ICAO

2025 ICAO TRIP SYMPOSIUM

MONTRÉAL , CANADA | NOVEMBER 4 - 6

Dion Chamberlain

Chairperson, ICAO Implementation and Capacity Building Working Group (ICBWG)

Co-Chair ICAO DTC Policy Sub-Group

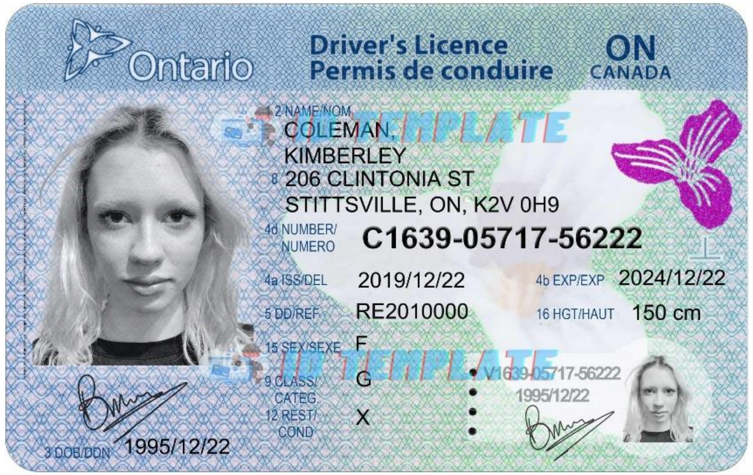
Director International and Product Strategy, Department of Internal Affairs, New Zealand

FAL Panel and TAG-TRIP Delegate for New Zealand

DIGITAL TRAVEL CREDENTIAL

DTC

VOTE: Are these passports?



Ontario

Driver's Licence
Permis de conduire

ON
CANADA

1,2 NAME/NOM
COLEMAN,
KIMBERLEY

8 206 CLINTONIA ST
STITTSVILLE, ON, K2V 0H9

4d NUMBER/NUMERO C1639-05717-56222

4a ISS/DEL 2019/12/22

4b EXP/EXP 2024/12/22

5 DD/REF RE2010000

16 HGT/HAUT 150 cm

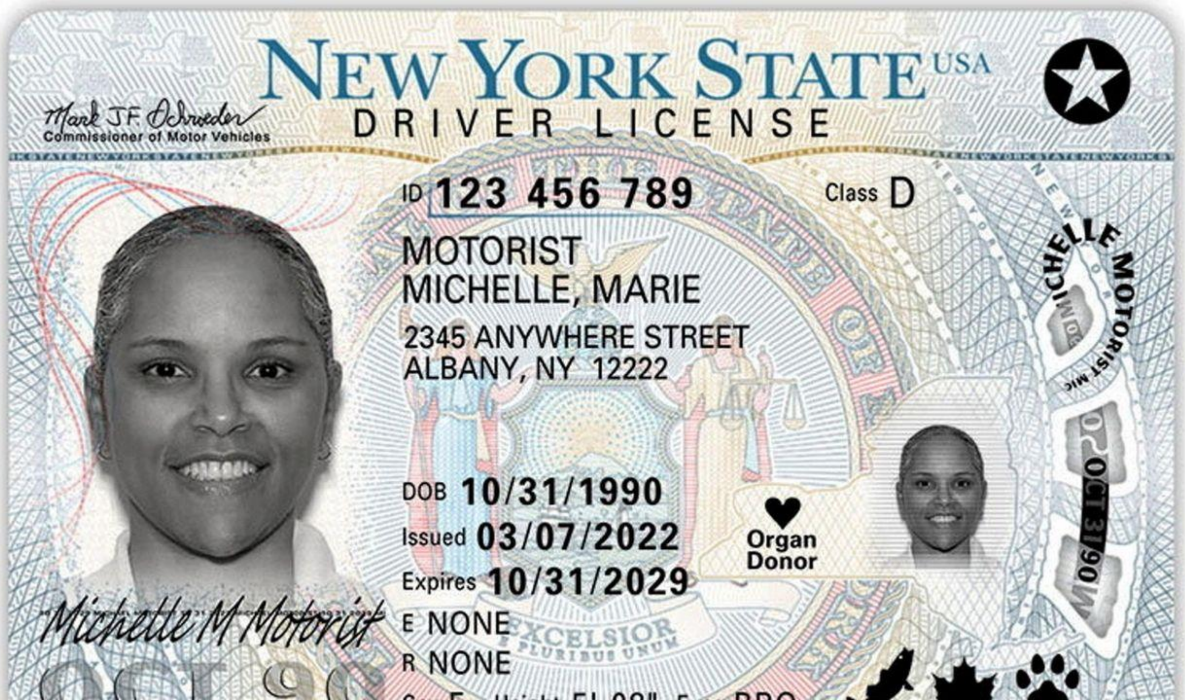
15 SEX/SEXE F

9 CLASS/CATEG G

12 REST/COND X

3 DOB/DDN 1995/12/22

V1639-05717-56222
1995/12/22



NEW YORK STATE USA

DRIVER LICENSE

Mark JF Schroeder
Commissioner of Motor Vehicles

ID 123 456 789

Class D

MOTORIST
MICHELLE, MARIE

2345 ANYWHERE STREET
ALBANY, NY 12222

DOB 10/31/1990

Issued 03/07/2022

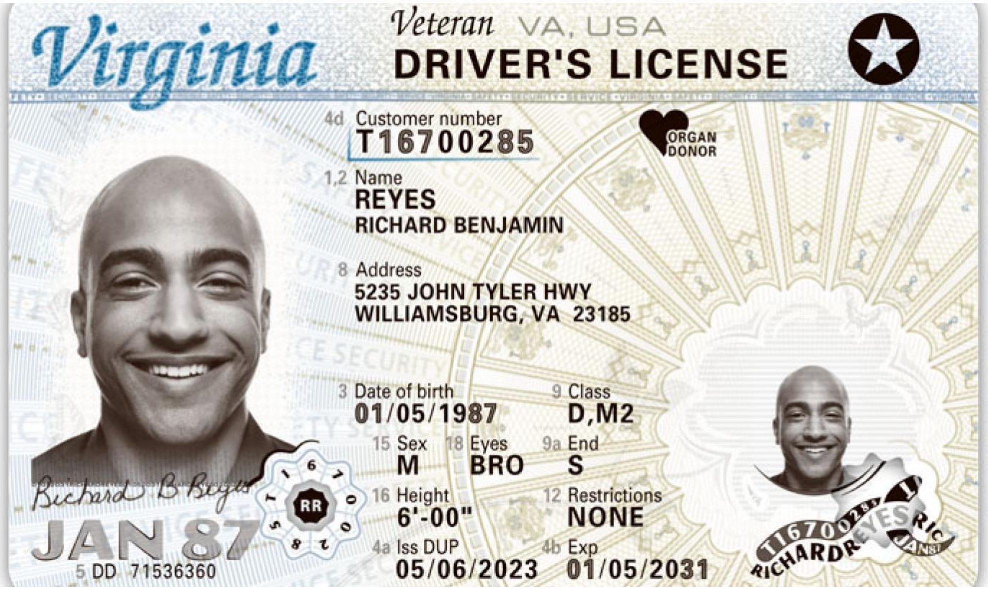
Expires 10/31/2029

E NONE

R NONE

Organ Donor

Michelle M Motorist



Virginia

Veteran VA, USA

DRIVER'S LICENSE

4d Customer number
T16700285

ORGAN DONOR

1,2 Name
REYES
RICHARD BENJAMIN

8 Address
5235 JOHN TYLER HWY
WILLIAMSBURG, VA 23185

3 Date of birth 01/05/1987

9 Class D,M2

15 Sex M

18 Eyes BRO

9a End S

16 Height 6'-00"

12 Restrictions NONE

4a Iss DUP 05/06/2023

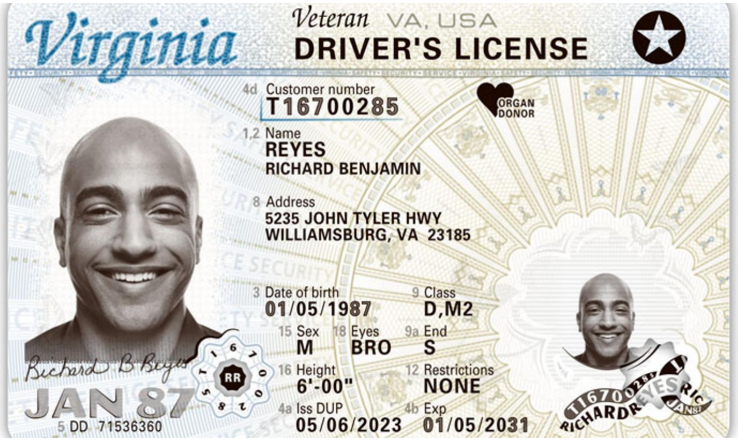
4b Exp 01/05/2031

Richard B Reyes

JAN 87

5 DD 71536360

And yet … when it is turned into a credential, put on a phone and used to clear border security …



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05/06/2023

4b Exp
01/05/2031

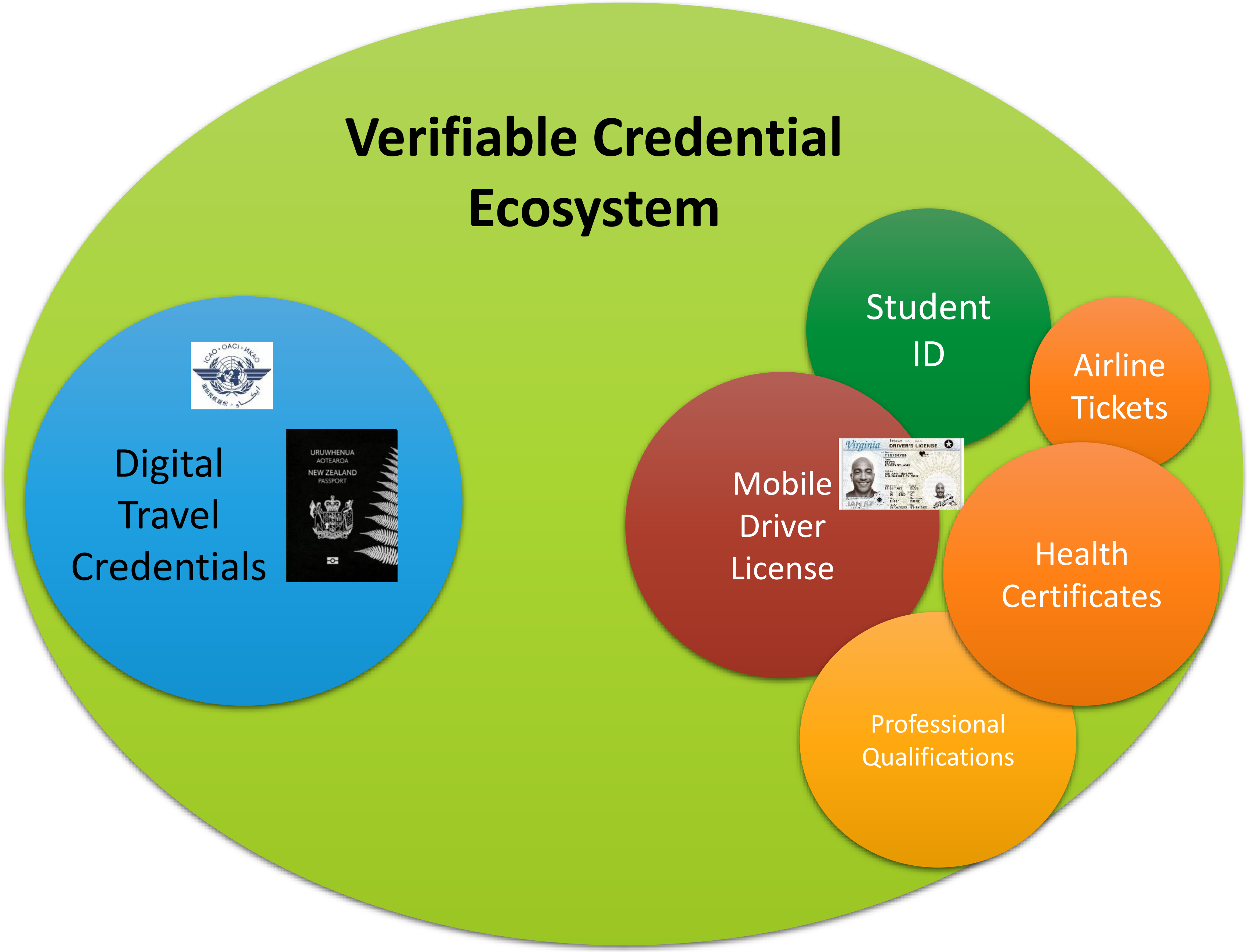
Richard B Reyes

JAN 87

5 DD 71536360

People start to think they are.

Verifiable Credential Ecosystem



Digital Travel Credentials

Student ID

Airline Tickets

Mobile Driver License

Health Certificates

Professional Qualifications

What gets even harder is when entities use the passport chip data to create verifiable credentials

BUT THEY START MESSIN’ WITH IT

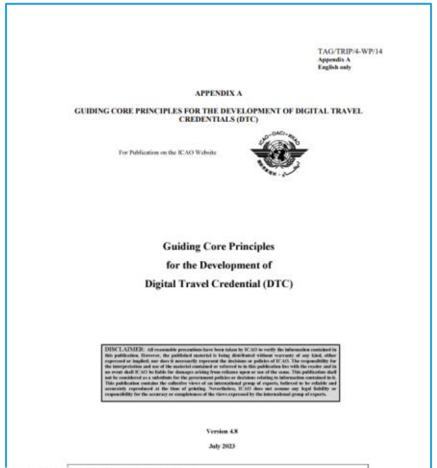
… AND CALLING IT A DTC

DTC Definition – Policy Paper

Travel credential in a digital format that conforms with the specifications contained in Doc. 9303 that is meant to temporarily or permanently substitute a conventional passport with a digital representation of the traveller's identity.

ICAO DTC Characteristics

- Intended and **specified** first and foremost for border clearance (ICAO)
- Globally interoperable
- Includes the facial biometric
- Signed by the issuing State (ePassports PKI)
- Like the passport, it is normally an assertion of bearer’s nationality



TAG/TRIP/4-WP/14
Appendix A
English only

APPENDIX A

GUIDING CORE PRINCIPLES FOR THE DEVELOPMENT OF DIGITAL TRAVEL CREDENTIALS (DTC)

For Publication on the ICAO Website

Guiding Core Principles
for the Development of
Digital Travel Credential (DTC)

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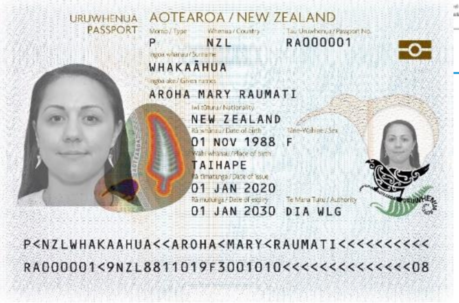
Version 4.8

July 2023

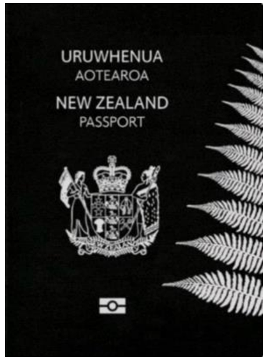
el Credential Specifications (DTC).doc
ification Programme (TAG/TRIP), Subgroup of the New Technologies Working



URUWHENUA PASSPORT
AOTEAROA / NEW ZEALAND

Momo / Type: P
Whenua / Country: NZL
Tau Uruwhenua / Passport No.: RA000001
Ingoa whānau / Surname: WHAKAĀHUA
Ingoa ake / Given names: AROHA MARY RAUMATI
Iwi tūturu / Nationality: NEW ZEALAND
Rā whānau / Date of birth: 01 NOV 1988
Tāne-Wahine / Sex: F
Wāhi whānau / Place of birth: TAIHAPE
Rā tīmatanga / Date of issue: 01 JAN 2020
Rā mutunga / Date of expiry: 01 JAN 2030
Te Mana Tuku / Authority: DIA WLG

```
P<NZLWHAKAAHUA<<AROHA<MARY<RAUMATI<<<<<<<<<<
RA000001<9NZL8811019F3001010<<<<<<<<<<<<<<08
```



From ePassport to the ICAO DTC-VC and DTC-PC (Hybrid Model) – based on slides by R Rajeshkumar

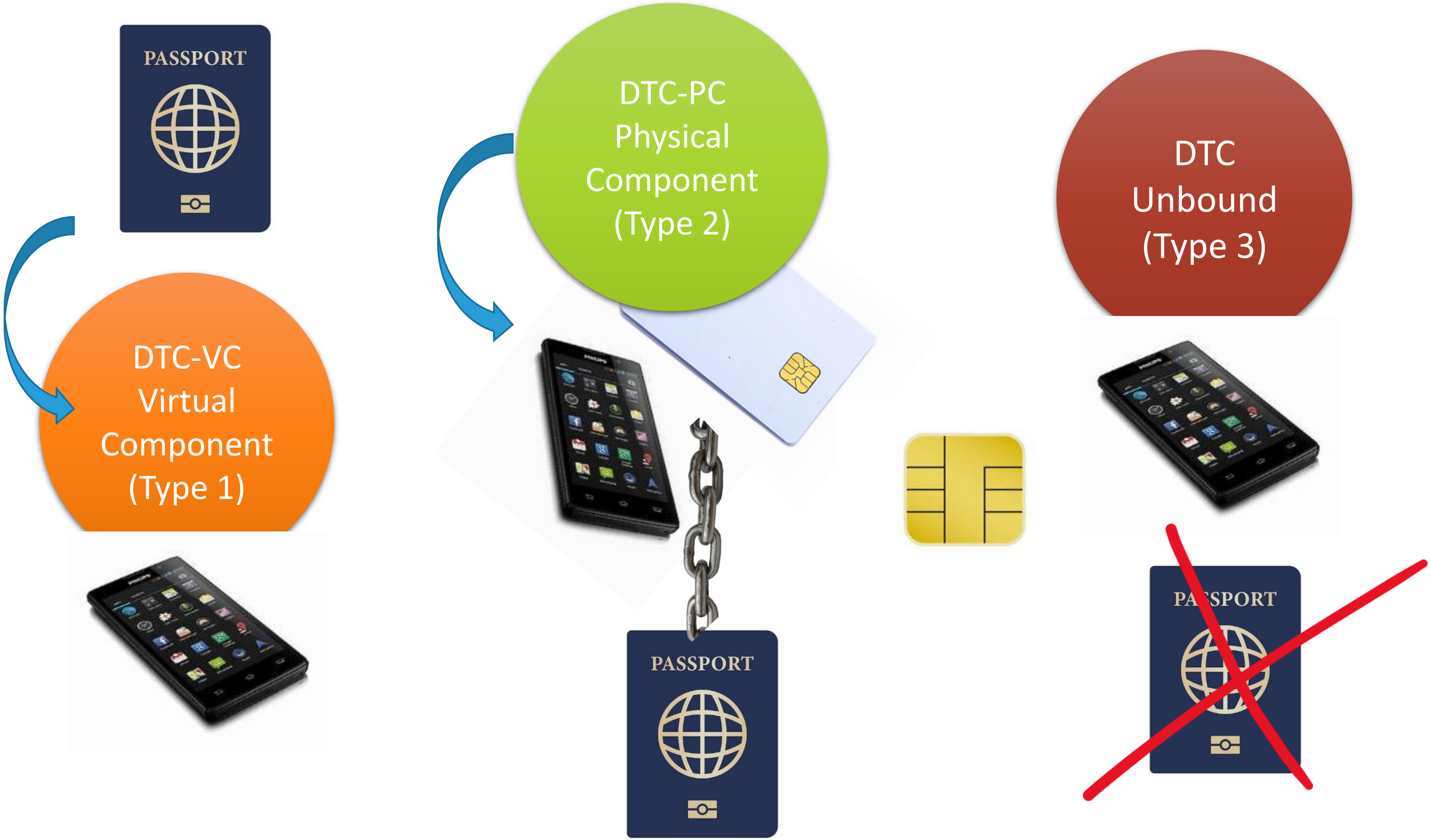
- Logical Data Structure;
- Security Object.

URUWHENUA
AOTEAROA
NEW ZEALAND
PASSPORT
VC
PC

- Crypto chip;
- Secure memory;
- AA/CA private key.

An ePassport can be viewed as a combination of:

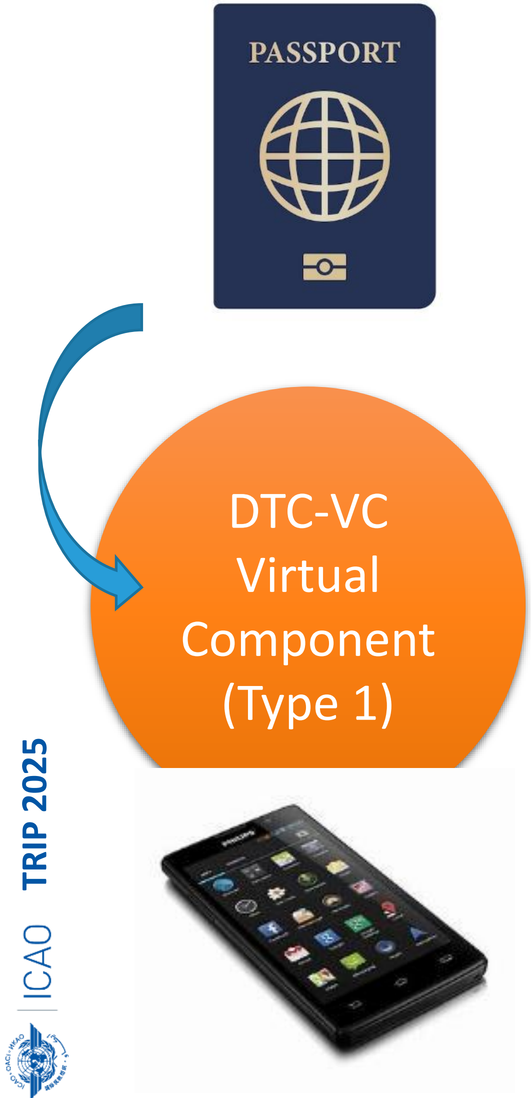
- A **Virtual Component (VC)** consisting of the data contained in the chip;
- A **Physical Component (PC)** consisting of the booklet and/or cryptographic link between the VC and the PC and acts as an **authenticator** (second factor).



DTC-VC
Virtual
Component
(Type 1)

DTC-PC
Physical
Component
(Type 2)

DTC
Unbound
(Type 3)



DTC-VC
Virtual
Component
(Type 1)

DTC – VC (Type 1)
Exact copy of information (from ePassport) – same validity

Can have a secondary wrapper or container when sending

Can be stored and transmitted from phone

Reliant on Passive Authentication (PKI) and Facial recognition by receiving party (binding on presentation at Border or possibly prior on phone/app)

Infinitely clonable

No device or chip authentication

No secure authentication with reader

DTC-PC Physical Component (Type 2)

DTC – PC (Type 2)

Contains the virtual component but also has a secondary Physical Component (card or mobile device)

Secondary components are cryptographically linked to passport

Provide opportunities to add other information (e.g. up to date photo)

Other components/devices can have shorter validity

Mobile device security challenges

No secure transmission between device and reader

Partly specified

DTC
Unbound
(Type 3)

DTC – Unbound (Type 3)

No passport

Pushed or enrolled onto a device by the issuing authority

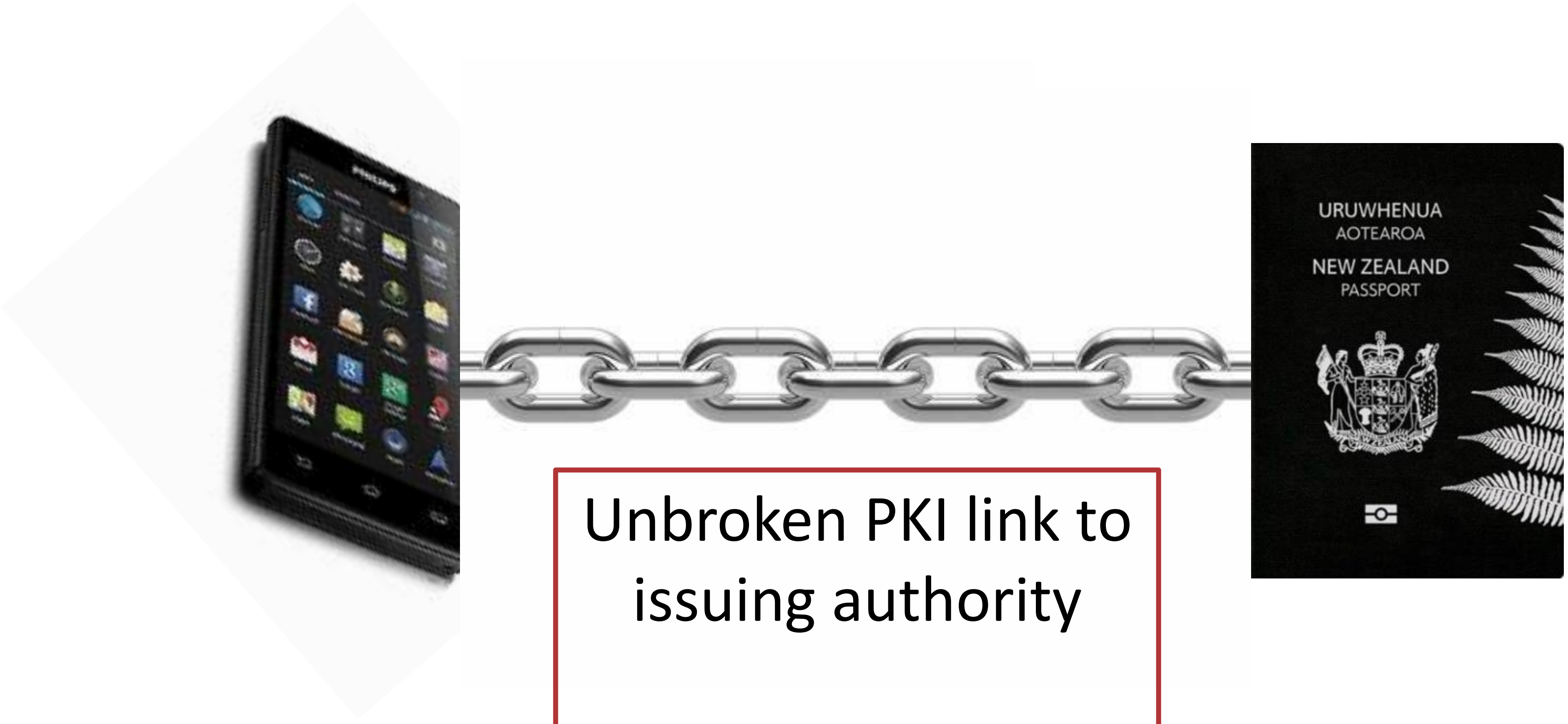
The 'endgame' in everyone's mind

Emergency/single trip may be a great early use case

Not specified

No passport

ICAO Digital Travel Credential

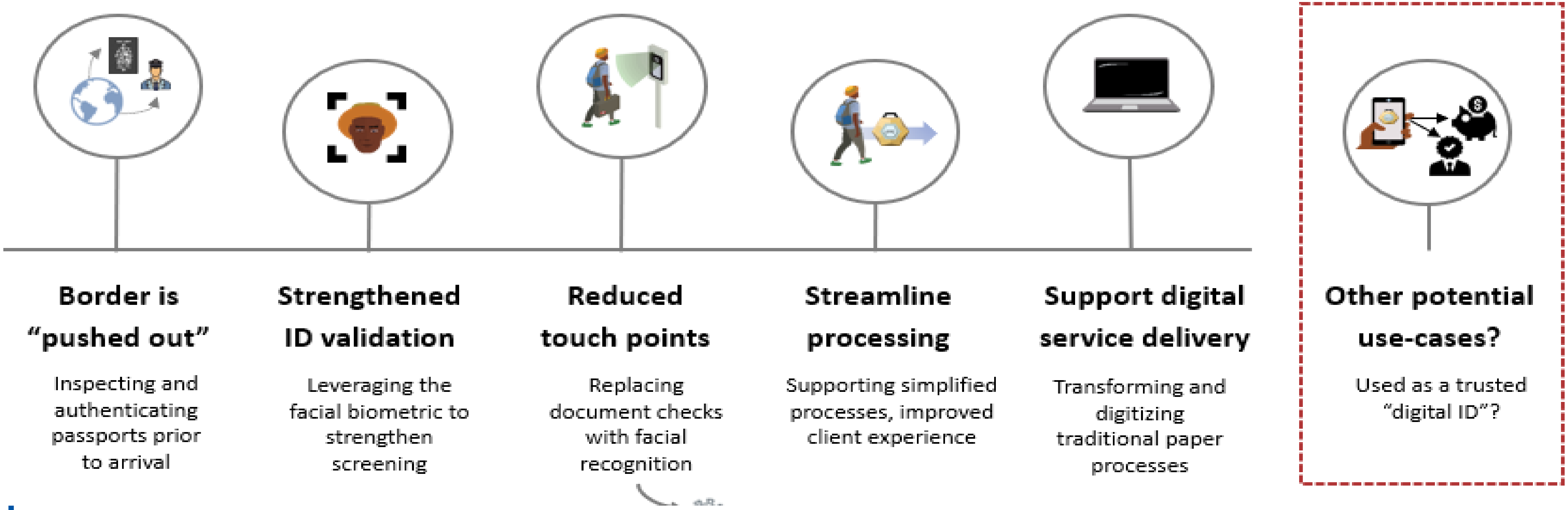


Unbroken PKI link to issuing authority

PKI available without impediment

Use Cases :

- Seamless Travel
- Advance Travel Authorization (ETA/DTA/…)
- Improving border processing time
- Emergency Travel Document



Border is “pushed out”

Inspecting and authenticating passports prior to arrival

Strengthened ID validation

Leveraging the facial biometric to strengthen screening

Reduced touch points

Replacing document checks with facial recognition

Streamline processing

Supporting simplified processes, improved client experience

Support digital service delivery

Transforming and digitizing traditional paper processes

Other potential use-cases?

Used as a trusted “digital ID”?

ICAO DTC Specifications (NTWG)

- ICAO DTC-VC Technical Report approved in 2020
- ICAO DTC-PC specifications divided into phases
    - Phase 1 – maintain backward compatibility (inspection systems) and replicate behavior of eMRTD – The Technical Report approved 2023
    - Phase 2 – investigate other form factors like mobile phones – gap analysis
    - **Later** phases – ISO, NTWG working on mobile-phone security
- Privacy and Transmission protocols - **NOW**

Draft Transmission Protocols (1)

For discussion at TAG-TRIP (12-14 November 2025)

1. The holder of the DTC must consent to the transmission of the DTC-VC

2. The endpoint to which the DTC is submitted must be authenticated and this endpoint must be verifiable by the submitter

3. The DTC-VC must not be transmitted in an unencrypted form. It must be encrypted specifically for the intended recipient, ensuring that only the authorized endpoint can access the data. Relying solely on Transport Layer Security (TLS) encryption at the transport layer is insufficient for this purpose.

Draft Transmission Protocols (2)

4. If the submission to the endpoint happens through intermediaries routing the information to the endpoint, the intermediate entities should not be able to access the DTC-VC information. Additional information that allows the intermediaries to route the DTC-VC to the correct end-point should be part of the transmitted datagram

5. The transmission protocol shall allow for the transmission of additional information (e.g. flight number, destination, date etc.) to be added to the transmitted datagram

6. An endpoint response must be sent back to acknowledge receipt of the DTC-VC

Draft Transmission Protocols (3)

7. The endpoint response may contain information that the DTC holder can additionally provide as supplementary information as part of the protocol or in another manner. The protocol always ends with the response given by the endpoint.

8. If the DTC-VC is in the ID wallet and there is additional information available in another application on the same mobile device, the ID wallet can obtain the necessary information directly from the other application. A standardized interoperable mechanism for retrieving information must be used in communication between applications.

9. The eMRTD trust framework shall be the basis of trust in the transmission.

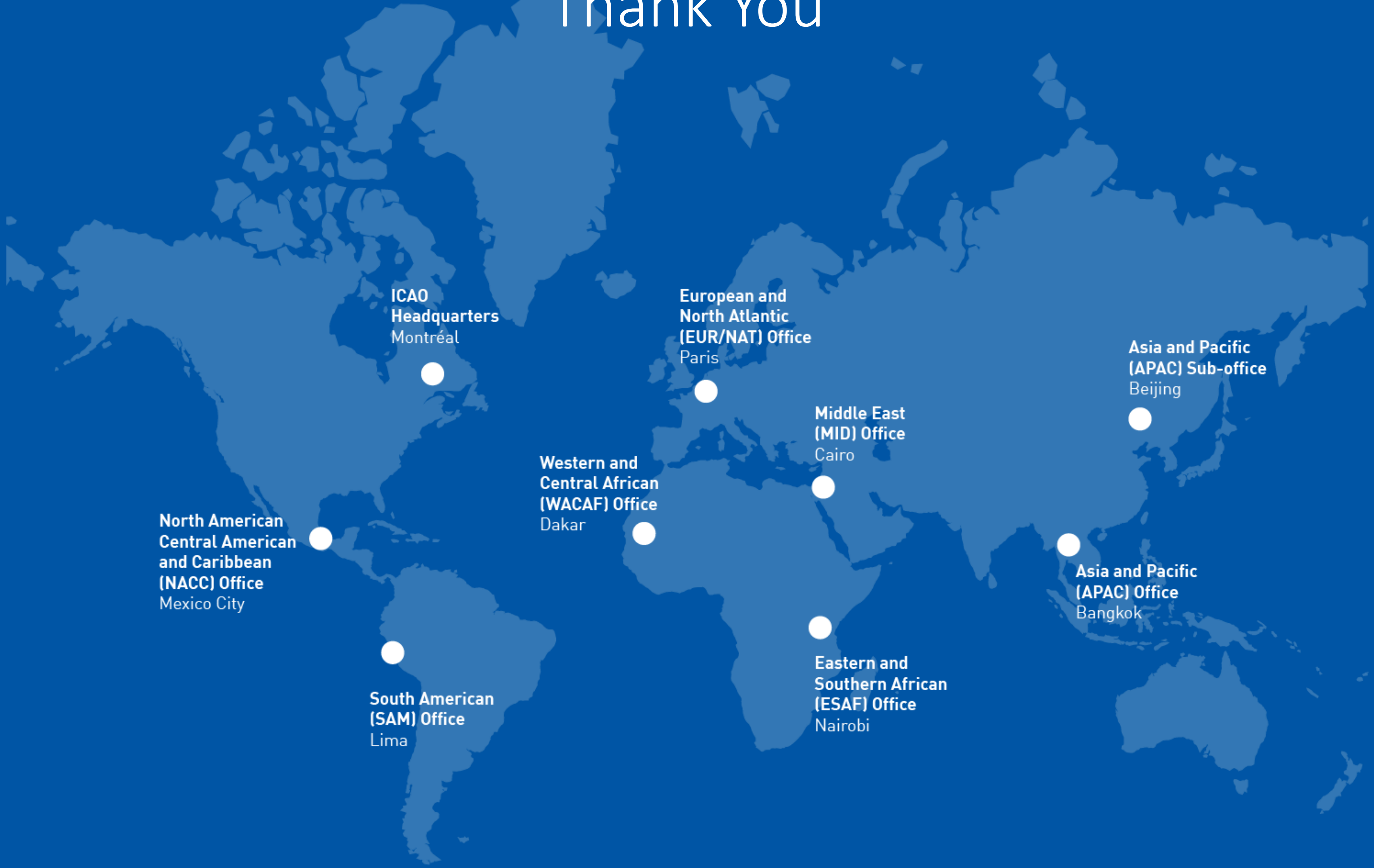
Next steps

- Pilots … we are learning a lot
- Device security
- Transmission protocols
- Convergence … how will the DTC work within the wider verifiable credential ecosystem in a seamless and usable way (wallets, airline flows etc)

DTC

DON’T BE MESSIN’ WITH IT

Thank You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