



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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RECONNECTING **THE** WORLD

ICAO Digital Travel Credentials (DTC) & Digital Travel Authorizations (DTA)

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From ePassport to the ICAO DTC Virtual Component and Physical Component



An ePassport can be viewed as a combination of:

- Virtual Component consisting of Data Group 1 and Data Group 2 of the eMRTD Logical Data Structure (LDS); and
- A Physical Component consisting of the chip/booklet and/or cryptographic link between the VC and the PC and acts as an authenticator (second factor).

What is a Digital Travel Credential (DTC)?

An interoperable, secure and verifiable digital identity, based on the trusted and tested eMRTD

eMRTD chip contains verifiable digital data

- document info
- biographic data
- facial image

DTC is essentially a digital replica of the chip

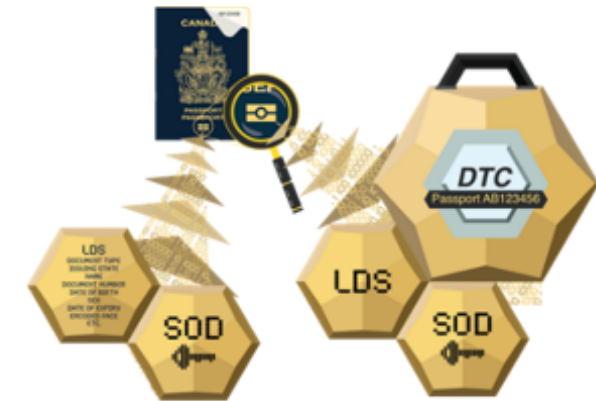
- shared in advance of travel
- enables remote travel document inspection
- facilitates increasingly touchless processing



What is a Digital Travel Credential (DTC)?

A **DTC** is an **electronic machine-readable document (eMRTD)** in a digital format consisting of a virtual component and a physical component, conforming with the specifications contained in DTC Technical Reports (and once incorporated, Doc 9303), which maintains a cryptographic link to the issuing authority and can be used in place of a physical passport.

It's the **conformance with ICAO's Doc 9303** which makes a DTC **ICAO-compliant** (or not).



ePassport chip data is stored in a globally interoperable format: the Logical Data Structure or LDS. The information required to verify the primary LDS data is stored in a separate component of the chip, called the Document Security Object or SOD.

DTC Overview Continued

Three DTC Types have been developed for measured implementation and to ensure backwards compatibility

DTC Type 1 *eMRTD bound DTC*

- Derived from eMRTD**
- VC created from eMRTD chip
 - PC = physical eMRTD
 - MUST be accompanied by passport book



DTC Type 2 *eMRTD-PC bound DTC*

- Issued alongside eMRTD**
- VC created from eMRTD chip
 - VC is cryptographically linked to another PC, e.g. a physical device apart from eMRTD
 - SHOULD be accompanied by physical passport during travel



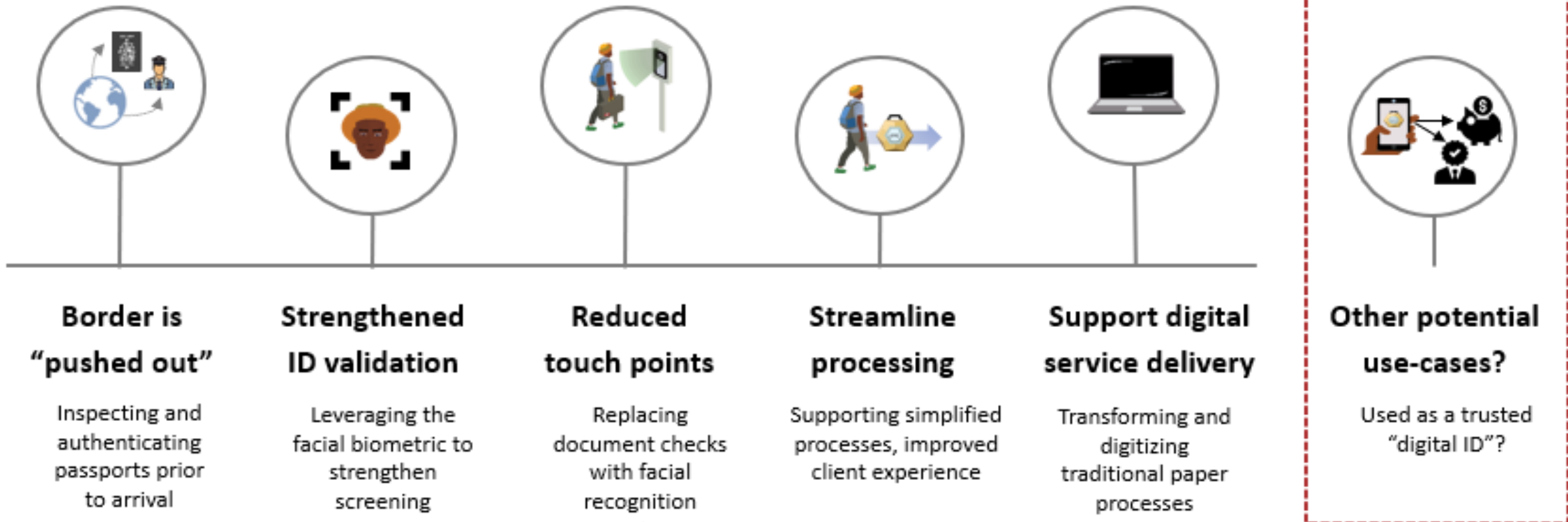
DTC Type 3 *PC bound DTC*

- No eMRTD issued**
- VC issued to a physical device (PC) with a cryptographic link
 - May have unique characteristics (e.g., passport number, validity, digital signature, etc.)



DTC Use Cases:

- Seamless Travel
- Advance Travel Authorizations (API / ETA / DTA)
- Improving Border Processing Time
- Emergency Travel Documents



Passport Issuer's Perspective

Operationalizing the DTC has implications for travel document issuing authorities

Ensuring global interoperability

- Compliance with DTC-VC and DTC-PC specifications

Identifying operational requirements

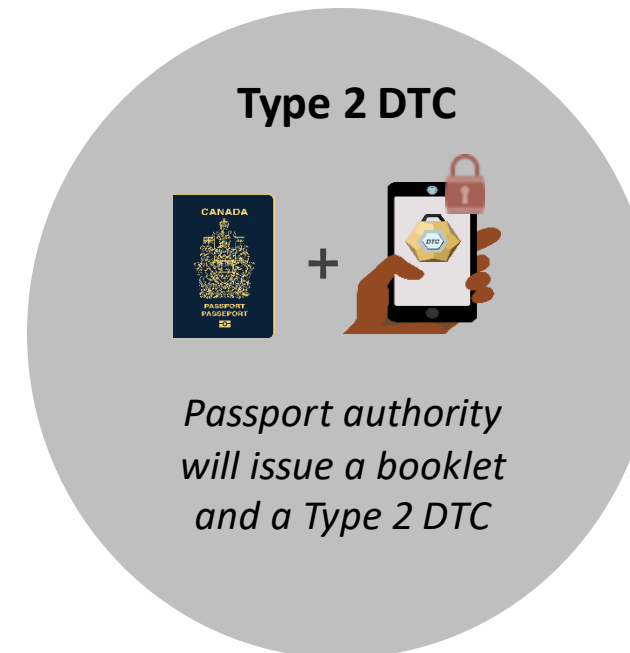
- Which type of form factor?
- Form factor supporting tools (e.g., app for mobile?)

Outlining program policy

- Validity period?
- Incorporate optional additional data elements?
- Safeguarding privacy
- Ensuring access and inclusivity

Defining service delivery

- How “touchless” can the issuance process be?
- Responding to evolving client expectations



ICAO DTC – To be or not to be

- **DTC Type 1 is essentially a digital replica of the chip.**
- It is the extraction of the data from the ePassport chip as a VC and placed into another digital medium or simply transferred.
- If the DTC are re-branded as micro-credentials and signed by an entity other than the issuing authority, **then this cannot be considered an ICAO DTC.**



ICAO Datastructure for Barcode (IDB)

- Digitally signed 2D barcode
- Provides security improvement for (usually paper based) documents having no microchip
- Re-uses the eMRTD PKI model:
 - CSCA => Barcode Signer => Signature
- Storage capacity barcodes is usually limited to a few kByte at most and neither the data nor the cryptographic keys or schemes for the digital seal can be updated on existing documents – no cryptographic agility
- Does not provide any protection against cloning (no active and/or chip authentication)

Barcode Use Cases

Constrained Environments

Visa Stickers

Emergency Travel Documents

Non- Constrained Environments

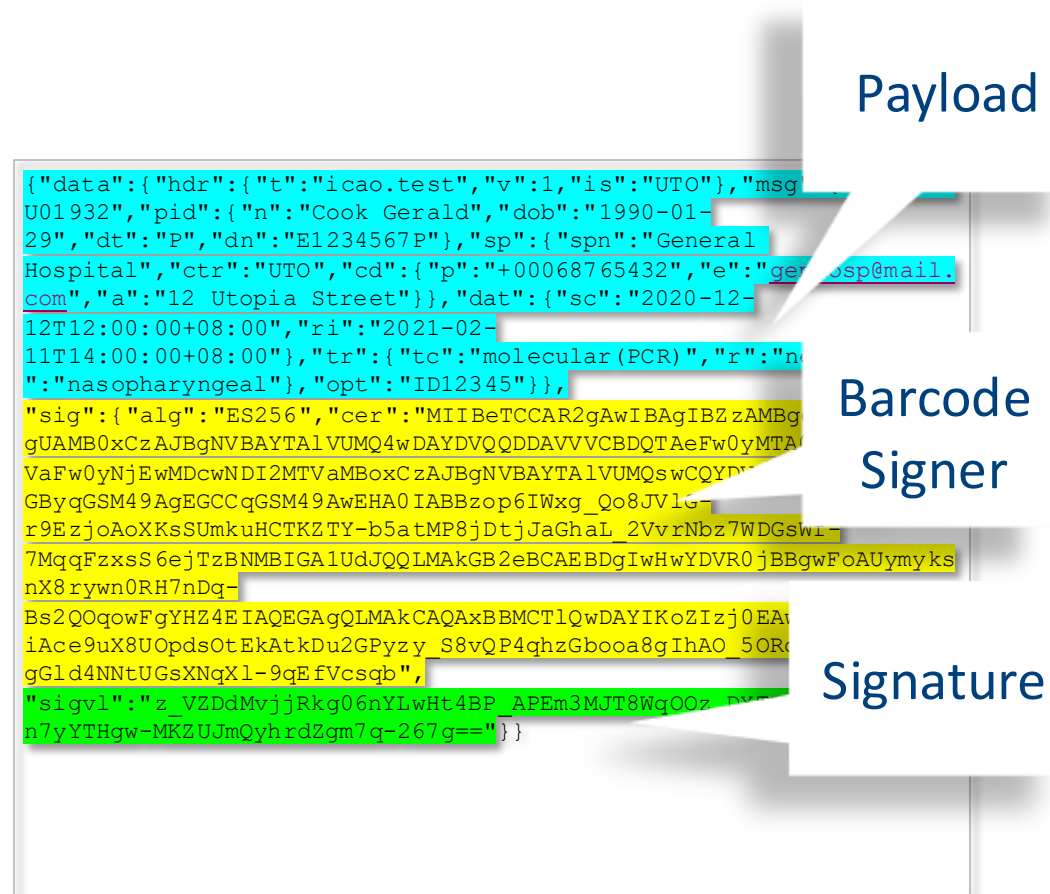
Health Proofs:

- Proof of Covid Testing
- Proof of Covid Vaccination
- Proof of Covid Recovery

Digital Travel Authorization (DTA)

Benefits of non-constrained barcode environments

- Uses I-JSON structure – makes it readable using any scanner
- Barcode Signer is included in the barcode – so distribution of barcode signer is not a problem
- Barcode Signer and Signature contained in barcode – so offline verifiable



Visas and Travel Authorizations

ICAO Doc 9303 and Annex 9 set the framework for visas and authorizations to travel, and related verification processes:

Credentials



- Machine Readable Visas (MRV)
 - Physical Visas
- Digital Travel Authorizations (DTA)
 - Non-Physical Visas

Process

- Electronic Travel Systems (ETS)

Digital Travel Authorization (DTA)

- Non-physical visa
- Designed for online application and issuance in digital format, with paper printing possible
- ICAO has standardized the “eVisa” with prescribed data content and format according to Doc 9303, Part 7
- 2D barcode with a verifiable digital signature

Digital Travel Authorization	Issued by UTO	Version 1	DTA Number: N156702B
PERSONAL INFORMATION			
Name of the Holder: Anna Maria Eriksson	Date of Birth: 1952-03-11	Nationality: USA	Sex: F
Passport Number: L8988901C			
DIGITAL TRAVEL AUTHORIZATION			
Place of Issue: Peacetown	Valid From: 2021-06-06	Valid Until: 2026-06-06	
Duration of Stay: 5 years, 0 months, 0 days	Number of Entries: Multiple	Type/Class/Category: Tourist	
Additional Information: Employment Prohibited			
			

Why issue a DTA?

- Globalization and standardization of “eVisa” system
- To facilitate international travel of citizens, especially for States with Batch API
- Use existing State-owned PKI infrastructure to save costs when issuing and inspecting DTA
- Use the ICAO Public Key Directory (PKD) as a multilateral distribution mechanism for PKI certificates

Electronic Travel Systems (ETS)

- ETS is not a visa or a credential
- ETS describes a validation process
- Aircraft operator transfers passport data via interactive API to the receiving State, which conducts system-based checks against records they hold in their databases
- ETS falls within Annex 9 RPs for Passenger Data Systems (Ch. 9)
- Primary use case is granting ***Electronic Travel Authorizations (ETA)***
- Traditionally for visa waiver nationals
- ETA is designed for online application and notification of approval
- In this scenario a barcode is only needed as a back-up

