ValidIDy Data Capsules

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Steve Wilson & Les Chasen

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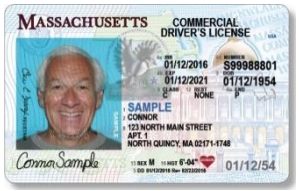
There's no shortage of truth

At the dawn of e-commerce, the Internet industry became obsessed with identity, as if that's the only means we have to establish the veracity of what's happening online. The trope of the anonymous Internet Dog – which KNOW Identity MC Dave Birch has long associated with "lazy consultants" – is in desperate need of an overhaul. Most businesses have developed a terrible habit of over-identifying.

The typical response to every new identification or authentication mishap is to pile on more identity data, creating a spiral of ever larger honeypots and ID theft.

ValidIDy is a data protection solution born out of a careful re-think of Digital Identity and attributes management. The ValidIDy approach begins by recognizing that the real world abounds with sources of truth. We have institutions, businesses, brokers and processes providing a great many personal and professional credentials which have come to be widely relied upon.

However facts and figures about people lose fidelity when converted casually into digital form. The solution is to digitize real world truths with greater care, and thus preserve their *provenance*.



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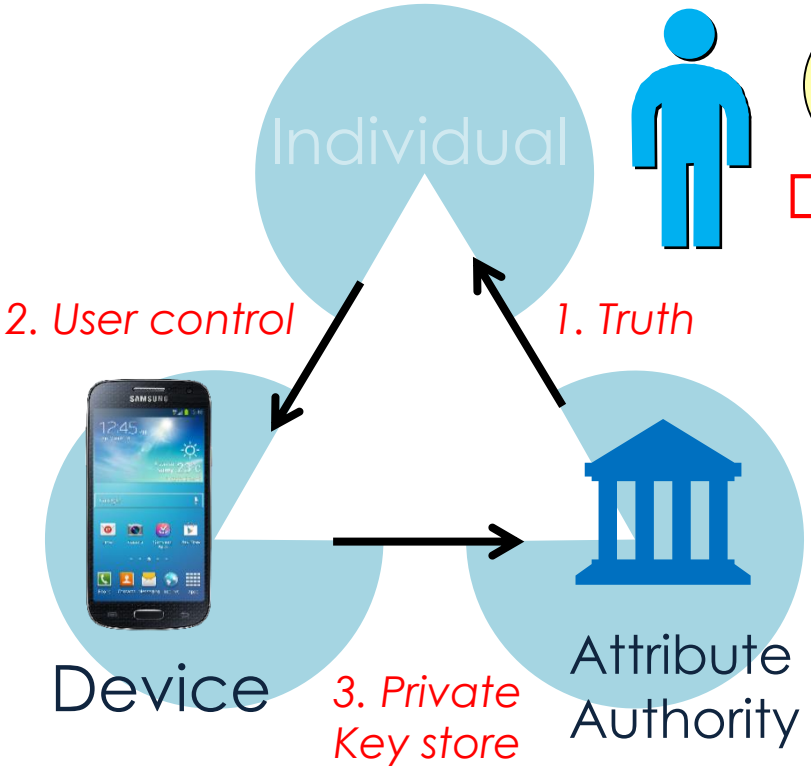
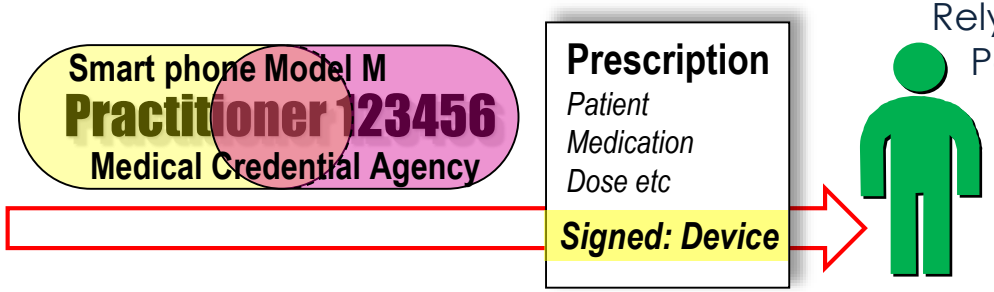
Analog to Digital Provenance



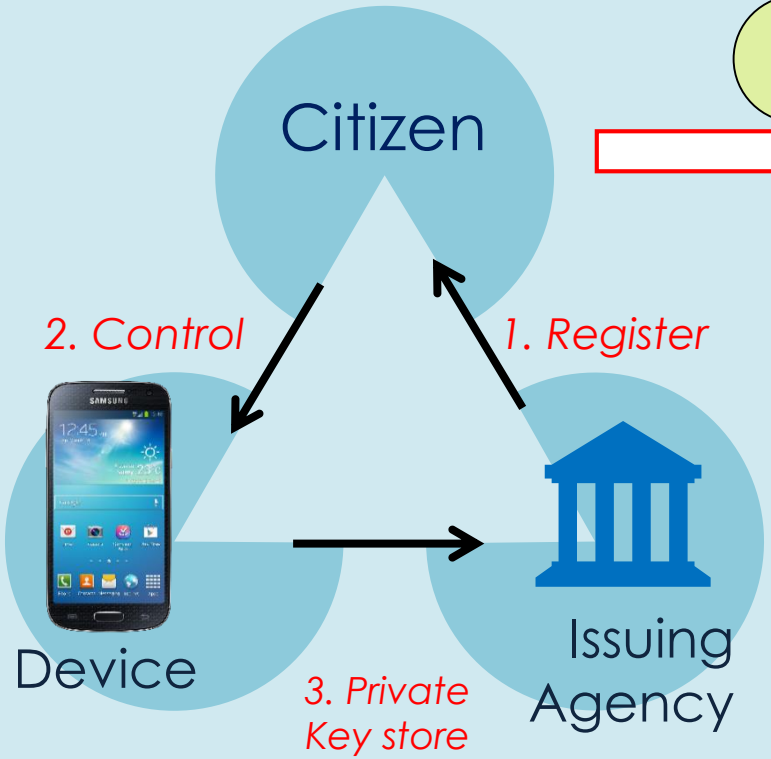


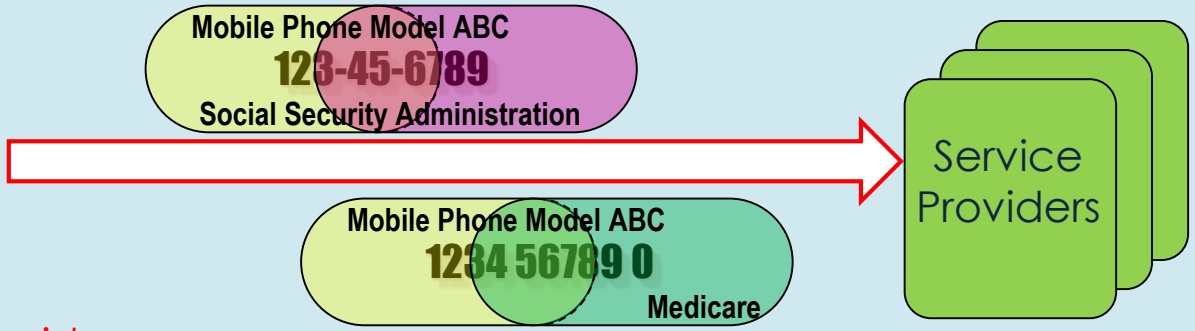
The ValidIDy technique leverages sources of truth, public key cryptography and the universality of mobile devices to fix the provenance of personal data. We bring these three elements together in a Public Key Certificate (depicted as a *capsule*) forming an inviolable logical triangle, as follows:

1. An Attribute Authority (AA) attests to some particular about an individual, e.g. the qualifications of a medical practitioner
2. the individual is in control of a mobile device with a standard cryptographic processor, and
3. the mobile device holds the private key corresponding to the certificate's public key.

If a Relying Party receives a digitally signed transaction and verifies the signature against the certificate (capsule) then they can be sure the attribute is true of the sender, the sender was in control of a device approved by the AA, and the sender was directly involved in creating the transaction. Under such circumstances, the name of the individual might be of no concern and can be dropped from the transaction without any loss of reliability.

Protecting against stolen SSNs





ValidIDy capsules could be used to mitigate the damage done when government identifiers are stolen and abused in identity crime. Social Security Numbers, Medicare Numbers and the like are routinely stolen in large scale data breaches, leading some to speculate about wholesale re-build of the social security system. But at what cost? A better response is to mitigate the misuse of stolen data.

ValidIDy capsules protect the *originality of data;* they allow Relying Parties and service providers to tell that personal data is genuine and that it has been presented afresh from a user's secure device with consent. By providing citizens the option of presenting identifiers via capsules instead of plain text, critical services most vulnerable to identity crime can be hardened to protect citizens and government.

Making *originality* meaningful is a fundamental breakthrough of the solution.

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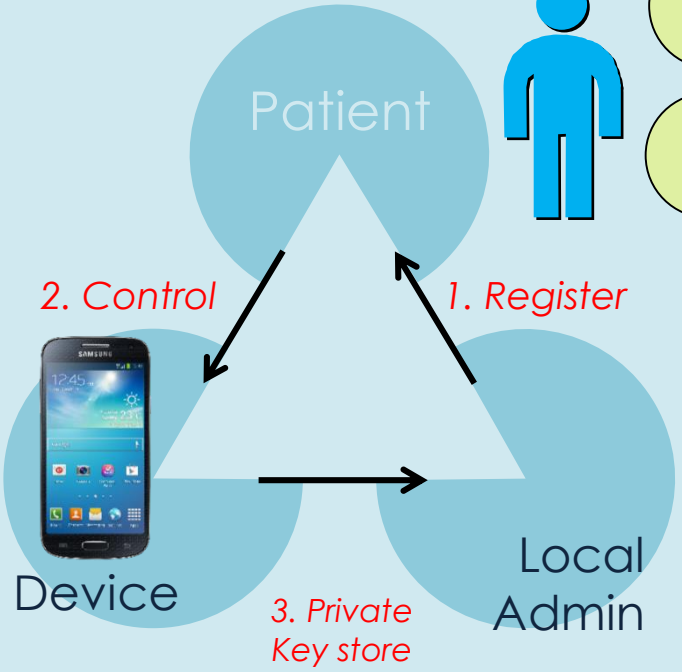
Protecting health data



Smart phone Model ABC
Trial ID 999 999
Clinical Research Org.

Smart phone Model ABC
Penicillin Allergic
Family Physician Reg 999

Smart phone Model ABC
Pt No. ZZ991122
Mental Health Record

Smart phone Model ABC
Ser. No. 800360801666905
Hearty Pacemakers Inc.

Study
EMR
Hospital
Device Register

Patients frequently participate in a number of separate health information systems, with identifiers or indices which could be managed in ValidIDy capsules, for better patient control, privacy, accuracy, and security. Furthermore, certain types of patient data, such as medic alerts, must ideally be vouched for by registered professionals (and not by patients themselves) to make them useful.

ValidIDy capsules could hold such patient data as clinical trial specific identifiers, patient numbers for condition-specific e-medical records such as mental health databases, notarised medical conditions, and implantable serial numbers used for device tracking. In all cases, respective receivers of messages signed with such capsules can be sure of the provenance of the data, that it is true of the patient, and that the patient consented to the data release, by way of unlocking the unique device to which the capsule is bound.

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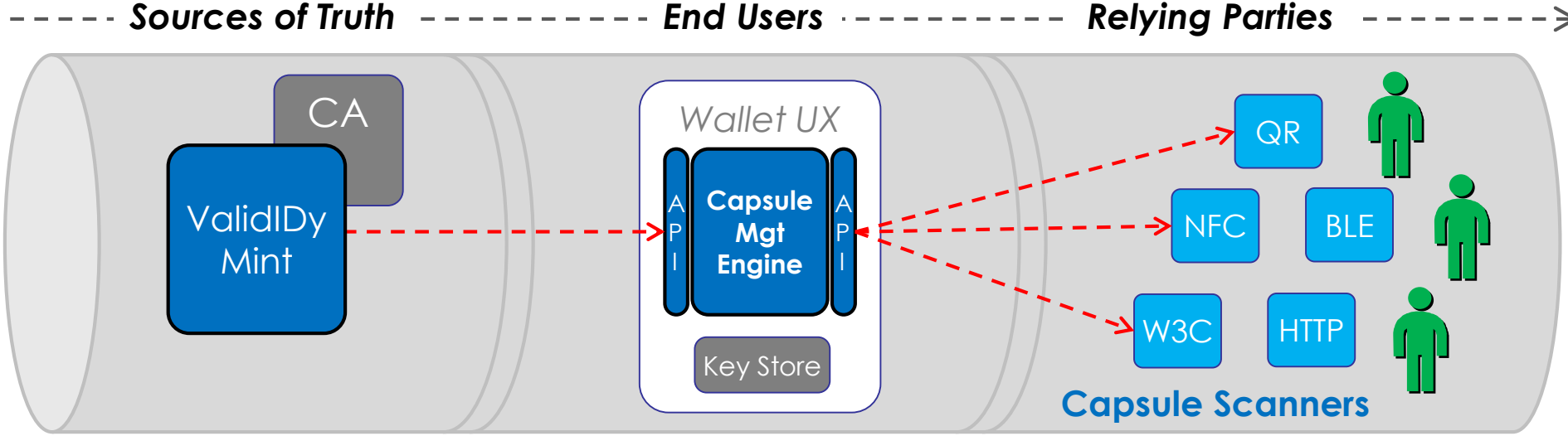
Securing data supply chains



ValidIDy envisions *data supply chains* emerging across the digital economy. Data capsules can fix the provenance of information about End Users, delivered from Sources of Truth through to Relying Parties. The ValidIDy solution has three sub-systems: (1) a white label **Capsule Management Engine** which is integrated into end user software typically to provide a wallet-like experience; (2) a crypto-graphic **Mint** which creates capsules on behalf of an Attribute Authority, generally working with a backend Certificate Authority; and (3) a **scanner** to receive a capsule (by a variety of peer-to-peer methods) and check the signature of the Mint. Thanks to public key certificate chaining, the provenance of the AA, the device and the End User's consent are all baked into the capsule, so ValidIDy scanners can work in isolation.

And so, if something is true in the real world, then ValidIDy makes it true in the digital world.

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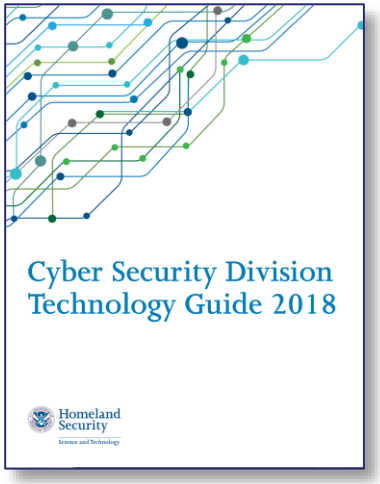
Reference Implementation, DHS

The reference implementation of ValidIDy is a credentials wallet known as *Mobile Device Attribute Validation* developed by us for the Department of Homeland Security. The wallet is used by emergency workers to prove their many qualifications and certifications to one another, with the typical use case being temporary assemblies of First Responders in disaster areas.

The app was featured in the 2018 edition of the DHS cyber security guide.



The DHS solution has been evaluated by the National Urban Security Testing Laboratory (NUSTL), and is available in the Apple & Google app stores.

ValidIDy is commercially supported in its current form for First Responders, and for adjacent use cases, such as temporary worker credentialing in the construction industry, and Electronic Visitor Verification in hospital-in-the-home settings.

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Benefits

ValidIDy makes a simple and elegant promise: If something about an End User is true in the real world, then the ValidIDy capsule proves that it's still true in the digital world.

More Secure

- ensures the provenance of individuals, devices and attribute issuers
- capsules and possession of the attribute can be verified in zero network environments
- forgery resistant; capsules cannot feasibly be cloned or counterfeited.

More Private

- no centralized registries needed to verify credentials; no PII honeypots
- no intermediaries needed to verify credentials; capsules presented peer-to-peer
- minimal disclosure; depending on use case, capsules need not identify end users.

More Cost Effective, Lower Risk

- each capsule means nothing more and nothing less than possession of an attribute
- minting a ValidIDy capsule has zero impact on AA's business processes
- built on a mature, open standards PKI technology stack.

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The ValidIDy vision

Government IDs

"KYC Once"

Open Banking

eHealth

~~Identity~~ Attributes of Things (IoT).

ValidIDy has the potential to radically enhance the reliability and value of identity attributes, and of personal data in general. Several opportunities exist along major transformation pathways in various sectors.

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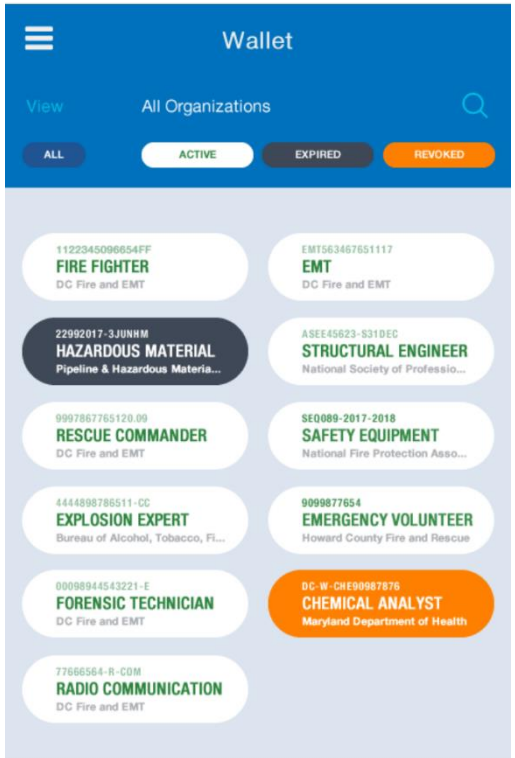
Questions



privacy
security
truth

steve.wilson@valididy.com
les.chasen@valididy.com
http://valididy.com

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