Interoperability Profiles in Practice

Leveraging Verifiable Credential Metadata and Trust Registries

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Digital Identity

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Who we are

SICPA is a long-trusted partner to close to 200 governments worldwide, providing solutions that enhance state sovereignty

- **Market leader in security inks** for governments, central banks, high security printers and industry
- Leading provider of **secured authentication, identification, traceability** as well as **taxation and supply chain solutions**
- Founded in 1927, headquartered in **Switzerland**, with more than **3’000 employees** & operating globally

Our “verticals” that enable trust

COCKPIT

Turning data into insights for faster and better decision-making

SOVEREIGN MONETARY SYSTEMS

Banknotes

Protecting the majority of the world’s physical banknotes

Digital sovereign payment platforms

Providing nations with CBDC solutions and digital social spending systems

DIGITAL IDENTITY & INTEGRITY

Enabling personal identity authentication and integrity certification of digital documents

REVENUE MOBILISATION & CONFORMITY

Increasing national revenue, broadening the tax base, reducing illicit trade and strengthening compliance with regulations

Products subject to excise tax

Telecom

Products subject to quality and safety standards

NATURAL RESOURCES

Enabling sustainable energy and raw materials value chains

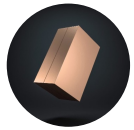
Fuel integrity solutions

HEALTH

Protecting nations' sovereignty in their response to health threats and critical supplies

PRODUCT AND BRAND PROTECTION

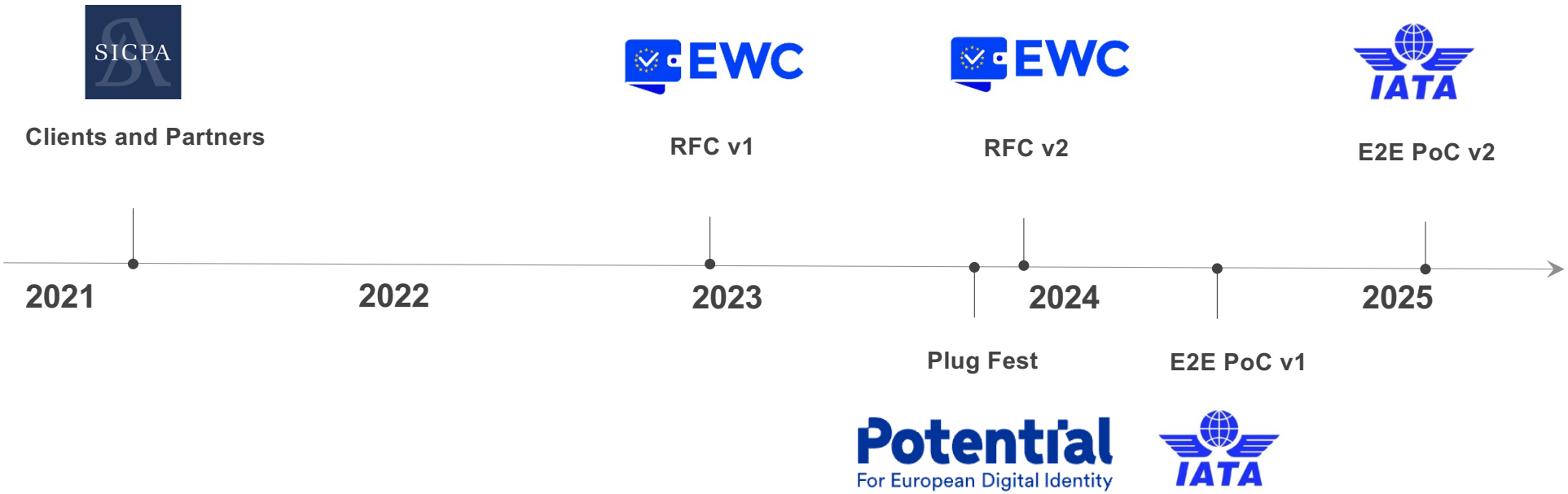
Protecting companies from the negative effects of illicit trade



VEHICLE LICENSE PLATES

Ensuring detection of fraudulent vehicle identification

Interoperability Engagement



IATA PoC Interop profile

Latest standards used

→ Verifiable Data Registries
did:web for Issuers

→ Credential exchange protocols
OPENID4VCI implementers draft 1.0 (Draft 13)
OPENID4VP ID 1.0 (Draft 20)

→ Signature Types
ECDSA - secp256k1

→ Credential Formats
sd-jwt vc (Draft 08)

2025 Additions

→ SD-JWT VC Type Metadata
Switching from vct as identifier to URI pointing at Metadata document

→ Revocation - Token Status List
IETF OAuth status list Draft 07

→ Trust Registries
Govern trust relationships

LATEST ADDITIONS

VC Type Metadata

➞ Defined in sd-jwt vc specs, it uniquely identifies the type of credential being issued

➞ it defines the structure and the rules on how a VC needs to be processed by all actors of the ecosystem to improve interoperability.

Credential

```
{
    "vct": "https://betelgeuse.example.com/education_credential",
    "vct#integrity": "sha256-WRL5ca_xGgX3c1VLmXfh-9cLlJNXN-TsMk-PmKjZ5t0"
}
```

VC Type Metadata Doc

```
{
    "vct": "https://betelgeuse.example.com/education_credential",
    "name": "Betelgeuse Education Credential - Preliminary Version",
    "description": "This is our development version of the education credential..",
    "extends": "https://galaxy.example.com/galactic-education-credential-0.9",
    "extends#integrity": "sha256-9cLlJNXN-TsMk-PmKjZ5t0WRL5ca_xGgX3c1VLmXfh-WRL5",
    "schema_uri": "https://exampleuniversity.com/public/credential-schema-0.9",
    "schema_uri#integrity": "sha256-o984vn819a48ui1llkwPmKjZ5t0WRL5ca_xGgX3c1VLmXfh"
}
```

➞ Governance bodies govern and manage VC metadata types and schemas.

➞ In our specific PoC, to centralize governance, metadata and schemas were stored in **Trust Registries**, acting as an authority within the ecosystem.

LATEST ADDITIONS

VC Type Metadata Key Features

→ Name, description
info of the type

→ Inheritance
can extend other(s) type metadata.

→ Schema
credential json-schema, embedded or uri

→ Display
how to display the credential by locale
simple or rendering svg templates (latest draft)

→ Claims
claims labels and description by locale
indicate if claim is selectively disclosable: *always, allowed, never*

***Priority over OPENID4VCI issuer metadata**

LESSON LEARNED

VC Type Metadata – Lesson learned

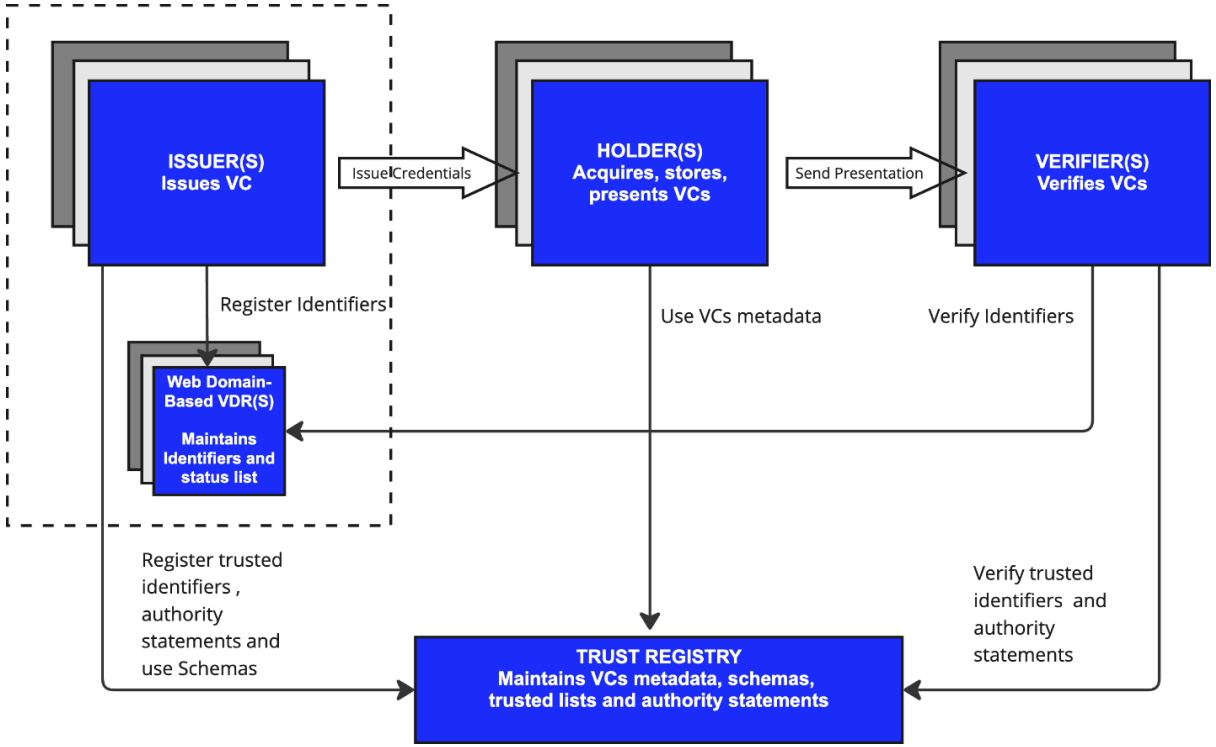
BENEFITS

- **Document is now accessible by all actors of the ecosystem.**
  e.g.: Verifiers now have full information about claims and if they are selectively disclosable.
- **Improved VC display capabilities.**
- **Governance bodies can enforce VC Type standardisation via inheritance.**
- **Actors of ecosystem can extend VC type to personalise display information**
  Logos, look and feel, translations.. Etc

CHALLENGES

- **Consumers must process first the base (extended) metadata**
- **Limited compatibility with other standards like PEX 2.0**
  Presentation definition cannot query for inheritance. It MAY BE supported by Query Language
- **Evolving between specification drafts**

Ecosystem and Trust Registries

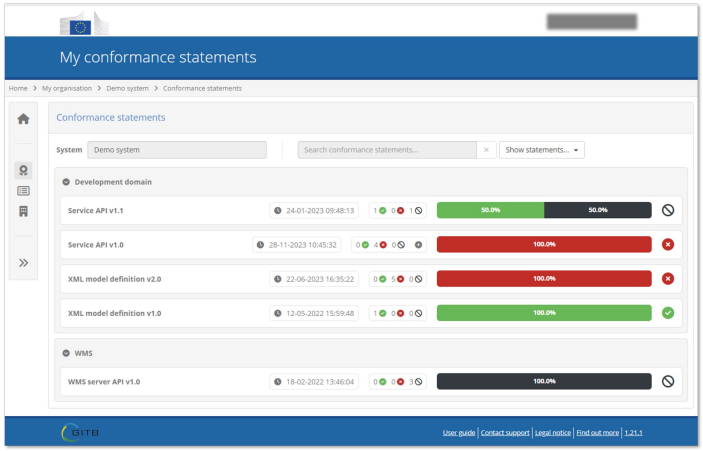


Interoperability tooling

Goal
Automate the conformity testing of an interop profile implementation.

→ **Automation**
→ **Fast feedback**
→ **Easier onboarding**

Example:
EWC uses **I**nteroperability **T**est **B**eds based on an EU open-source project.



LESSON LEARNED

Interoperability – our experience

➞ **Narrow down specs and limit optionality** to accelerate implementation adoption and lower costs of development

➞ Be aware of the **cost to work with Draft Specification**, ideally use final versions not draft.

➞ **Freeze, deliver and repeat**

➞ **Automate via conformity test beds** to accelerate onboarding of implementers in the ecosystem.

Thank you

SICPA