VALTIOVARAINMINISTERIÖ

Blockchain technology, European Blockchain Partnership and some thoughts on copyright infrastructure

4.9.2020 Kimmo Mäkinen

Bitcoin: A Peer-to-Peer Electronic Cash System

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Abstract. A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself requires minimal structure. Messages are broadcast on a best effort basis, and nodes can leave and rejoin the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone.

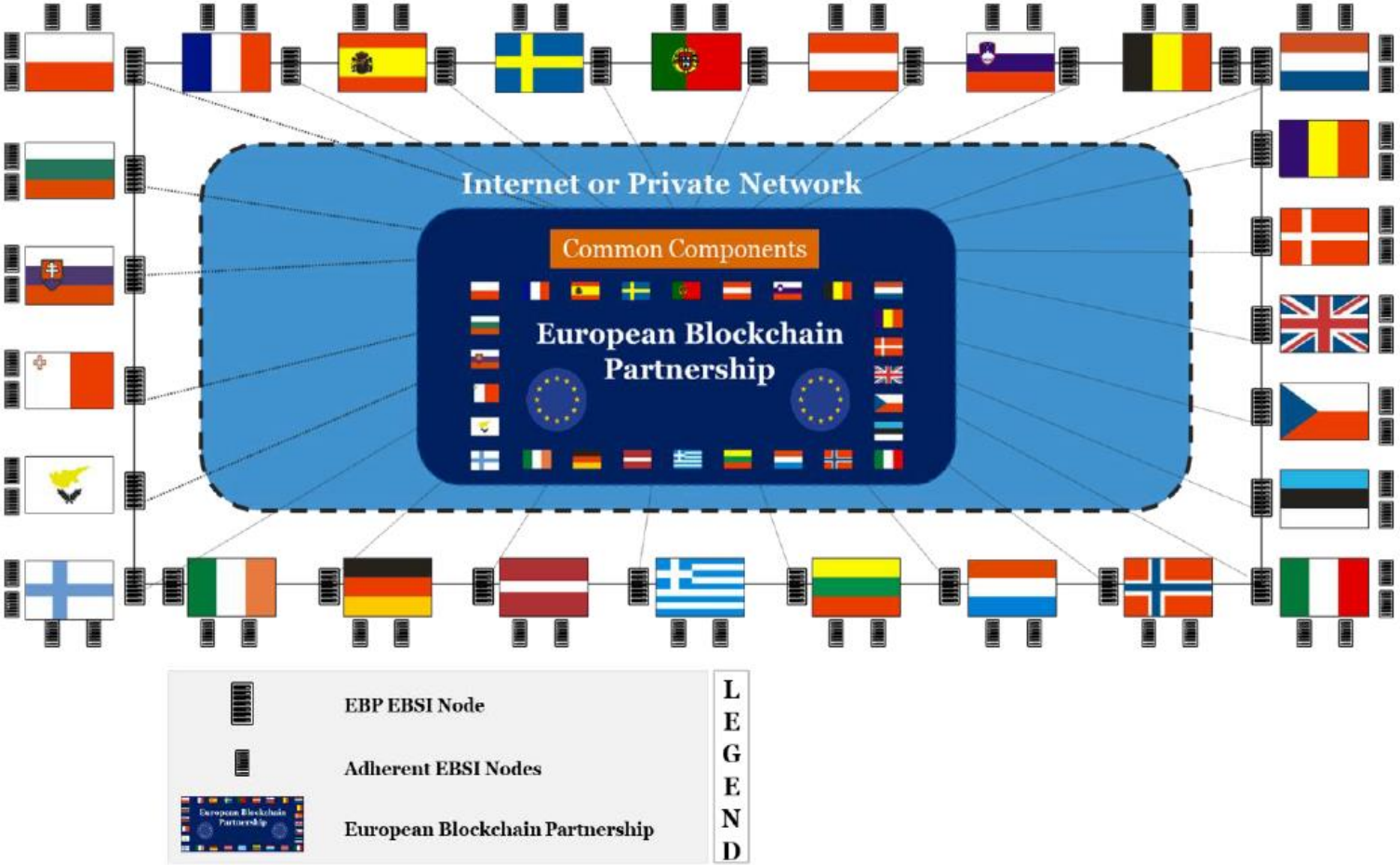
Why blockchain technology?

- P2P (no middlemen)
- Data can be trusted (proof of work)
- One truth (no double spending, internet time)
- No central single-point-of-failure (zero down time)
- Blockchain can strore not only data but program code as well (smart contracts)

European Blockchain Partnership

10TH APRIL 2018

Brussels, Belgium


Internet or Private Network
Common Components
European Blockchain Partnership
EBP EBSI Node
Adherent EBSI Nodes
European Blockchain Partnership
LEGEND

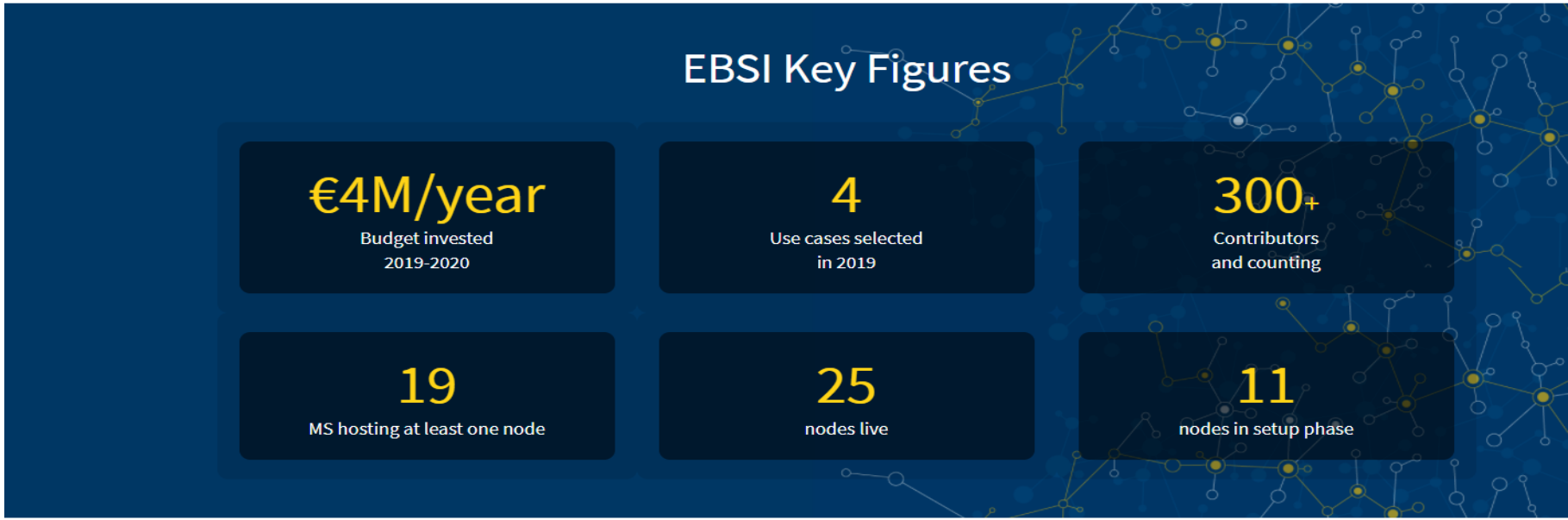
What is EBSI

- The European Blockchain Services Infrastructure (EBSI) aims to become a “gold standard” digital infrastructure to support the launch and operation of EU-wide cross-border public services leveraged by blockchain technology.
- EBSI aims to establish itself in ‘virtually’ every public sector domain that can benefit from blockchain technology. EBSI will focus on specific use cases where blockchain technology can enhance cross-border digital public services.
- These use cases are identified and selected each year by the EBP Member States and the European Commission.

What is EBSI

- Common facts
  - https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/ebsi
- Documentation
  - https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITALEBSI/EBSI+Documentation+home
- (to be noticed EBP has joined INATBA Govermental Advisory Board)
  - https://inatba.org/

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



> *"New decentralised digital technologies such as blockchain offer a further possibility for both individuals and companies to manage data flows and usage, based on individual free choice and self-determination. Such technologies will make dynamic data portability in real time possible for individuals and companies, along with various compensation models".*
>
> *A European strategy for data, 2020*

Public permissioned blockchain - EBSI

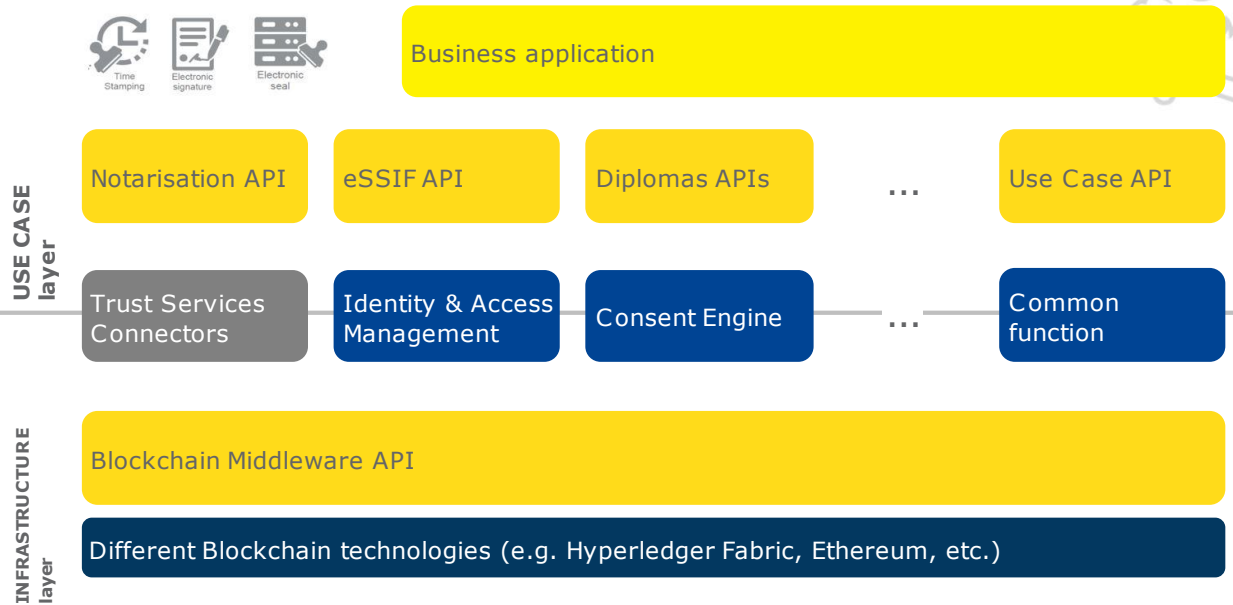
- Public
  - EBSI aims to be open to public bodies, citizens and enterprises.
- Permissioned
  - Sustainability and energy efficiency (A permissioned blockchain can operate with a consensus mechanism that consumes a reasonable amount of electricity.)
  - Legal certainty concerning compliance with EU laws (NIS, GDPR, eIDAS)

EBSI AT A GLANCE

The EBP Member States will operate EBSI nodes at national level. These nodes will be able to create and broadcast transactions that will update the ledger. The architecture of each node will be composed of two main layers.

A **use case-specific APIs layer** developed to enable business applications to interface with the node.

An **infrastructure layer** with capabilities common to all use cases. A thorough analysis will determine the EBSI native network based on specific use case requirements.



SELECTED USE CASES FOR 2019

An EBP Member State led and composed user group has been established per selected use case. These user groups aim to deliver a working prototype connected to the infrastructure layer of EBSI by the beginning of 2020. A new set of use cases will be selected by the European Blockchain Partnership Policy Group for 2020 (and onwards).

Notarisation of Documents for Auditing Purposes

Leveraging the power of blockchain to create trusted digital audit trails, automate compliance checks in time-sensitive processes and prove data integrity.

Certification of Diplomas

Giving control back to citizens to validate their education credentials, significantly reducing verification costs and improving authenticity trust.

EU Self-Sovereign Identity Framework

Implementing a generic Self-Sovereign Identity capability, allowing users to create and control their own identity without relying on centralized authorities.

Trusted Data Sharing

Leveraging blockchain technology to securely share data (e.g. IOSS VAT identification numbers and import one-stop-shop) amongst customs and tax authorities in the EU.

EBSI use-case groups 2019 ->

- Diplomas
  - Korhonen Jonna OKM, Kytölä Tomi OKM
- eSSIf
  - Pirinen Jari DVV, Kupari Anneli DVV
- Notarisation
  - Kerttula Timo VTV
- Trusted data sharing
  - Sinervo Pasi Vero, Helenius Jari Vero

EBSI use-case groups 2020 ->

- European Social Security Identification Number
  - Sunblad Mia KELA, Rasimus Suvi KELA
- Asylum Process Management
  - Untamo Tuomas Migri, Montin Mikko Migri
- SME Financing
  - Suomi ei ole mukana

Possibilities for use of blockchain technology

- Metadata on ownership and other aspects of the copyright asset can be stored on the blockchain
- Smart contracts
  - containing a set of rules for how a copyright asset for example a digital photograph is licensed
  - automating who has access to the asset and under what conditions
- Compensation of the use of the copyright asset using FIAT, CBDC, cryptocurrencies / tokens
- Is there need for traditional copyright infrastructures?

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Thank you!

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