

# EBSI

European Blockchain Services Infrastructure

9/2025

AUSTRIA/PRO

# European Blockchain Services Infrastructure

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# 2020: EU hat(te) mehrere (digitale) „Building Blocks“

https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/EBSI

CEF Digital  
Connecting Europe

About us ▾ Building Blocks ▲ DSIs ▾

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**Big Data Test Infrastructure**  
A free big data analytics sandbox to power your data-driven decision-making

**Blockchain (EBSI)**  
Build the next generation of European Blockchain Services Infrastructure

**Context Broker**  
Make data-driven decisions in real time, at the right time

**eArchiving**  
Preserve, migrate and reuse data securely, according to European Standards

**eDelivery**  
Exchange electronic data and documents in an interoperable and secure way

**eID**  
Offer services capable of electronically identifying users from all across Europe

**eInvoicing**  
Send and receive electronic invoices in line with European directives


**eSignature**  
Create and verify electronic, paperless signatures

**eTranslation**  
Enable multilingual public services and communication

**Once Only Principle**  
Reduce administrative burden for individuals and businesses

APPLY FOR GRANTS


# 2025: EBSI „wieder da“



### eDelivery

Exchange electronic data and documents in an interoperable and secure way


[Learn more >](#)



### eSignature

Create and verify electronic, paperless signatures


[Learn more >](#)



### eID

Offer services capable of electronically identifying users across Europe


[Learn more >](#)



### eInvoicing

Send and receive electronic invoices with automated processing, in line with the European standard


[Learn more >](#)



### Once-Only Technical System (OOTS)

Reduce administrative burden on citizens and businesses


[Learn more >](#)



### EUDI

Secure seamless cross-border digital identity solutions across Europe

[Learn more >](#)



### EBSI

Enhance trust and efficiency in cross-border services using blockchain technology

[Learn more >](#)

# EBSI

## What is EBSI?

The European Blockchain Services Infrastructure (EBSI) aims to leverage the power of blockchain for the public good. EBSI is an initiative of the European Commission and the European Blockchain Partnership.

Find out about:

- Business: What can you do with EBSI?
- The technology: How does it work?
- The infrastructure: the pan-European node network



# „Three Pillars“

## Understanding EBSI: three pillars

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As the first pan-European, public-driven blockchain initiative of its kind, at EBSI we tap into blockchain's tamper-evident, immutable and decentralised properties to support better public services for all Europe. The blockchain ledger can be used to store information in a trusted, decentralised way, allowing for new forms of verification, traceability and transparency for citizens.



### Business: What can you do with EBSI?

Several domains and industries can benefit from using blockchain in their business processes. Here we introduce EBSI's major Use Case families and domains, so you can find out how you can benefit from it.



### Technology: How does it work?

Every transaction recorded on the EBSI ledger follows the same path. Here we explain the way in which EBSI's APIs, Smart Contracts and ledger work together to provide trusted information to its users.



### Infrastructure: a pan-European network of nodes

EBSI's infrastructure is decentralised: instead of a unique database, there are many synchronised copies hosted in our network of European nodes. This is what makes EBSI tamper-proof.

# 1) Business: What can you do with EBSI? (Update 9/2025)

- Use Case Families and domains
  - Verifiable Credentials
    - Education
    - Social Security
  - Track & Trace (coming soon)
    - Document Traceability (coming soon)
    - SMEs financing (coming soon)
  - Trusted Data Exchange (coming soon)
    - Asylum management (coming soon)
    - Trusted Data Exchange (coming soon)

## 2) The Technology: How does it work?

- All Use Cases make use of EBSI's core Technical Services
- The basic architecture of EBSI is composed of three main elements:
  - **APIs**, exposed on the public internet, which allow applications to connect;
  - **Smart Contracts**, which act as a go-between the outside world (APIs) and the
  - **EBSI Ledger**: decentralised database of information that can be accessed by actors looking to complete a business process.
- The Data Flow is the same across all EBSI Use Cases
  - When an actor is performing a business operation that falls in one of EBSI's use cases, they will use an application to connect to EBSI's APIs. This, in turn, allows them to read information stored on the ledger, or write transactions on the ledger (if they are permitted to do so). Based on the request of the user, the API will call a Smart Contract that will perform the operation and record transactions on the ledger. The ledger is immutable (meaning the information recorded on it can never be amended) and therefore functions as a trust anchor.



## 2.1) APIs

- EBSI makes available a set of APIs, or Application Programming Interfaces, on the public internet. This is what allows users to interface with EBSI and, ultimately, retrieve needed information from the blockchain ledger. Each API fulfills a specific function, associated with one or several use cases. Are you a developer looking to connect your software with EBSI? Discover our API catalogue and libraries here:
  - <https://hub-test.ebsi.eu/apis>
- Authorisation API
- DID Registry API
- Ledger API
- **Timestamp API**
  - EBSI Core Service enabling to interact with the TimeStamp SC to **timestamp hashes**, supports timestamping records/versions (and linking the timestamps), verify timestamps.
- ...

## 2.2) Smart Contracts

- Smart Contracts are a type of "digital contract" that only execute and perform an operation if certain conditions are met.
- In EBSI, the Smart Contracts are strictly controlled and cannot be deployed by anyone - they respond only to calls made to EBSI's APIs by conformant applications, and allow for transactions to be recorded on the ledger.

## 2.3) Ledger

- EBSI's ledger is a decentralised database keeping a record of all transactions written on it.
- The information is stored in blocks that are cryptographically linked to each other, forming a chain - hence "blockchain"- making the information almost impossible to tamper with.
- On our ledger, we make available specific registries that can be used by the Use Cases as a source of trust.
- For example, EBSI's Trusted Issuers registry can be used in the education domain to keep a tamper-evident record of all universities accredited by a national educational body, increasing trust and making verification of diploma credentials much easier.

### 3) Infrastructure: a pan-European network of nodes

- EBSI's infrastructure is fully decentralized
- All of EBSI's Core Technical Services - APIs, Smart Contracts, and the EBSI ledger - are hosted in a decentralised way ...
  - ... by a network of nodes all across Europe.
  - They **synchronise their copies of the ledger**, making it distributed, and all make EBSI's Core Technical Services available.
- Anyone can choose to operate an EBSI Node, but Node Operators must abide by EBSI's Governance rules and respect its General Conditions for Node Operators in order to ensure the integrity and stability of the network.

# EBSI (current) Use Cases

- Identity
  - Self-Sovereign Identity Use Case; implement cross-border verification of identity credentials allowing users to create and control their own identity across borders.
- Diploma
  - Implement cross-border verification of educational credentials. This means that a diploma issued by Member State A can be verified by a university or third party, e.g. “employer” from Member State B.
- Document traceability
  - create trusted digital audit trails, automate compliance checks - for example in time-sensitive processes - and to prove data integrity. The intention is also to serve as generic registration and traceability capabilities for other EBSI Use cases.

# EBSI Use Cases - coming soon

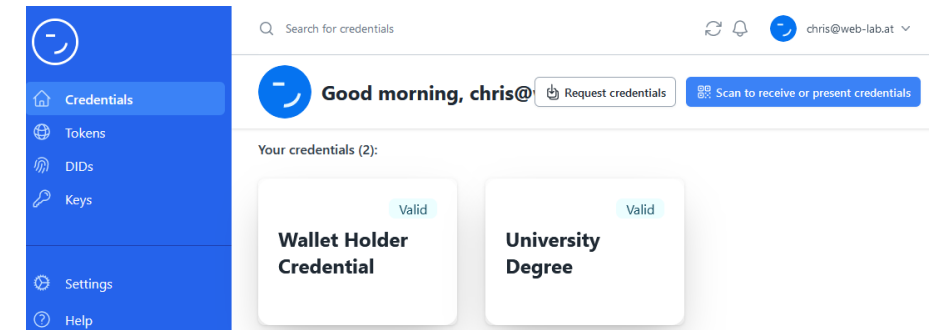
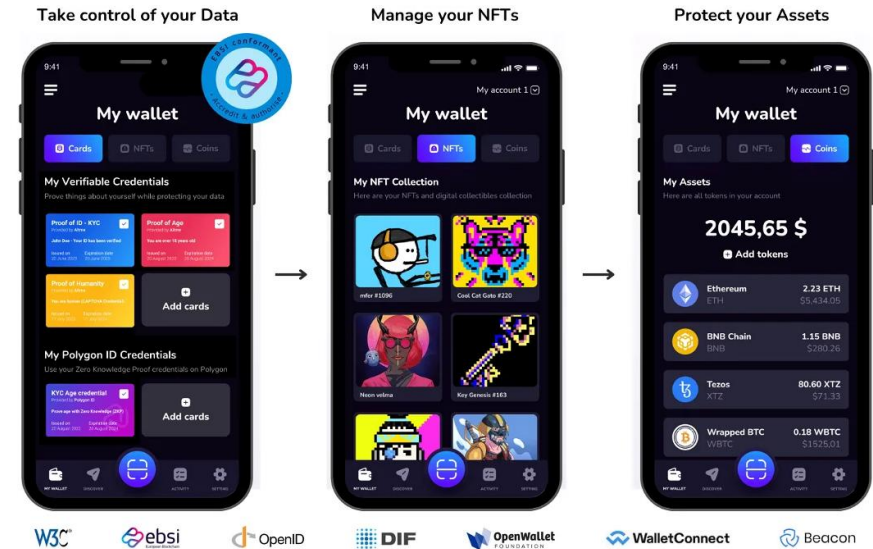
- Social Security
  - verification of social security coverage of posted workers, i.e. verification of the PDA-1 document. This means that a Social Security competent institution in a Member State issues the PDA-1 document as a verifiable attestation and an inspector in another Member State verifies it.
- Trust Data Sharing
  - ...
- SME Financing
  - ...
- Asylum Process Management
  - ...

# Wallets

- A digital wallet in the context of EBSI is a type of online storage that lets you **securely keep track of your digital assets** and information, like **digital certificates and digital identity information**. It's like a traditional wallet but storing digital information.
- A conformant wallet is a type of wallet that has successfully passed the Conformance Test.
- Types
  - For Holders
  - For Issuers
  - For Verifiers

# Wallets (2025)

- Individual wallet (31 Anbieter)
  - Natural persons
- Organisation wallets (16 Anbieter)
  - Issuer, verifier
  - Provide credentials
- Teilweise OpenSource
- Links direct to wallet (Beispiele!)
  - <https://altme.io/>
    - “First all-in-one wallet to manage your data and assets”
    - Ursprung: Cryptowallet
  - <https://walt.id/>
    - „One wallet for everything“: credentials, keys, NFTs, data storage ...
    - Web & App
    - Opensource -> developers
    - (keine wesentlichen Änderungen seit 2022)





# Available Repositories

- <https://code.europa.eu/ebsi>
- Repo
  - Public (Core Sourcecode)
    - „aktiv“
  - Technical Office (Usecases)
  - Ecosystem
  - ...

EBSI / Technical Office

A

arch

002

B

bb

0101

2

2 Grafana

★0

11.07.2023

C

conformance

★0

11.07.2023

D

Demo Homepage

★0

11.07.2023

D

Diploma

★0

29.08.2024

J

Json Schema

★0

11.07.2023

N

Notarisation

★0

11.07.2023

T

Test Scripts

★0

11.07.2023

T

Test Scripts Blockchain Protocols

★0

11.07.2023

T

Trusted Data Sharing

★0

11.07.2023

W

Wallet Web Client

★0

11.07.2023

D

dev

005

D

devops

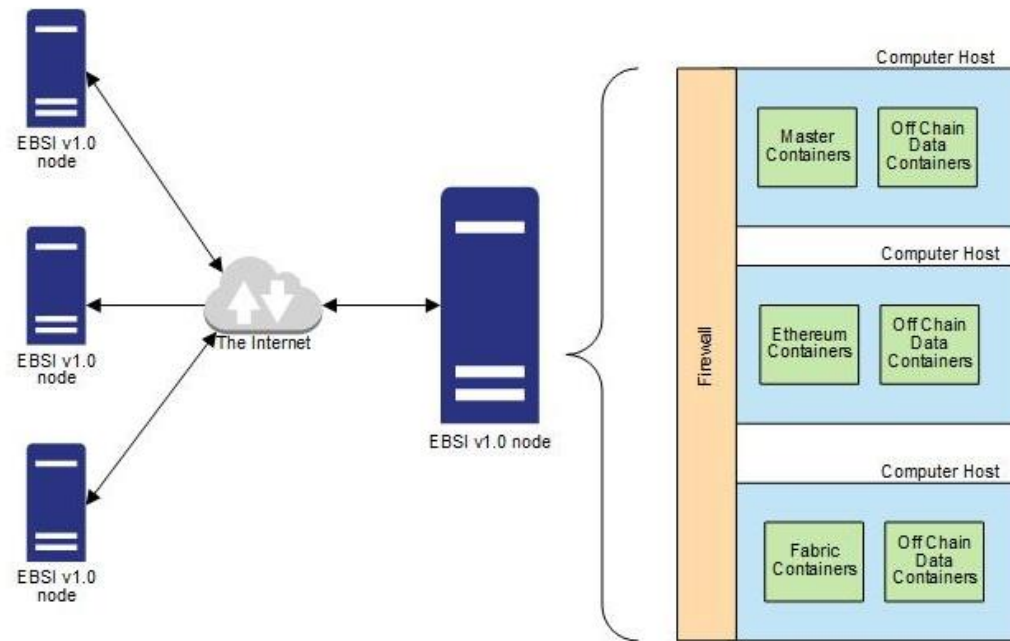
0103

# Become a node Operator?

- Each EBSI Node can deploy one or several of EBSI's environments:
  - Pilot environment: user testing purposes
  - Pre-Production: acceptance testing
  - Production environments: live EBSI network
- There are minimum technical requirements and SLAs to be met, all outlined in the EBSI Node Operator General Conditions
  - <https://ec.europa.eu/digital-building-blocks/wikis/display/EBSI/Node+Operators>
- Quite complex process ...

# Node Architecture (update?)

- 1 Node = 3 (virtuelle) Hosts mit ca. 14 Services ...



BESU	EBSI Nodes (All)	MS EBSI Node	TCP 48745	Ethereum (Besu) ledger (RPC Service)
BESU	EBSI Nodes (All)	MS EBSI Node	TCP+UDP 48733	Ethereum (Besu) ledger (Syncro Service)
Master/Application	EBSI Nodes (All)	MS EBSI Node	TCP + UDP 24007, 24008 & TCP 49152	GlusterFS (not used in V1.0)
Master/Application, BESU, FABRIC	EBSI Nodes (All)	MS EBSI Node	TCP 27017	Mongo DB (Redundancy Option) (not used in V1.0)
Master/Application, BESU, FABRIC	MS management network OR internet	MS EBSI Node	TCP 48790	Cockpit
FABRIC	EBSI Nodes (All)	MS EBSI Node	TCP 7054	Fabric CA Service
FABRIC	EBSI Nodes (All)	MS EBSI Node	TCP 7053	Fabric Peer External (Even Notification)
FABRIC	EBSI Nodes (All)	MS EBSI Node	TCP 7051	Fabric Peer Internal (GRPC)
FABRIC	EBSI Nodes (All)	MS EBSI Node	TCP 7050	Fabric Orderer Service
FABRIC	Internet	MS EBSI Node	TCP 48780	Fabric Block Explorer
Master/Application	EBSI Nodes (All)	MS EBSI Node	TCP 7000	Cassandra DB
Master/Application, BESU, FABRIC	Internet	MS EBSI Node	TCP 443	NGINX (HTTPS Traffic)
Master/Application, BESU, FABRIC	MS management network OR Internet	MS EBSI Node	TCP 48722	SSH (for Node Computer Unit admin)
Master/Application, BESU, FABRIC	infra.ebsi.xyz	MS EBSI Node	TCP 8140	For configuration management

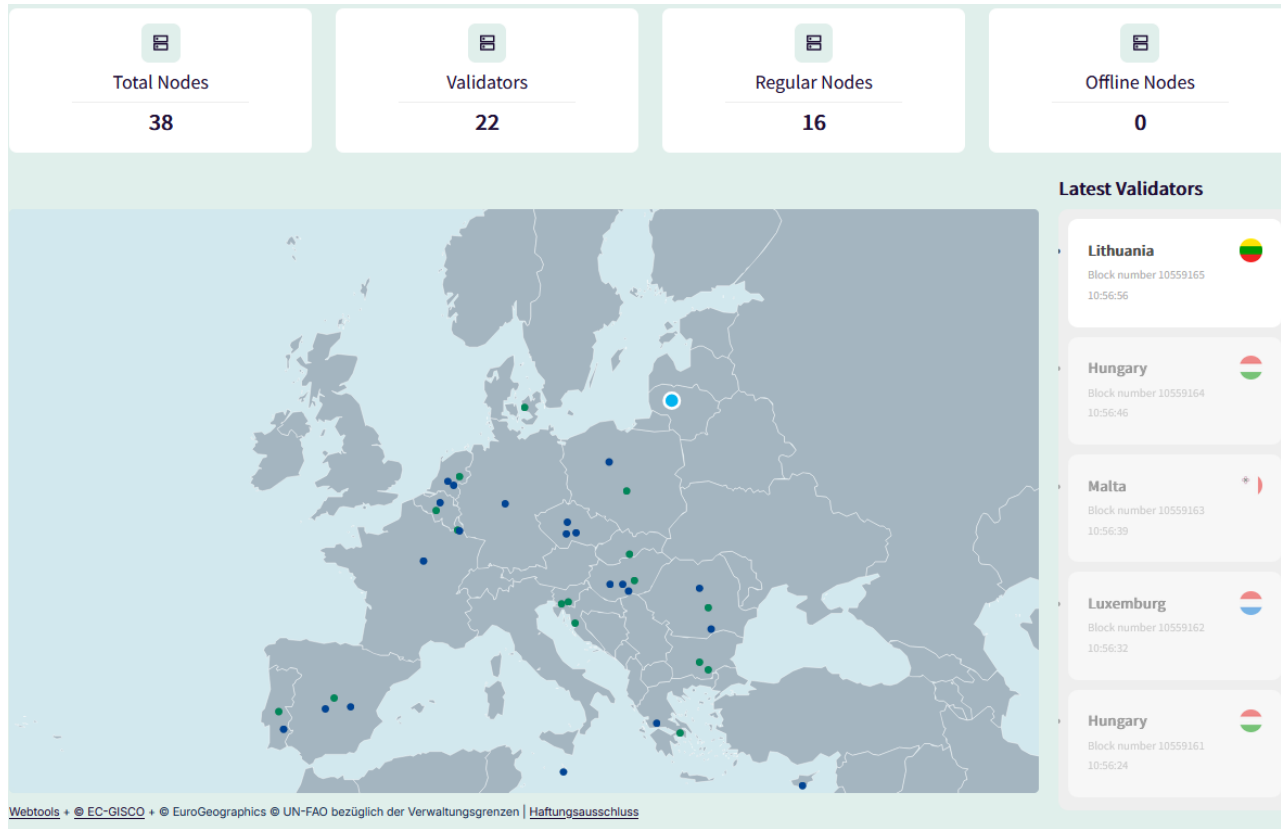
## EBSI in AT? (Info aus 2021/2022)

- EBSI4Austria is a CEF funded project that will focus on **hosting the Austrian EBSI node and supporting Austrian stakeholders to participate in EBSI**. Besides the two participating universities, namely Graz University of Technology and Vienna University of Economics, is the third stakeholder a company (DanubeTech).
  - <https://www.a-sit.at/ebsi4austria-at/>
  - <https://medium.com/@markus.sabadello/report-from-ebsi4austria-b79c0ed8ab8d>
  - <https://github.com/danubetech/ebsi4austria-examples>
- European Blockchain Partnership
  - <https://digital-strategy.ec.europa.eu/en/policies/blockchain-partnership>

# Status / Vergleich

- EBSI
  - „Eierlegende Wollmilchsau“
  - Hohe Komplexität: technisch, organisatorisch
  - Teilnahme erfordert hohen Aufwand: Kosten, Zeit
  - Diverse Prototypen seit 2019/2020
  - Nur wenige Usecases in Echtbetrieb
- Vergleich mit APSB?
  - Schwer!
  - Aufwand EBSI (Nodes, Implementierungen ...) min. Faktor 10-20 komplexer/teurer
  - APSB Infrastruktur seit Ende 2019 in Echtbetrieb
  - Usecase: Datenzertifizierung (Notarisierung)
- EBSI: „Top-Down“ / APSB: „Bottom-Up“

# EBSI Network Map



18.09.2025

Environment	Validators	Regular Nodes	Offline Nodes	Total Nodes
Pilot	22	16	0	38
Pre-Production	14	10	0	24
Production	15	8	0	23

<https://ec.europa.eu/digital-building-blocks/sites/spaces/EBSI/pages/726007941/Node+Operator+Map>

# Konnex zu AustriaPro?

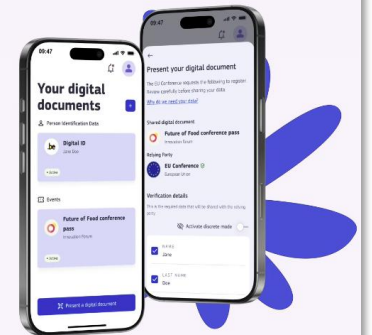
- Weitere Beobachtung des Projektes
  - U.a. im Rahmen der AG Technik & Lab
- **Plan war: Definition next steps???**
  - **Mögliche Koppelung APSB zu EBSI??**
    - **Notarisierung?**
    - **z.B. in Form von Anchoring**
  - **Ggf. Node betreiben und Umsetzung von weiteren Usecases überlegen???**
- Abhängig von
  - Interesse von Stakeholdern?
  - Finanzierung?

# EBSI Status 9/2025 aus Sicht von AT

- „... seit Pilot nicht weiterverfolgt, auch den Knoten nicht weiterbetrieben ...“
- „... BKA wollte mit BRZ reden ...“
- Ansicht, dass die meisten Usecases „nicht passend für Blockchain“ waren/sind.
- EU-Wallet (EUDI - EU Digital Identity Wallet) wird diverse Usecases übernehmen ...
  - Identität
  - Diverse credentials
    - Reisepass
    - Diplomas
    - Auch: eHealth!

**A digital ID and personal digital wallet** for EU citizens, residents and businesses

EU Digital Identity Wallets will provide a safe, reliable, and private means of digital identification for everyone in Europe. Every Member State will provide at least one wallet to all its citizens, residents, and businesses allowing them to prove who they are, and safely store, share and sign important digital documents.



<https://ec.europa.eu/digital-building-blocks/sites/spaces/EUDIGITALIDENTITYWALLET/pages/694487738/EU+Digital+Identity+Wallet+Home>