

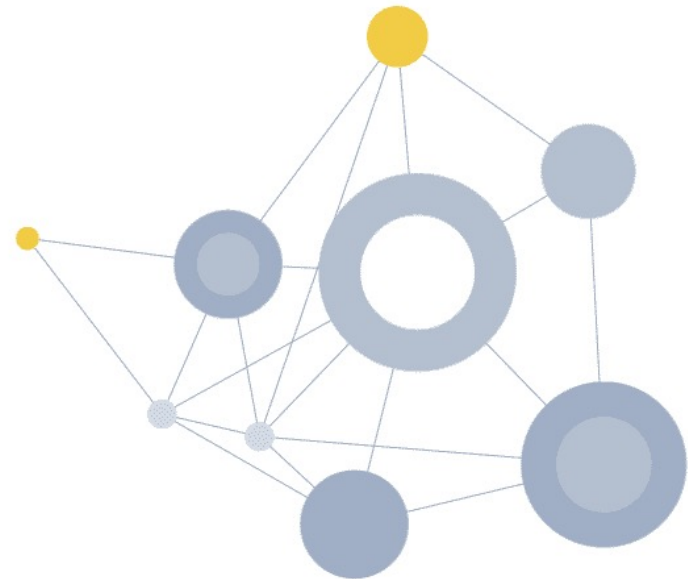
Self-Sovereign Identity for Legal Entities and their Representatives globally

Global infrastructure for business identity

GAIN

2nd June 2022

GLEIF



Introducing the Global LEI System

In 2011, the G-20 leaders supported "the creation of a global legal entity identifier (LEI) which uniquely identifies parties to financial transactions."



Who is Global Legal Entity Identifier Foundation?

- GLEIF is a not-for-profit Swiss foundation, founded by the Financial Stability Board (FSB).
- GLEIF is overseen by 65 regulators and 19 observers in the Regulatory Oversight Committee (LEI ROC) from 50 countries.
- GLEIF Board has 16 independent directors.



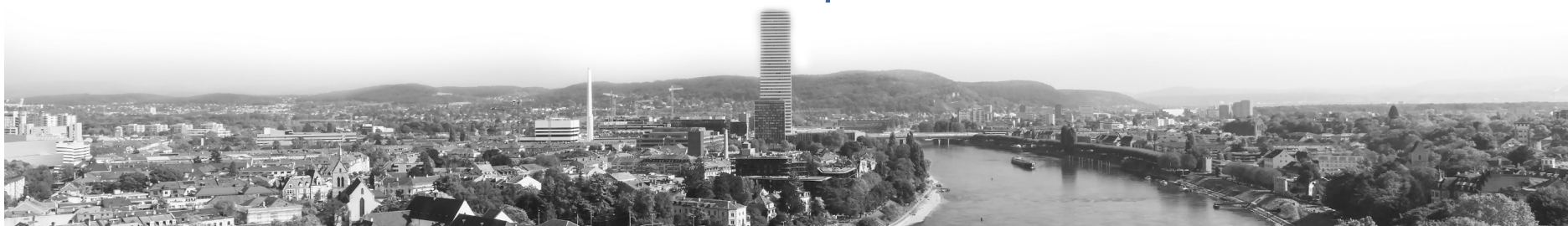
**Partners for
LEI issuing (LOUs)**

38
and growing



**Issued LEIs
to date**

> 2,107,110



The LEI

Live demo

- The LEI is a life-long code **owned** by the respective legal entity.
- It points to the associated reference data.
- The LEI is an ISO standard ISO 17442

Level 2 Data: Who Owns Whom

Parents

NATURAL_PERSONS (Direct Parent Exce)

Direct children (69)

Nestlé S.A.

Maggi-Unternehmungen AG (Direct)

Nestle Marcas S.A.C (Direct)

네슬레코리아 유한책임회사 (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)

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 (Eidg. Amt für das Handelsregister) Switzerland, Switzerland RA000549 |
| Registered As | CHE-105.909.036 |
| Jurisdiction Of Formation | CH |
| Entity Legal Form | Aktiengesellschaft MVII |
| Entity Status | ● ACTIVE |
| BIC Code | NESNCH22XXX |

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)

Galderma Nordic AB (Ultimate)

네슬레코리아 유한책임회사 (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)

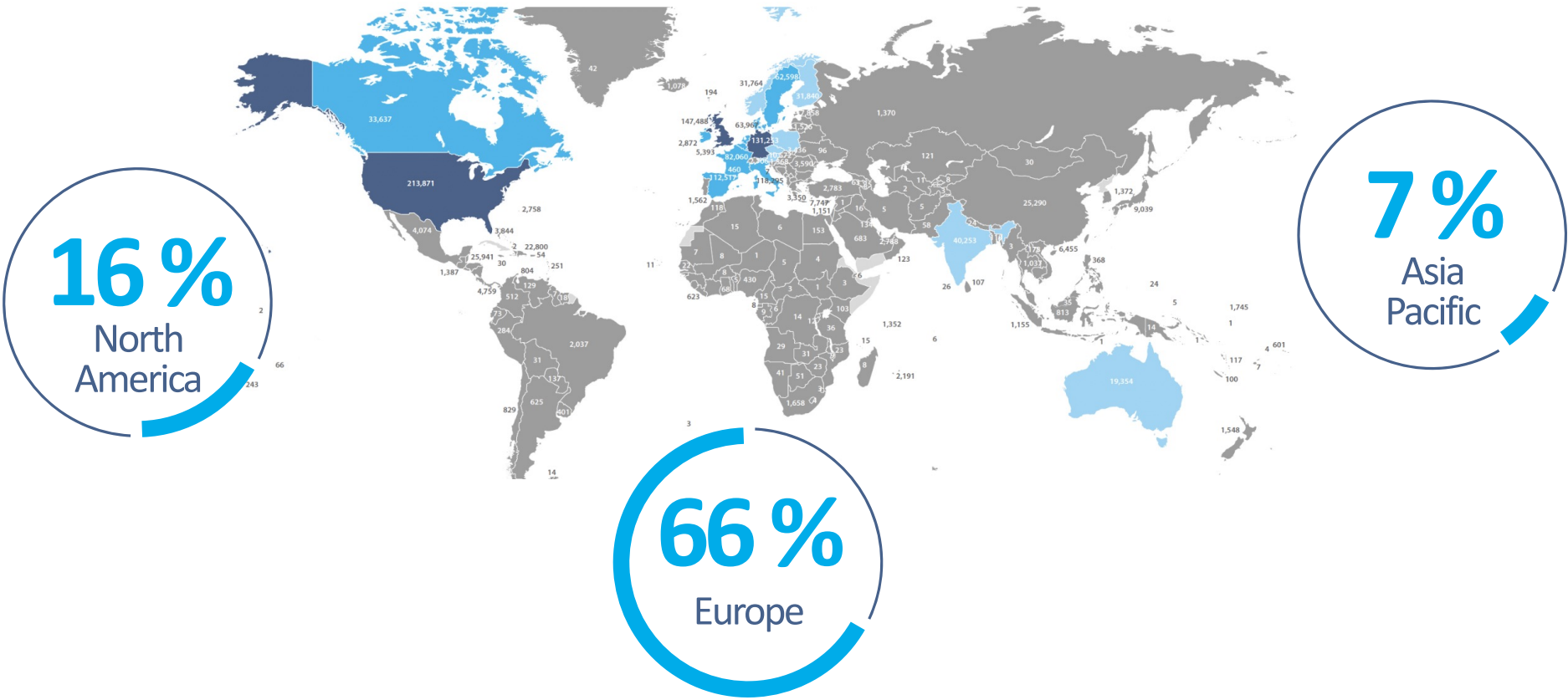
Nestle Middle East Manufacturing LLC (Ultimate)

Nestle Lanka PLC (Ultimate)

Fondation Nestlé pour l'étude des problèmes de l'alimentation dans le monde (Ultimate)

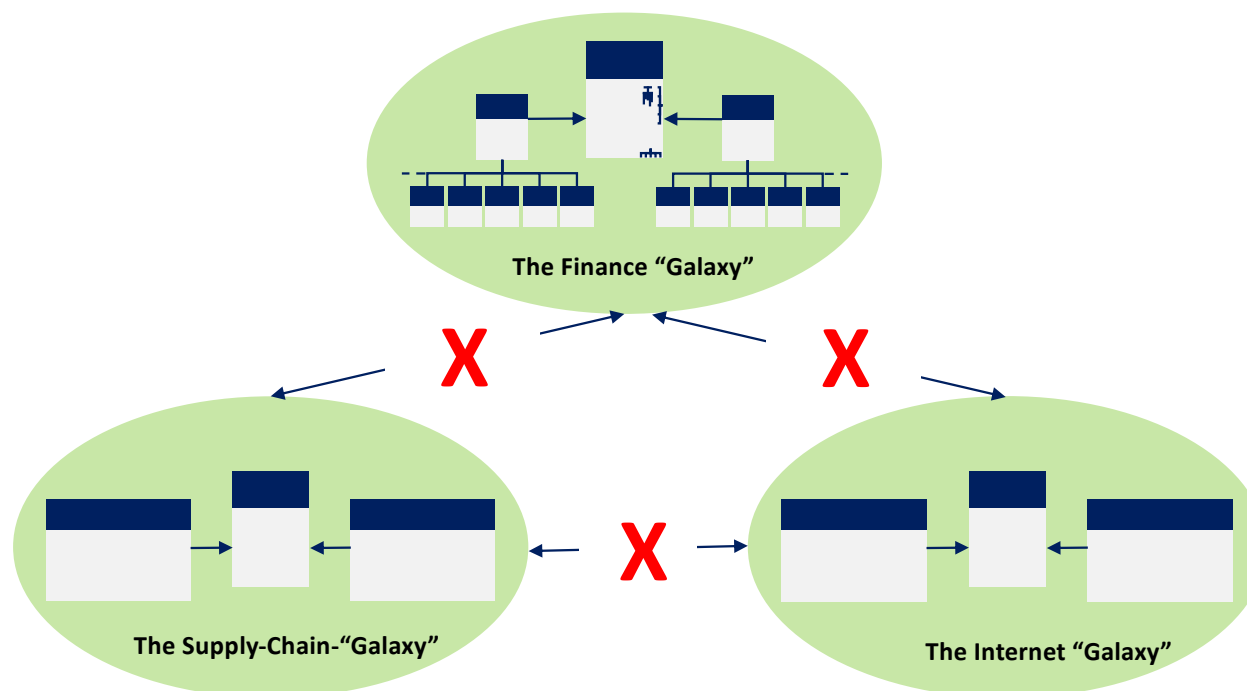
Nestle (Thailand) Limited (Ultimate)

Distribution of the LEIs across jurisdictions



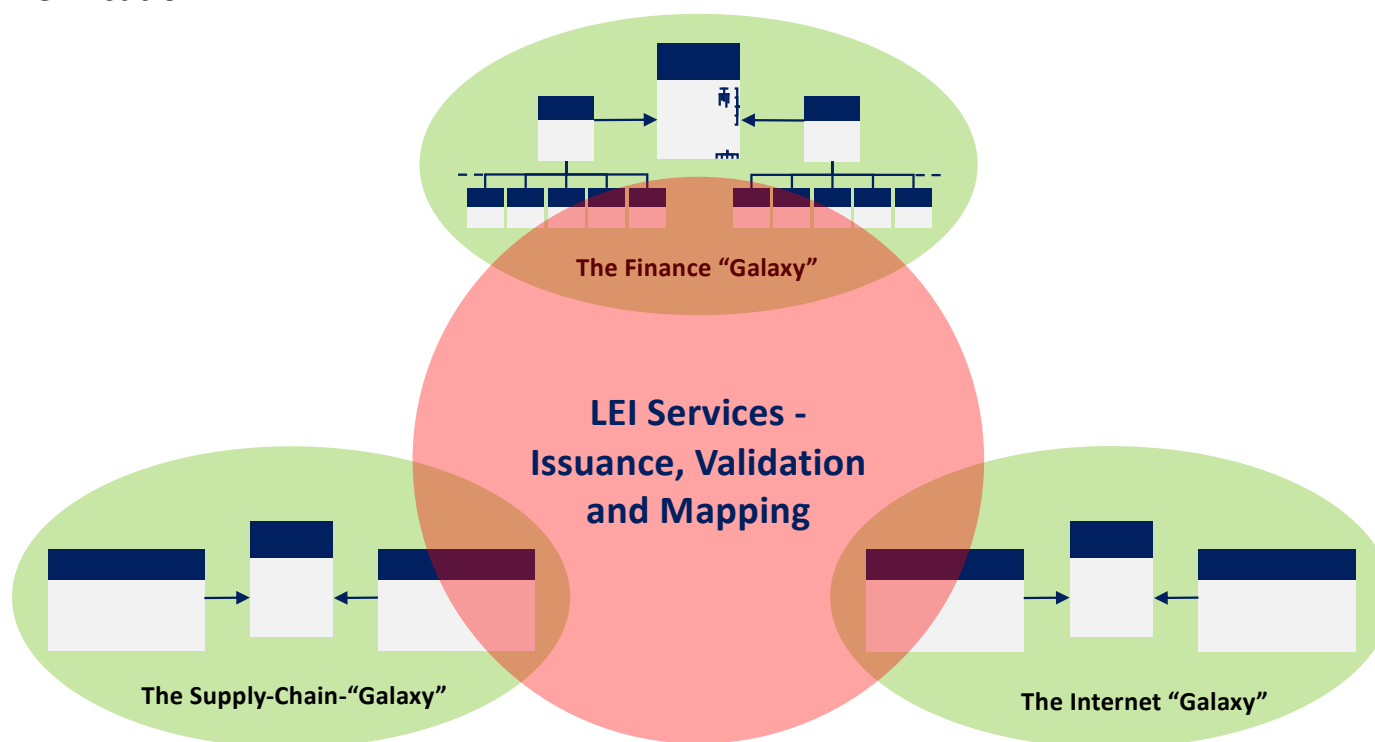
Today's problem – Grown over decades

Today there is no standard way of bridging various “galaxies”. All three “galaxies” have similar issues, but identify legal entities independently and with great manual effort in data collection and 3rd party validation.



GLEIF's vision for a global vLEI infrastructure

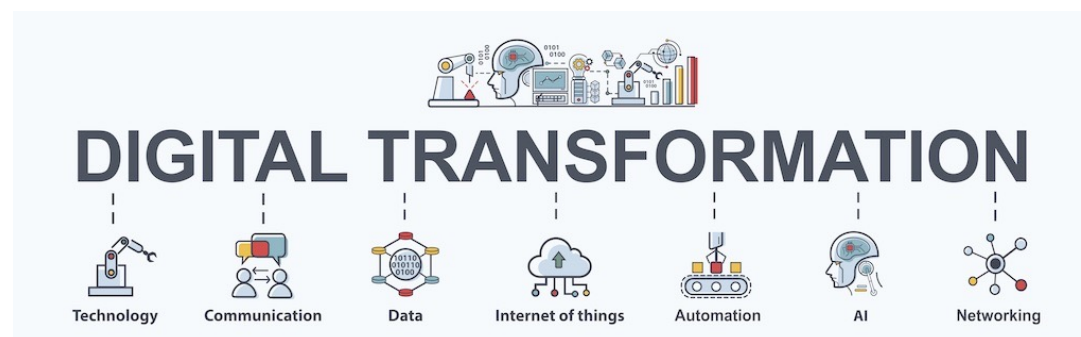
The LEI is the only regulatory mandated ID Management System for Legal Entities. The vLEI is the digital equivalent. It has the potential to support all “galaxies” via its standards for unique, global, open, reliable and trusted services for issuance, validation and verification.



The model – fostering LEI adoption

Digital Transformation of entire industries

- Digital transformation, e.g., Platform Economy, Artificial Intelligence, Distributed and federated Networks etc., is changing the way we interact with each other
- Digital Identity and Strong Authentication become vital for distributed systems spanning many actors

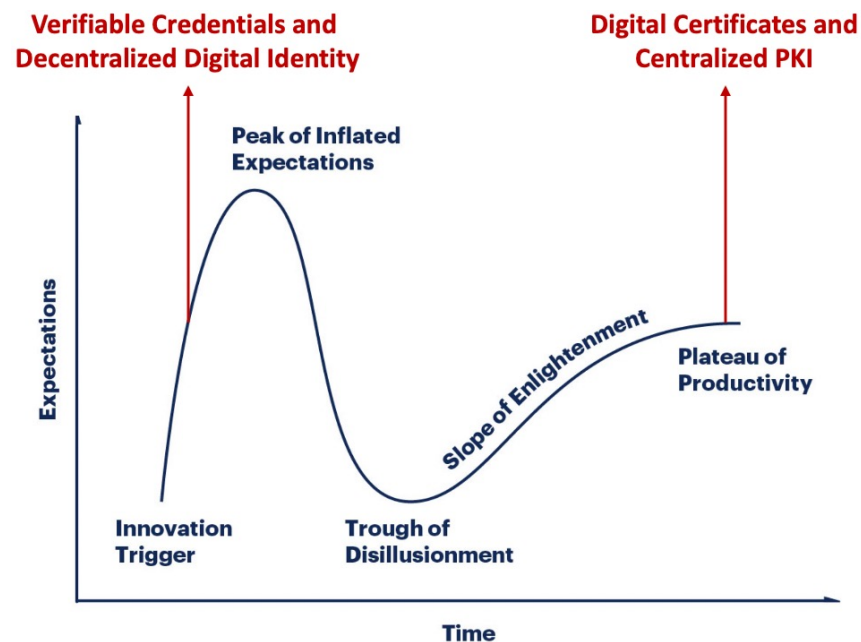


* Source: <https://sdlt.asia/blockchain-platforms/>

LEI Digital Strategy

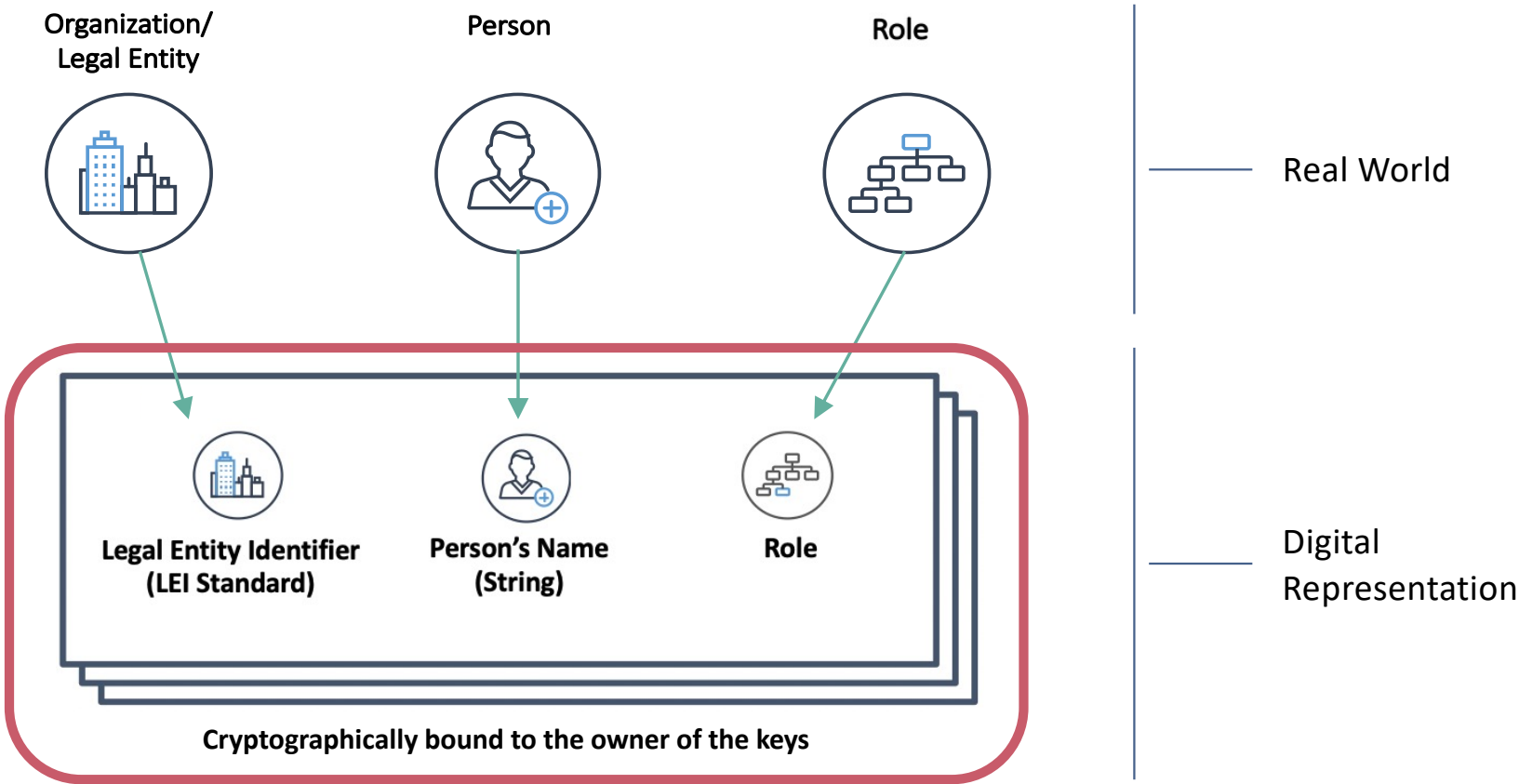
Digital Certificates as well as Self-Sovereign-Identity Networks

- 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**



Embedding the LEI in digital tools

Representing Organizations, Persons and Roles



The LEI as a Verifiable Credential – the vLEI Trust Chain

- GLEIF is the Root of Trust
 - Root AID (Autonomic Identifier) to establish the Root of Trust
 - Delegated AIDs to issue Credentials
- GLEIF will establish a trusted network of Qualified vLEI Issuers (QVIs)
- QVIs are qualified to issue Entity and Role Credentials:
 - to Legal Entities
 - to Persons who represent Legal Entities either in official or functional roles

GLEIF



Qualified vLEI Issuers



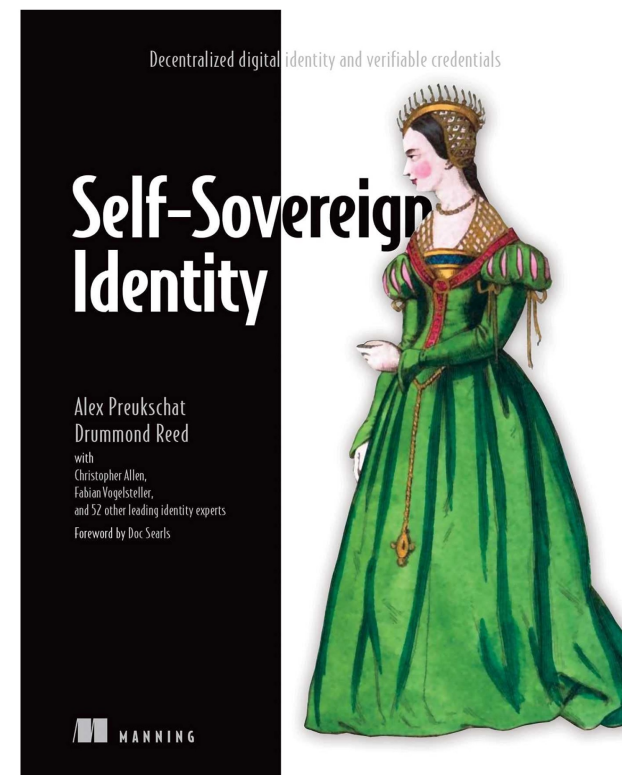
Legal Entities



**Persons Representing
Legal Entities**

Self-Sovereign Identity (SSI)

- Self-sovereign identity (SSI) is an approach to **digital identity** that gives individuals control of their digital identities.
- It is generally recognized that for an identity system to be self-sovereign, **users control the verifiable credentials** that they hold and their consent is required to use those credentials.
- This is contrasted with the centralized identity paradigm where identity is provided by some outside entity.
- In an SSI system, holders generate and control unique identifiers called decentralized identifiers (DID). Most SSI systems are decentralized, where the credentials are managed using crypto wallets and verified using public-key cryptography anchored on a **distributed ledger**.



* https://en.wikipedia.org/wiki/Self-sovereign_identity

Target Audiences & Use Cases



GLEIF vLEI Ecosystem for many industries

■ Financial

- Retail, commercial, and investment banks
- Credit Unions
- Insurance companies
- Brokerage firms
- Payment networks and gateways
- Regulators

■ Telecom & Internet

- Wired and wireless operators
- Cable companies
- Internet service providers
- E-commerce

■ Supply chain

- Shipping
- Logistics & distribution
- Transportation
- Manufacturers
- Warehousing & fulfillment

■ Healthcare

- Hospitals and clinics
- Pharma
- Biomedical

Any industry that is complex, global, or highly regulated will benefit greatly from ubiquitous vLEIs.

Digital Signature Based System from Self-certifying identifiers (SCIDs)

Enables legal compliance (regulatory and contractual).

■ Non-repudiable digital signature-based proofs:

- Cryptographically end-verifiable
- Full multi-signature support
- Hierarchically weighted multi-signatures
- Security derived from internal key management infrastructure security not external internet infrastructure security
- Consensus based notarization via witnesses for enhanced multi-threshold security

Digitized (electronic) Signature:

A stylized, handwritten signature in black ink that reads "John Doe".

Digital Signature:

0BYbLI0lRx8xh5taCxW-_aCBoPboLAZjK5-d1DP40Z9PWn13BpPCe12ZFVZfFlSsM3Pv-z1jbsJnR6Adz7iE5ZAw

- **Verifiable corporate documentation and communications**

- Company and signatory-specific documents and reports.
- Regulatory filing and reporting by a filer/reporting party directly, by a third-party filer on behalf of the filer/reporting entity or by an auditor.
- Contracts and legal agreements.
- Private, secure, peer-to-peer communication with customers, employees, and other stakeholders.

- **Counterparty verification supporting digital business interaction/automation**

- Client/counterparty due diligence & Know Your Customer compliance.
- Import/export, supply chain, customs/border control, payment for goods (e-invoicing).
- Authorized signatory verification.
- e-invoice and e-payment instruction validation.

- **Licensing and corporate registration**

- Trusted supplier/provider network membership and registration.
- Payment systems membership and registration.
- Business entity registration and licenses.
- Educational institutions - qualification certification and verification.

- **Other use cases**

- Digital wallets, digital asset management, and decentralized finance.
- Verification of transacting parties.
- Employee and authorized agent ID for any organizational use-case.
- Any LEI can be presented either in verifiable form, as a vLEI, or as a regular, non-verifiable LEI when convenient to do so, when fraudulent presentation of an LEI is not a concern.

Business Identity and vLEIs

Use case: Pharma Industry



GLEIF's Annual Report 2021



- Combines the strengths of the LEI and verifiable credentials
- Connect the role of the signatory to an organization through the vLEI
- Goes live on GLEIF's website in June 2022



Global Legal Entity Identifier Foundation
Annual Report 2020



Example: Embed the LEI within an annual financial report



| Statement of Comprehensive Income for the Period from January 1 to December 31, 2020 | | | |
|---|-------------|-------------------|-------------------|
| | Notes | Jan. to Dec. 2020 | Jan. to Dec. 2019 |
| | | US\$ | US\$ |
| Fee revenue | 3.1 | 11,987,725 | 14,516,715 |
| Wages and salaries | | -5,894,056 | -4,616,880 |
| Social contributions and expenses for pensions and care | | -780,217 | -543,684 |
| Personnel expenses | 3.2 | -6,674,273 | -5,160,564 |
| Other operating expenses | 3.3 | -4,465,448 | -5,561,990 |
| Other operating income | 3.4 | 345,590 | 181,344 |
| Amortization and depreciation expense | 4.5/4.6/4.7 | -1,070,035 | -873,846 |
| Operating surplus | | 123,559 | 3,101,659 |
| Subsidies and donations | 3.5 | 28,811 | 25,368 |
| Financial income/expense | 3.6 | -61,766 | -234,837 |
| Net surplus | | 90,604 | 2,892,190 |
| Changes of components of net equity from actuarial gains and losses in pensions and similar obligations | 3.2 | -6,984 | -11,410 |
| Items that will not be reclassified to net surplus | | -6,984 | -11,410 |
| Other comprehensive income | | -6,984 | -11,410 |
| Total comprehensive income | | 83,620 | 2,880,780 |

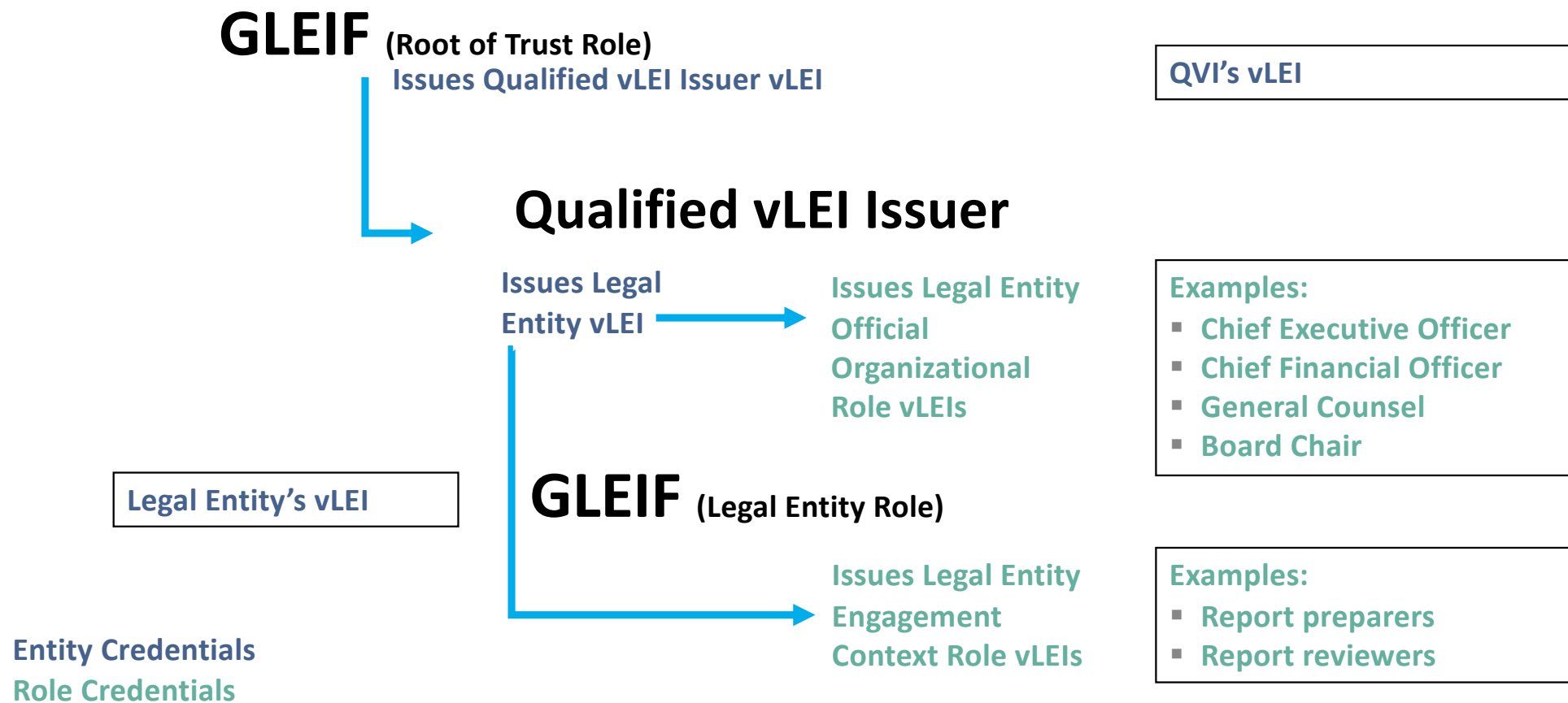
| Fact Properties | |
|---|---|
| Search | Navigation |
| Concept | |
| <ul style="list-style-type: none"> (ifrs-full) Licence fee income <p>The amount of income arising from licence fees.</p> | |
| Dimensions | |
| Date | 1 Jan 2020 to 31 Dec 2020 |
| Fact Value | US \$ 11,987,725 |
| Accuracy | 0 (ones) |
| Change | 17.4% decrease on 1 Jan 2019 to 31 Dec 2019 |
| Entity | [LEI] 506700GE1G29325QX363 |
| Concept | ifrs-full:LicenceFeeIncome |
| 1 of 1 | |
| Anchoring | |
| Wider anchor | |
| <ul style="list-style-type: none"> None | |
| Powered by workiva | |

Business Identity and vLEIs

Use case: Regulatory reporting

- Legal Entity vLEI Credential
 - An **Entity level vLEI Credential** issued by a Qualified vLEI Issuer (QVI) to a Legal Entity containing the Legal Entity's LEI.
 - Legal Entity vLEI Credentials only can be issued by QVIs.
 - **Legal Entity Official Organizational Role vLEI Credentials** (OOR vLEI Credentials)
 - vLEI Role Credentials issued by the QVI to specified officers of a Legal Entity
 - Examples:
 - Chief Executive Officer
 - Chief Financial Officer
 - General Counsel
 - Board Chair
 - OOR vLEI Credentials also only can be issued by QVIs since validation of the official persons in their respective roles is required before issuance.
- **Legal Entity Engagement Context Role vLEI Credentials** (ECR vLEI Credentials)
 - vLEI Role Credentials issued by the QVI to persons in functional roles at a Legal Entity
 - Examples:
 - Report preparers
 - Report reviewers
 - Legal Entities can contract with QVIs to issue ECR vLEI Credentials.
 - Use of vLEI Credentials eliminates the need for public sector entities to issue and maintain usernames, passwords and entitlement lists of persons from private sector reporting entities
 - The report can be signed with the Legal Entity vLEI Credential and one or more OOR and ECR vLEI Credentials. Once the public sector entity has verified the status of the vLEI Credentials and the validity of the signatures on the report, the public sector entity can accept the report into its 'system'.

Focus: vLEI Credentials and Report Signing



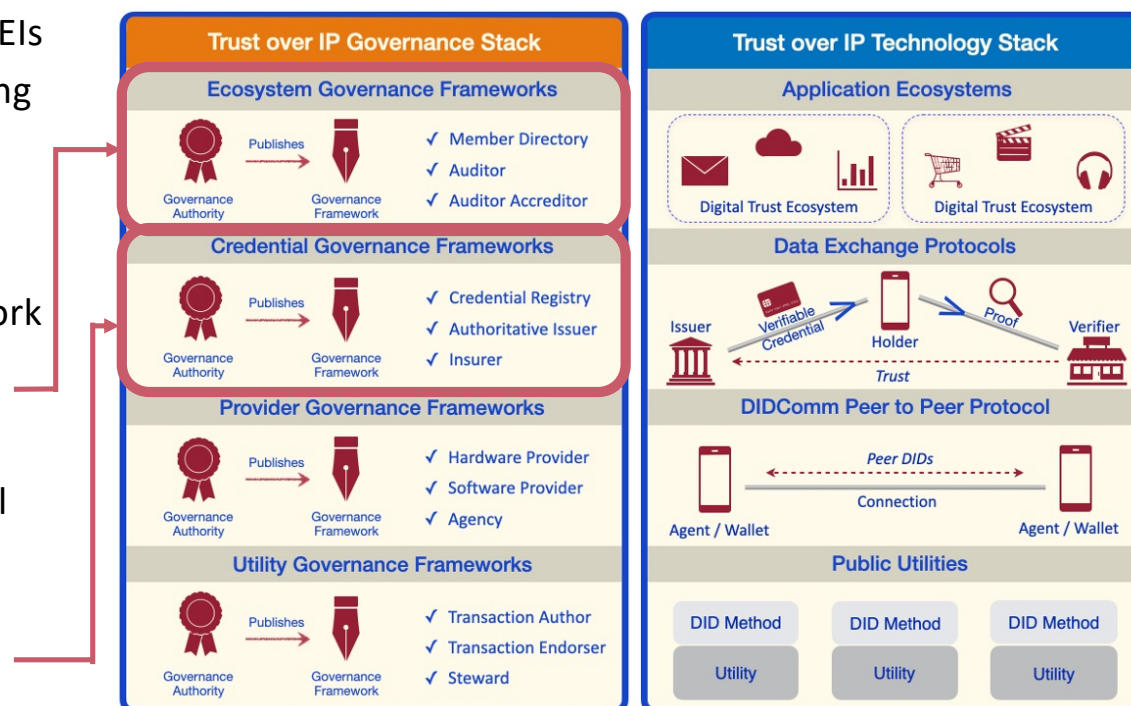
The vLEI ecosystem is in full accordance with ToIP standards

- 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

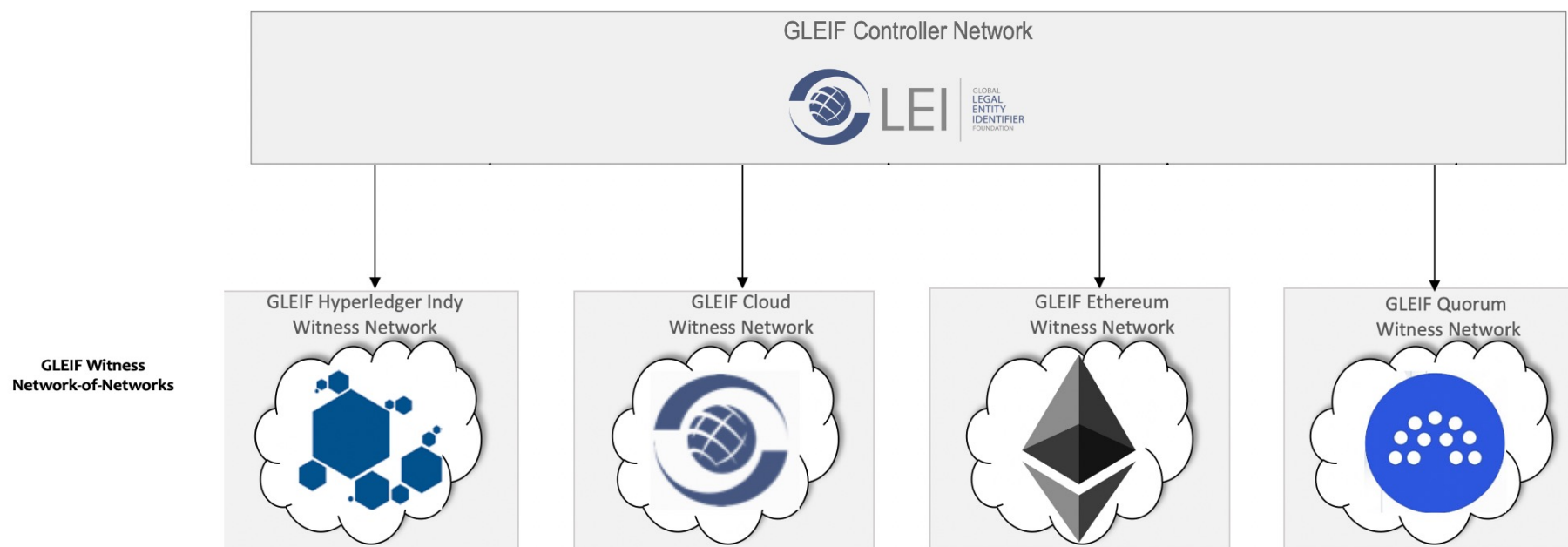
- vLEIs will be issued by vLEI Issuers of two types:
 - Existing LEI issuers who elect to issue vLEIs
 - New issuers who will issue vLEIs by calling APIs provided by GLEIF and current LEI issuers
- All vLEI Issuers will be qualified under the GLEIF vLEI Ecosystem Governance Framework
 - **A ToIP-compliant 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**



Network-of-networks

True interoperability and portability

- Development of the capabilities needed for issuance, verification and revocation of vLEIs do not need to operate on blockchain or distributed ledger technology.
- This would allow GLEIF to **connect to any blockchain or distributed ledger technology SSI network or cloud infrastructure** without the need for custom implementation, cost and overhead of operation.



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 has developed the capabilities for vLEI based on KERI during 1Q to 3Q of 2021. vLEI Beta software qualification testing has been completed and preparations for pilots have begun in 4Q 2021 and into 1Q 2022.

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.



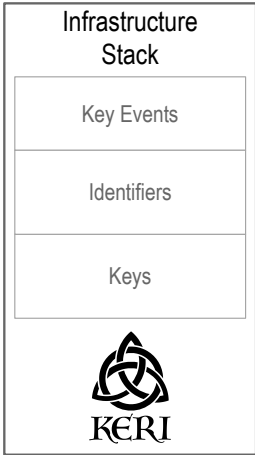
<http://github.com/WebOfTrust/keri>

vLEI is built on a fully portable decentralized SSI infrastructure

KERI (Key Event Receipt Infrastructure)

■ Infrastructure “Stack” Features

- Fully provenanced verifiable establishment of control authority over identifiers and associated authorizations
- Ledger-agnostic, DID method-agnostic
- Horizontally scalable performance (global scale)
- Hierarchical delegation with recoverable control authority
- Legally admissible, auditable, non-repudiable, digital signature-based system
- Support for GDPR compliance
- Post-quantum proof
- Universally interoperable event-based protocol
- Advanced DKMI (Decentralized Key Management Infrastructure)
- Best practices for PKI (Public Key Infrastructure)



Limitations



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