ICAO MRTD and eMRTD Standards and Specifications

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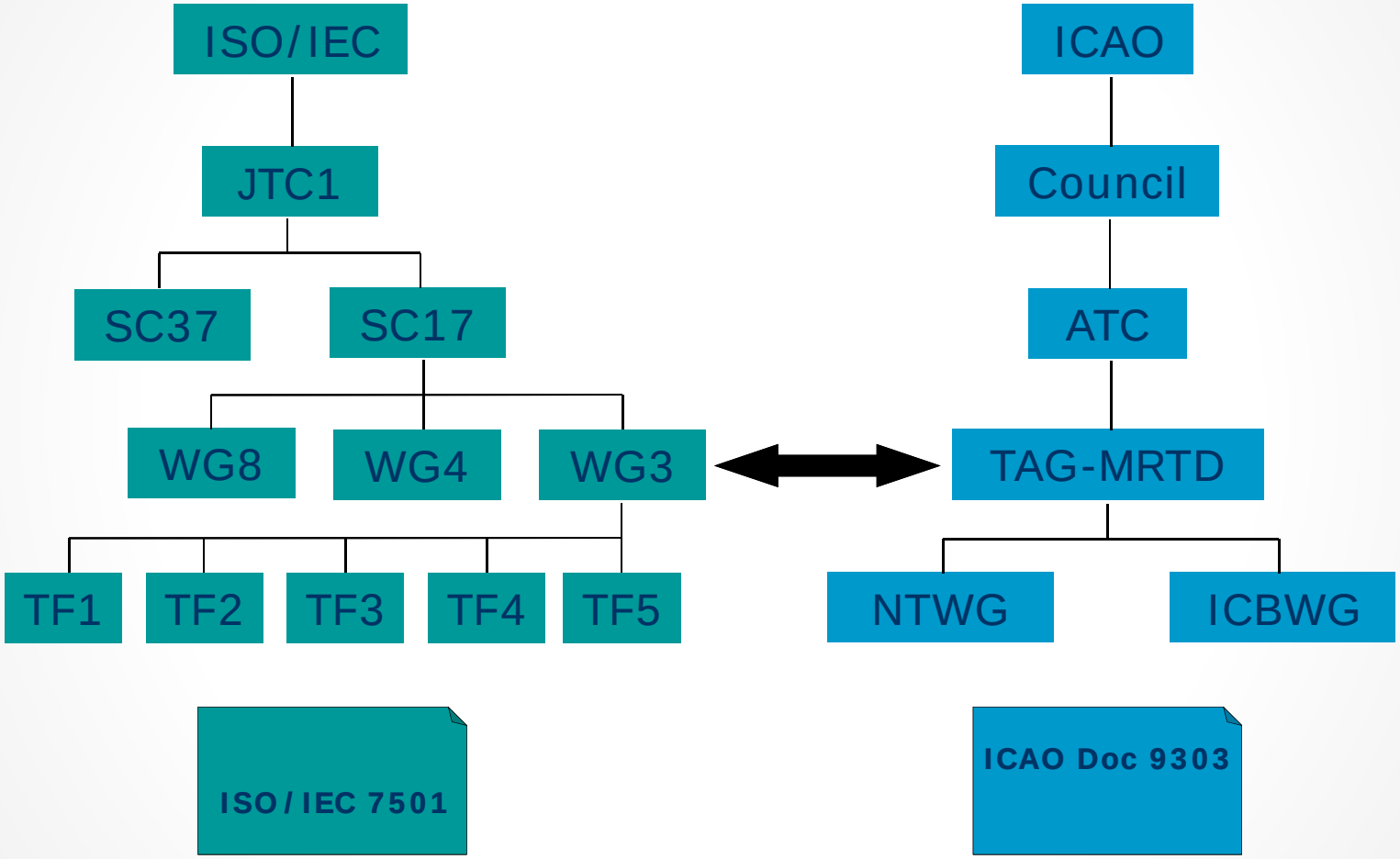
ICAO-ISO collaboration



Doc 9303

- Part 1 - Machine Readable Passports, Sixth edition - 2006
- Part 2 - Machine Readable Visas, Third edition - 2005
- Part 3 - Machine Readable Official Travel Documents, Third edition - 2008

Doc 9303 Part 1
Machine Readable Passports

- Introduction
- References and definitions
- Security of design, manufacture and issuance
  - Security standards
  - Machine assisted document security verification
  - Prevention of fraud associated with the issuance process
- Technical specifications of MRPs
  - Physical charasteristics
  - Layouts and zones
  - Data structures
  - Representations of States, Nationalities, Dates
  - Three letter codes
  - Transliterations
  - Guidelines for portraits

Doc 9303 Part 1

- Data Page
  - Zone I - Header
  - Zone II - Personal data elements
  - Zone III - Document data elements
  - Zone IV - Signature
  - Zone V - Identification feature
  - Zone VI - Optional data elements on back of data page
  - Zone VII - Machine Readable Zone (2x 44 characters)

Doc 9303 Part 1

- Data Page
  - **Zone I - Header**
  - Zone II - Personal data elements
  - Zone III - Document data elements
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  - Zone V - Identification feature
  - Zone VI - Optional data elements on back of data page
  - **Zone VII - Machine Readable Zone**

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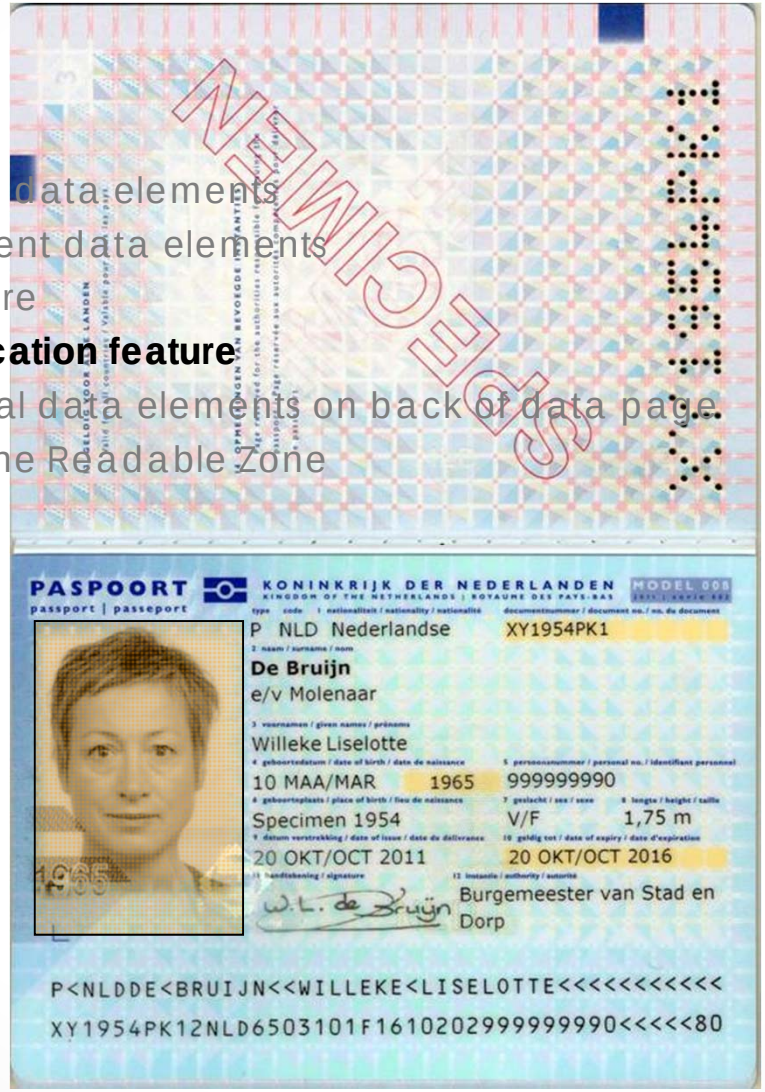
  - Zone VII - Machine Readable Zone

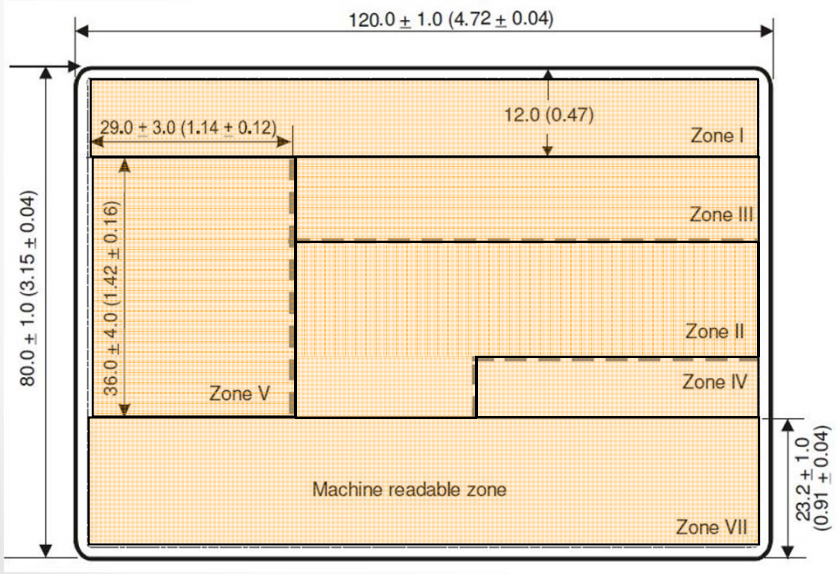


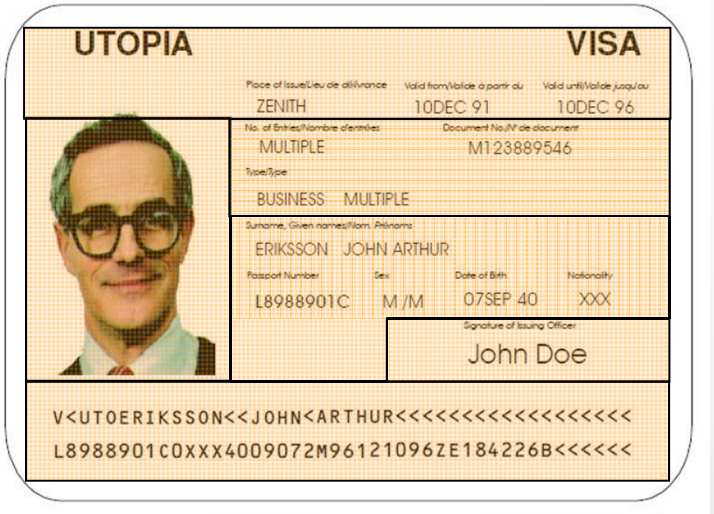
Doc 9303 Part 2
Machine Readable Visas

- Introduction
- Technical specifications for Machine Readable Visas
- Technical specifications common to all MRVs
  - Physical charasteristics
  - Security aspects
  - Layouts and zones
  - Representations of States, Nationalities, Dates
  - Machine reading requirements
  - Three letter codes
  - Transliterations
- Technical specifications for format-A MRVs
- Technical specifications for format-B MRVs

Doc 9303 Part 2

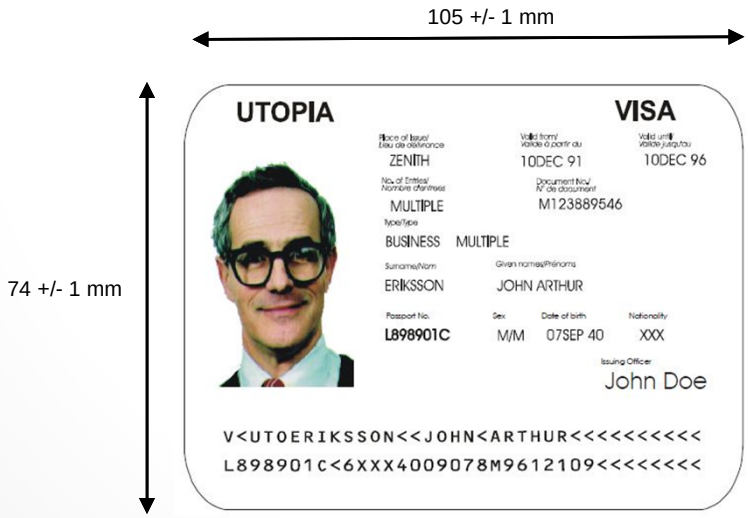
- MRV-A
  - Zone I - Header
  - Zone II - Personal data elements
  - Zone III - Document data elements
  - Zone IV - Signature
  - Zone V - Identification feature
  - Zone VII - Machine Readable Zone (2x 44 characters)





Doc 9303 Part 2

- MRV-B
  - Zone I - Header
  - Zone II - Personal data elements
  - Zone III - Document data elements
  - Zone IV - Signature
  - Zone V - Identification feature
  - Zone VII - Machine Readable Zone (2x 36 characters)

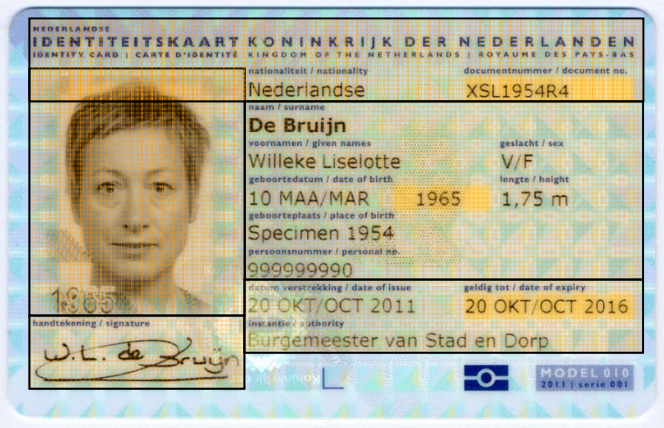


Doc 9303 Part 3
Machine Readable Official Travel Documents

- Introduction
- References and definitions
- Security of design, manufacture and issuance
  - Security of the MRtd and its personalization
  - Machine assisted document security verification
  - Prevention of fraud associated with the issuance process
- Technical specifications common to both Size 1 and Size 2
  - Physical charasteristics
  - General layouts and zones
  - Representations of States, Nationalities, Dates
  - Three letter codes
  - Transliterations
  - Guidelines for portraits
- Technical specifications unique to Size 1
  - Dimensions
  - Data structures
- Technical specifications unique to Size 2
  - Dimensions
  - Data structures

Doc 9303 Part 3

- Size 1
  - Zone I - Header
  - Zone II - Personal data elements
  - Zone III - Document data elements
  - Zone IV - Signature
  - Zone V - Identification feature
  - Zone VI - Optional data elements
  - Zone VII - Machine Readable Zone (3x 30 characters)



Doc 9303 Part 3

- Size 2
  - Zone I - Header
  - Zone II - Personal data elements
  - Zone III - Document data elements
  - Zone IV - Signature
  - Zone V - Identification feature
  - Zone VI - Optional data elements
  - Zone VII - Machine Readable Zone (2x 36 characters)

Doc 9303 Part 1/3, Volume 2

Electronically enabled MRTDs

- Physical document
  - Data Page
  - Personal and Document data elements
  - MRZ
  - Physical security features
- Electronic document
  - RFID chip
  - Personal and Document data elements
  - MRZ
  - Electronic security features

Doc 9303 Part 1/3, Volume 2

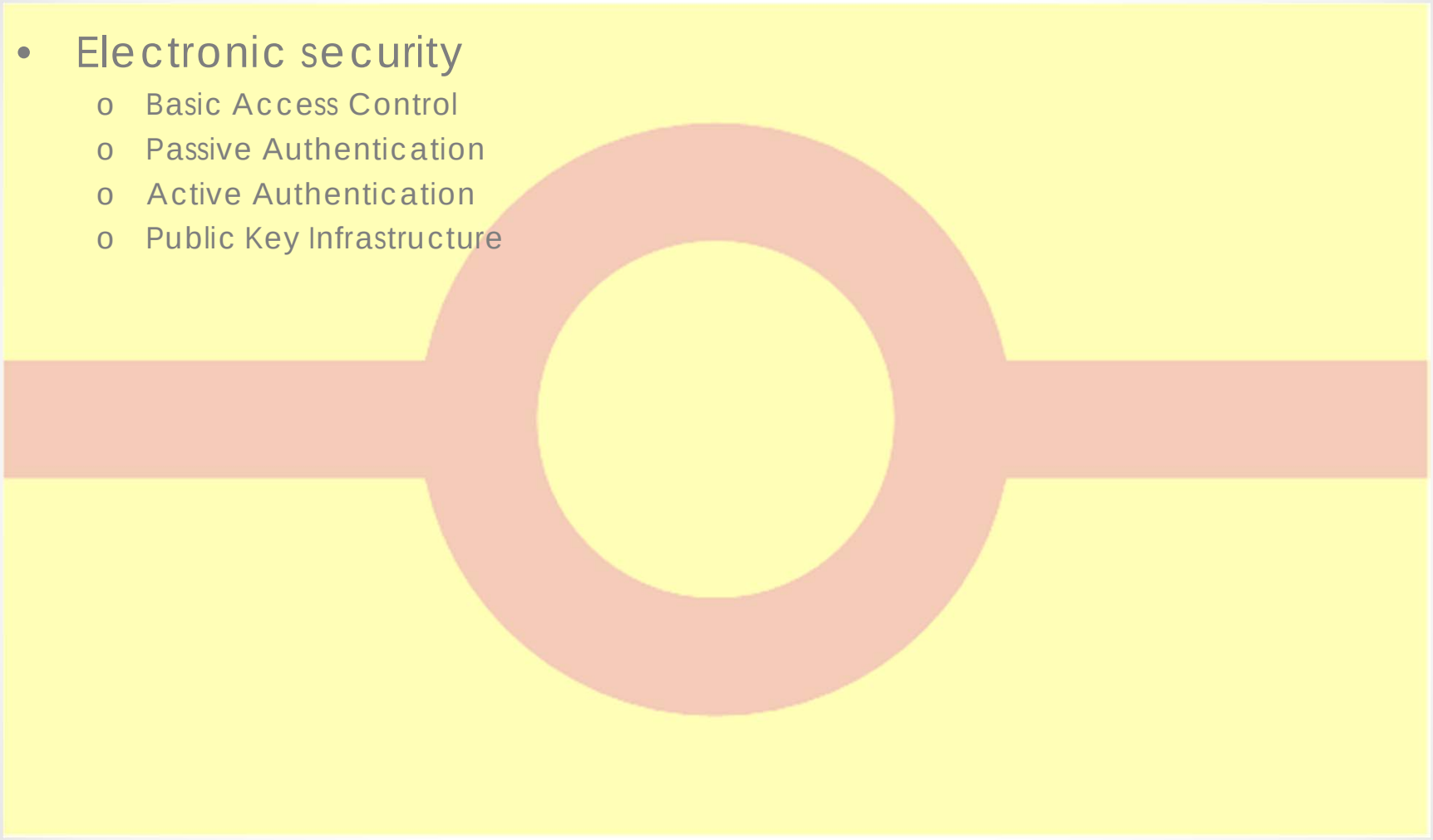
- RFID chip
  - High capacity
  - Independent of location in document
  - Capable of performing cryptographic operations
  - Existing standards (ISO/IEC)
- Biometrics - Face
  - Least cultural obstructions
  - Everybody has it
  - Capture at a distance
  - Interoperable (image)
  - Also usable without biometric verification

Doc 9303 Part 1/3, Volume 2

- Logical data Structure (LDS)
  - Data Group 01 - Machine Readable Zone
  - Data Group 02 - Encoded face
  - Data Group 03 - Encoded fingers
  - Data Group 04 - Encoded Irises
  - Data Group 05 - Displayed portrait
  - Data Group 06 - Reserved for future use
  - Data Group 07 - Displayed signature or usual mark
  - Data Group 08 - Data features
  - Data Group 09 - Structure features
  - Data Group 10 - Substance features
  - Data Group 11 - Additional personal details
  - Data Group 12 - Additional document features
  - Data Group 13 - Optional details
  - Data Group 14 - Security options for secondary biometrics
  - Data Group 15 - Active Authentication public key info
  - Data Group 16 - Persons to notify

Doc 9303 Part 1/3, Volume 2

- Electronic security
  - Basic Access Control
  - Passive Authentication
  - Active Authentication
  - Public Key Infrastructure



Basic Access Control

Privacy protection

- You can't read a closed book
  - Hand over willingly
  - Open passport book ???
- Skimming
  - Unauthorized contacting and reading
- Eavesdropping
  - On existing communications

Basic Access Control

Privacy protection

- Machine Readable Zone
  - Document Number
  - Date of Birth
  - Date of Expiry
- Anti Skimming
  - Access to the chip
- Anti Eavesdropping
  - Encrypted communications

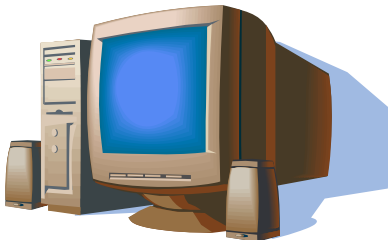
Passive Authentication
Integrity and Authenticity

- Digital Signature
  - Cryptographic operation
  - Calculated over LDS Data Groups contents
  - Stored on the MRTDs chip
  - Verifiable at inspection
- Private / Public key pair
  - Private Key for signing
  - Public Key for verification

Active Authentication

Anti copying

- Digital Signature
  - Private Key in chip's secure memory
  - Public Key in LDS Data Group 15



Passive Authentication

✓

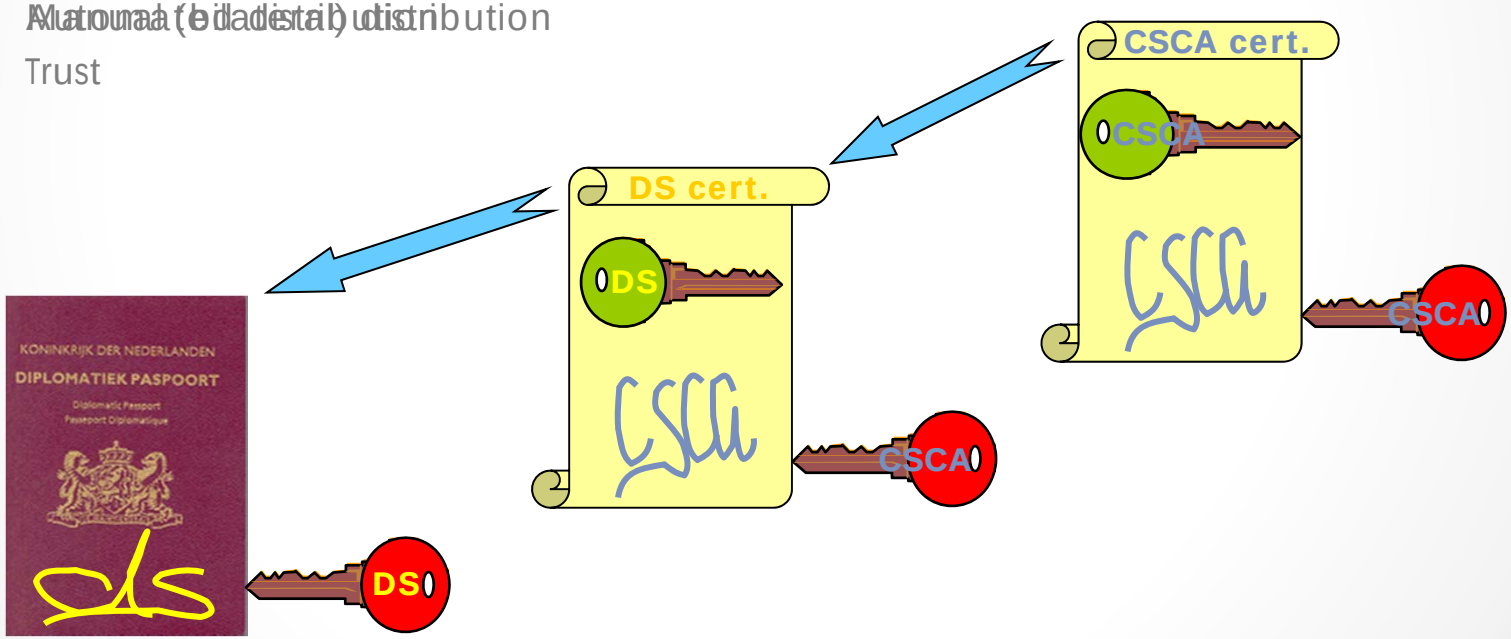
✓

Public Key Infrastructure
for Passive Authentication

- Digital Signature
  - Private Key for signing
  - Public Key for verification
- Private Key safe keeping
  - Confidentiality
  - HSM
- Public Key distribution
  - Trust
  - Authenticity
  - Integrity
  - Public Key Certificate

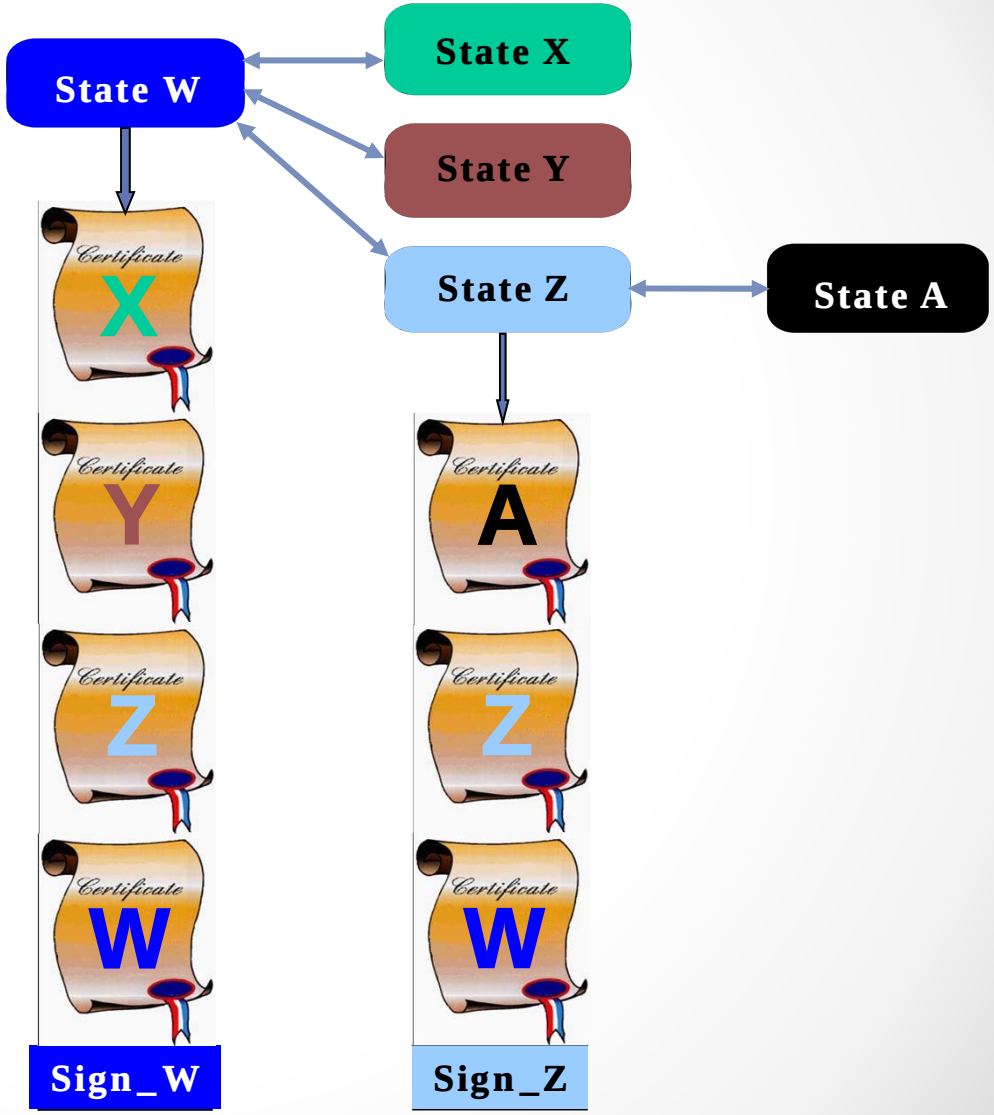
Public Key Infrastructure
Certificates

- Document Signer
- Country Signing Certification Authority
  - Not so many Document Signers
  - Long lifetime
  - CSCA certificate
  - Manual (bilateral) distribution
  - Trust
- Document Signer
  - Many documents
  - DS certificate
  - Automated distribution



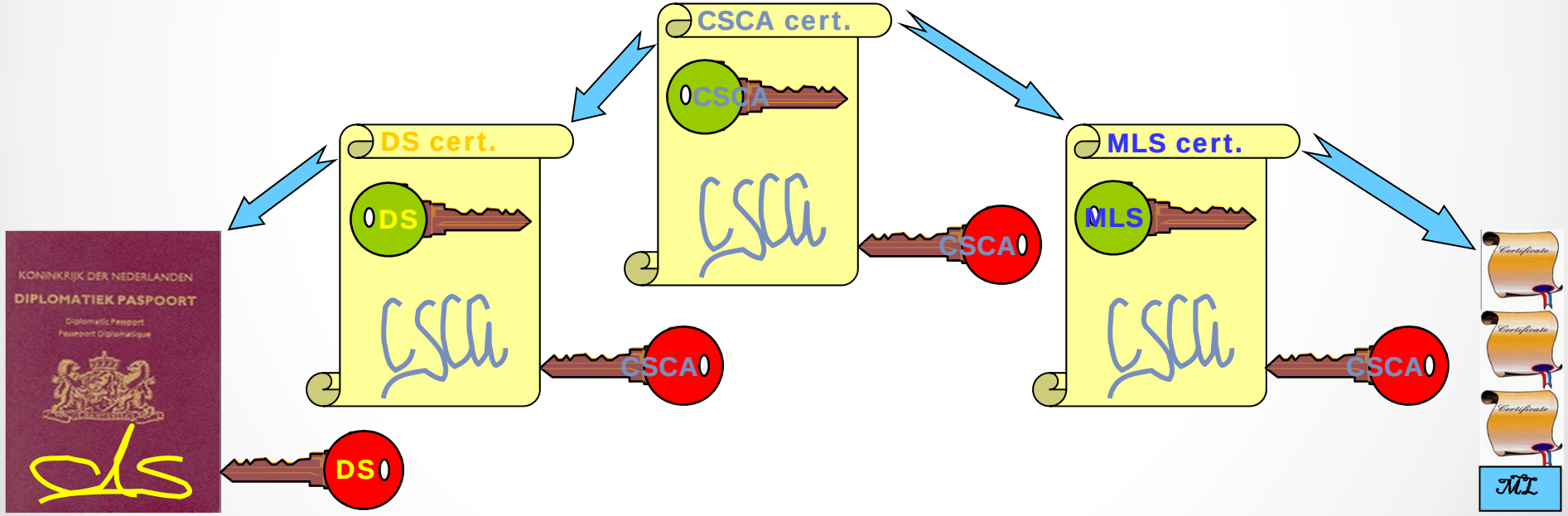
Public Key Infrastructure
Certificates

- CSCA Master List
  - State-to-State service
  - Automated distribution



Public Key Infrastructure
Certificates

- Master List Signer
- Master List Signer certificate
  - Signed by CSCA
  - Automated distribution



Public Key Infrastructure
Revocation

- Private Key compromised
  - Trust in certificates damaged
  - Trust in ePasports damaged?
- Inform relying parties
- Certificate Revocation List (CRL)
  - Signed
  - Revoked certificates
  - … or Null
  - Automated distribution

Public Key Infrastructure
Distribution

- Document Signer certificates
  - ePassport chip
  - PKD
- Country Signing CA certificates
  - Bilateral
  - CSCA Master List
- CSCA Master Lists
  - PKD
- Certificate Revocation List (CRL)
  - Bilateral
  - PKD

Public Key Infrastructure

ICAO Public Key Directory (PKD)

- The PKD is a Central Repository
  - Upload and download facilities
  - Document Signer Certificates
  - CSCA Master Lists
  - Certificate Revocation Lists
  - Doc 9303 compliancy reference and validation service
- The PKD is not
  - A Certification Authority
  - An inspection system
  - Replacing border control systems and policies
  - Preventing illegal entry

The Doc 9303 standard

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http://www.icao.int/security/mrtd/pages/default.aspx

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THANK YOU