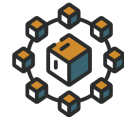




ΥΦΥΠΟΥΡΓΕΙΟ
ΕΡΕΥΝΑΣ, ΚΑΙΝΟΤΟΜΙΑΣ
ΚΑΙ ΨΗΦΙΑΚΗΣ ΠΟΛΙΤΙΚΗΣ
ΚΥΠΡΙΑΚΗ ΔΗΜΟΚΡΑΤΙΑ



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Ενημερωτική Ημερίδα

ΤΟ ΕΡΓΟ

“CY-EBSI – ESTABLISHMENT OF EBSI NODE(S) IN CYPRUS”

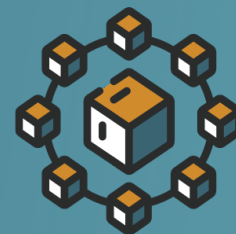
***ΚΑΙ Η ΣΗΜΑΣΙΑ ΤΗΣ ΤΕΧΝΟΛΟΓΙΑΣ BLOCKCHAIN
ΣΤΗΝ ΨΗΦΙΑΚΗ ΔΙΑΚΥΒΕΡΝΗΣΗ***

18 Μαρτίου 2022, 08:30 – 11:00

Πανεπιστήμιο Λευκωσίας, Αμφιθέατρο UNESCO



Συγχρηματοδοτείται από την Ευρωπαϊκή Ένωση
Διευκόλυνση «Συνδέοντας την Ευρώπη»



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Υποδομή EBSI και δυνατότητες

Δρ. Κλείτος Χριστοδούλου,
Επίκουρος Καθηγητής, Τμήμα Ψηφιακής Καινοτομίας,
Πανεπιστήμιο Λευκωσίας



The Digital Trust Challenge

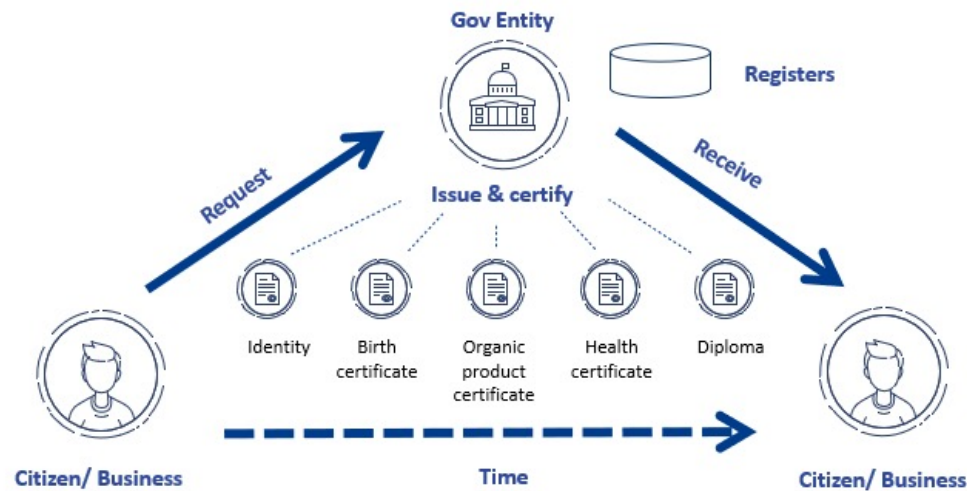
- to create a unified and seamless **digital society** away from paperwork and time-consuming processes
- However -> processing sensitive digital data (e.g., identification documents) could lead to vulnerabilities and fraudulent activities



“figuring out a way to make everyday online interactions safe and trustworthy for all parties involved is challenging”



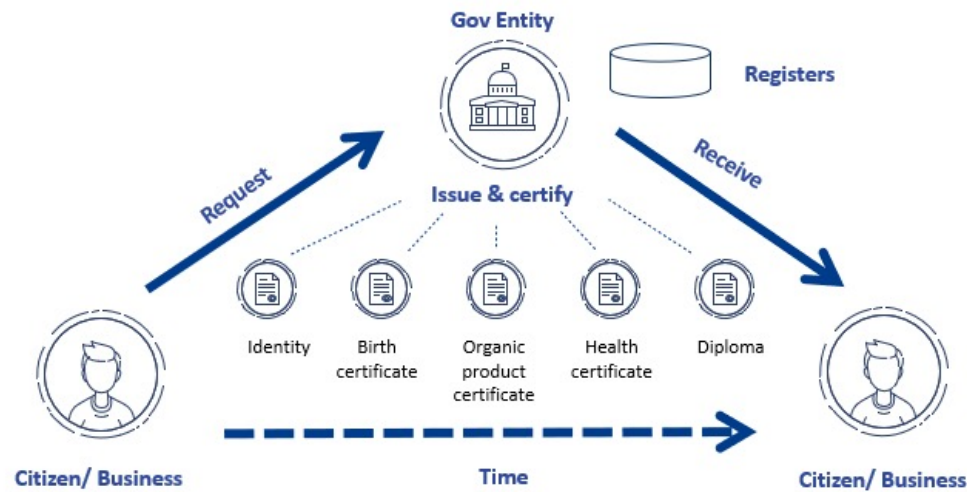
The triangle of trust for Gov entities?



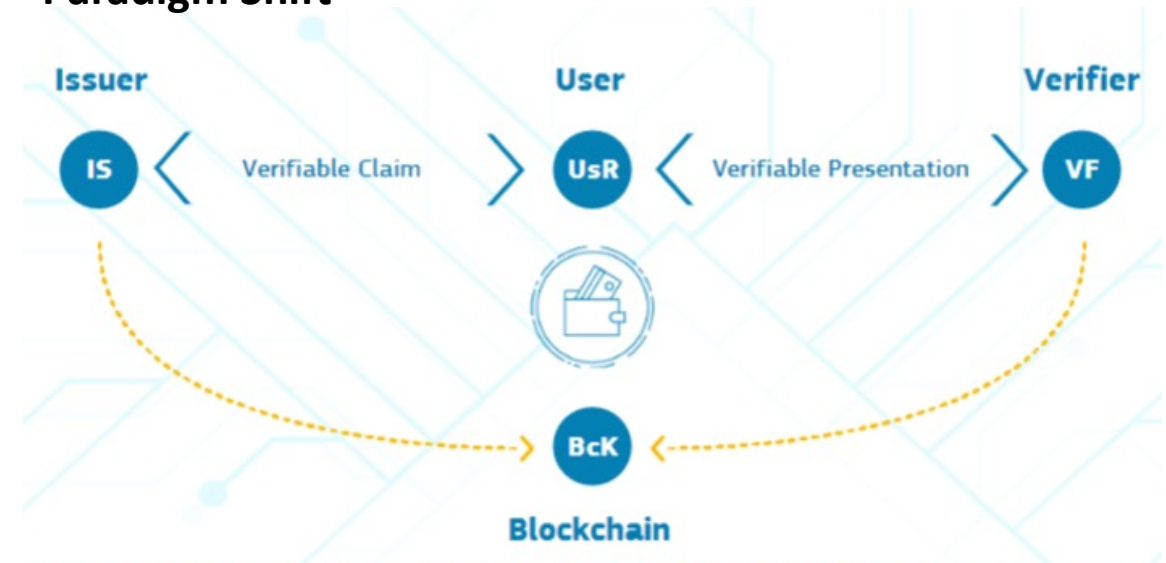
- How can governments trust digital data?
- How to share official documents, called 'evidences' or 'credentials' in a way that can be trusted?
- How to prevent digital fraud?
- How to create safe processes when exchanging and processing documents and information over the internet?



The triangle of trust for Gov entities?



Paradigm Shift



- How can governments trust digital data?
- How to share official documents, called 'evidences' or 'credentials' in a way that can be trusted?
- How to prevent digital fraud?
- How to create safe processes when exchanging and processing documents and information over the internet?



- EU launched several EU-wide initiatives to support the development of digital solutions that can enable public administrations, businesses and citizens in Europe to benefit from **cross-border** and **cross-sector** services.

European Blockchain Service Infrastructure (EBSI)



*Accelerate the creation of cross-border services and put **blockchain/DLTs** at the service of public administrations.*

eDelivery



Exchange electronic data and documents in an interoperable and secure way

eID



Offer services capable of electronically identifying users across Europe

eSignature



Create and verify electronic, paperless signatures

eInvoicing



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



What is EBSI?



EBSI

- EBSI provides a common, shared, and open public blockchain infrastructure and service layer
- The infrastructure delivers a secure and interoperable ecosystem that enables the development, launch and operation of EU-wide cross-border digital services in the public sector

Mission

- To build the first EU-wide blockchain infrastructure
- To make public services more trustworthy and accessible by European citizens

Design Principles

- Working towards the public good
- Transparent governance
- Data compatibility
- Open-source software
- Compliance with EU regulations e.g., GDPR and eIDAS



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Self-Sovereign Identity



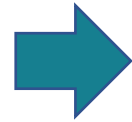
Cross-border verification of identity credentials allowing users to create and control their own identity across borders.

Diplomas



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



Build a trusted, time stamped audit trail of digital artefacts that are linked together

Data Sharing – Social Security Use case



Cross-border verification of social security coverage of posted workers.

Other use-cases being explored:

- *Tax Audit, Customs*
- *SME Financing, Public Administration*
- *Asylum Process Management*

**Verifiable Credentials
Lifecycle**



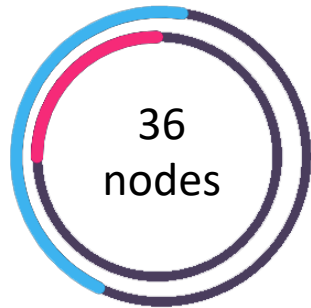
**Cyprus’s EBSI Pilot with
University Networks**



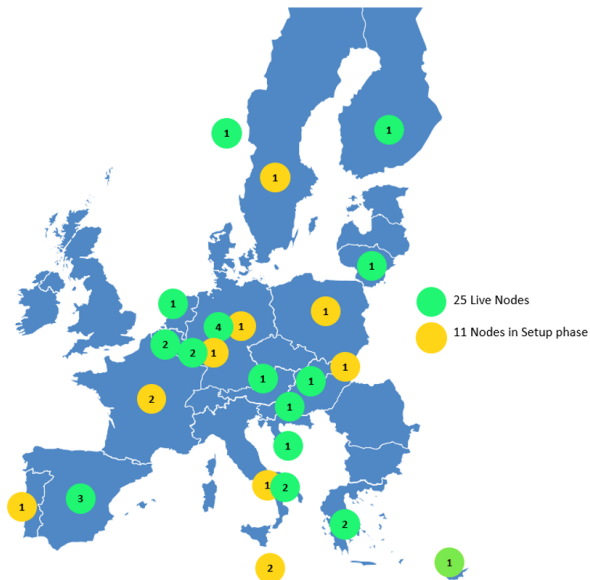
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EBSI network status



- 25 live nodes
- 11 nodes in setup phase



EBSI Nodes Eligibility

- EBSI enables a "public permissioned" blockchain
- Network nodes (EU members) managed by the European Commission
- Additional members of the European Blockchain Partnership within individual regions

Cyprus EBSI Node

- EBSI node for Cyprus implements the infrastructure elements required to setup an EBSI node
- To support EBSI's layered architecture which is used to aggregate tools and services needed to develop, build, test and deploy an EBSI use-case
- Support EBSI by providing resources and increase its decentralization degree



CPU

- 4 cores datacenter CPU or vCPU, newer than 2018 generation

RAM

- 32 GB Ram (minimum)

Storage

- 80 GB SSD – for OS
- 256 GB SSD – for Data Volume

Connection

- 100MBps – 1 fixed public IPv4
- 1GBps (LAN bandwidth)

No

3 VMs for EBSI

- 1 EBSI v2.0 All in one Full stack pilot network
- 2 EBSI v2.0 All in one Full stack production network
- 3 EBSI v1.0 All in one Full stack Node



EBSI's Infrastructure Layers



Core Services

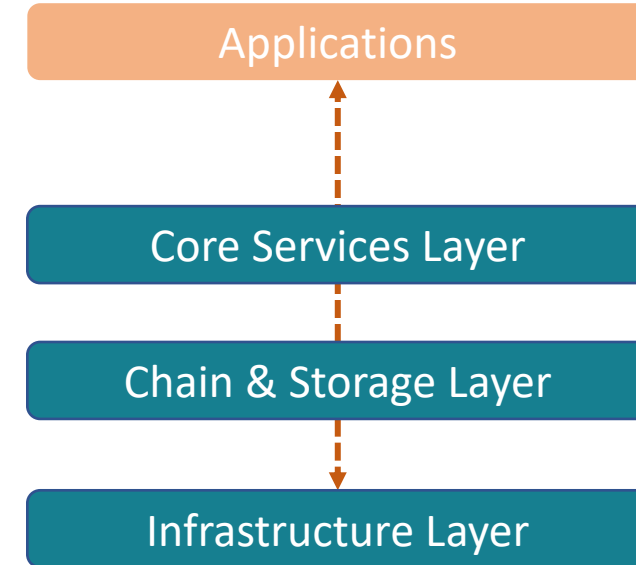
- A set of standardised interfaces (APIs), which enable third-parties to develop different applications while ensuring compliance with the five guiding principles defined by the EBP

Chain & Storage Layer

- The chain and storage layer encompasses both the blockchain and the off-chain storage protocols currently supported by EBSI

Infrastructure

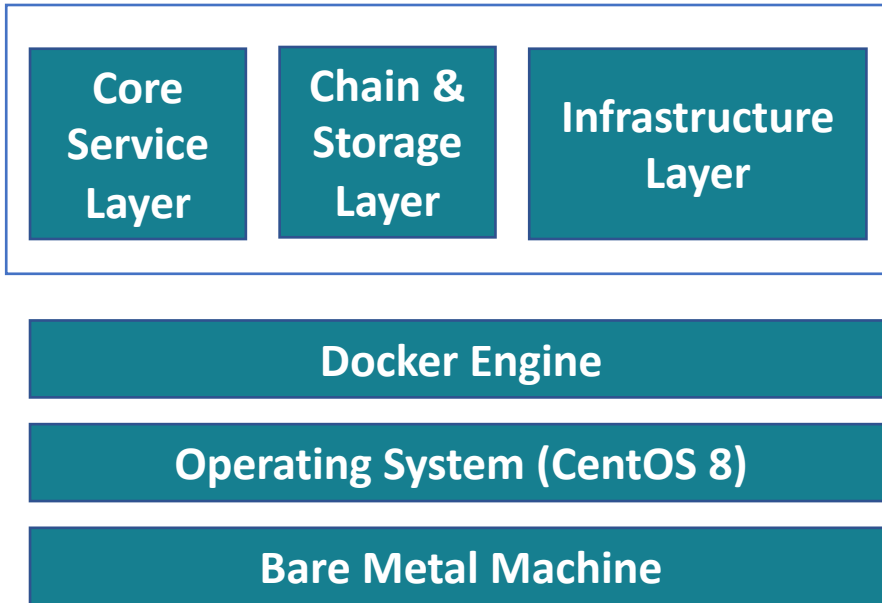
- Host images, and tools for connecting and monitoring the blockchain networks and other EBSI services



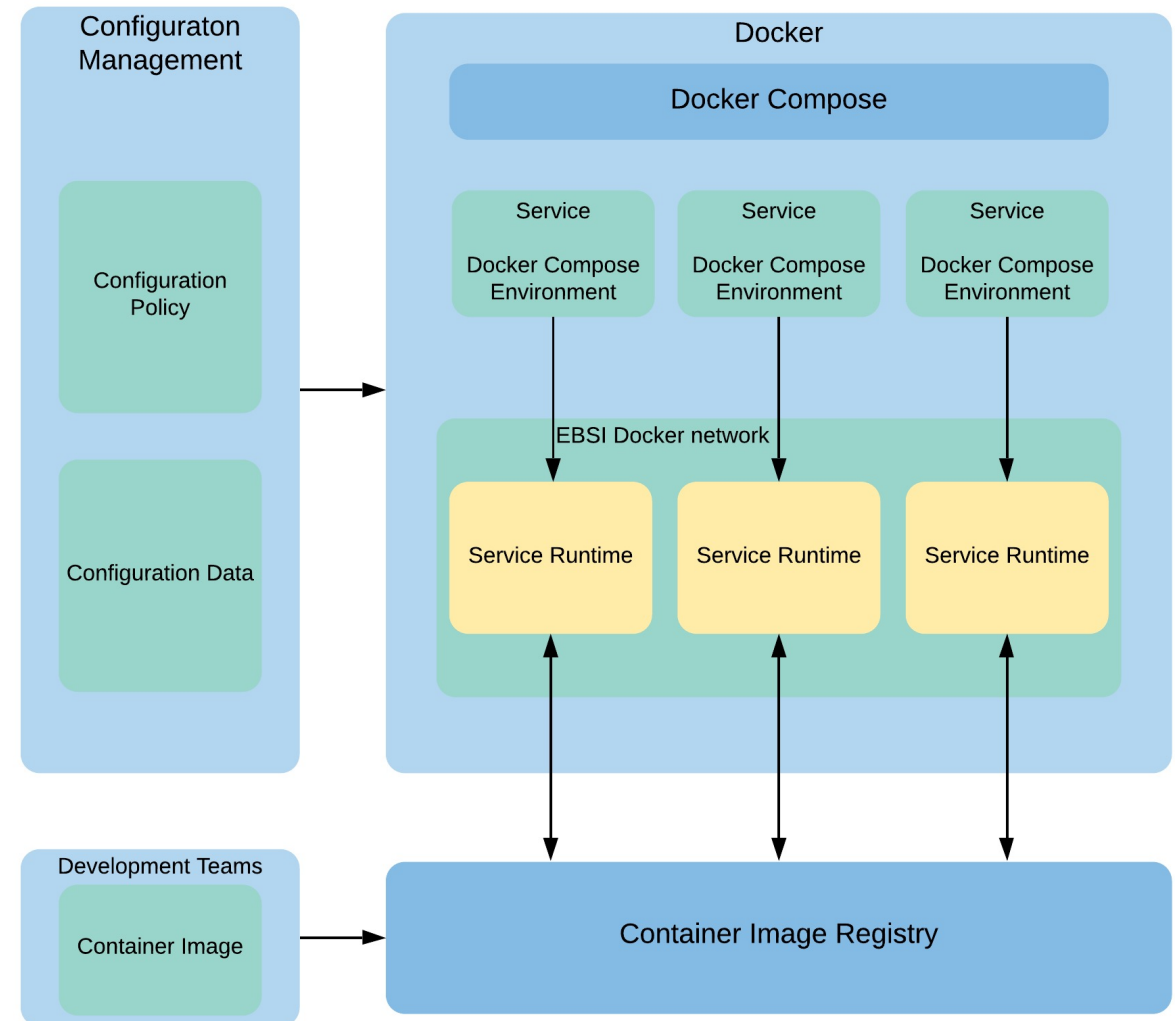
Cyprus EBSI Node (2/2)



EBSI Containers



Remote Monitoring



Abstract overview of EBSI's Layers

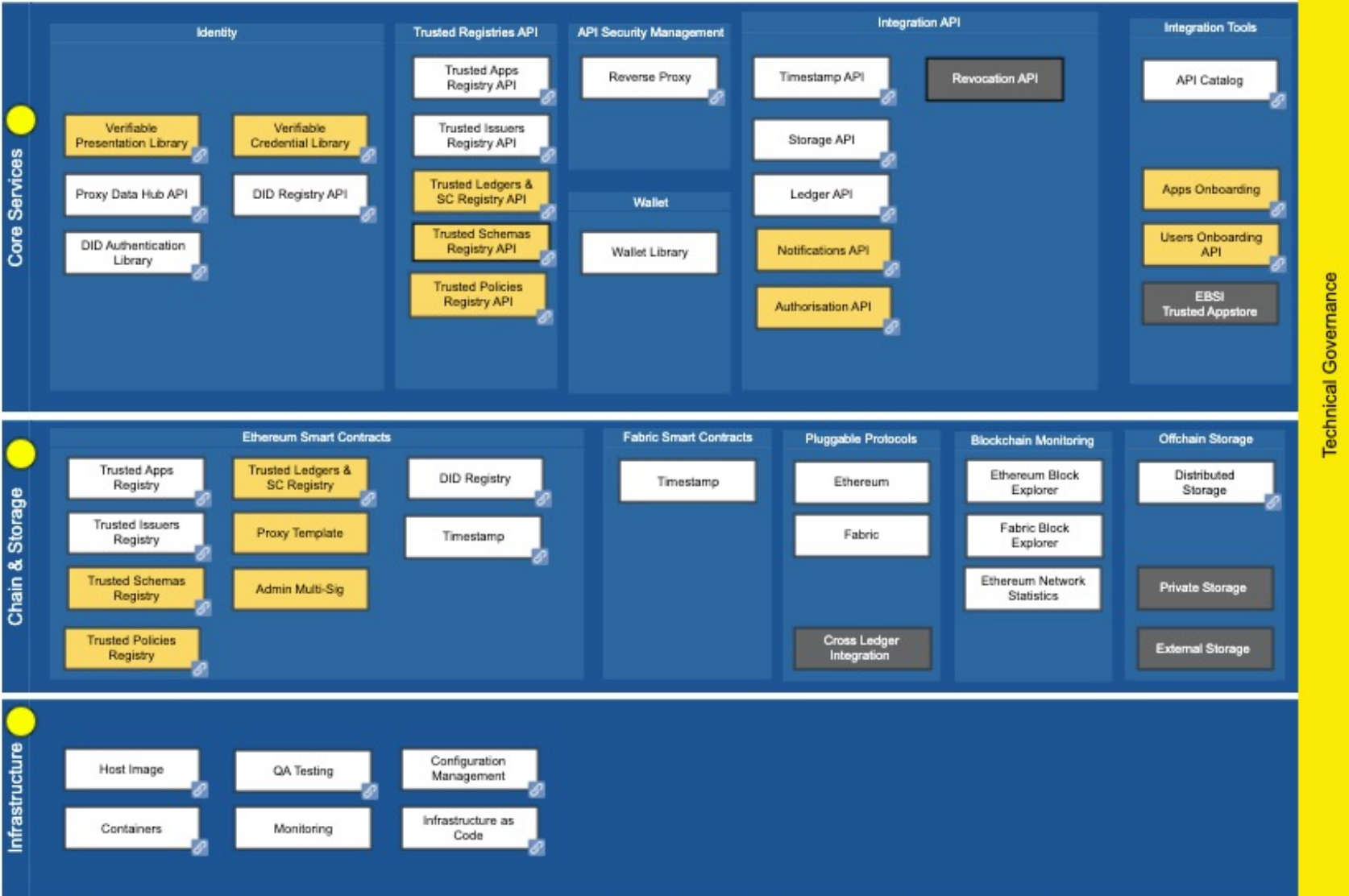


Figure shows the generic services provided by the underlying EBSI infrastructure to enable various use-cases.

[1] <https://ec.europa.eu/digital-building-blocks/wikis/display/EBSIDOC/Build>

Existing service in EBSI V1 New service in EBSI V2 *Future service in EBSI V2+



EBSI Monitoring – Block Explorer



Ethereum Lite Explorer

An open source Ethereum block explorer. Available on

LAST BLOCKS TRANSACTIONS

LATEST BLOCK **#4335450** TIME **1 minute ago** TRANSACTIONS **0** UNCLES **0**

Blocks by tx count



BLOCK	#4335450	TIME	1 minute ago	3 confirmations	UNCLES	0
HASH	0xbbba ... 6d98c8	PARENT	0xce40 ... 3db5a6			
NONCE	0x0000000000000000	SIZE	1,438 bytes			
TRANSACTIONS	0					
TX TRIE	0x56e8 ... 63b421	SHA3UNCLES	0x1dcc ... d49347			
MINED BY	0x386a ... 4475e4					
GAS LIMIT	100,000,000	GAS USED	0	0%		
DIFFICULTY	1H					
EXTRA DATA	<pre>ù ù \$ð ðoiv~Xεçp @É *J "L ÜDs1óÑ 7 È {q8 % 'L :WÅ U&á ° 4i p .BÉi ÿp ÉH á C iDØ É ,Çc &Bá ú¯ =RBj'ÝJ¶,49 ,A-øÀ' Ñçp" 5 .vÜ NI] è% g® ù 9 jiaİ,A òi , à>ù§ Åm óh2p#α!α é1d,i'~&¶< ò ÜöfAÜg, uİ¶É q6øP è,Ð ÒØ ,Aøá JOøi » 'òz+& @µ ò(Øeé(A ¶\R s% ýc> ,AÆ zobA ùð°²ÜpÙ¥ xy éðÁóáİ Pv x'Ä1#1±µ VQTØ</pre>					
MIX HASH	0x6374 ... 6e6365	RECEIPTS TRIE	0x56e8 ... 63b421			

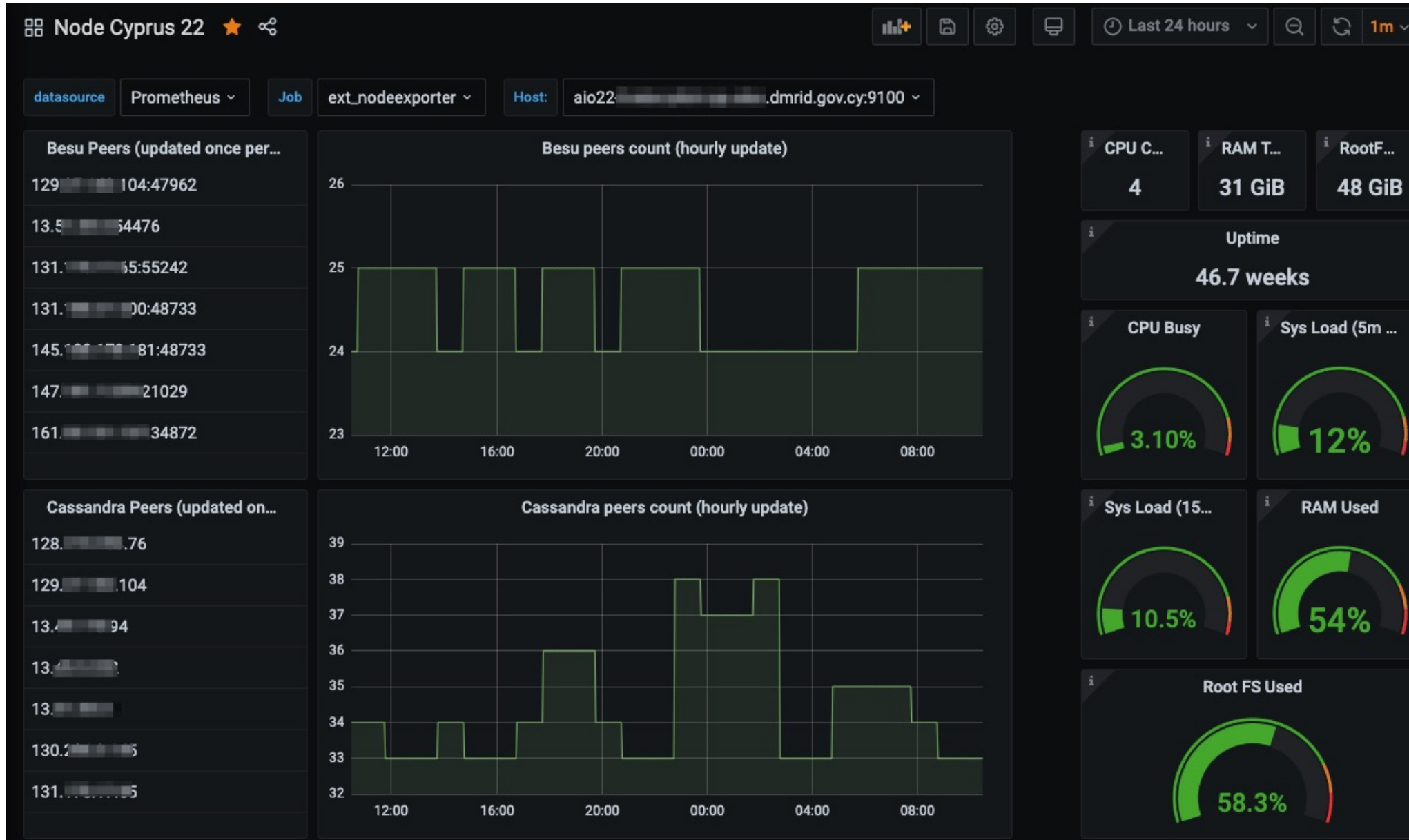
[1] <https://app.preprod.ebsi.eu/besu-explorer/>



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EBSI Monitoring - Grafana



What is next for EBSI phase 2



Aim:

- to pilot innovations and to improve: scalability, energy efficiency, security, privacy, and interoperability of EBSI

Scalability



For EBSI to be able to cater an increasing number of transactions from users in the long term

Consensus



Research on robust consensus algorithms for reaching decentralized agreements, authenticate and validate transactions. Consensus should be dynamic and configurable

Governance



EBSI structures to be used for both permissioned or permissionless settings and the same time adapting to different European Institutions and Regulators

Identity



Implement a GDPR-compliant Identity Solution with a new framework for EU digital identity proposed by the European Commission. This will allow businesses and citizens to have better control over their data.

Interoperability



Provide on-chain and off-chain bridges to other protocols outside EBSI. Also, support for Ethereum Virtual Machine (EVM) and other enterprise systems



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What is next for EBSI phase 2



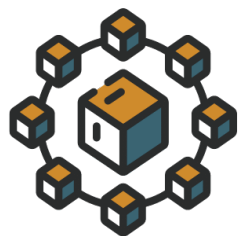
Regulatory Sandbox

The regulatory sandbox will be instrumental to accompany the use cases on EBSI and beyond, enabling regulators and users as well as providers of DLT and blockchain technologies to interact in a trusted environment.

[1] <https://www.eublockchainforum.eu/news/regulatory-sandbox-blockchain-and-legal-advice-ebsi-production-phase>



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ΚΥΠΡΙΑΚΗ ΔΗΜΟΚΡΑΤΙΑ



Ευχαριστώ!

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Συγχρηματοδοτείται από την Ευρωπαϊκή Ένωση
Διευκόλυνση «Συνδέοντας την Ευρώπη»