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Creating Confidence

Digital Cash

Secure wallets for online and offline payments

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Java Card Forum Webinar
2024-12-09


FINE
GOLD

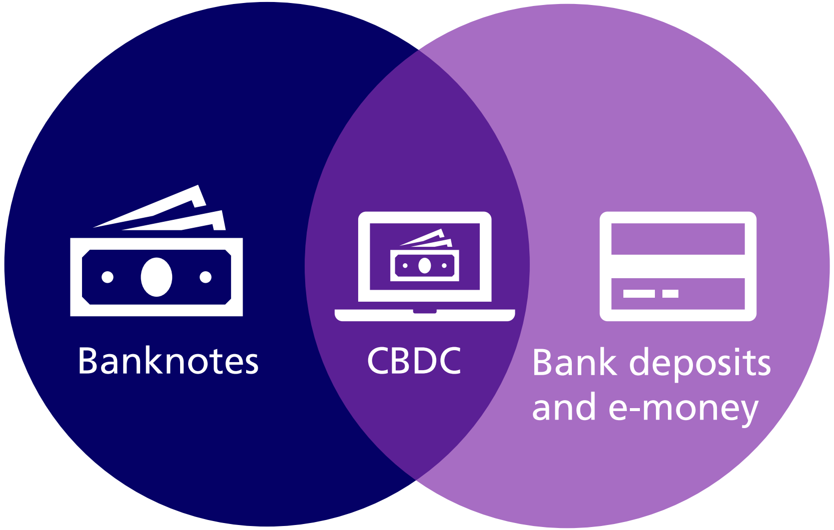

100
EURO
FEDERAL RESERVE NOTE

Digital Cash

- What is it?
- How do wallets work?
- Where is it used?
- How can I pay?

Central Bank Digital Currency

Issued by the
central bank



Digital money

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The move towards CBDC is gaining momentum

94%

of central banks worldwide are actively engaged in CBDC work

54% are developing proof-of-concept technology

31% are deploying pilot projects

Source: Bank for International Settlements, 2023-24

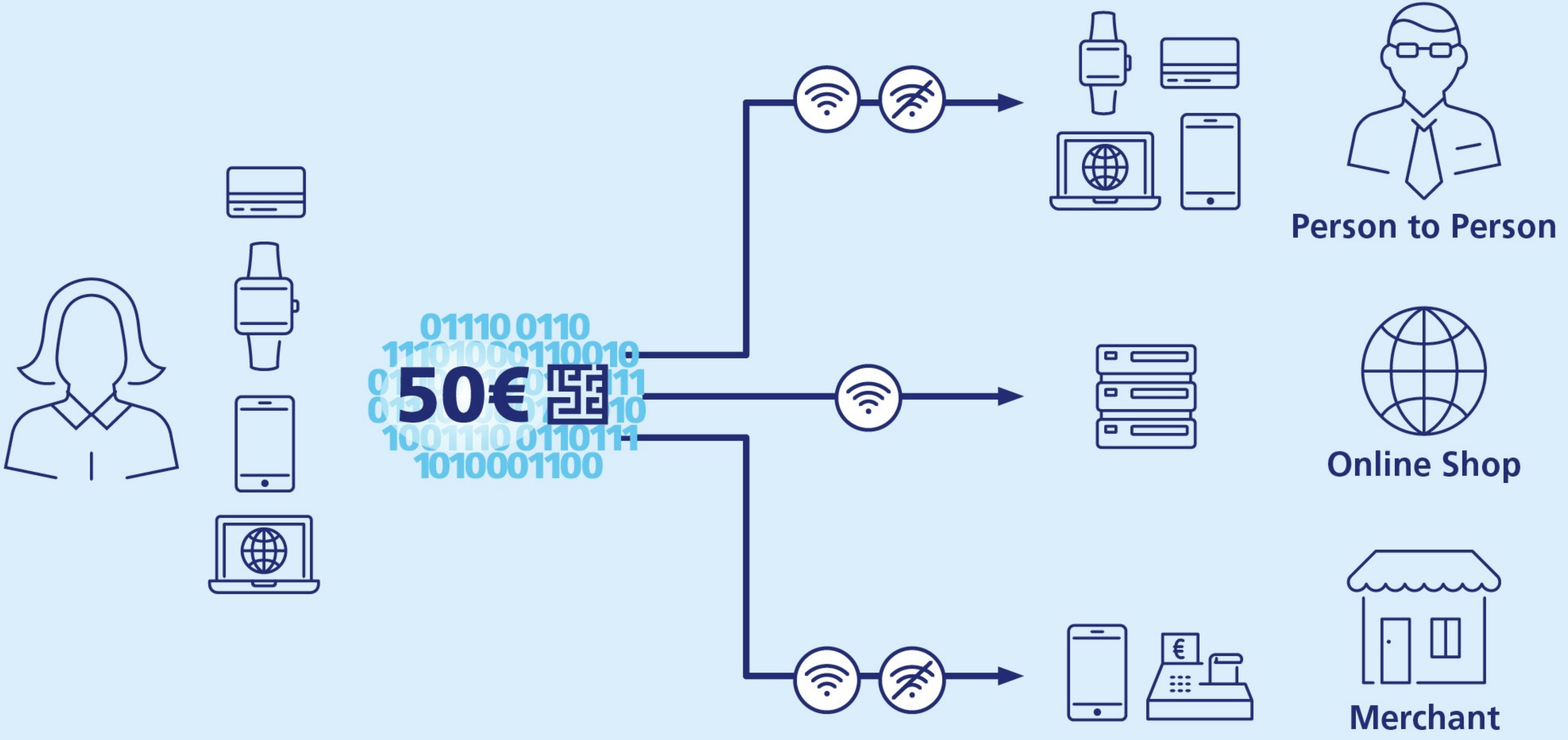
More than 13 million adults in the EU face financial exclusion

PRESS RELEASE

ECB publishes second progress report on the digital euro preparation phase

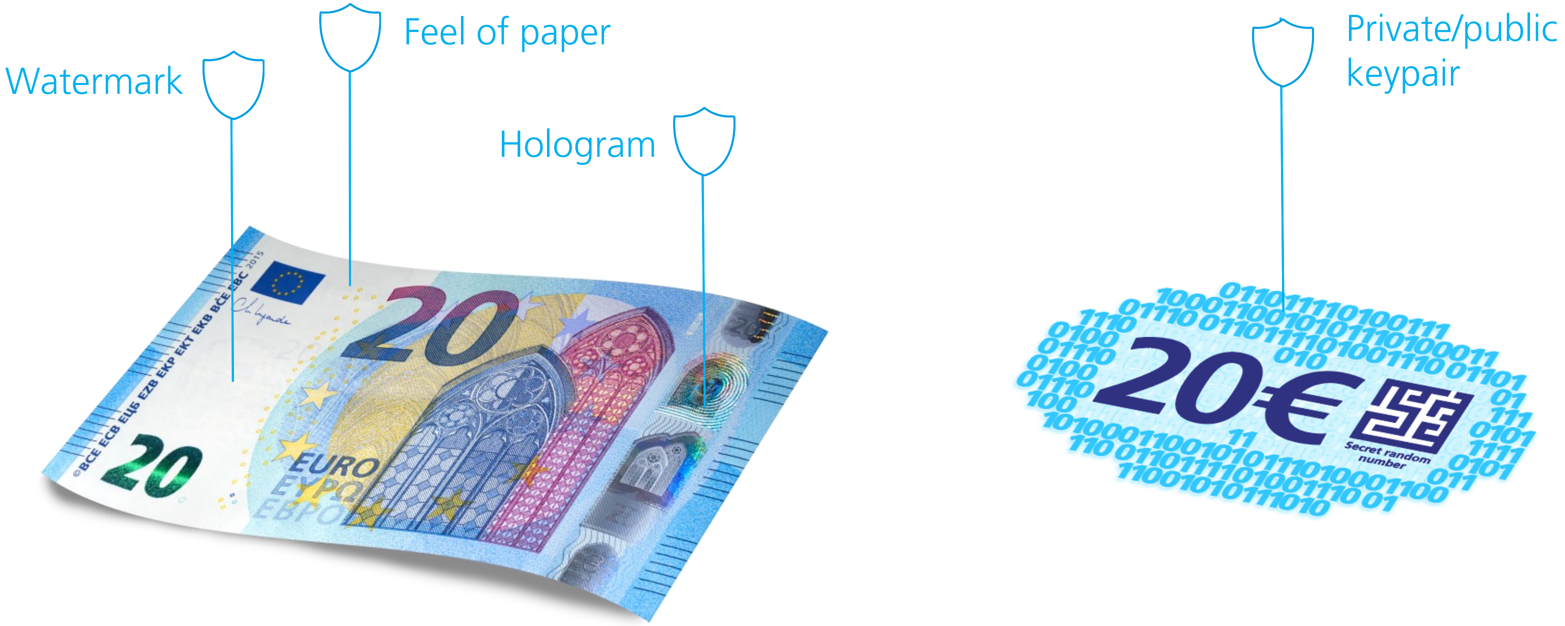
2 December 2024

- ECB updates digital euro rulebook following joint review with consumers, retailers and payment service providers
- ECB concludes call for applications to select potential external providers and publishes invitation to tender
- ECB launches new research to incorporate users’ digital euro design preferences
- Stakeholder engagement across euro area remains key priority to support ongoing legislative deliberations

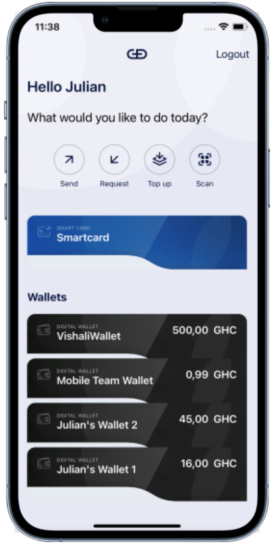


50€
Person to Person
Online Shop
Merchant

Modelling digital cash after physical cash



Wallet form factors



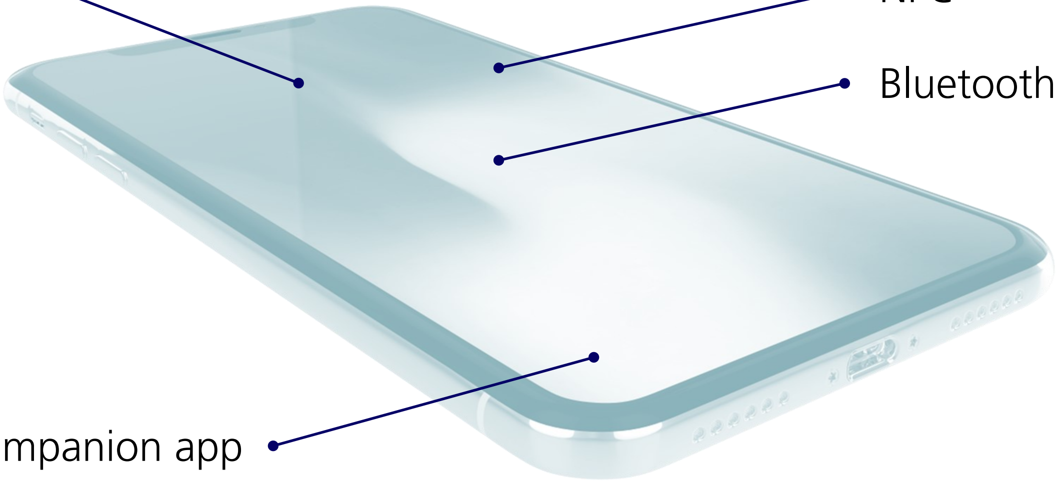
Now, where is my money?

Custodial wallet

Bearer wallet


NETFLIX

Hardware wallet requirements



A simple payment

Token transported via E2E-encrypted channel (SCP)

Public Key: `0xCAFE`
Amount: 20 €

Public key (without metadata) for integrity check

Date: 2024-11-06
Time: 10:15 CET
Payer: me
Payee: `023ab5`
Amount: 20 €

Wallet ID = pseudonym; KYC managed by intermediary

Metadata kept in both wallets; shared on demand

Date: 2024-11-06
Time: 10:15 CET
Payer: `014ca3`
Payee: me
Amount: 20 €


Ownership
Payer identity
Payee identity
Authenticity

Security requirements of (digital) money

Payer identity
Payee identity

Non-repudiation

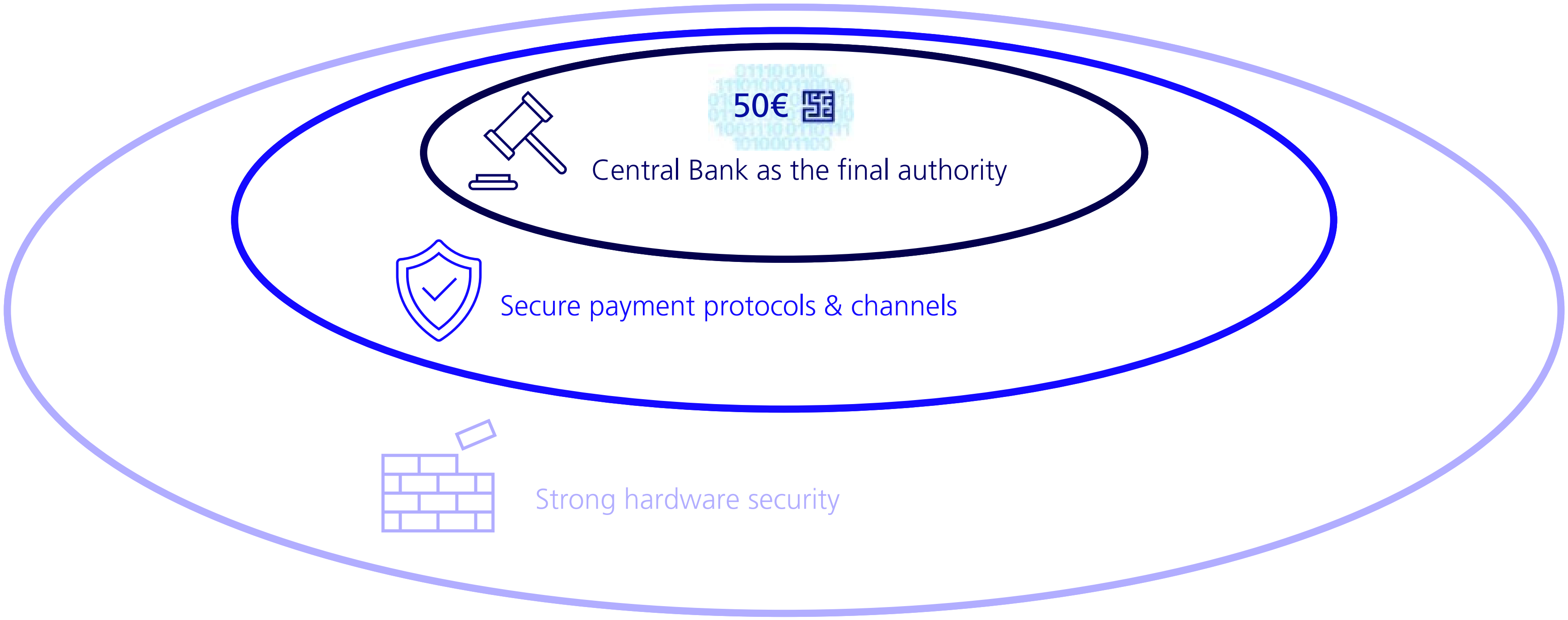
Authenticity

No double spending

Ownership

No tracing

A security architecture with three lines of defence



Designs that create confidence

Reference projects

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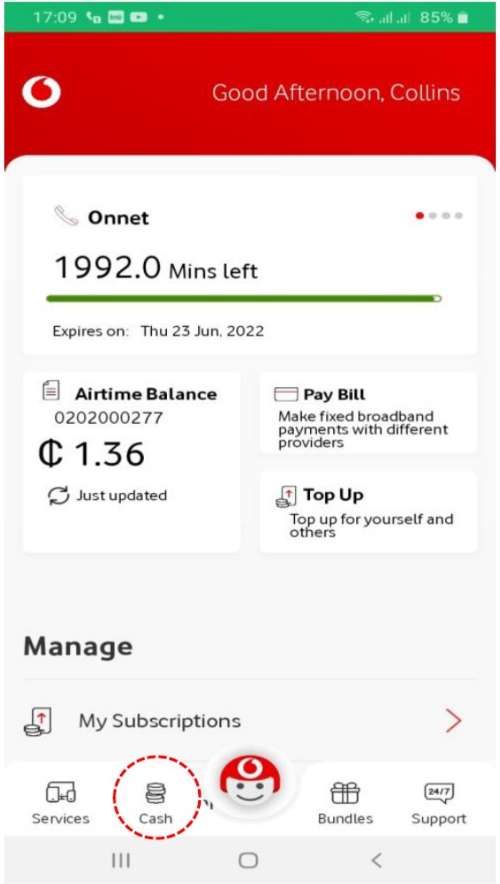
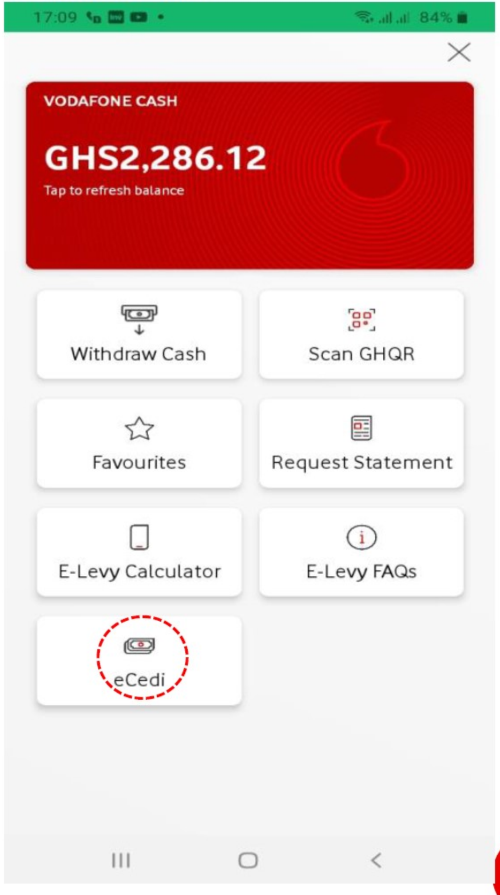
Mobile app integration

Select Cash



Select e-cedi




Logout
Hello
Fleamarket-ehkd-user-002,
What would you like to do today?
Send
Request
Top up
Scan
standard chartered
Wallets
eHKD Wallet
500.00 HK$
standard chartered
hypothetical
e-HKD

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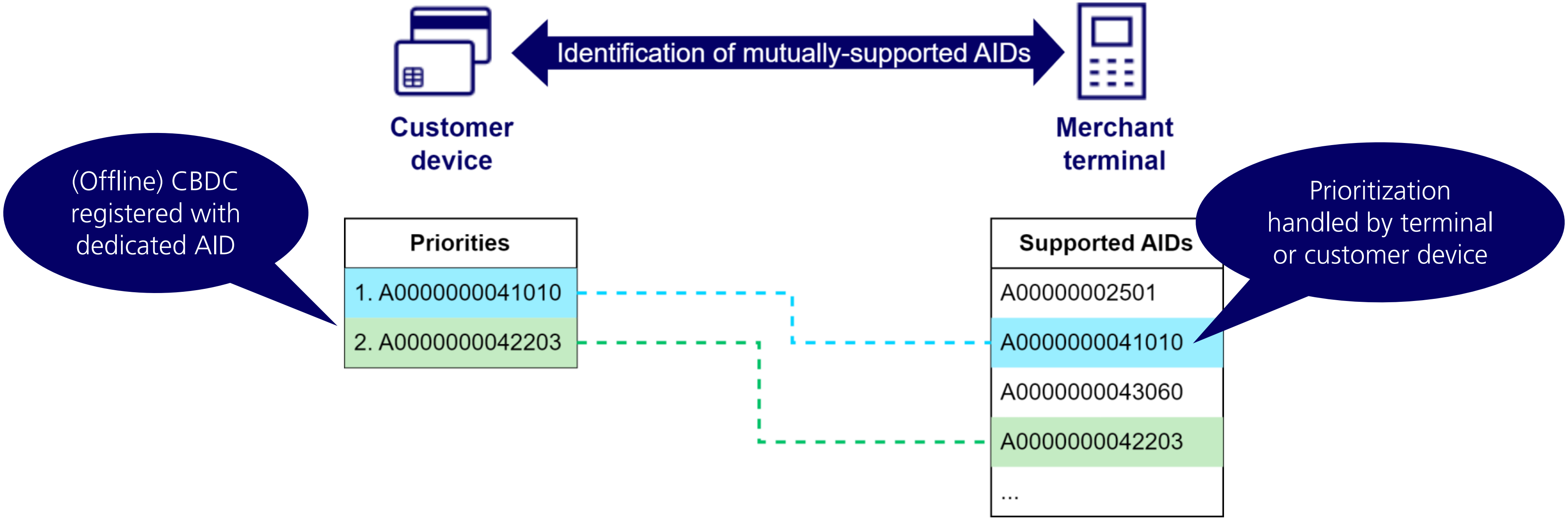
How would payments work in practice?

2021

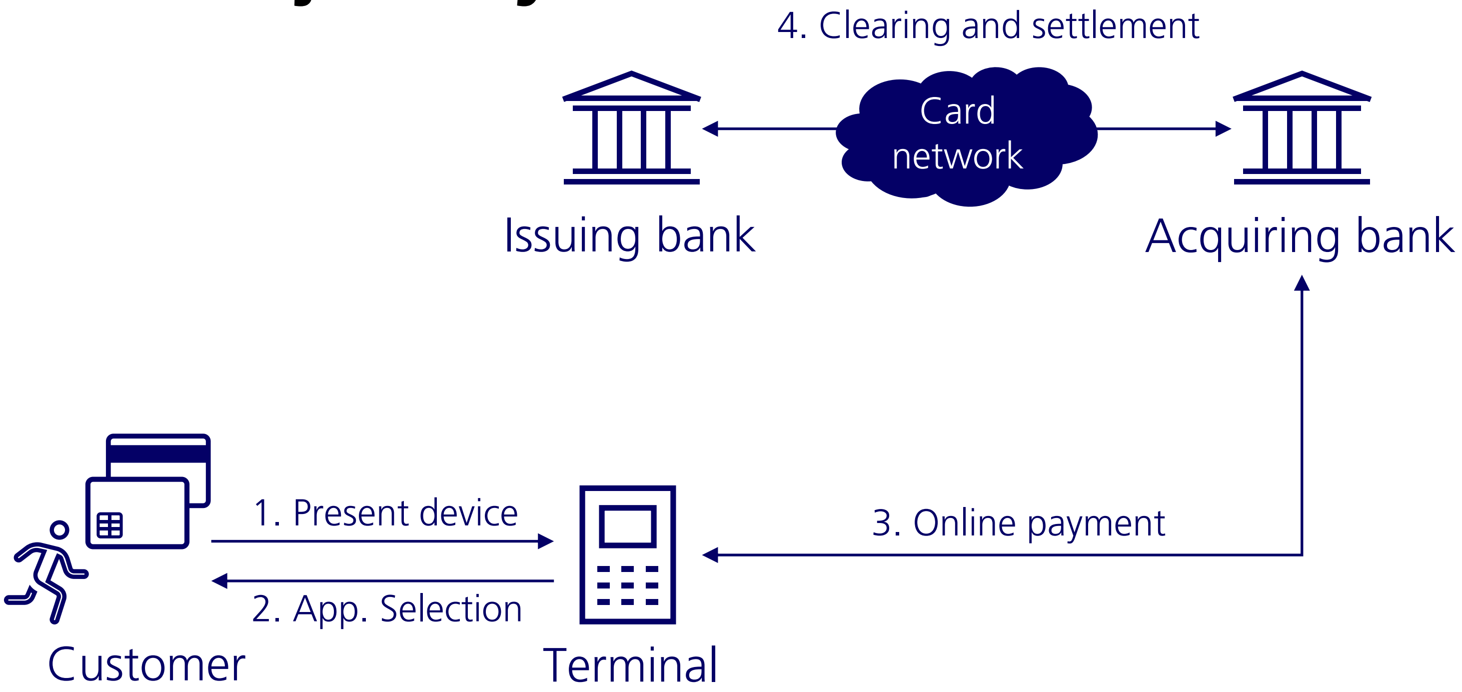

EXIT

“The EMV applications on the smart cards **were not appropriate for storing offline balances** … Therefore, we developed a new application that could store offline balances on the smart cards. This new application was **not based on EMV standards so we also needed to deploy a new kernel** …”

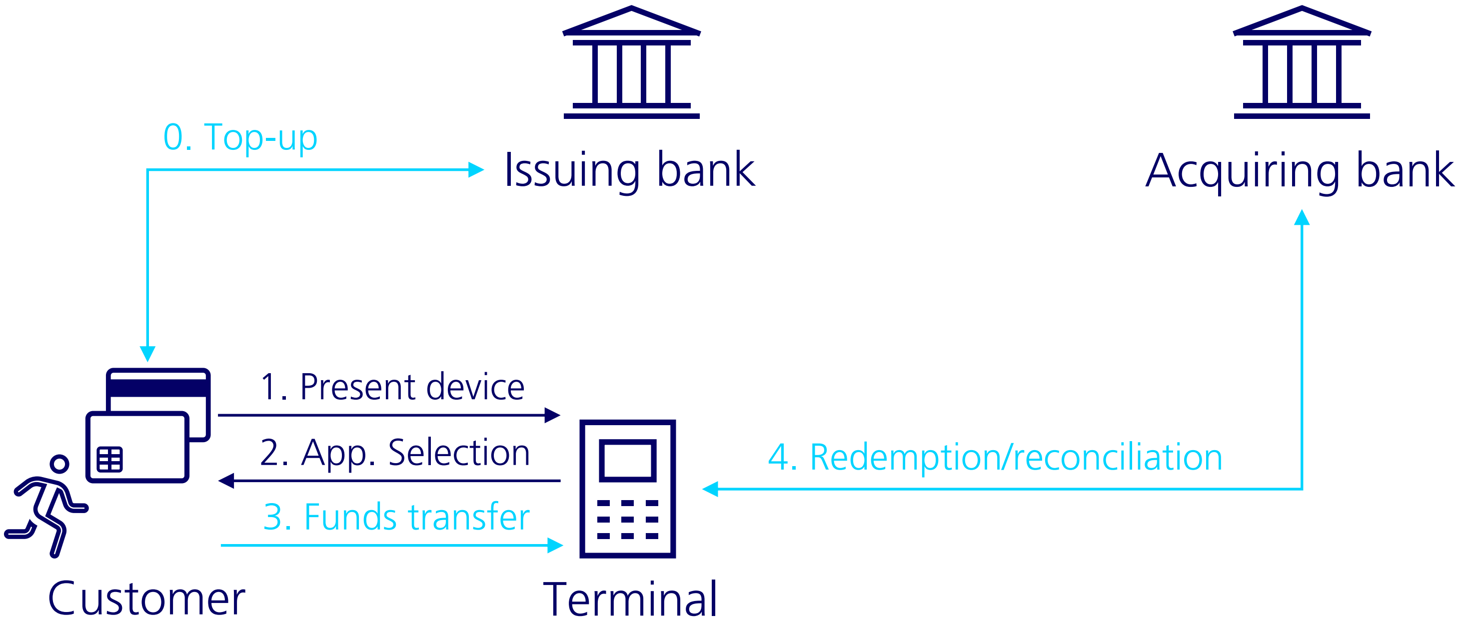
Application selection



Traditional user journey



Offline user journey



Application Selection

↓

Offline transfer of funds

↓

Reconciliation

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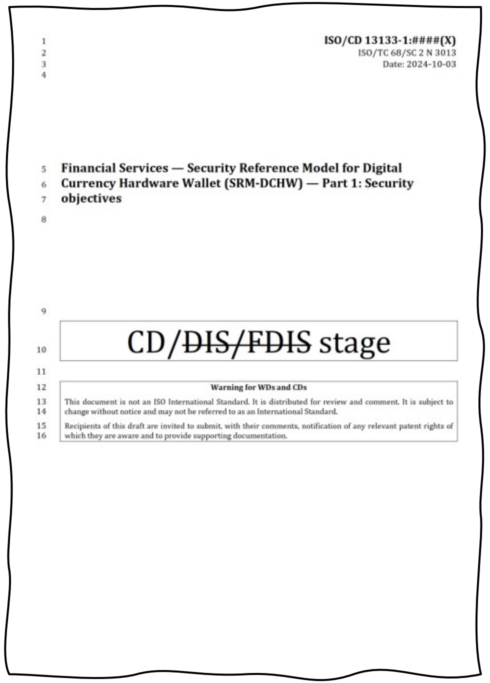
ISO/CD 13133-1:####(X)
ISO/TC 68/SC 2 N 3013
Date: 2024-10-03

Financial Services — Security Reference Model for Digital Currency Hardware Wallet (SRM-DCHW) — Part 1: Security objectives

CD/~~DIS/FDIS~~ stage

Warning for WDs and CDs

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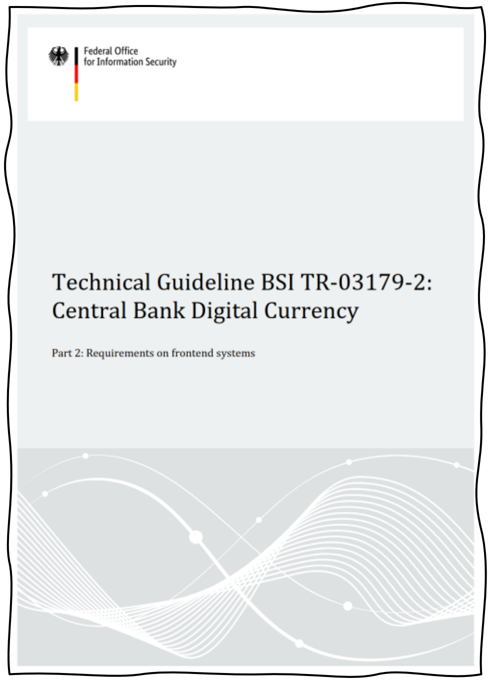
Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TC 68/SC 2/WG 13
ISO/CD 13133


Federal Office
for Information Security

Technical Guideline BSI TR-03179-2: Central Bank Digital Currency

Part 2: Requirements on frontend systems

BSI
TR-03179-2

Questions?
Answers!

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