Development of a Demonstrator for Issuing Electronic Learning Certificates for the EU Digital Identity Wallet

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VERBUND SACHSEN-ANHALT

Hochschule Harz
Hochschule für angewandte Wissenschaften

SACHSEN-ANHALT

Finanziert von der Europäischen Union

eIDAS

Starting point eIDAS Regulation (910/2014)

eIDAS Regulation

28.8.2014 EN Official Journal of the European Union L 257/73

REGULATION (EU) No 910/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 23 July 2014

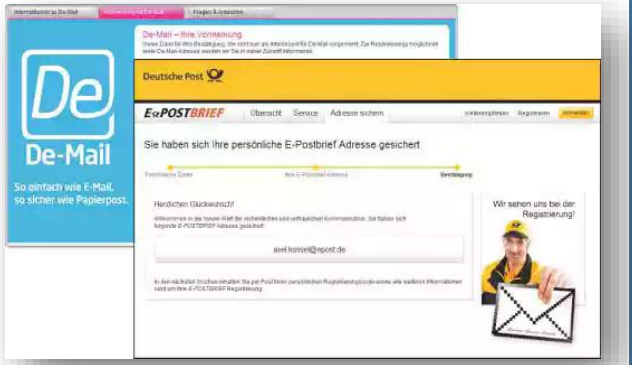
on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Fields of Application of eIDAS Regulation

Electronic Signatures

Electronic Identification



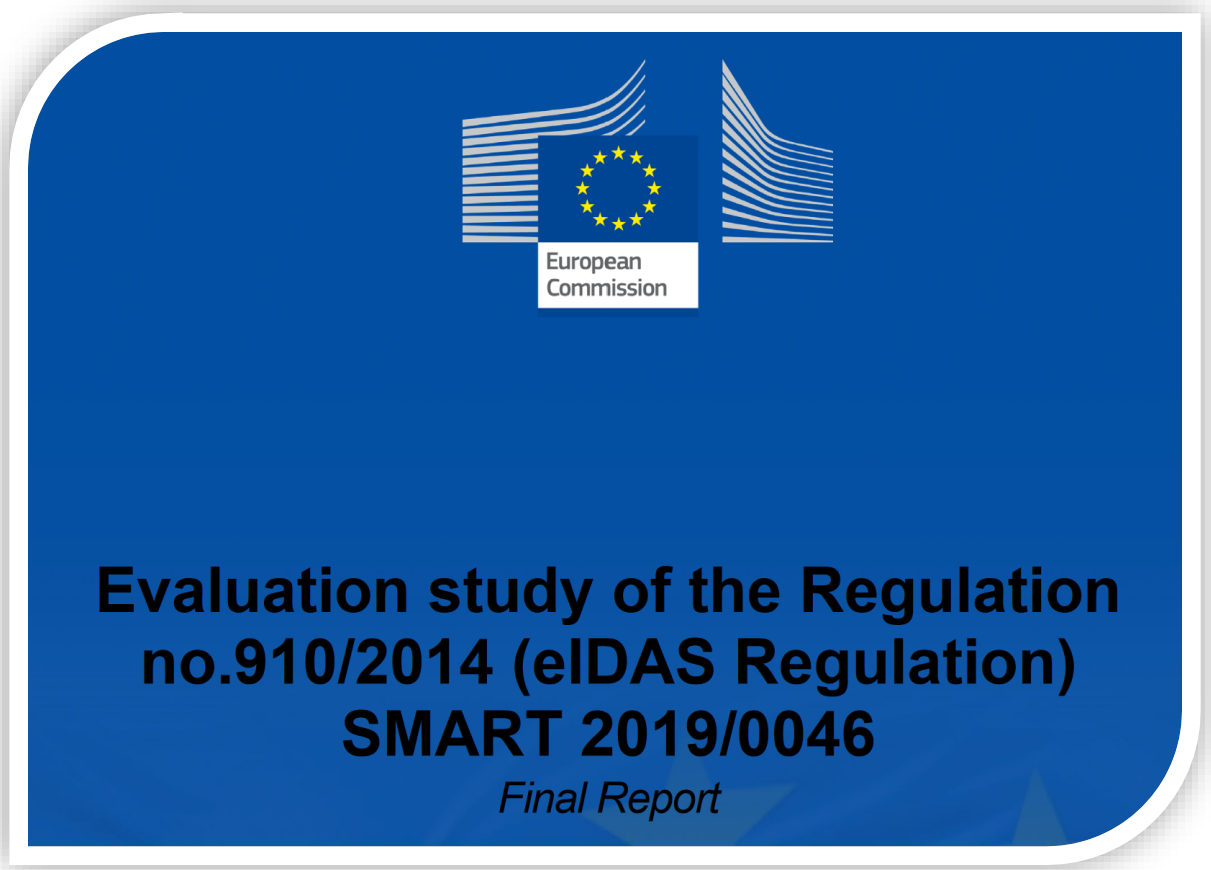
Online Mail Registration

Electronic Seal

Electronic Timestamp

Website Authentication

eIDAS 2.0 – Why?


European Commission
Evaluation study of the Regulation no.910/2014 (eIDAS Regulation)
SMART 2019/0046
Final Report

eIDAS 2.0 – Why?

- **Evaluation Study of the European Commission**
  - *Shortcommings in different Areas of Life* (e.g. Education, Banking, Travel Sector)

- **eIDAS Online-Identification**
  - Enables Proof of **who** a **Person** is
  - Does not enable Proof of **what** a **Person** is

Limitation of the eIDAS Regulation

eIDAS 2.0

Amendment of the eIDAS Regulation

eIDAS 2.0

Official Journal
of the European Union

EN

L series

2024/1183

30.4.2024

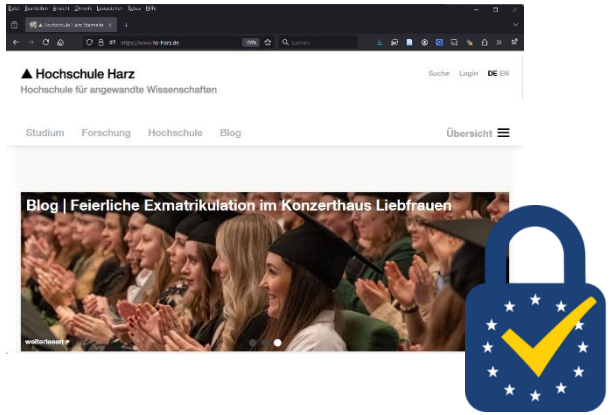
REGULATION (EU) 2024/1183 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 11 April 2024

amending Regulation (EU) No 910/2014 as regards establishing the European Digital Identity Framework

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

New Fields of Application of eIDAS 2.0



Qualified Certificates for Website-Authentification

Qualified Attestation of electronic Attributes (QEAA)

European Digital Identity Wallets
(EUDI-Wallets)

EUDI-Wallet: Use Cases

Based on: https://ec.europa.eu/digital-building-blocks/sites/display/EUDIGITALIDENTITYWALLET/The+many+use+cases+of+the+EU+Digital+Identity+Wallet

Examples of Use Cases for the eIDAS 2.0 Regulation

eIDAS (Who?)

Name, Age, Birthday

eIDAS 2.0 (What?)

University Entrance Qualification

Enrolment

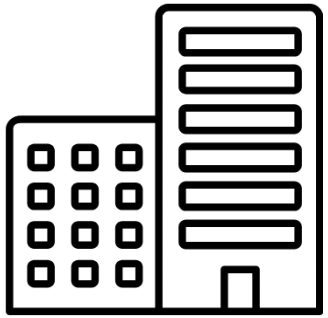
Examples of Use Cases for the eIDAS 2.0 Regulation

eIDAS (Who?)

Name, Age, Birthday

eIDAS 2.0 (What?)
Bachelor's degree

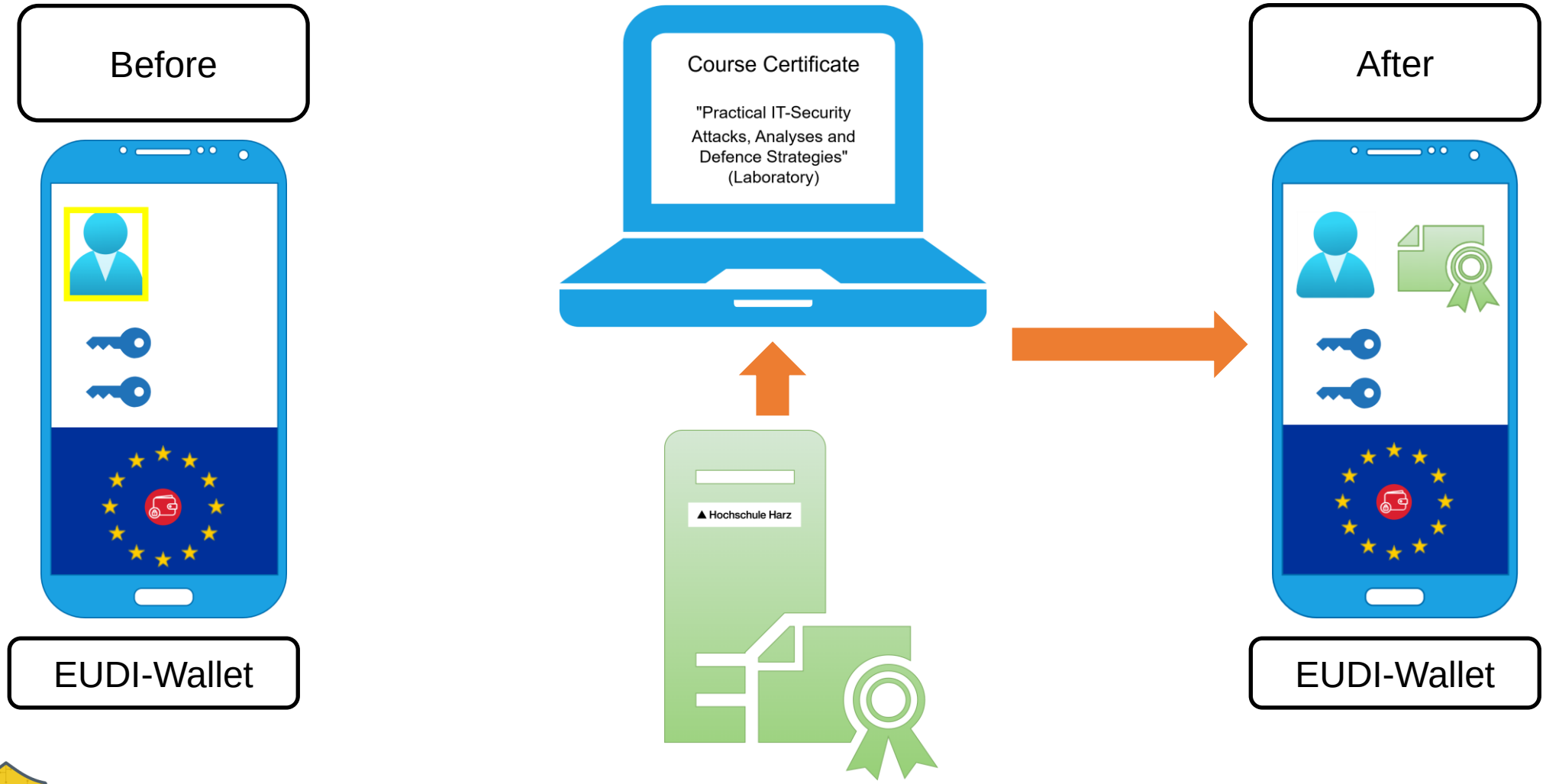
Job Application



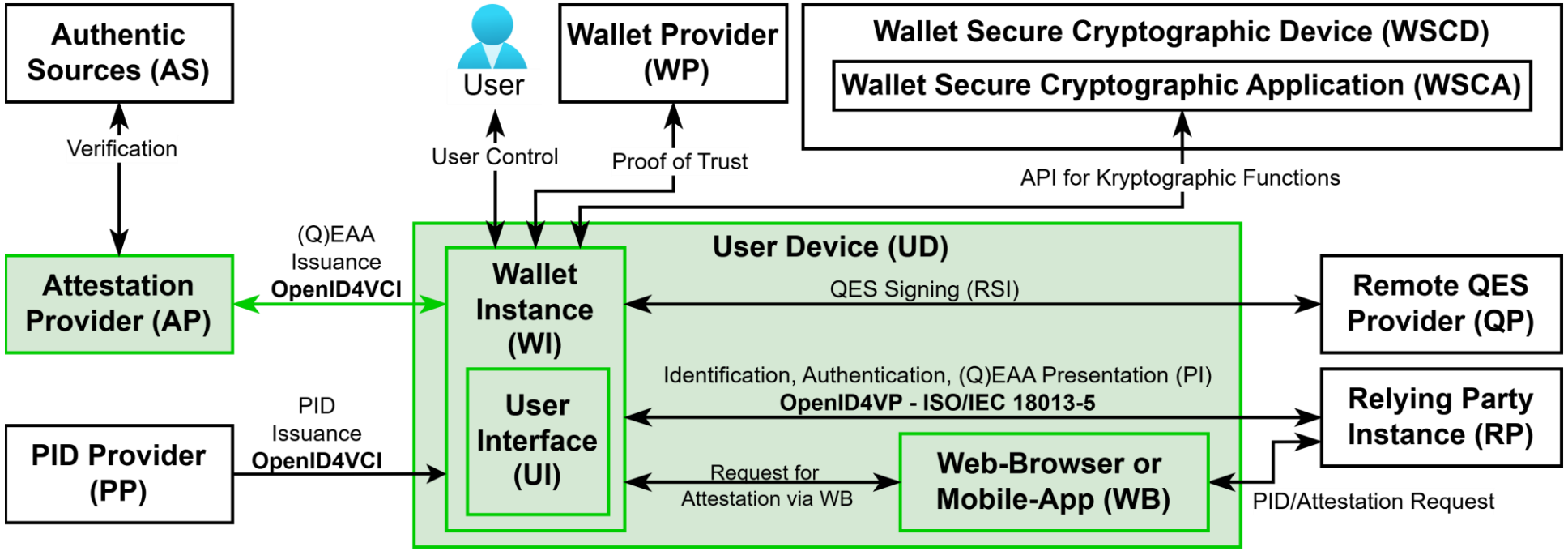
Feasibility Study

Demonstrator developed by Hochschule Harz:
Electronic Learning Certificates for EUDI-Wallets

Procedure of the Issuance of Learning Certificates

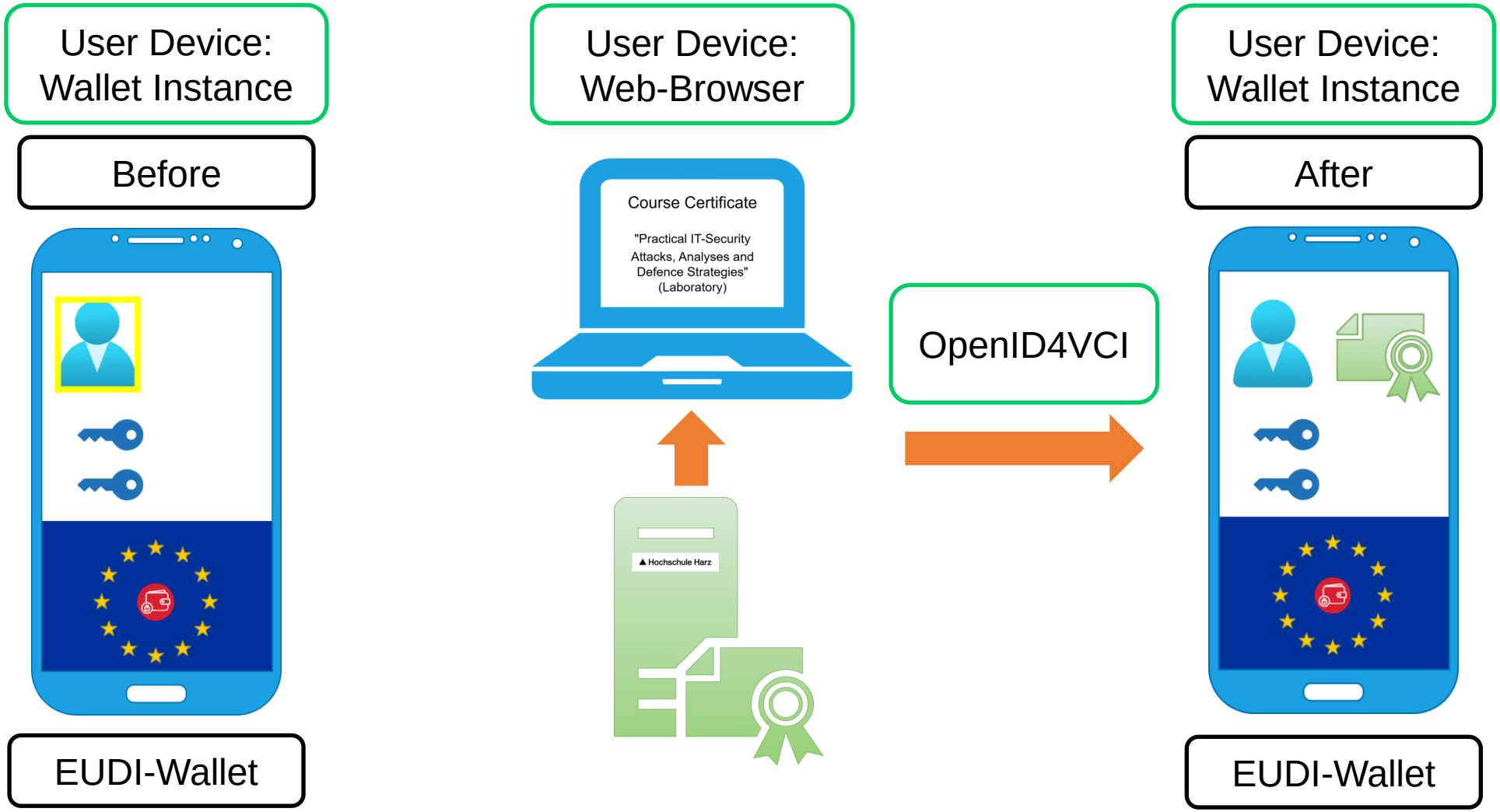


Architecture of the EUDI-Wallet

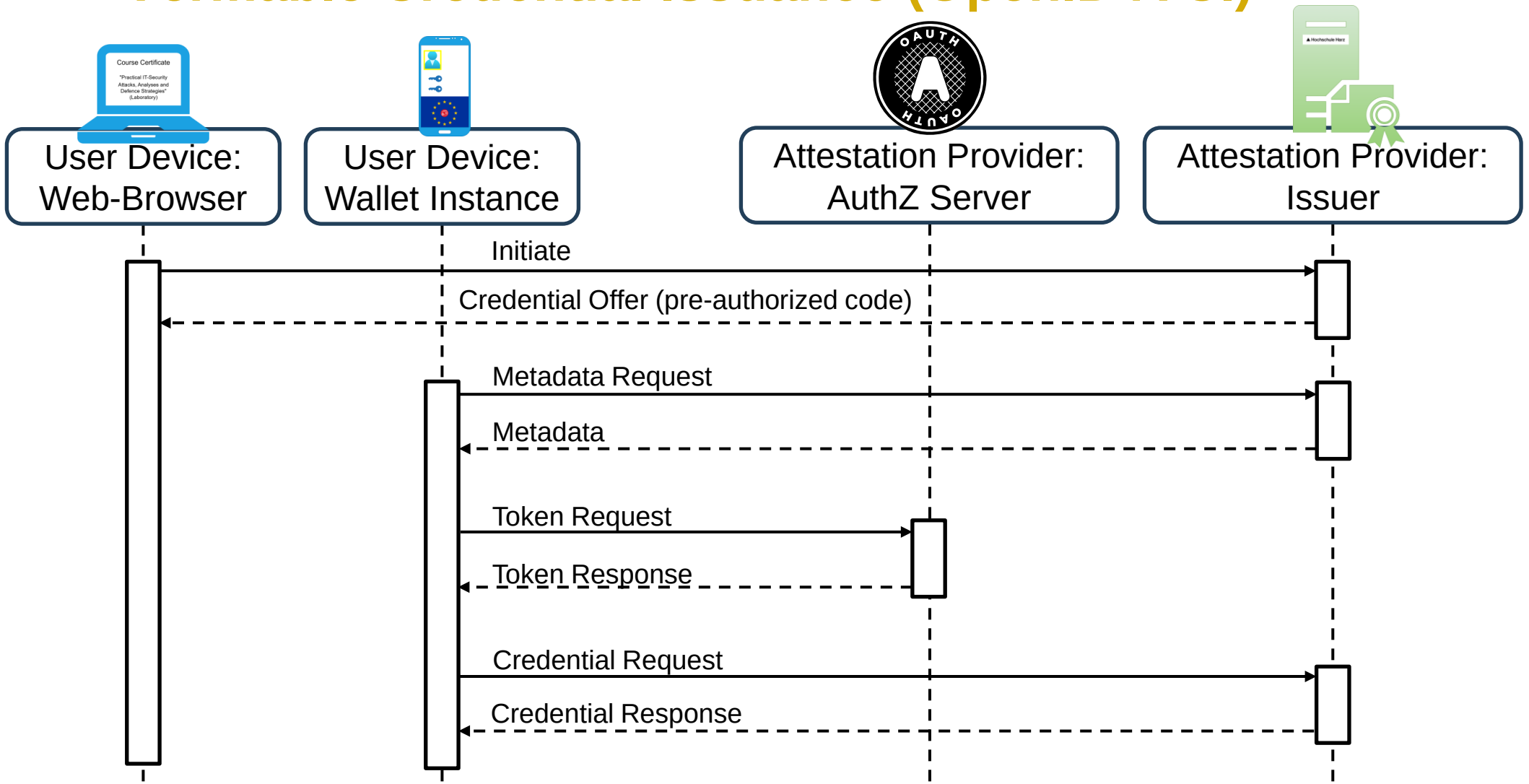


Based on: https://eu-digital-identity-wallet.github.io/eudi-doc-architecture-and-reference-framework/1.8.0/

Architecture of the EUDI-Wallet

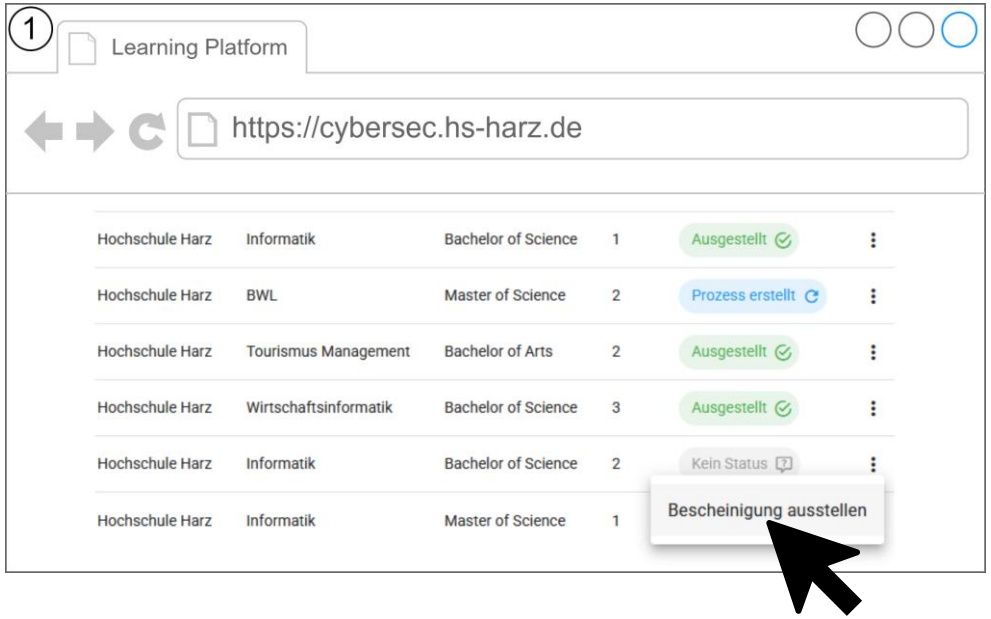


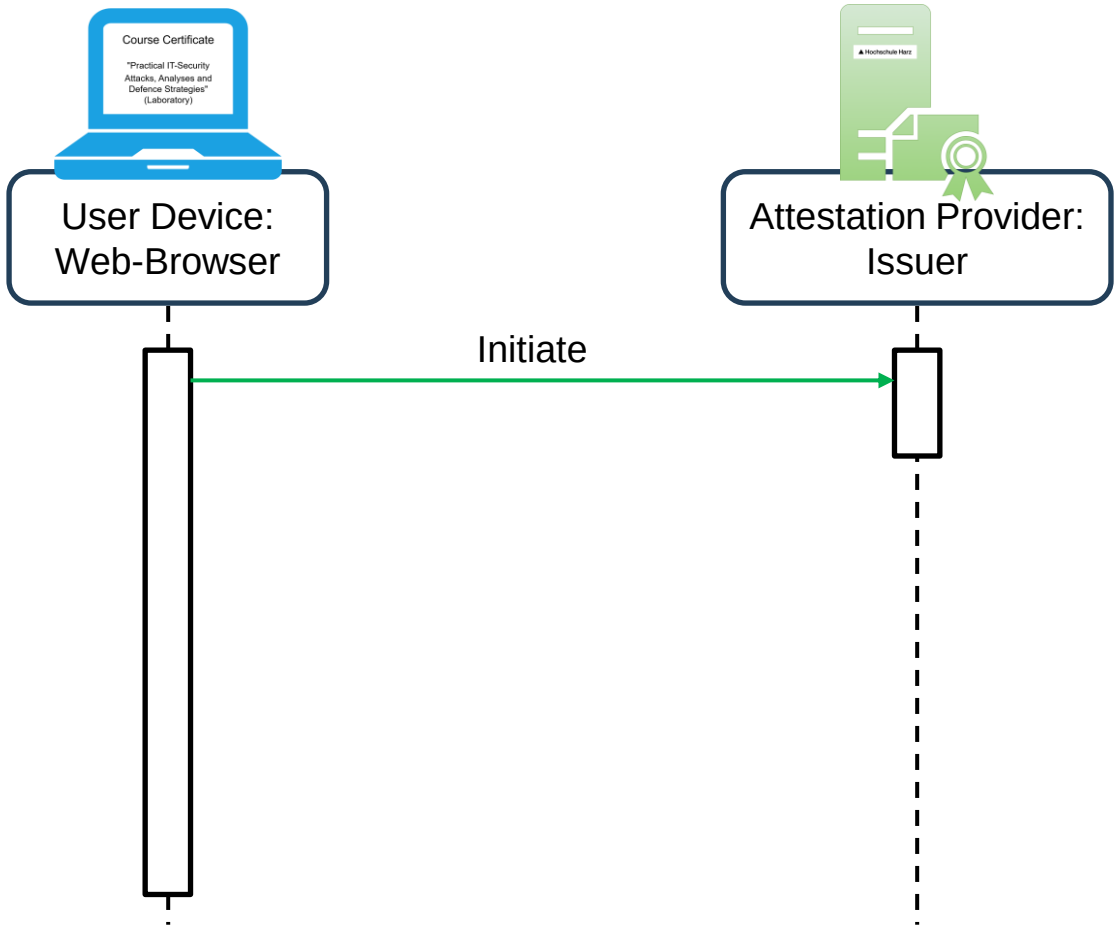
Verifiable Credential Issuance (OpenID4VCI)



Based on: https://openid.net/specs/openid-4-verifiable-credential-issuance-1_0.html

Demonstrator developed by Hochschule Harz: Electronic Learning Certificates for EUDI-Wallets





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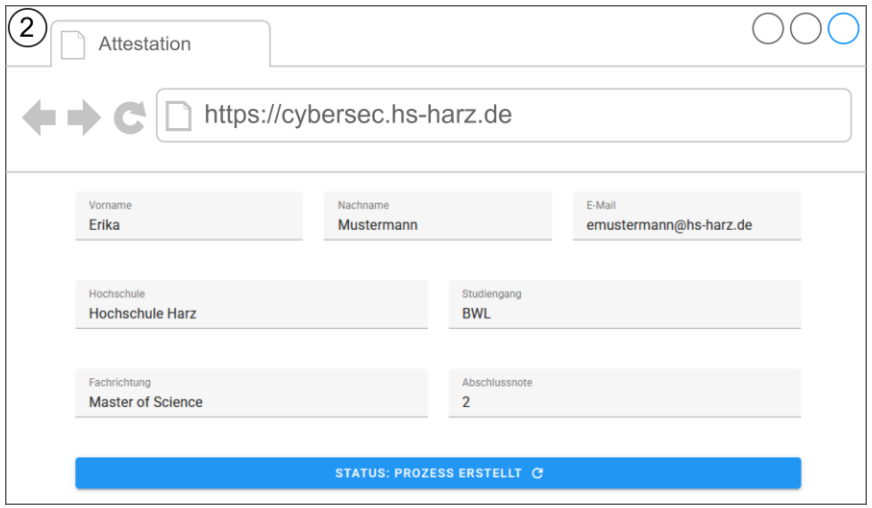

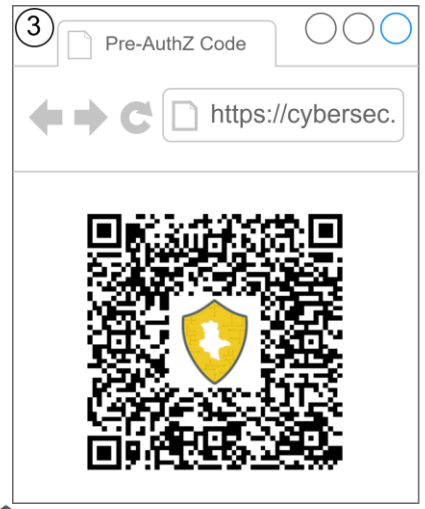

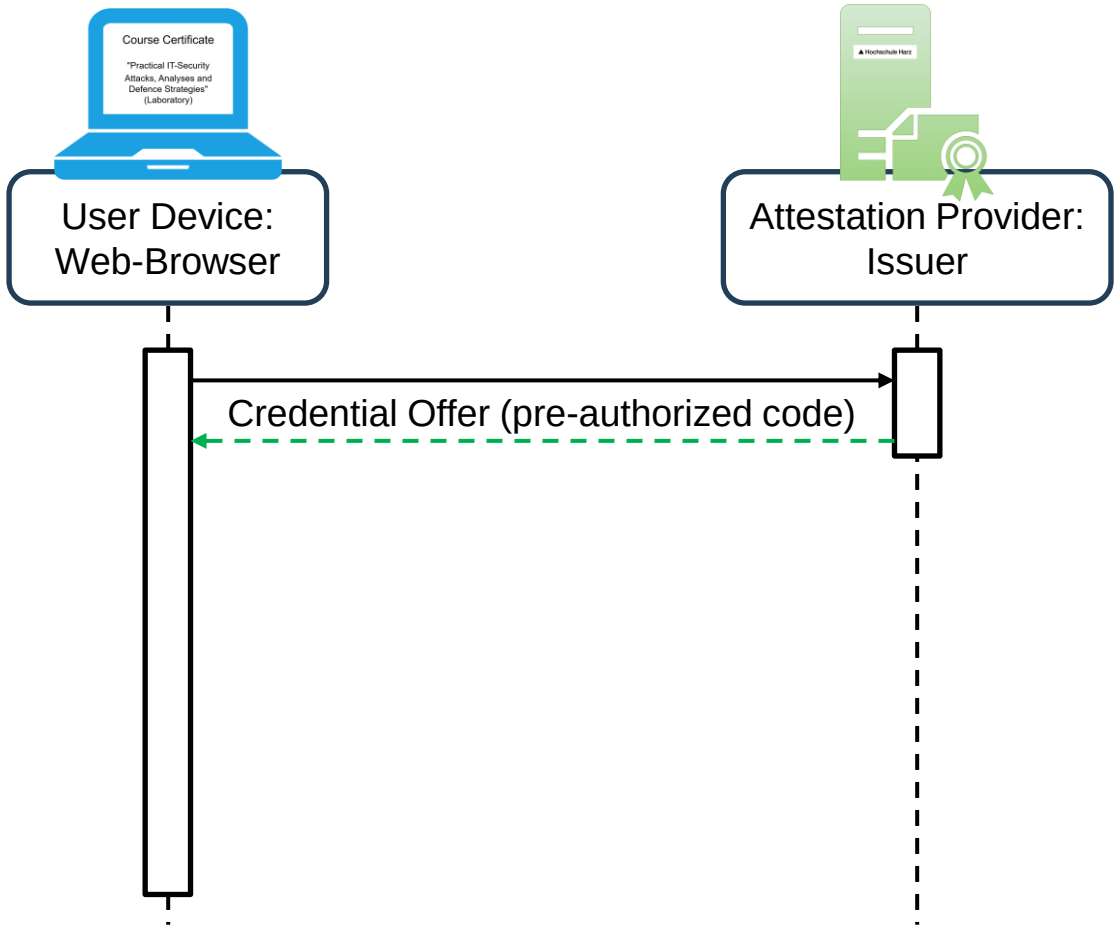

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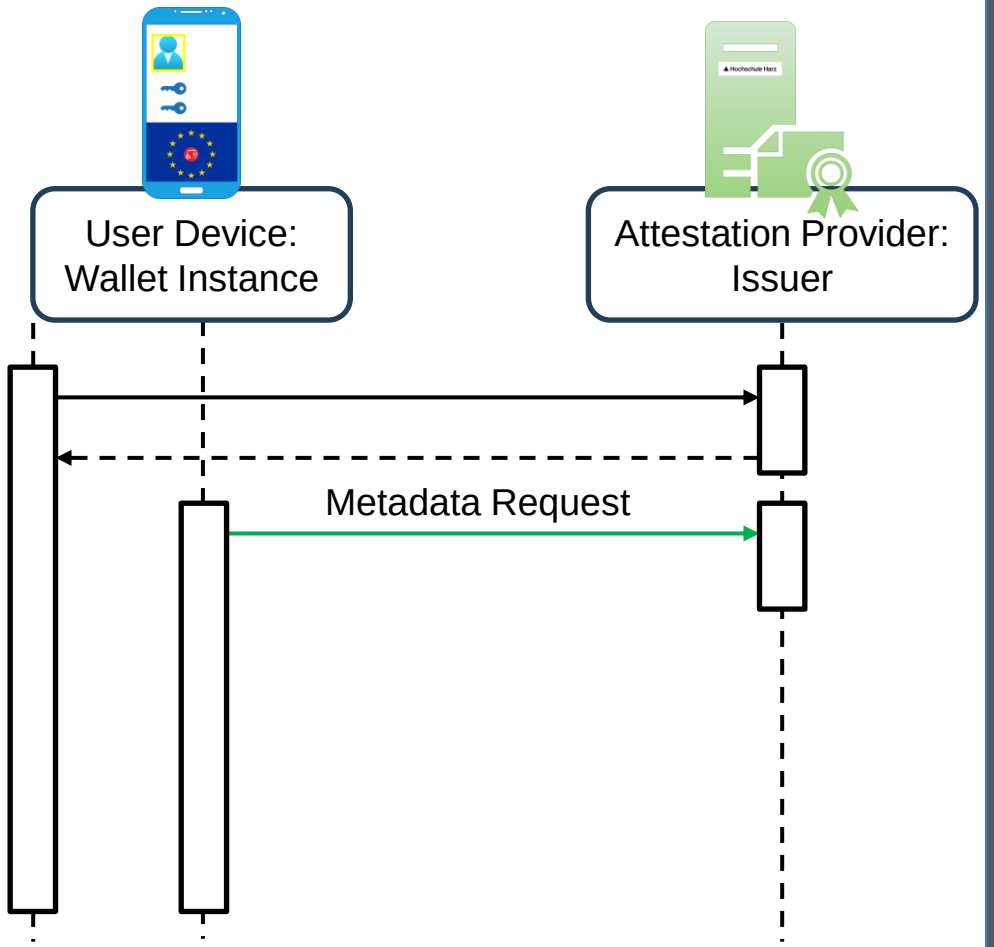

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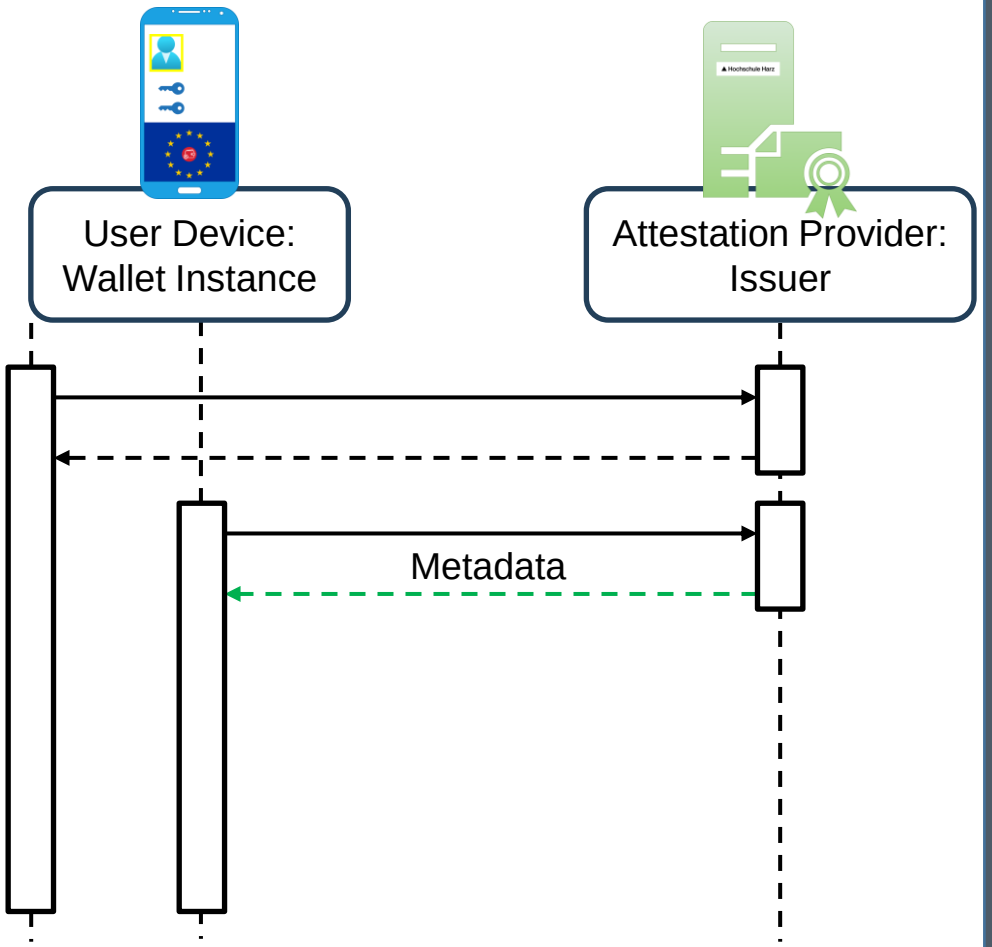

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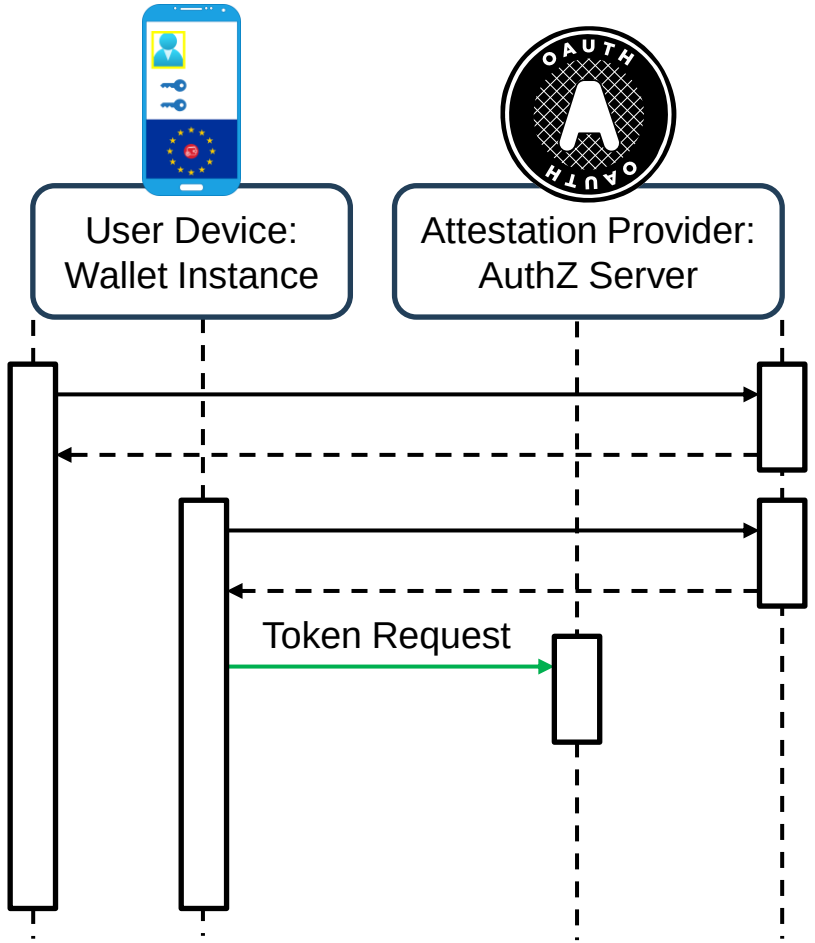

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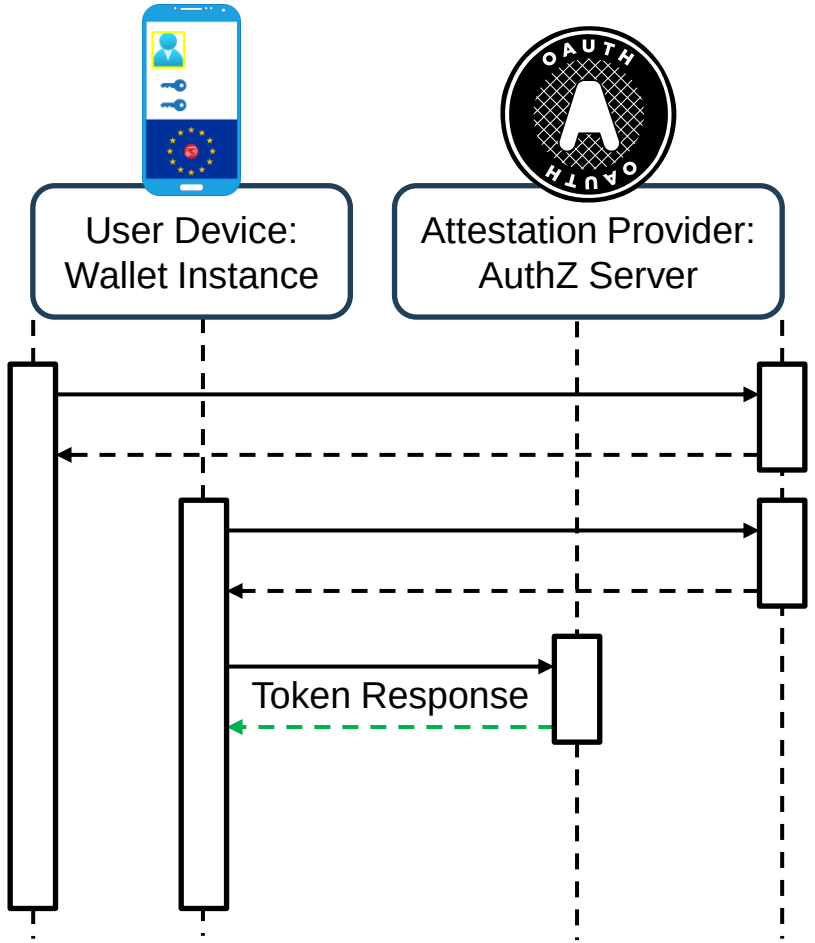

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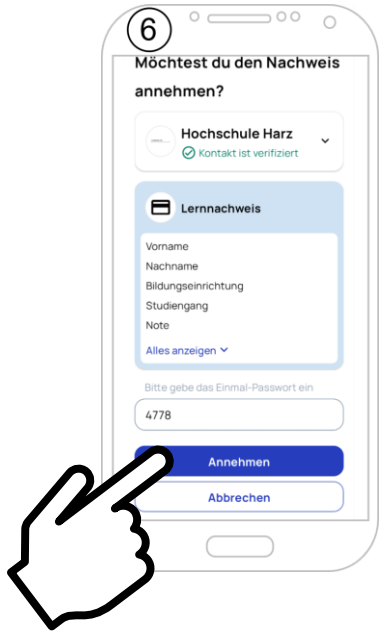

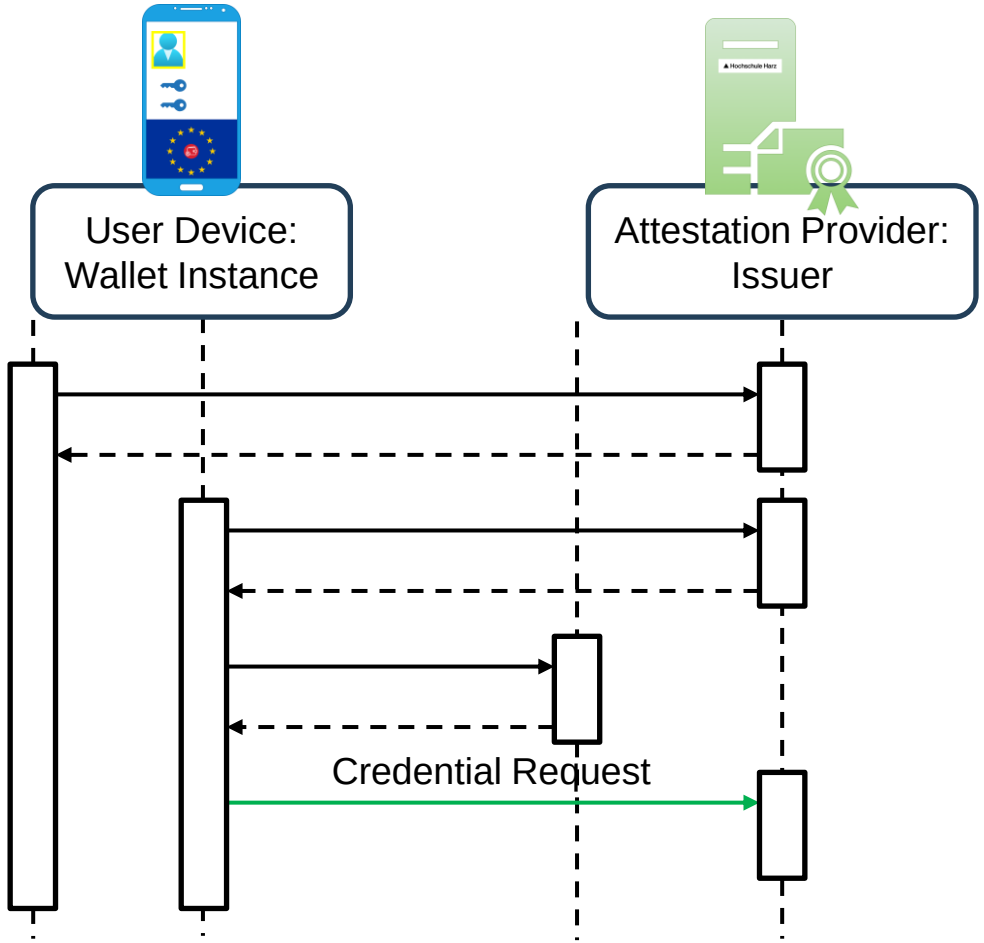

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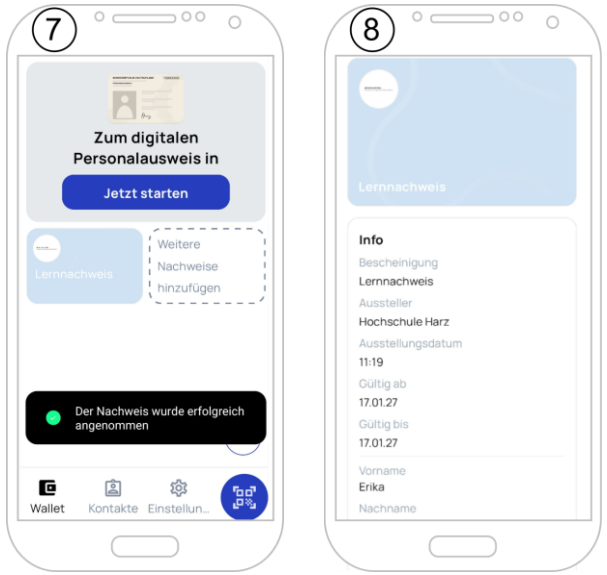

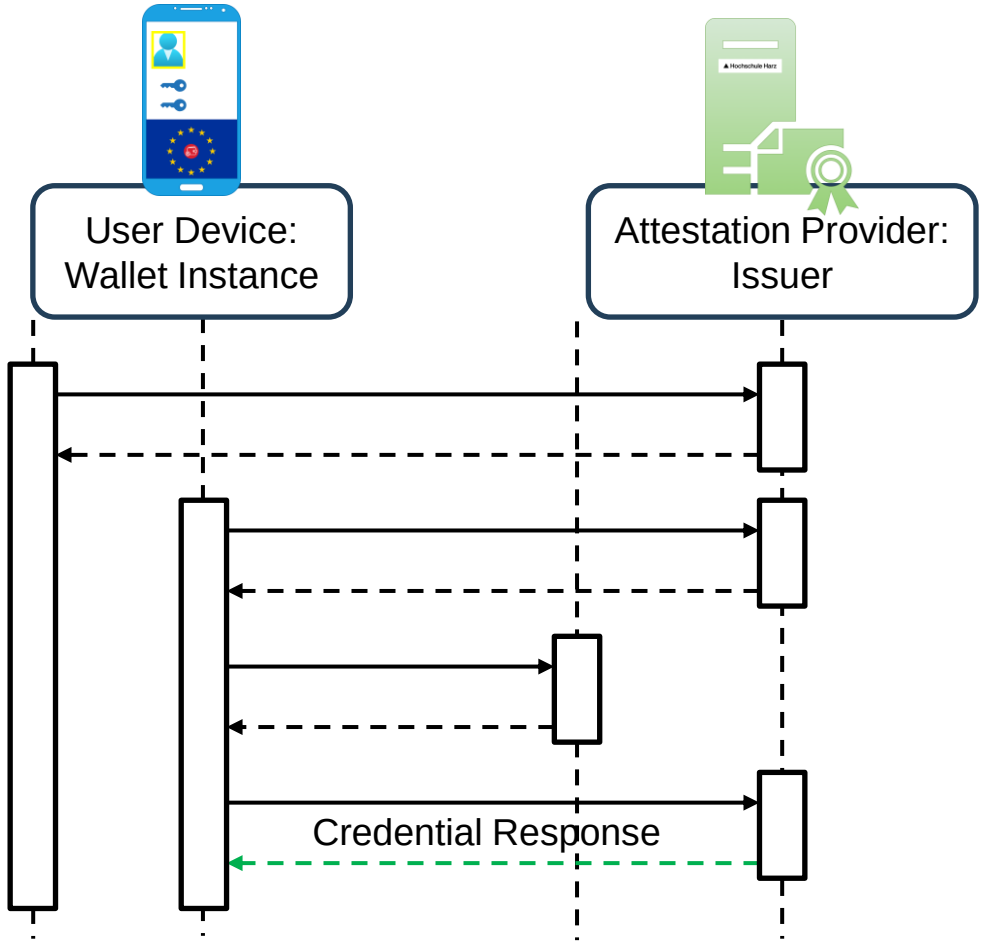

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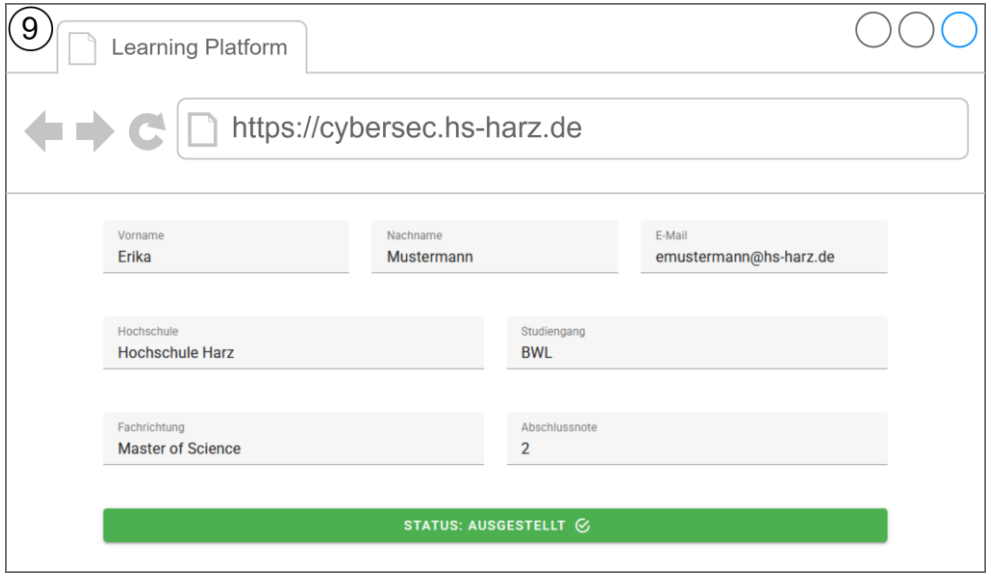

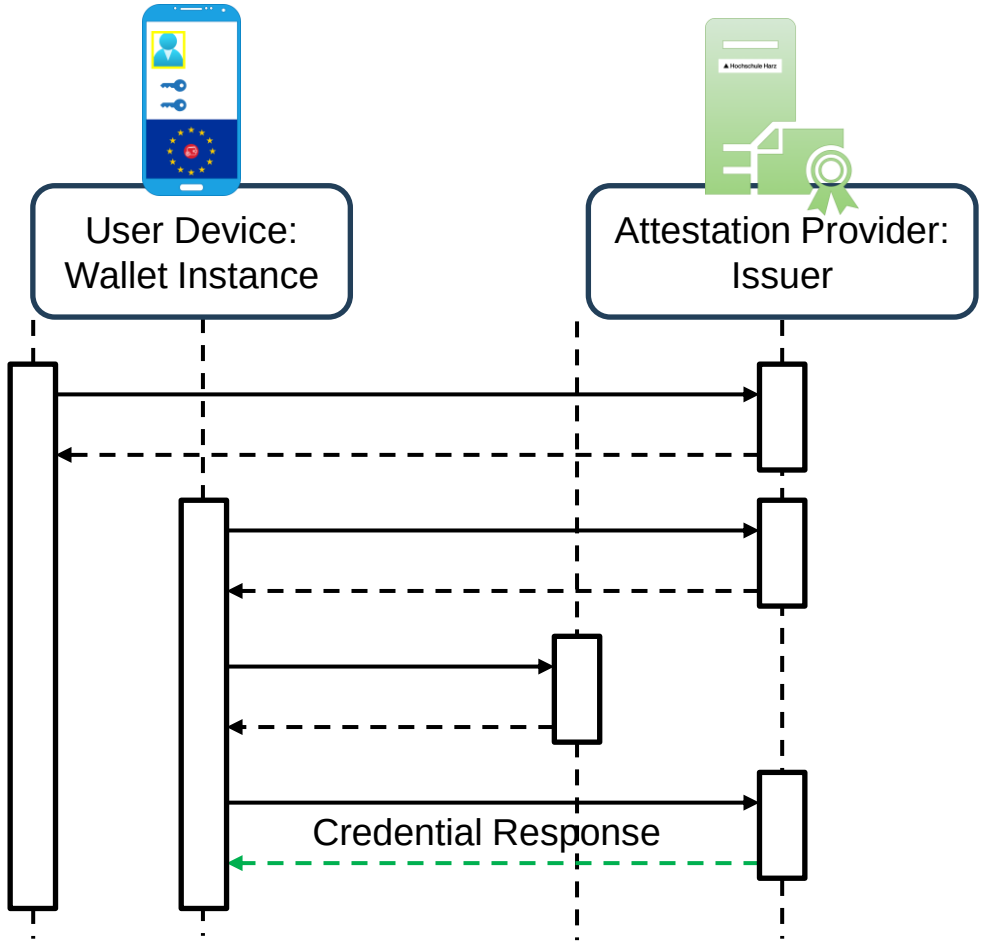

Related Work

- **R. Bochnia et al.:** Long-Lived Verifiable Credentials: Ensuring Durability Beyond the Issuer's Lifetime (2024) [1]
  - Long-Lived Verifiable Credentials (LLVCs) for educational diplomas

Related Work

- **T. Fridel et al.:** The future is in your wallet – how EMREX plans interaction with the EUDI wallet (2023) [2]
  - Implementation of EMREX in DC4EU

Related Work

- **P. Rizomiliotis et al.:** Decentralized Identity Management and the European Identity Reform (2025) [3]
  - Examination of the EUDI-Wallet Use Cases
    - Banking
    - eHealth
    - Digital credential sectors
  - Review of challenges and threats to privacy and design of the eIDAS 2.0

Summary and Future Work

- OpenID4VCI Demonstrator developed by Hochschule Harz
- For Issuing Electronic Learning Certificates for EUDI-Wallets
- Implementation of additional Use Cases (OpenID4VCI and OpenID4VCP)

References

[1] Ricardo Bochnia and Jürgen Anke. Long-Lived Verifiable Credentials: Ensuring Durability Beyond the Issuer's Lifetime. In *Proceedings of the 19th International Conference on Availability, Reliability and Security*, pages 1–9, Vienna Austria, July 2024. ACM.

[2] Tor Fridell, Geir Vangen, Janina Mincer-Daszkiewicz, Jan Joost Norder, Kimmo Rautio, Igor Drvodeli´c, and Guido Bacharach. The future is in your wallet – how EMREX plans interaction with the EUDI wallet. In *Proceedings of European University Information Systems Congress 2023*, pages 209–201, 2023.

References

[3] Panagiotis Rizomiliotis and Maristel Hairetaki. Decentralized Identity Management and the European Identity Reform. In Nikolaos Pitropakis and Sokratis Katsikas, editors, *Security and Privacy in Smart Environments*, volume 14800, pages 240–255. Springer Nature Switzerland, Cham, 2025.

Questions, Contact, Research & Development Cooperations

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