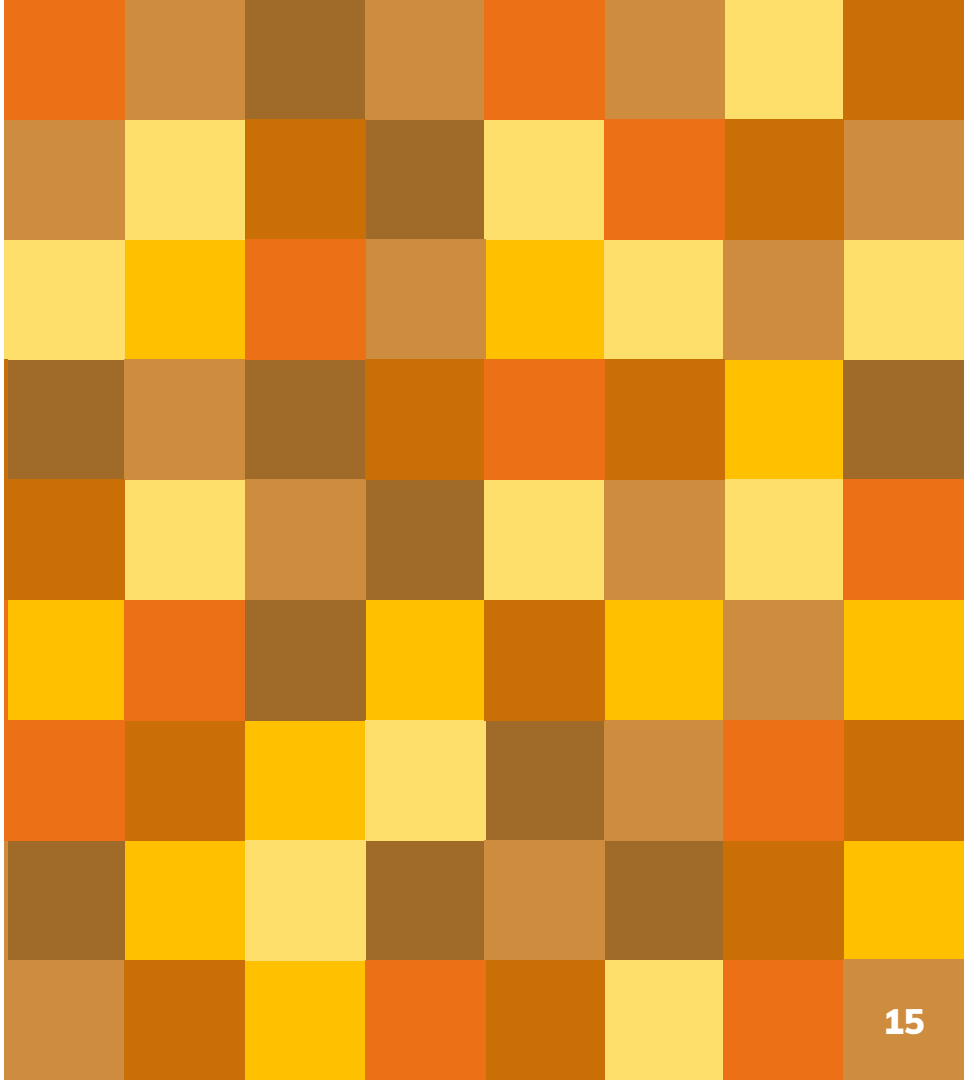
We already have federated identity management and authorization protocols

- OpenID Connect / Oauth 2.0
- Though not normally deployed in a truly federated way (at most, used for a federation with a single identity provider)

We miss a place to keep the directory of all existing identities, and a protocol for looking identities up into it

2.

Where do we keep a public directory for identities?



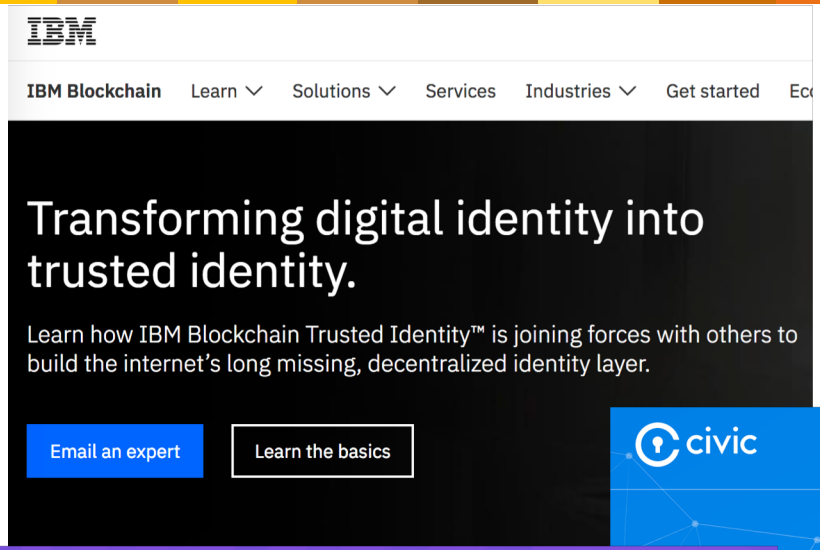
The Web people do it on the Web

OpenID Connect already has an optional discovery mechanism

- It is based on WebFinger, which is based on HTTPS
- Only accepts URIs as identifiers, with email addresses as a special case

But it requires you to deploy a web server and a WebPKI certificate on each and every domain that you want to use for identifiers

Hey, but the web is so uncool now!
Why don't we use a blockchain?
Don't you want to be self-sovereign?
And by the way, here are some tokens from my ICO!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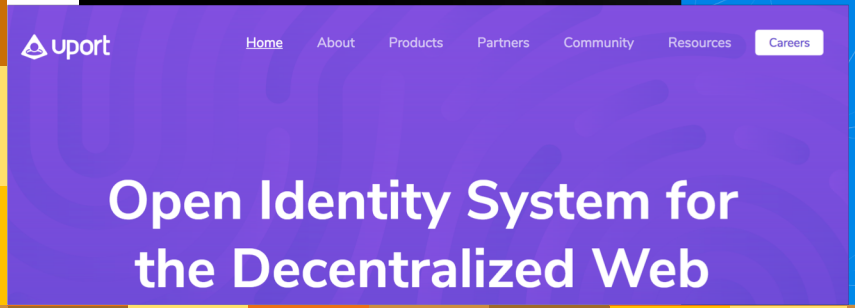
uport
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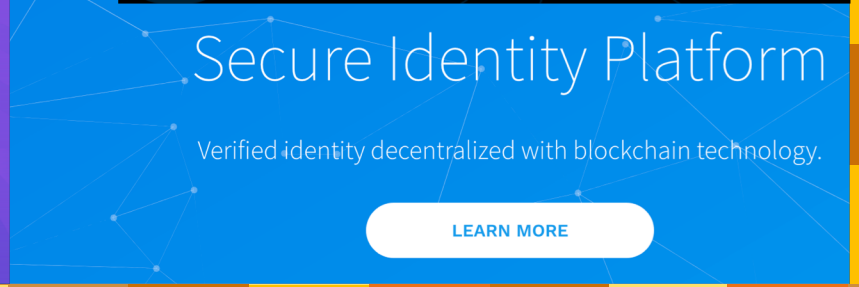
Open Identity System for the Decentralized Web


Secure Identity Platform
Verified identity decentralized with blockchain technology.
LEARN MORE

The blockchain people do it on the blockchain

- Identities, or at least pointers, or at least hashes, are written into the blockchain
  - The rest is often unclear, or proprietary, or vaporware, or all together
- The selling point is that this is «decentralized»
  - Down with «central authorities»! No government, no ICANN can get in your way!
- Unofficial standardization ongoing at the W3C on a «DID» URI scheme

A survey by a potential customer found
91 blockchain ID projects,
63 of which were having an ICO,
but only 17 of them had a non-placeholder website,
only 3 had downloadable software,
and only 0 had working software.

(source: presentation at
European Identity Conference 2018)

Wait a minute…

We already have a «public distributed ledger»

It is an open, public standard with many free implementations

It is widely available to everyone everywhere

It has been working reliably for 30+ years

It is secure (if you care to deploy the security extensions)

It can scale effectively to any amount of traffic

It is regulated to prevent capture

It is decentralized and federated


It’s the DNS!

The DNS provides the namespace

In the real world, people use «natural» names which are neither unique nor uniform nor easily parsable

So you need a namespace to name identities uniquely on a global scale, while distributing its management… but it's the same problem that was already solved for host names 35 years ago

The DNS provides the namespace (2)

- Using the DNS, you can assign human-readable identifiers to identities in a naturally federated namespace
- Users are already familiar with DNS-like strings
- You can even use email addresses if you wish
- Or you can encourage people to get their personal domain name and own a piece of the namespace

The DNS provides the discovery scheme

- We just need a pointer to know who is responsible for an identifier
- Again, same problem already solved for email 35 years ago
- We use a TXT record, rather than a new RRtype
  - So we are not adding straw onto the camel's back
- Two Internet drafts independently submitted

_openid.<identifier>

TXT

v=OID1;iss=<issuer>;clp=<claims_provider>

Though, in the end…

This discovery is «blockchain-ready»

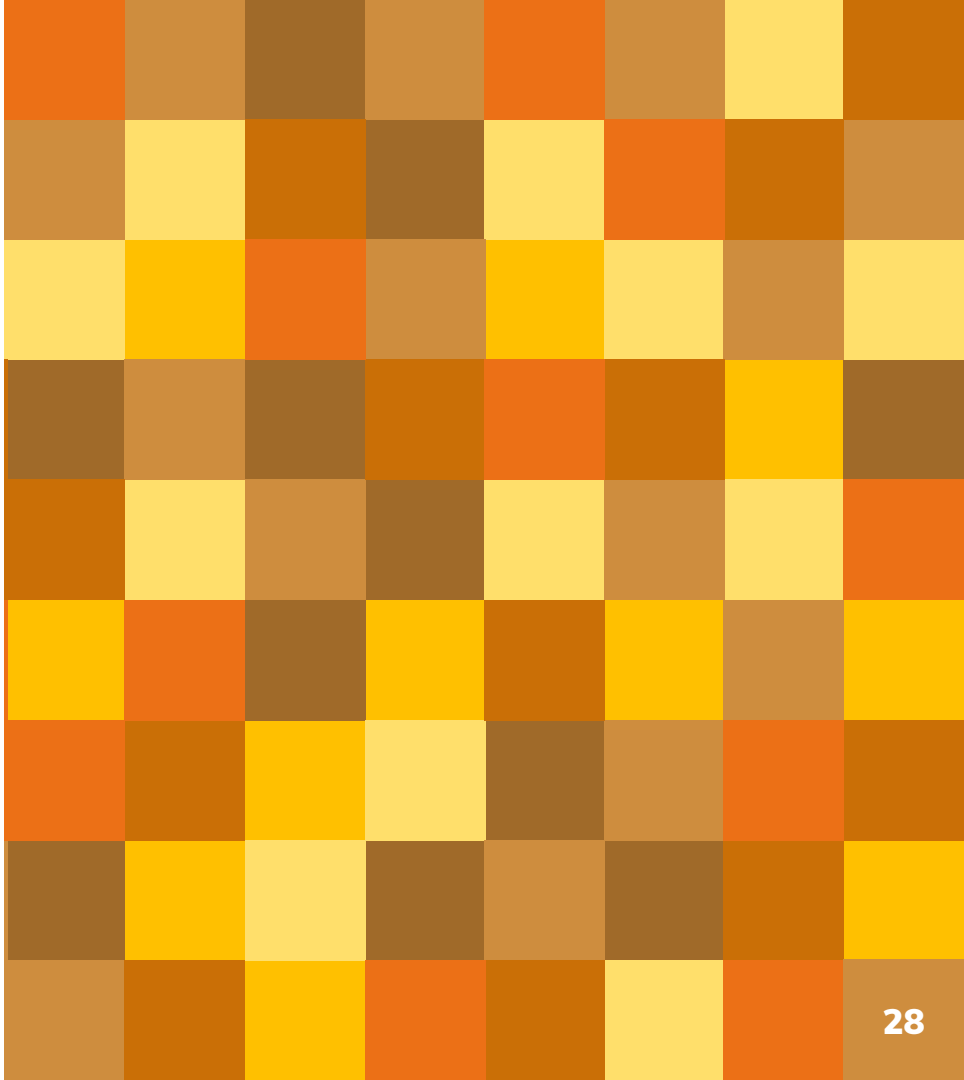
- You will just need to replace the DNS-based «public distributed ledger» with a blockchain-based one

However, we want something that can immediately be deployed to mass scale

Or it will be too late to compete with Facebook etc.!

3.

The ID4me project



ID4me

Originally promoted by three companies, now a non-profit consortium

All standards are public and patent-free

The recipe for ID4me

1

Take OpenID Connect / OAuth 2.0 – the de facto standard for authorization and authentication over the Internet.

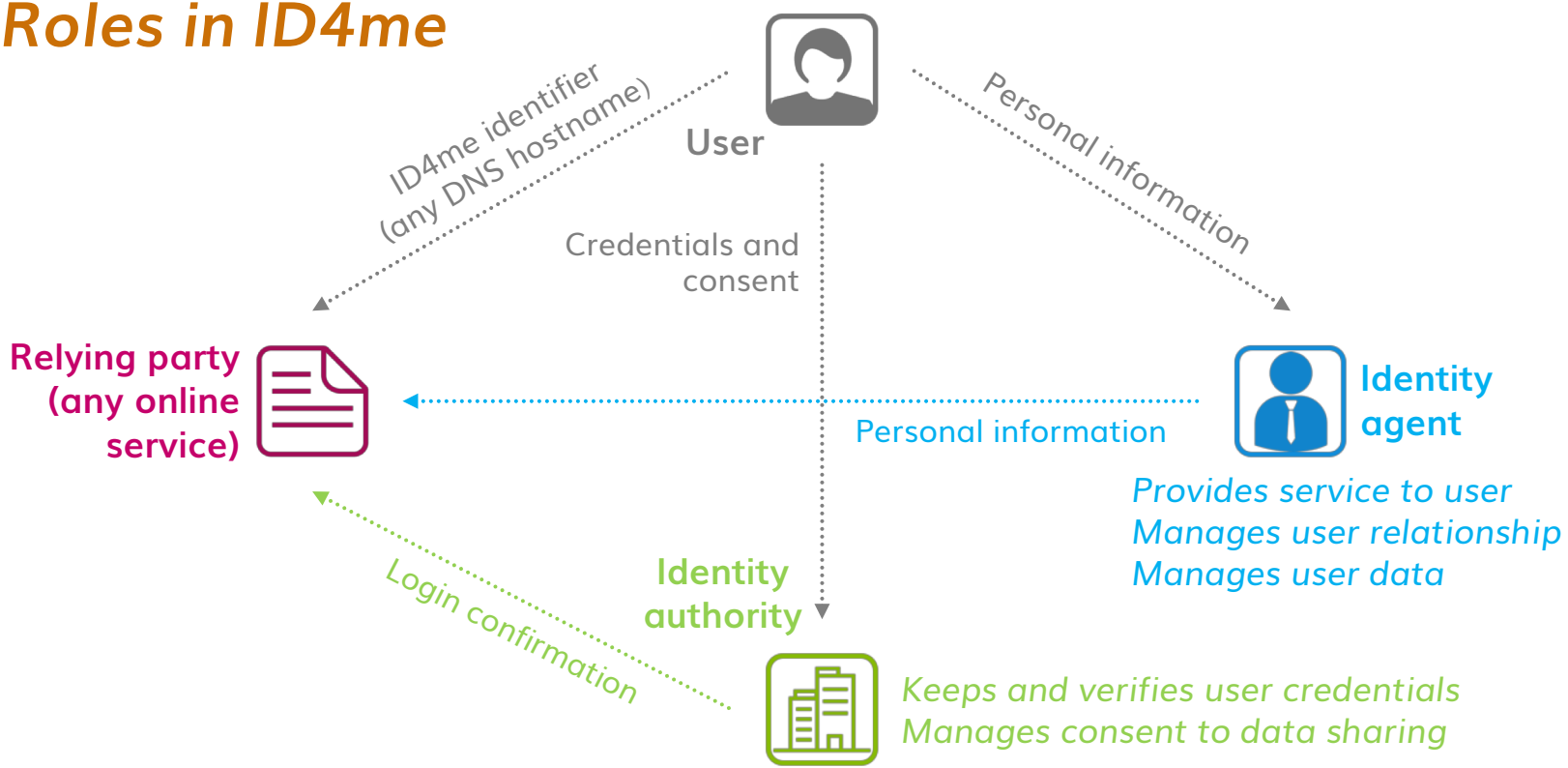
2

Use the DNS to build a distributed, decentralized database of all existing identities and their providers, using “hostnames” as identifiers.

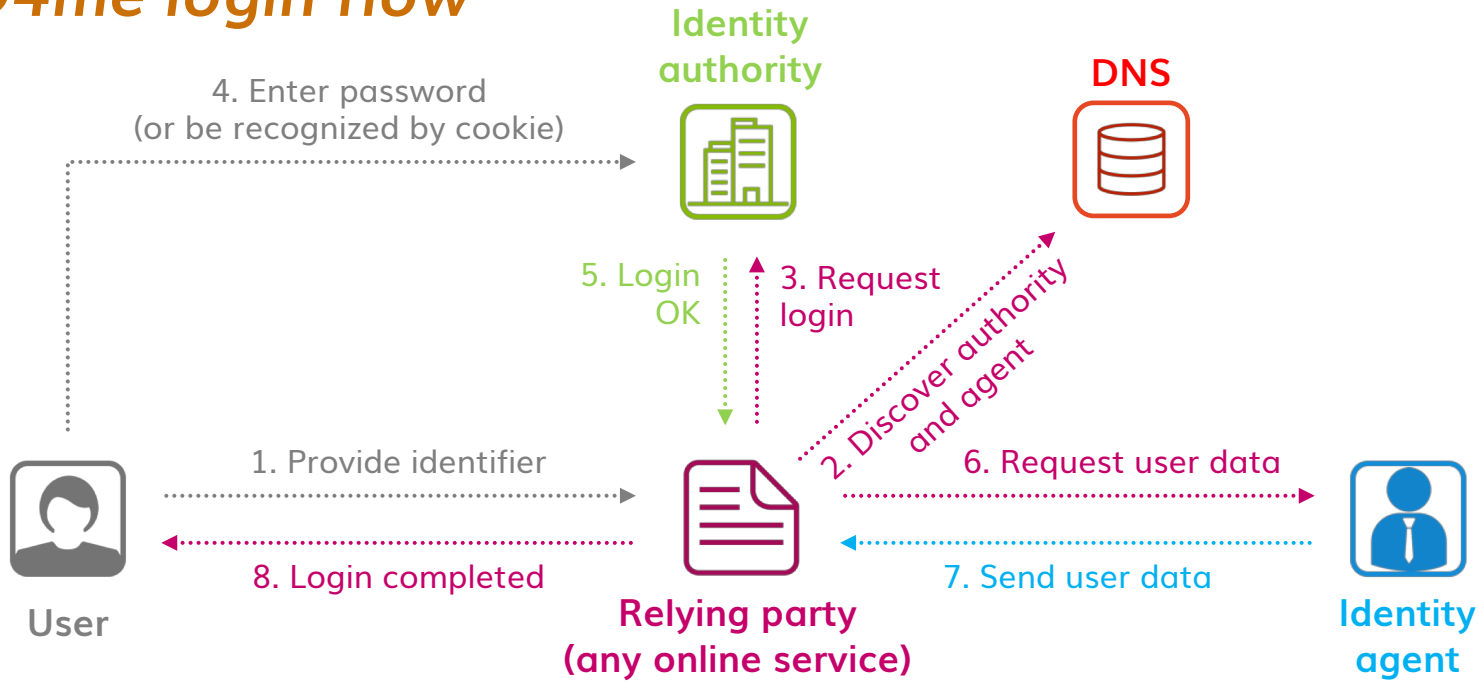
3

Add functionalities on top, extend and publish the standards, create a common ontology for user information, and present to the public.

Roles in ID4me



ID4me login flow



Status

Website, public specifications, Java API released

Additional features under development

Started up the international non-profit

A prototype up and running

Beta public launch at Cloudfest (end of March)

Looking for feedback and participation

https://id4me.org/

Thanks!

Any questions?

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