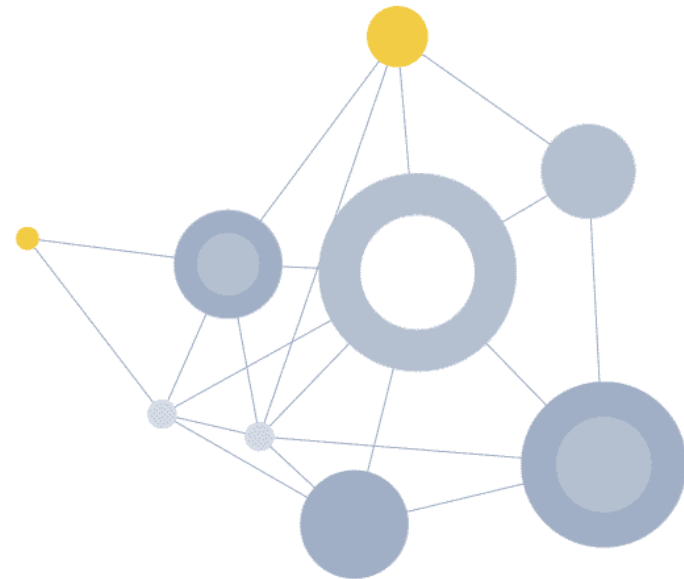


Digital Identity with LEIs

LEI Digital Strategy – Digital Certificates
and Introducing the verifiable LEI (vLEI)

Accredited Standards Committee (ASC) X9 Webinar
February 9, 2021
GLEIF





Agenda

- 1. Introduction: GLEIF digital strategy for the LEI
- 2. Safeguard trust in tomorrow's digital economy using the LEI
- 3. Delivering the vLEI with an interoperable and technically agnostic solution

The LEI

Live demo

- The LEI is a life-long code owned by the respective legal entity.
- It points to the associated reference data.

Nestlé S.A.

LEI Code KY37LUS27QX7BB93L28 Hide

| | |
|---------------------------|---|
| (Primary) Legal Name | Nestlé S.A. |
| Transliterated Names | Nestle S.A. |
| Registered At | Commercial Register (Ministry of Justice) Handelsregister (Stidg. Amt für das Handelsregister) Switzerland, Switzerland RA000549 |
| Registered As | CHE-105.909.036 |
| Jurisdiction Of Formation | CH |
| Entity Legal Form | Aktiengesellschaft MVI |
| Entity Status | ACTIVE |
| BIC Code | NESNCH22XXX |

Level 2 Data: Who Owns Whom

Parents

NATURAL_PERSONS (Direct Parent Exposed)

Direct children (69)

Nestlé S.A.

- [Maggi-Unternehmungen AG](#) (Direct)
- [Nestle Marcas S.A.C](#) (Direct)
- [네슬레코리아 유통책임회사](#) (Direct)
- [Nestle Waters Brasil - Bebidas E Alimentos Ltda.](#) (Direct)
- [Nestle Brasil Ltda.](#) (Direct)
- [Nestle de Colombia S.A.](#) (Direct)
- [Nestle Türkiye Gıda Sanayi Anonim Şirketi](#) (Direct)
- [Nestle Middle East FZE](#) (Direct)
- [Nestle Dubai Manufacturing L.L.C.](#) (Direct)
- [Nestle Middle East Manufacturing LLC](#) (Direct)
- [Nestle Lanka PLC](#) (Direct)

Sections

- Empty fields
- Entity details
- Addresses
- LEI Registration details
- LOU details
- Level 2 Data: Who Owns Whom

Ultimate children (110)

- [Maggi-Unternehmungen AG](#) (Ultimate)
- [Nestle Marcas S.A.C](#) (Ultimate)
- [Galderna Nordic AB](#) (Ultimate)
- [네슬레코리아 유통책임회사](#) (Ultimate)
- [CPW Brasil Ltda.](#) (Ultimate)
- [Chocolates Garoto SA](#) (Ultimate)
- [Nestle Waters Brasil - Bebidas E Alimentos Ltda.](#) (Ultimate)
- [Nestle Nordeste Alimentos E Bebidas Ltda.](#) (Ultimate)
- [Nestle Brasil Ltda.](#) (Ultimate)
- [Nestle de Colombia S.A.](#) (Ultimate)
- [Nestle Middle East FZE](#) (Ultimate)
- [Nestle Dubai Manufacturing L.L.C.](#) (Ultimate)
- [Nestle Middle East Manufacturing LLC](#) (Ultimate)
- [Nestle Lanka PLC](#) (Ultimate)
- [Fondation Nestlé pour l'étude des problèmes de l'alimentation dans le monde](#) (Ultimate)
- [Nestle \(Tha\) Limited](#) (Ultimate)

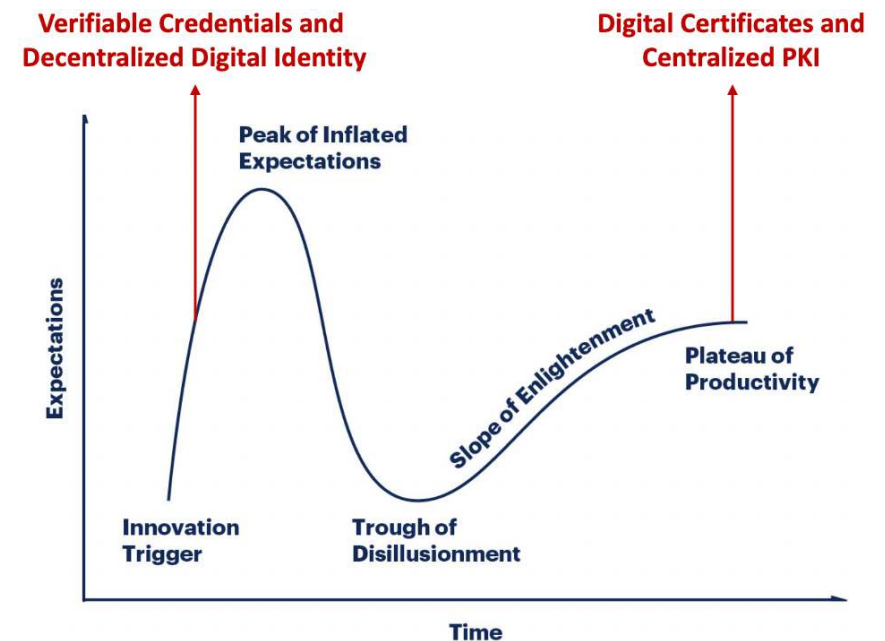
Introduction: GLEIF digital strategy for the LEI



LEI Digital Strategy

Digital Certificates as well as Self-Sovereign Identity Networks

- The LEI has a critical role to play in today's digital world through its ability to provide organizations with unique, permanent identification globally. This especially is important in the context of **identifying legal entities involved in digital transactions**
- LEI delivers value to both the more mature product - Digital Certificates - and the more recent innovation of **Verifiable Credentials**



LEI in digital certificates



LEI inclusion in Digital Certificates

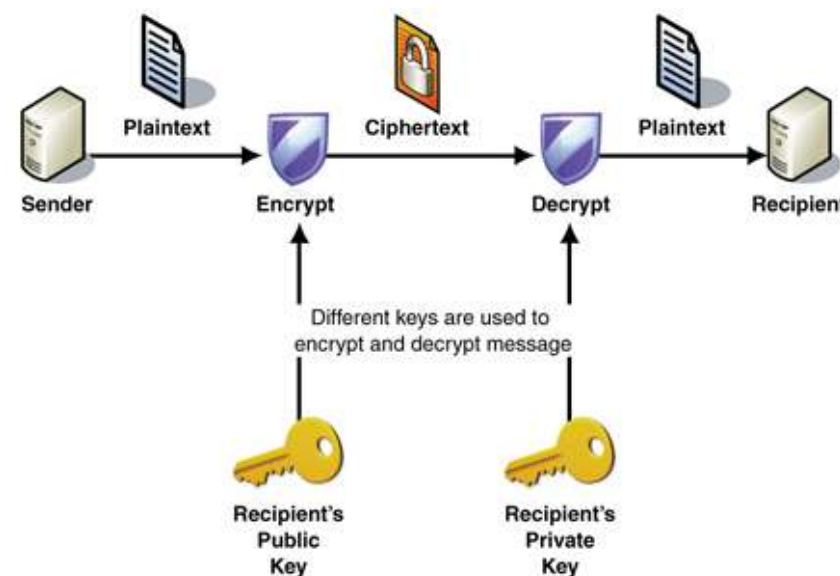
Signing and encrypting

Digital signatures offer the following main advantages:

- **Authentication:** legally enforceable proof of who actually signed the document
- **Non-repudiation:** assurance that a signer can't falsely deny having signed
- **Integrity:** proof that a document has not been changed since signing

In addition:

- Embedding **LEI codes** into digital certificates brings true digital and updated identity of legal entities



X.509 Digital Certificates

Example 1: GLEIF Annual Reports

Digital Certificates &

- Combine the strengths of the LEI and digital certificates
- In GLEIF 2018 Annual Report, eIDAS compliant certificates, for the first time, connect the role of the signatory to an organization through the LEI
- Watch how it works: <https://youtu.be/w4muYdNIQ-Q>

Statement of Comprehensive Income

for the Period from January 1 to December 31, 2019

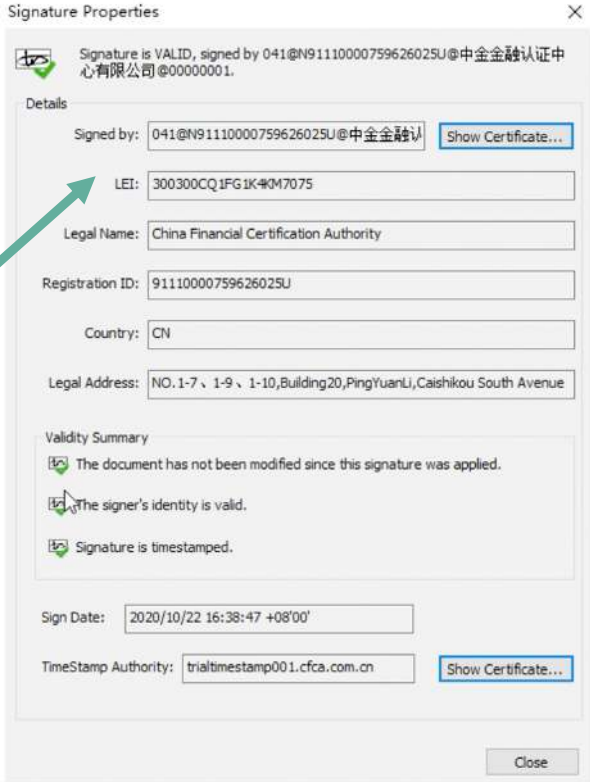
| | 2019 | 2018 | 2017 |
|---|-------------|------------------|------------------|
| Fee revenue | | 17,855,899 | |
| Wages and salaries | | -4,288,684 | |
| Social contributions and expenses for pensions and care | | -618,341 | |
| Personnel expenses | | -4,907,225 | |
| Other operating expenses | | -4,054,185 | |
| Other operating income | | 384,703 | |
| Amortization and depreciation expense | 4,514,614.7 | -873,846 | -344,735 |
| Operating surplus | | 3,101,859 | 8,634,457 |
| Subsidies and donations | 3.5 | 25,368 | 40,482 |
| Financial income / expense | 3.6 | -234,837 | -325,544 |
| Net surplus | | 2,892,190 | 8,349,395 |

Stephan Wolf, CEO
stephan.wolf@gleif.org
LEI: 506700GE1G29325QX363

- This document was signed on 10.6.2020, and has since not been modified. The signing time is based on the clock of the signer's computer at the time of signing.
- The signer's identity has been verified by Certificate Authority: **Autoridad de Certificacion Firmaprofesional CIF A62834068**
- The signer has the certified role of CEO at: **Global Legal Entity Identifier Foundation**
- The certificate is a Qualified Certificate in accordance with eIDAS (EU Regulation No 910/2014)

Chinese demonstration of embedded LEIs in certificates

With courtesy of CFCA (China Financial Certification Authority)



Safeguard trust in tomorrow's digital economy using the LEI



LEIs in a digital world

Making LEIs verifiable

- When presenting an LEI, it is not clear if
 - The LEI is valid
 - the presenter is the LEI owner or an affiliate
 - the presenter has the right to use it
- As a result
 - the recipient of the LEI must still check and verify,
 - background checks are often done manually at a high cost



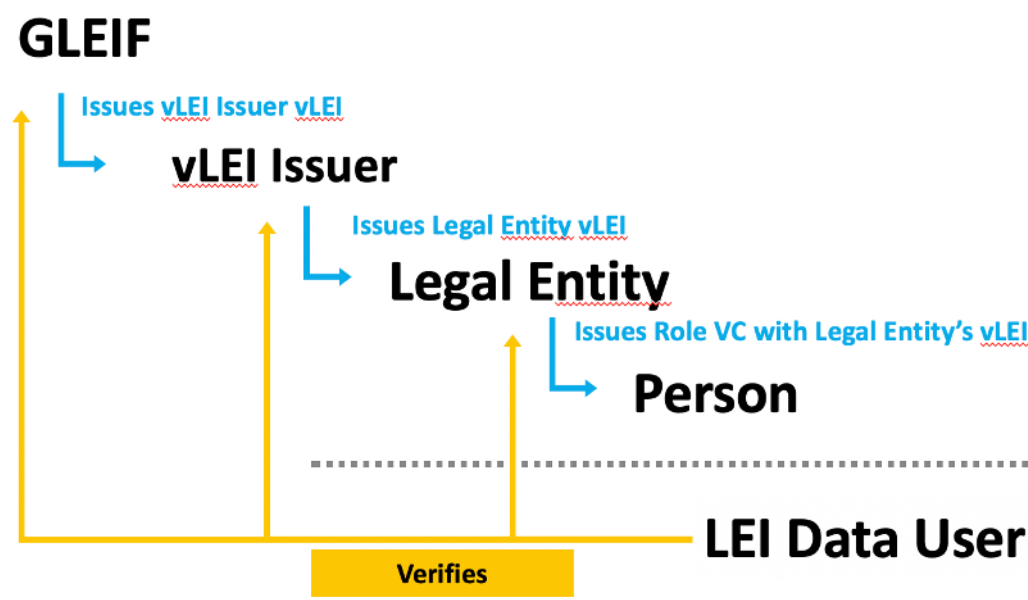
Verification examples

- The police verifies the driving license by comparing the photo on the ID with the presenter (biometrics are used widely)
- An employer calls the university to see if the job applicant's diploma is real
- Despite the presented LEI, a bank asks for business register evidence during onboarding of a legal entity customer

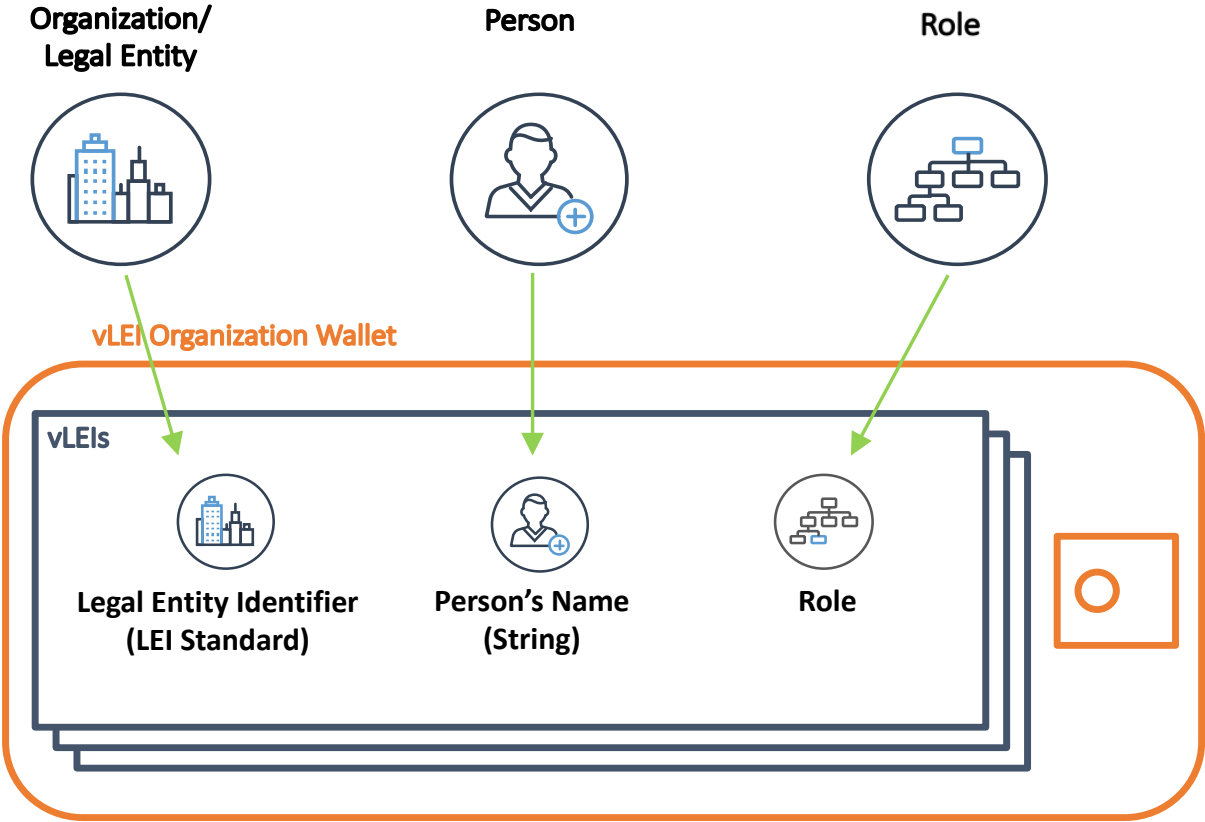
Common problem is the lack of trust – and the costs involved for creating trust

The LEI as a Verifiable Credential – the vLEI Trust Chain

- Every Verifiable Credential is created by an **issuer**
- The issuer **cryptographically** signs the credential with its private key
- An issuer is the organization or entity that asserts information about a **subject** to which a credential is issued
- In our example, the vLEI Issuer is an organization **certified** by GLEIF
- GLEIF issues vLEIs to vLEI Issuers as attestation of trust.
- GLEIF is the Root of Trust



Application of the vLEI Role Credential



Broader application of the vLEI Role Credential

- vLEI Role Credentials issued by Legal Entities to Persons whose **Official Organizational Roles** (ISO 5009 standard in development) that can be verified both by the Legal Entity as well as against one or more public sources

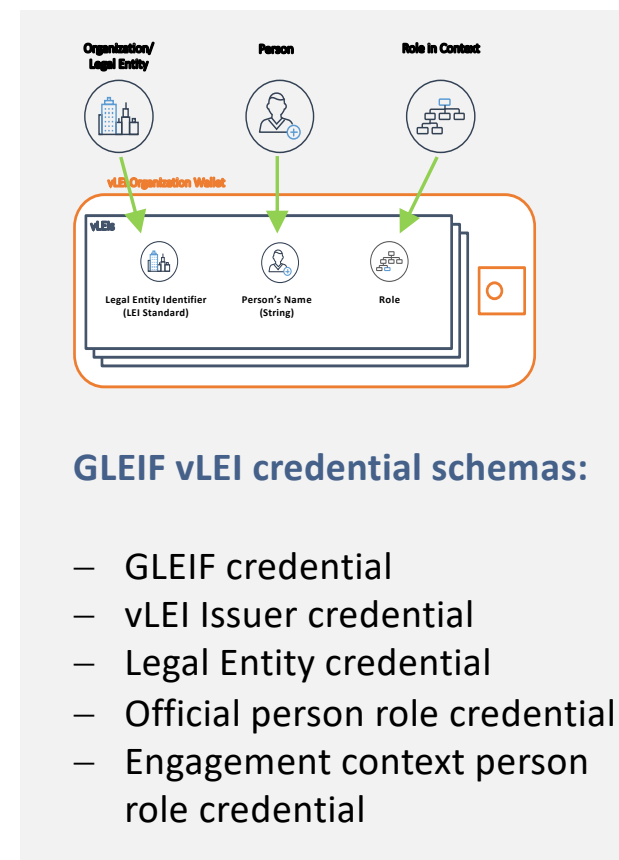
Examples:

 - Legal Entity – CEO
 - Legal Entity – Board Chair

- vLEI Role Credentials issued by Legal Entities to Persons in the **context of the engagement** of those Persons with the Legal Entities which can be verified by the Legal Entity

Examples:

 - Legal Entity – Other Employees
 - Hospital/Physician’s practice – Patients
 - Community/Ecosystem/Exchange/Registered Member
 - Trusted Supplier/Provider/Registered Member



Delivering the vLEI with an interoperable and technically agnostic solution



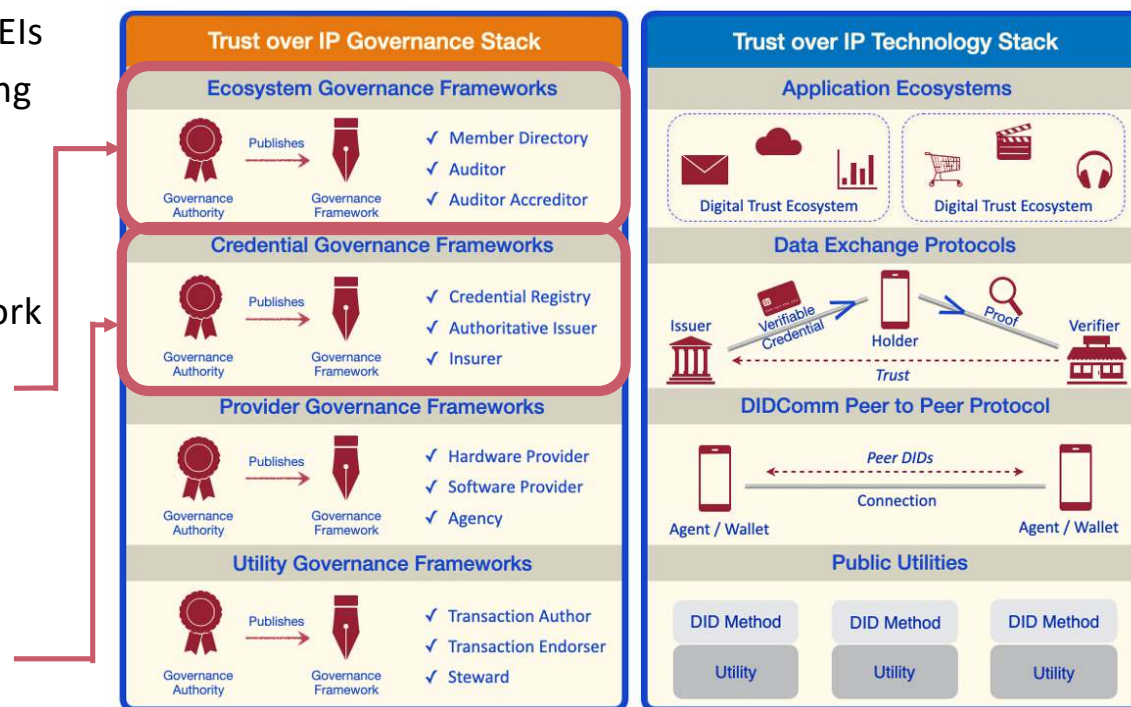
The vLEI ecosystem is in full accordance with ToIP standards

- Launched May 2020
- Grew from 27 to 125 member companies in less than six months
- Founding Members include Mastercard, IBM, Accenture, Government of British Columbia, LG, GS1, Mitre, SICPA, R3, Kiva, and 4 universities
- GLEIF joined ToIP as Contributor Member
- Hosted by the non-profit Linux Foundation
 - Home to over 250 of the world's leading open source/open standard projects including Cloud Native Computing, Hyperledger, Automotive Grade Linux, Hyperledger, and the Decentralized Identity Foundation



vLEI Governance Frameworks

- vLEIs will be issued by vLEI issuers of two types:
 - Existing LEI issuers who elect to issue vLEIs
 - New issuers who will issue vLEIs by calling APIs provided by GLEIF & current LEI issuers
- All vLEI issuers will be qualified under the GLEIF vLEI Ecosystem Governance Framework
 - **A ToIP-compliant Layer 4 governance framework**
- The vLEI family of verifiable credentials will be defined by the GLEIF vLEI Credential Governance Framework
 - **A ToIP-compliant Layer 3 governance framework**
- Both frameworks are scheduled to be ready for initial review by Q2 2021

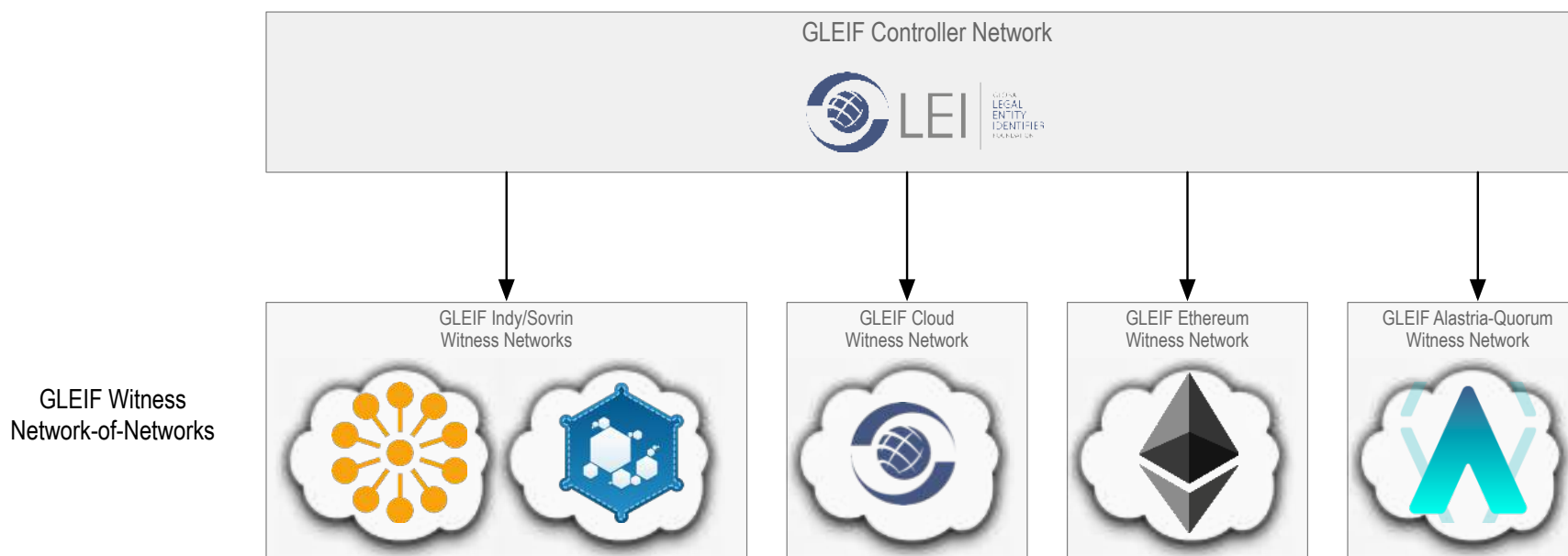


Network-of-networks

True universality and portability

vLEIs are hostable on both ledgers and cloud infrastructure

1. The decentralization of ledgers plus the control and performance of cloud
2. Portability enables GLEIF's ecosystem to unify all ledger-based ecosystems that support the vLEI



GLEIF's vLEI approach

Agnostic to any network

- Development of the capabilities needed for GLEIF to issue and verify vLEIs for vLEI Issuers does not need to operate on blockchain or distributed ledger technology.
- GLEIF can implement **KERI (Key Event Receipt Infrastructure)** to support fully decentralized portable secure key management operations on self-certifying identifiers.
- GLEIF is undertaking development of the capabilities based on KERI during 1Q to 3Q of 2021 and aim for initial live beta implementation with an SSI Network starting in 4Q.

Interoperability

- This would allow GLEIF to **connect to any blockchain or distributed ledger technology SSI network** without the need for custom implementation, cost and overhead of operation.
- KERI is **Quantum Safe**. It is resistant to attacks by both classical and quantum computers.



<https://keri.one>

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