

Bedrock Business Utility

A public identity utility supported by LF Governance Networks, Inc.

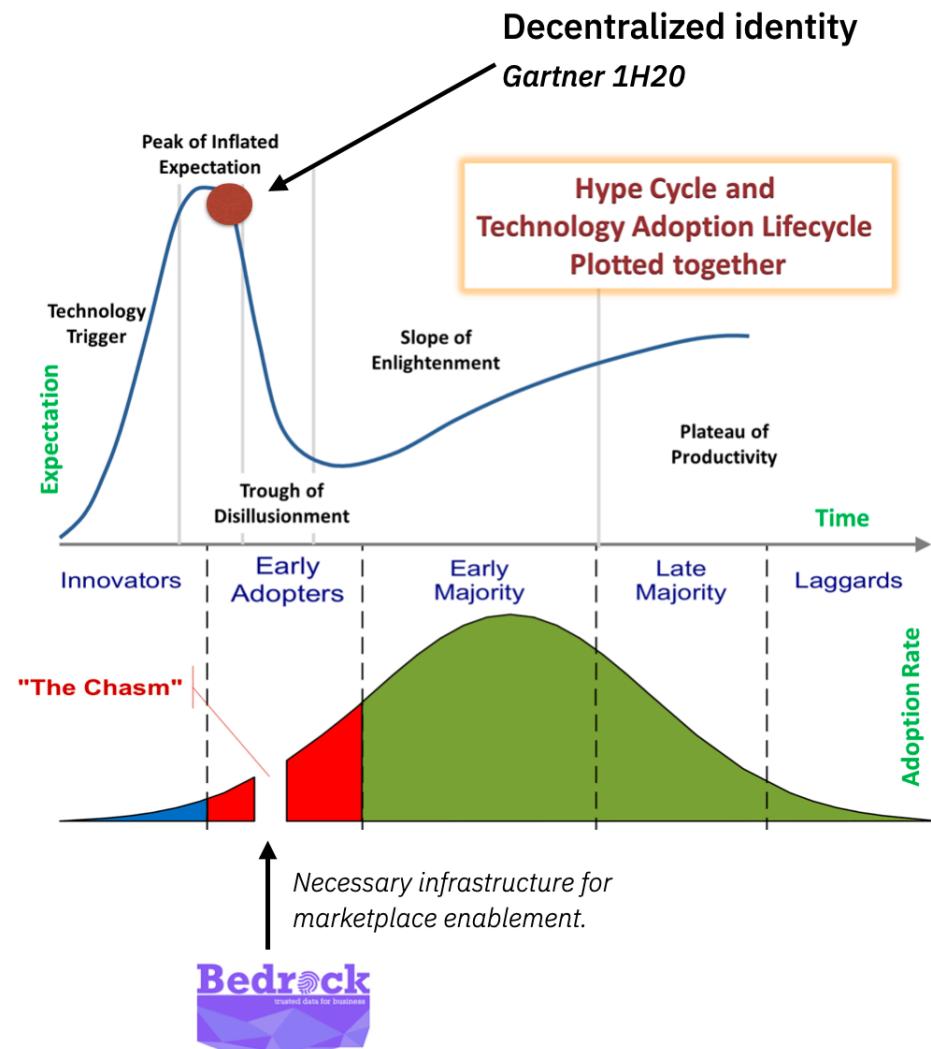
Bedrock Consortium Governance Framework Working Group

 THE LINUX FOUNDATION

Prospective Member Briefing

Agenda Topics

- Why should I care?
- What is a public identity utility?
- What is BBU?
- Why is BBU needed?
- What is the BBU Business Model?
- What are the BBU Membership Options?
- How is the BBU organized?
- How to join?



Why should I care?

- Why is identity so problematic?
- What is the solution?
- What will it take to solve?
- Should you act or wait?

Our Identity is Broken

The pain associated with **proving things about us** is all too familiar.

- **24 hours** to onboard a doctor
 - Causes 40,000 lost clinical days in the UK
- **6 minutes** to verify a caller
 - Knowledge-based authentication is slow, insecure & expensive
- **23 fields of information** to complete a purchase
 - Friction, abandonment, over-sharing of personal data
- **100s of passwords** for business and personal accounts
 - Leads to re-use, poor security



Failing Legacy Approaches

Today's solutions have **serious shortcomings**.

- Siloed IAM platforms
 - Centralizing control and data moves friction to the boundaries
- Repetitive, manual processes
 - Inefficient and often inaccurate
- Check-the-box compliance solutions
 - Rarely addresses the problem at its source



Solution: Portable Digital IDs

Equip individuals & organizations with **secure verifiable credentials**:

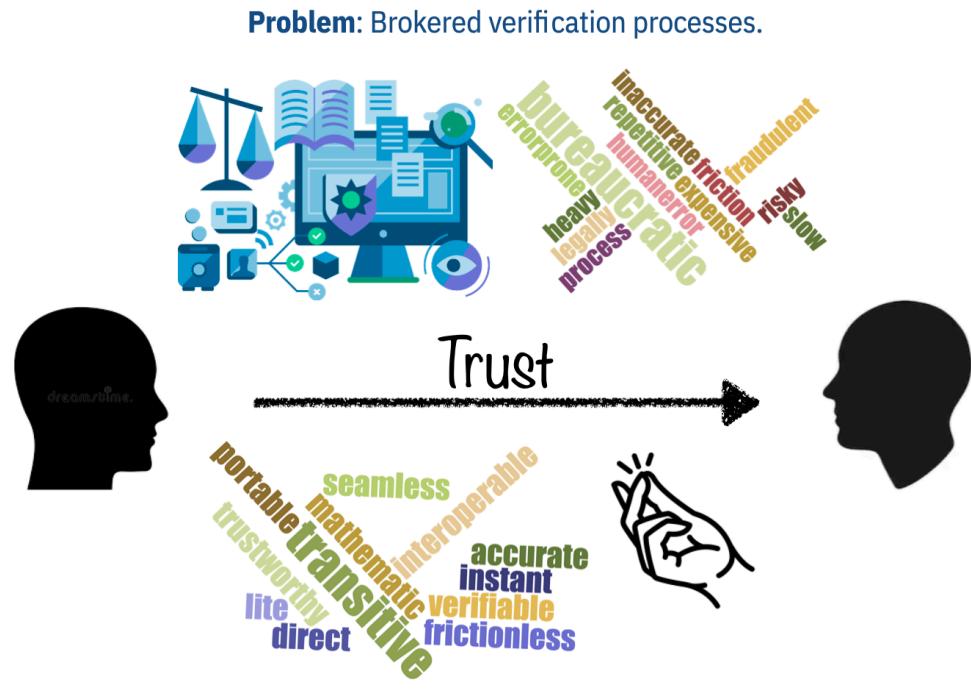
- **24 hours → 5 minutes** to onboard a doctor
 - Enabling fast, secure mobility of healthcare providers between clinical settings
- **6 minutes → 6 seconds** to verify a caller
 - Greater customer satisfaction & more efficient use of call center resources
- **23 fields of information → 1 tap** to complete a purchase
 - Driving sales, loyalty & convenience
- **100s of passwords → 1 device** for business and personal accounts
 - Keep credentials & personal data securely under your own control



How? Improved Verifiability

Moving from a brokered verification process to a **direct verification process**.

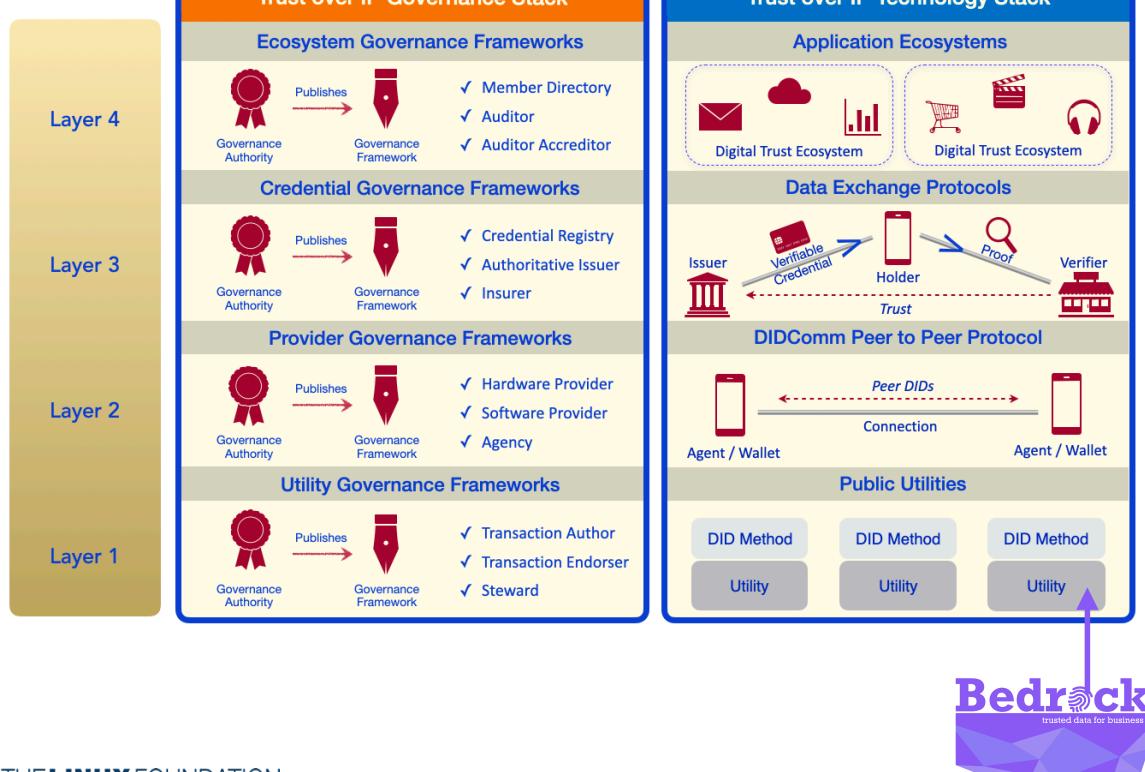
- **Transition:** Decentralized identity infrastructure leads to **portable digital IDs**.
- **New Approach:** Verifiability using **Transitive Trust** where digitally signed statements from outside parties can be *instantly verified mathematically*.



Solution: Instant verifiability direct from the source.

What is under the hood?

The industry has built a set of open technologies to support the next-generation of interoperable and standards-based identity infrastructure.



- **Open technology that supports:**
 - Secure & tamper-proof
 - Instantly verifiable
 - Controlled by the user
 - Improved privacy
- **17,000+ contributions from 150+ developers and 90+ organizations**
- **Decentralized Infrastructure**
 - Public Identity Utilities

Why now?

Personal data has gone from asset to liability.

- **Privacy** is hot
 - Contactless interactions (identity, payments) stemming from hygiene factor
- **Regulation** is a requirement
 - Compliance costs \$150Bn in the US, and enforcement has barely begun
- IAM solutions underpin **digital transformation**
 - Spend almost doubling to \$38Bn by 2023
- Business need to **mitigate risk exposures** associated with Centralized IAM approaches
 - 7.9Bn records breached in 2019



Innovator v. Laggard

The industry trend toward decentralized identity is underway. How will you act?

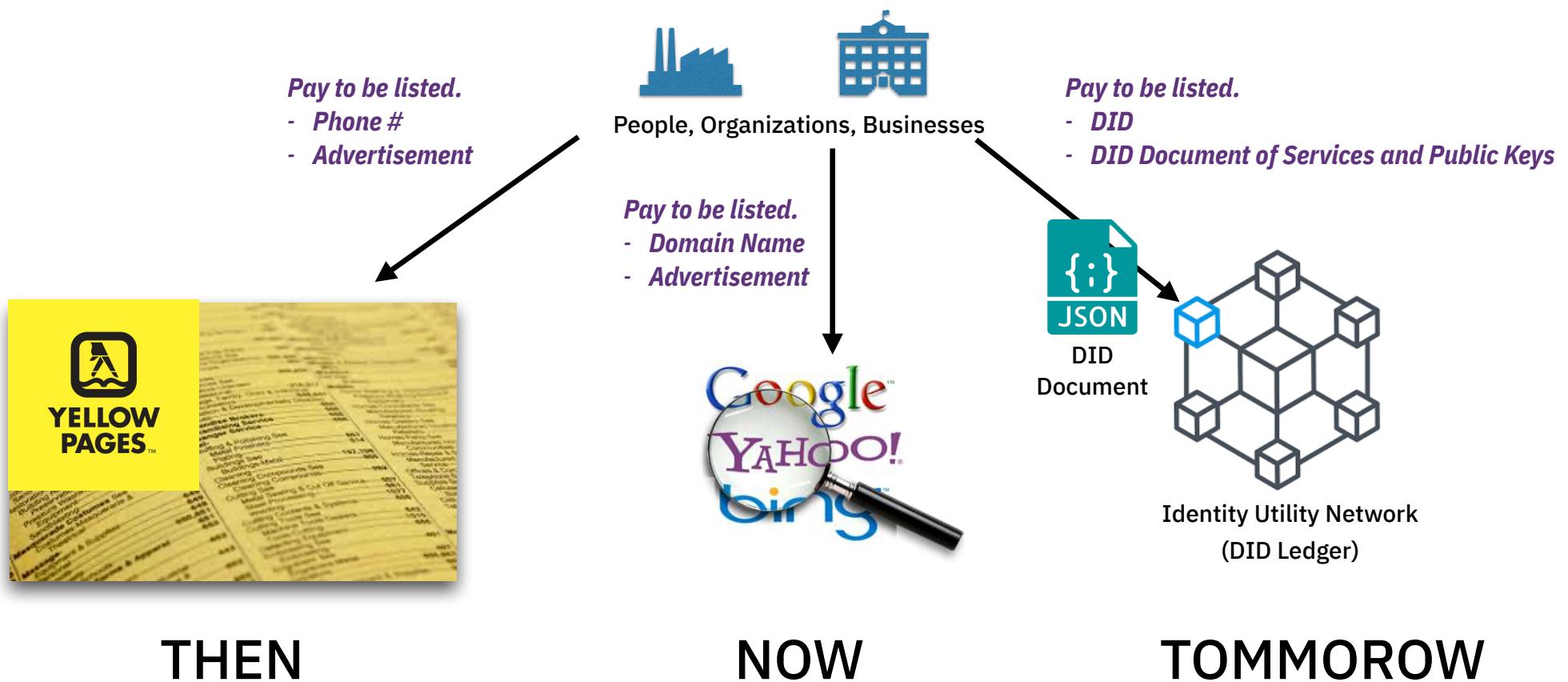
| Collaborate | Do Nothing |
|---|--|
| <ul style="list-style-type: none">• Help bootstrap marketplace through collaboration on an initial network; open learning• Eliminates the time and expense of establishing a private network• Positions businesses to offer additional products and services to customers now• Reach new customers segments• Validate regulatory privacy compliance trends• Improved KYC processing in a manner that reduces the reliance on 3rd party verification services | <ul style="list-style-type: none">• Convene or build your own Public Identity Utility<ul style="list-style-type: none">• Risk: starting from scratch is Hard, Timely, and requires gathering interested parties because decentralized identity is a team (collaborative) effort.• Pay-as-you-go!<ul style="list-style-type: none">• Risk: Pay other utilities for which you will have no say in the governance model or pricing impact to your business |

Public Identity Utilities

- How are entities discoverable?
- How do entities become verifiable?
- What influences business models?

How do entities become discoverable?

Lookup and verification business models continue to improve.



What are the basic concepts of a Public Identity Utility?

Some introductory terms and concepts.

- **Decentralized identifiers (DID):** A W3C Specification for unique identifiers.
- **Schema:** A set of attribute data types and formats that can be part of a credential claim.
Eg., the fields within a passport/license document.
- **Credential Definition:** A public statement by the issuer that they will publish credentials against a specific schema(s).
- **Credential:** An issuer-specific data fields that can come from one/more schemas and defines the proofs sent by the holder. Eg., proof of education, age, nationality, etc.
- **Verifiable Credential (vCred):** A W3C Specification for Verifiable Credentials.
- **Revocation List:** A registry that helps identify the revocation of a private DID of a holder
- **DID v. Verifiable Credential:** DIDs create the cryptographic trust between two entities whereas the verifiable credential creates the business trust across the same.

How do entities become verifiable?

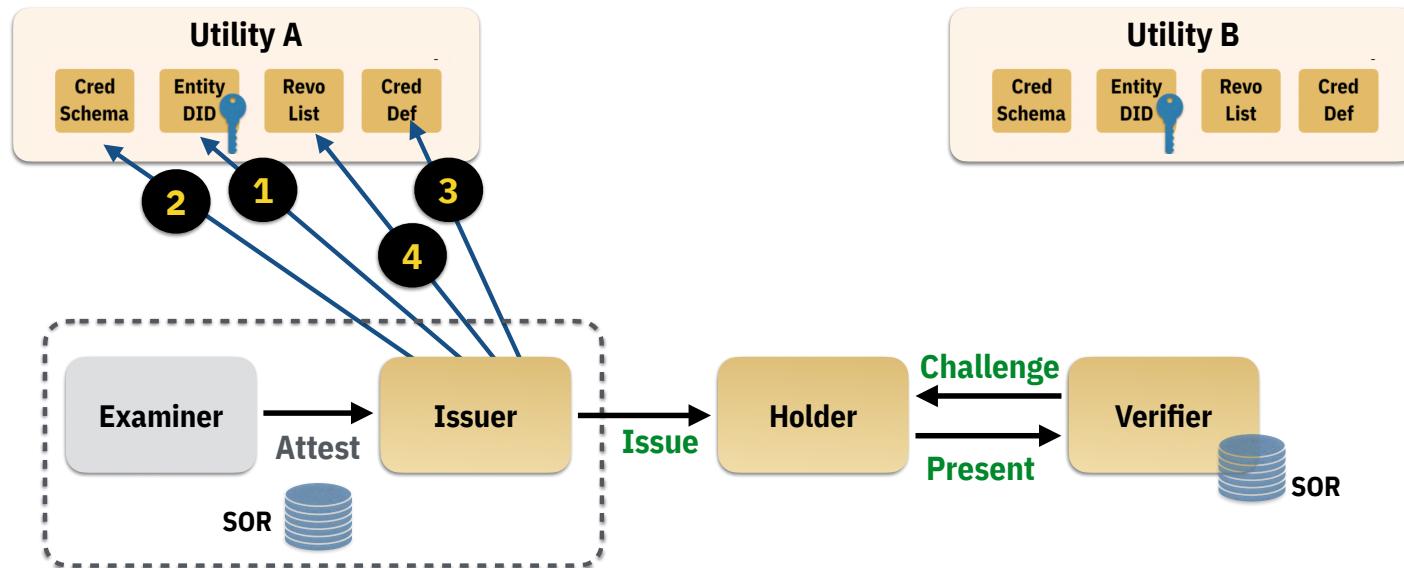
A minimal set of non-personal meta-data is stored on the ledger.



Each write to the ledger will pertain to a set of specific transaction types that may be accompanied by different fee values.

Utility Interactions: Sample issuer transactions

An issuer is responsible for several types of write transactions to a public identity utility.

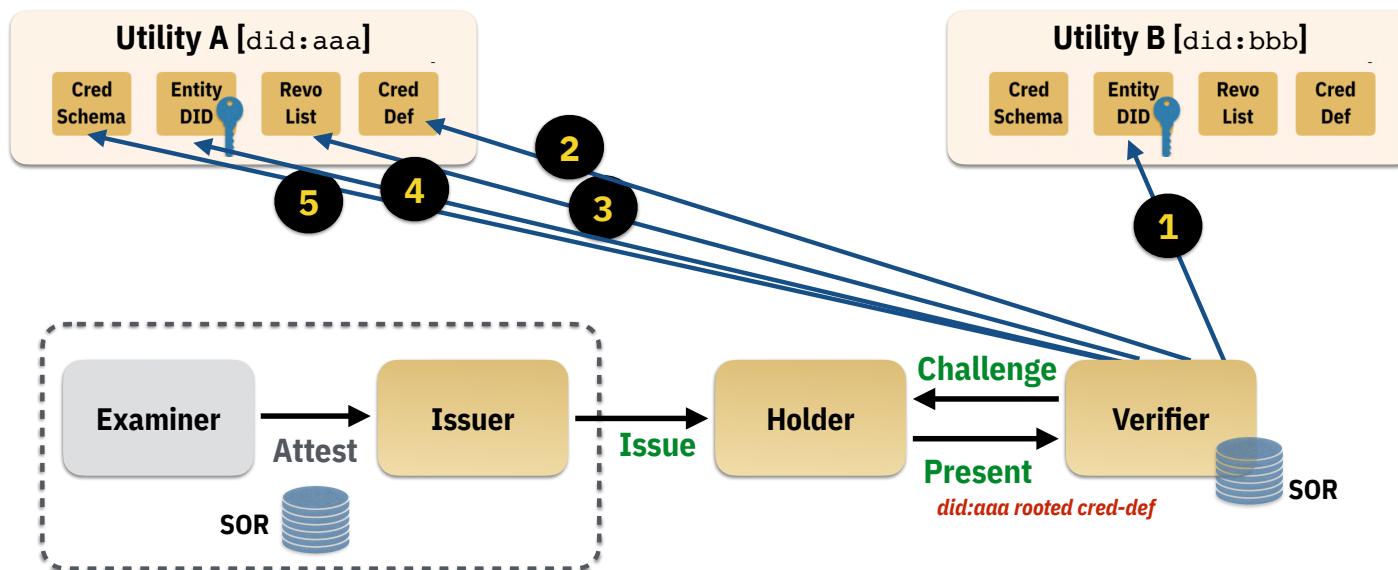


1. Publishing a DID Document containing at least one public key and possibly several service URLs. The DID Document is associated with a Public DID.
2. Publishing a Credential Schema.
3. Publishing a Credential-Definition that allows an Issuer to associate their DID with a specific Credential Schema.
4. Publishing a list of revoked credentials.

NOTE: Public DIDs are written to the public Utility whereas private DIDs are maintained off-ledger.

Utility Interactions: Sample verifier transactions

A verifier is responsible for several types of write and read transactions to one or more public identity utilities.

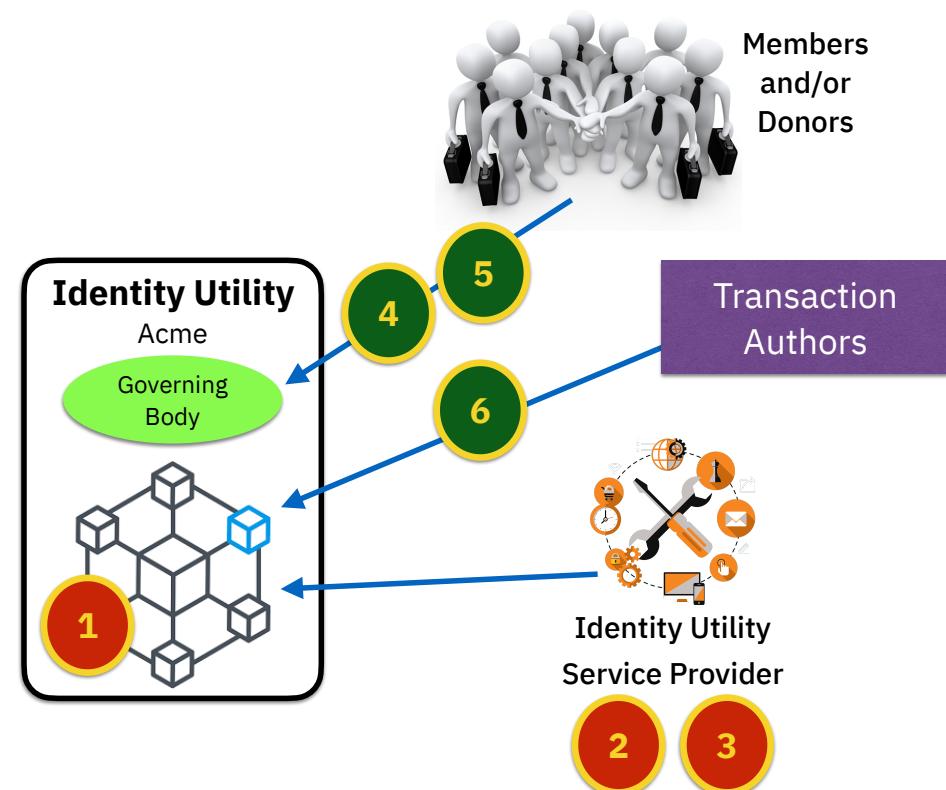


1. Publishing a DID Document containing at least one public key and possibly several service URLs. The DID Document is associated with a Public DID.
2. Process presented credential. Locate Utility associated with DID Root Namespace and validate Cred-Def. Fail verification process if does not exist.
3. Check if Credential is on Revocation List. Fail verification process if true.
4. Validate the existence of Issuer DID corresponding to Cred-Def. Fail verification process if not valid.
5. Validate the existence of Credential Schema corresponding to Cred-Def. Fail verification process if not valid.

What factors impact an identity utility business model?

Public Identity Utilities have specific income and expense characteristics that are addressed by the principles, policies and procedures outlined in their governance frameworks.

- Expenses
 - 1. Node Hosting
 - 2. Network Operation and Maintenance Services
 - 3. Consortium Governance
- Income
 - 4. Consortium Membership
 - 5. Community Donations
 - 6. Transaction Revenue



Bedrock Business Utility (BBU)

- Who is the Bedrock Consortium?
- What is the BBU?
- What are goals of the Governance Framework?

Bedrock Consortium

A participant organization in the digital trust marketplace influenced by the ToIP Foundation.

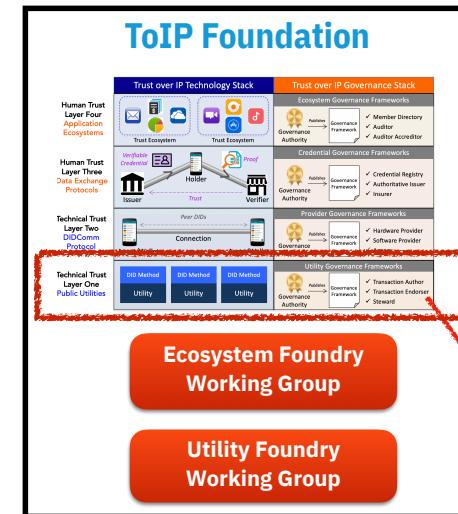
- A collection of international private sector companies that operate the Bedrock Business Utility
- Initially represented as 9 *prospective members* seeking to establish the new BBU.
- Comprised of companies that:
 - desire to participate in **digital trust ecosystems**
 - share a common interest in collaborating on the **delivery of the infrastructure and governance** necessary for a dedicated and trusted public identity utility based on decentralized identity technology.



Bedrock Business Utility

An instance of a public identity utility.

- An independent self-governed and self-sustainable public identity verification service.
- Supported by the Bedrock Consortium and enabled by the LF Governance Networks, Inc. (a non-profit legal entity).
- Intended to reliably serve the verifiability of both physical and online digital identity interactions.



Layer 1

Advise

DID Utility

Bedrock

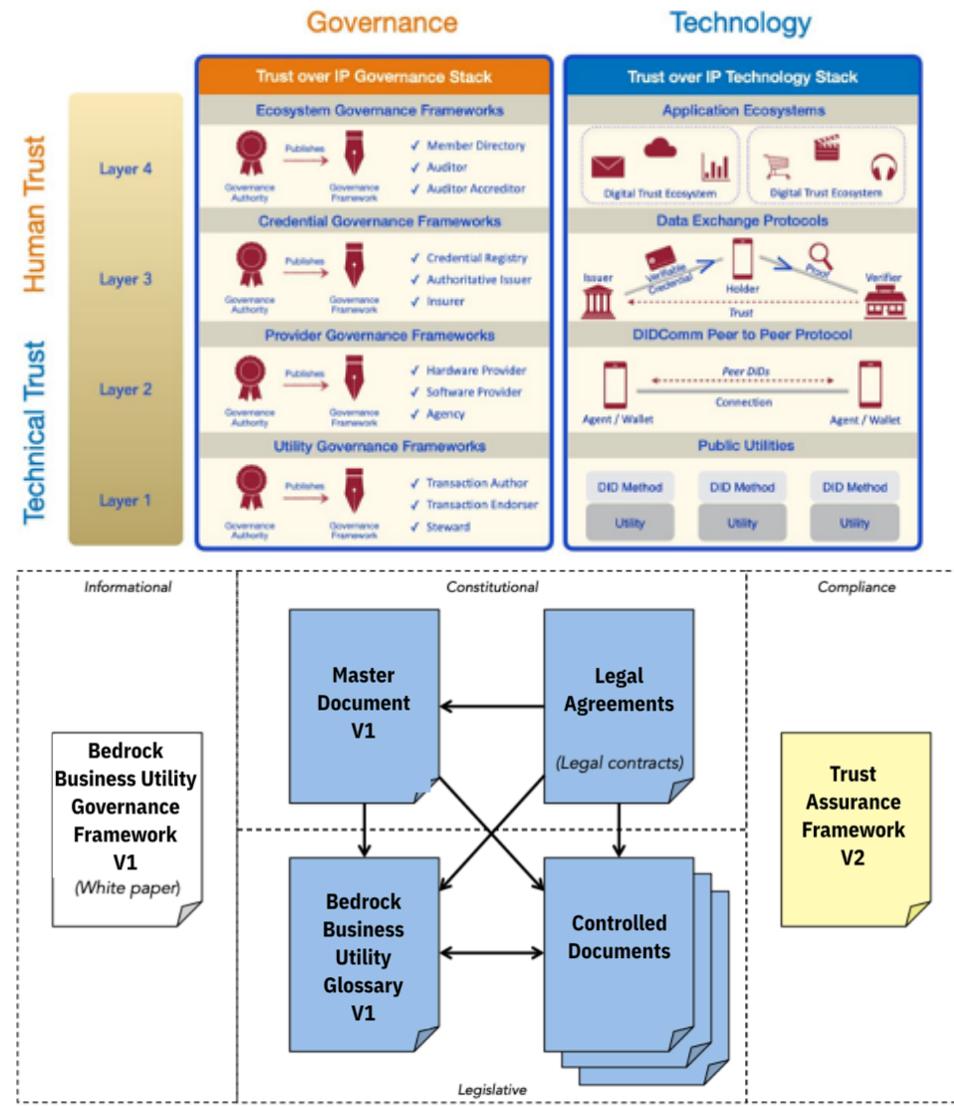
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Governing Board

Governance Framework

A compendium of informational, constitutional and compliance oriented documents used to govern a Layer 1 Public Identity Utility

- Enforces permissioned-writes with contractual instruments that will conform to privacy regulations such as GDPR.
- Maintains financial sustainability of the consortium members without the use of cryptographic tokens.
- Establishes a governing board so that no single organization owns the identity utility.
- Adheres to specific open standards and protocols. As an example, the BBU will use *Hyperledger Indy*.

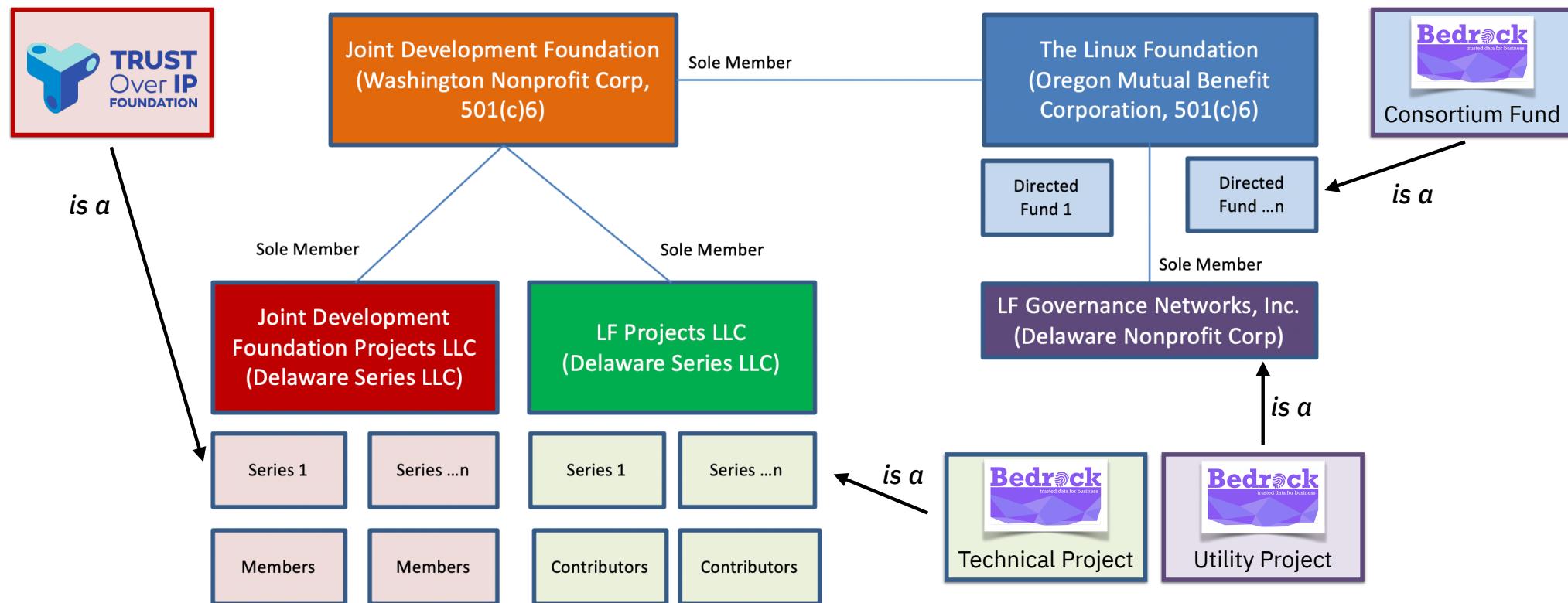


Legal Entity Model

- What LF Legal Entity Structure?
- What is BBU affiliation with ToIP Foundation?
- What contractual instruments are required?

Linux Foundation: Legal Entity Structure

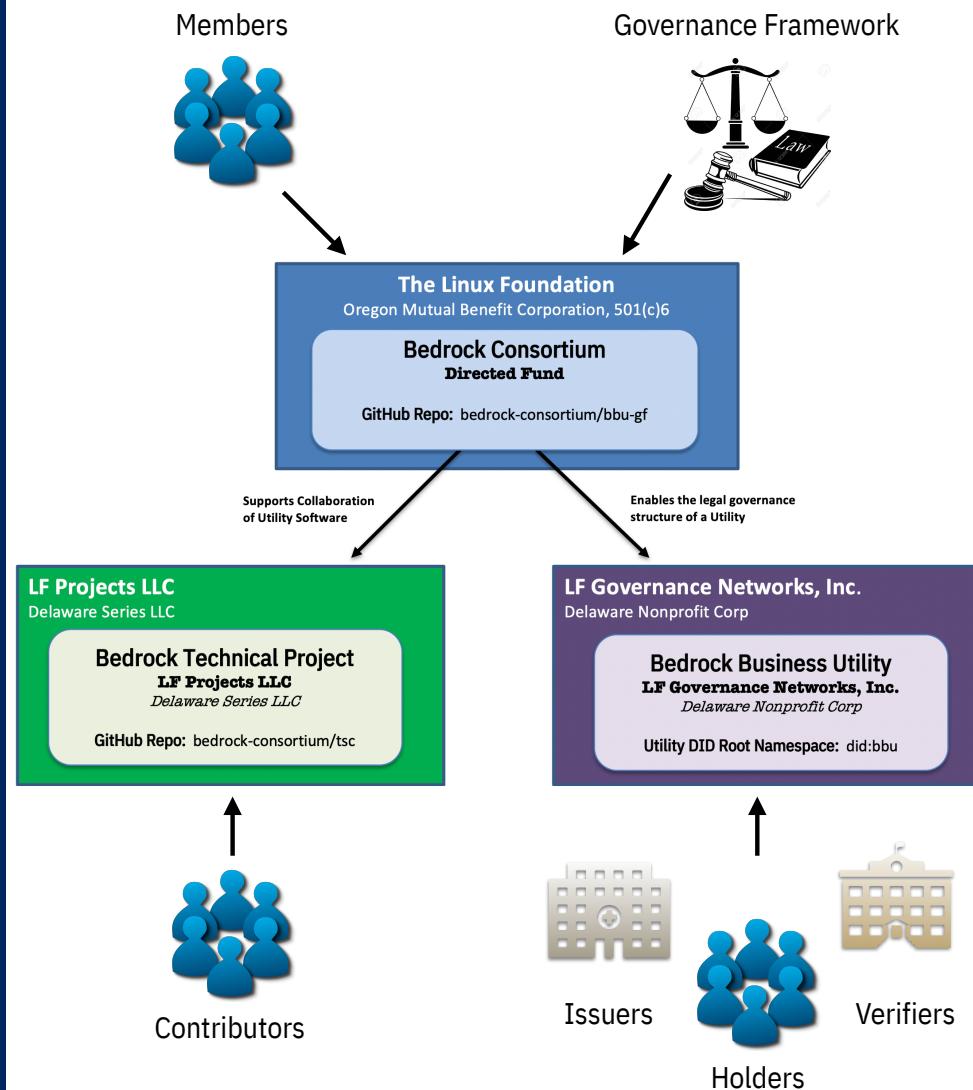
The LF provides a proven and reproducible organizational structure for a variety of open source projects.



Bedrock Business Utility

The BBU operates as a Linux Foundation LF Governance Networks, Inc. (a Delaware Nonprofit Corp) under its own governance framework.

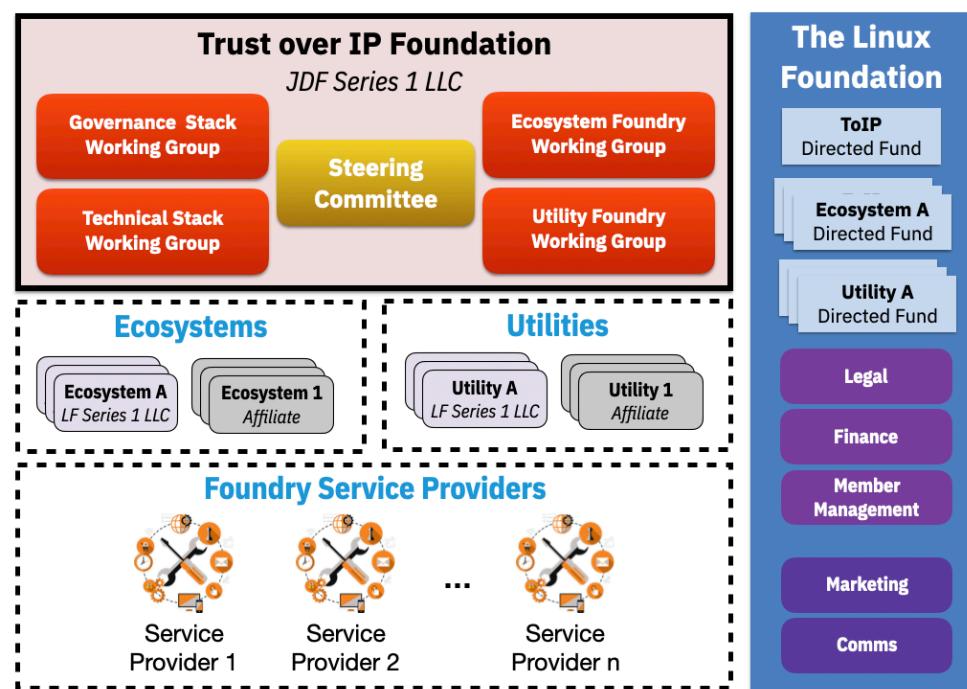
- **Bedrock Consortium:** Represent a collection of international private sector companies and other organizations that operate and manage the Utility. A directed fund of the Linux Foundation (“LF”), serves the purpose of raising, budgeting and spending funds in support of the Utility and the Technical Project.
- **Bedrock Business Utility:** A public identity utility supported by the LF Governance Networks, Inc. (a Delaware non-profit corporation). This non-profit corp serves as a signatory by executing the various agreements relating to the management of, or transacting with, the Utility.
- **Bedrock Technical Project:** The Technical Project is established as the Bedrock Technical Project a Series of LF Projects, LLC with the mission of supporting the technical needs of the Bedrock Business Utility. Note: This Project will leverage other external open source projects where necessary.



ToIP Foundation Affiliation

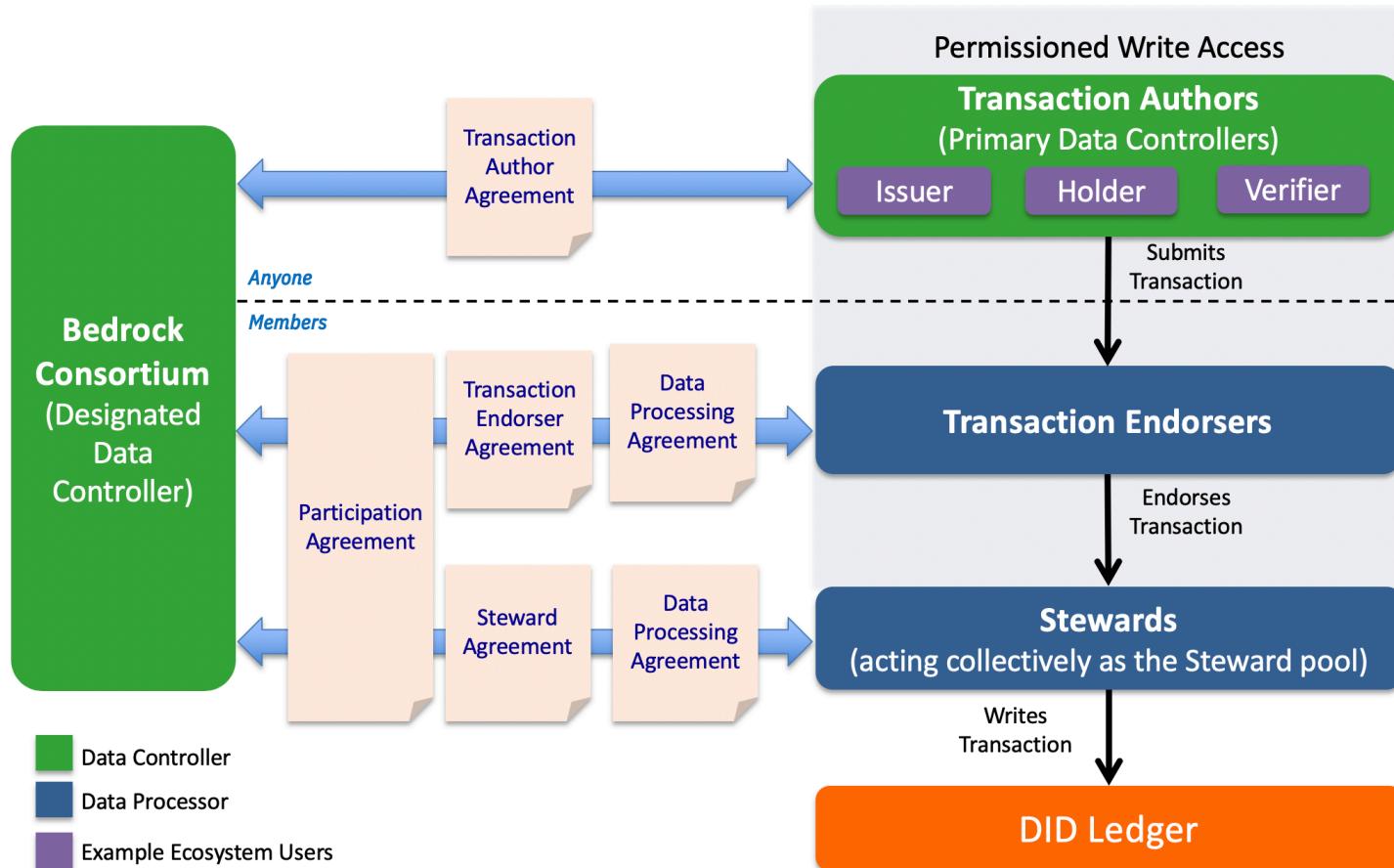
The BBU operates as a Linux Foundation LF Governance Networks, Inc. (a Delaware Nonprofit Corp) under its own governance framework.

- The ToIP Foundation provides an open source collaborative community for the technologies and services necessary to establish, operate, maintain and govern digital trust ecosystems and associated utilities.
- The Bedrock Consortium is an instance of an organization that will contribute to and leverage ToIP guidance.



Bedrock Business Utility: Contractual Instruments

A dedicated decentralized identity utility for trusted commerce that is a safe-zone for enterprises.



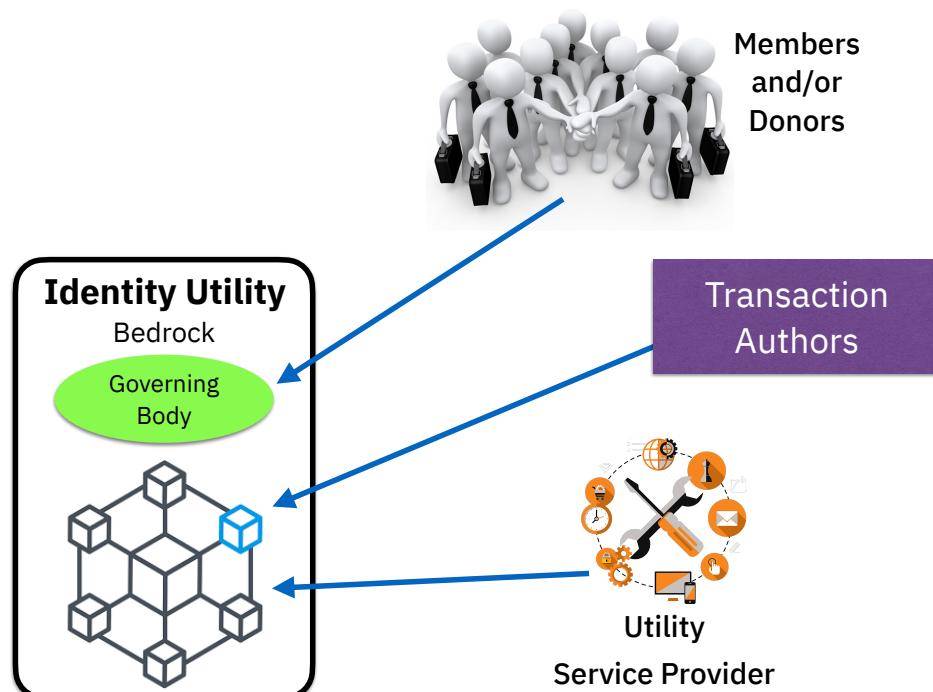
Key BBU Concepts

- What is the BBU business model?
- What are the BBU access policies?
- What membership types are available?

Business Model

Self-sustainability is a key BBU principle.

- Governance Framework
 - Version 0.9
 - Online: <http://bbu.bedrockconsortium.org/>
- Income
 - Annual Membership Fees
 - Members receive **transaction entitlements** that they can monetize
- Expenses
 - Ledger Operations and Maintenance is outsourced to a **Utility Service Provider**.



Business Model

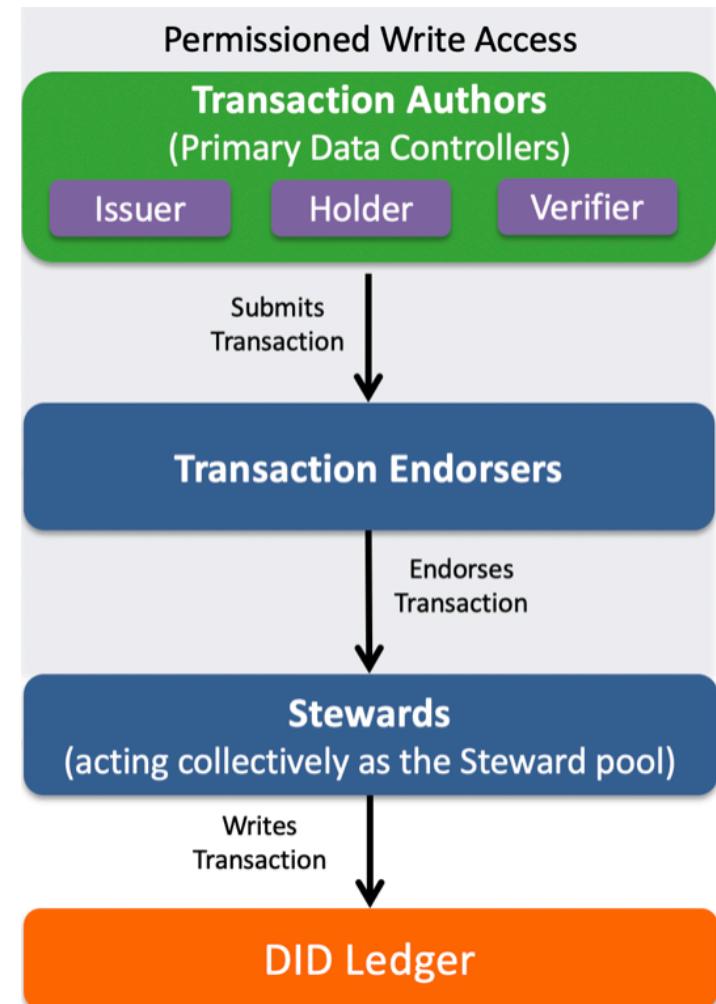
There are several factors that need to be considered with respect to a sustainable business model.

| | Node Hosting | Utility O&M Services | Membership Revenue | Transaction Revenue |
|------------------------|--|---|---|--|
| Concept | A single centralized entity can not own and operate the ledger or the nodes attached to the ledger. | The management of a distributed ledger MUST be administered by skilled personnel. | Read transactions are generally publicly accessible and free, write transactions are typically fee-based. | The governing body of a public identity utility may charge fees for write access. |
| BBU Perspective | Some members are required to host nodes and are responsible for the financial demands of such hosting. | The Governing Board will hire personnel responsible for the operation and maintenance of the Utility. | Write transactions are entitlements of membership. | The BBU does not collect revenue from transaction fees. Transaction Endorsers are free to charge any fee they desire for access to their write transaction entitlements. |

Ledger Access Policies

Permissioned access is a key BBU principle.

- Permissioned Writes via Membership Entitlements
 - Transaction Authors **submit** write requests
 - Transaction Endorsers **must approve** all write requests
 - Stewards **process** write requests
- Read access is available to the public



Membership

Entities can join and renew membership on an annual basis under three possible membership types.

| | Governing Member | Operational Member | Subscriber |
|--------------|--|---|--|
| Roles | 1. Steward 2. Transaction Endorser 3. Transaction Author (<i>Optional</i>) | 1. Steward 2. Transaction Endorser 3. Transaction Author (<i>Optional</i>) | 1. Transaction Endorser 2. Transaction Author (<i>Optional</i>) |
| Obligations | 1. Must host 1 utility infrastructure node. 2. Must sign the required Utility Agreements. 3. Must assign appropriately skilled resources that will meet the required time commitments for each of the governing bodies and the Technical Project. This includes, future additional governing bodies. | 1. Must host 1 utility infrastructure node. 2. Must sign the required Utility Agreements. 3. Must assign appropriately skilled resources that will meet the required time commitments for at least one Directed Fund Committee and the Technical Project. | 1. Must sign the required Utility Agreements. |
| Entitlements | 1. A single representative on the Governing Board. 2. Appointment of representatives to any Committee within the Directed Fund. 3. Approval to act as a Transaction Endorser. 4. Write Transactions as a Transaction Endorser | 1. Appointment of representatives to any Committee within the Directed Fund. 2. Approval to act as a Transaction Endorser. 3. Write Transactions as a Transaction Endorser | 1. Appointment of representatives to any Committee within the Directed Fund. 2. Approval to act as a Transaction Endorser. 3. Write Transactions as a Transaction Endorser |

Membership

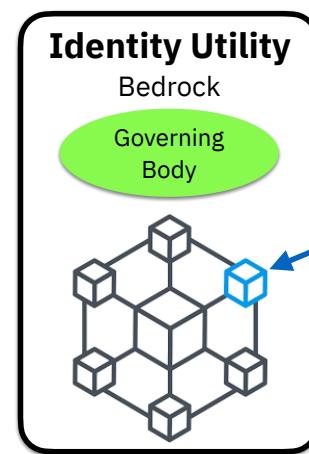
Participants in the Bedrock Consortium, a LF Directed Fund, must sign a set of Utility Agreements upon entrance and annual renewal. These agreements are in addition to the require Participation Agreement.

| Utility Agreement | Governing Member | Operational Member | Subscriber Member |
|---|------------------|--------------------|-------------------|
| Steward Agreement | Required | Required | |
| Steward Data Processing Agreement | Required | Required | |
| Transaction Endorser Agreement | Required | Required | Required |
| Transaction Endorser Data Processing Agreement | Required | Required | Required |
| Transaction Author Agreement | Optional | Optional | Optional |

Transaction Authors

As a public utility the BBU is available for free read transactions in support of identity verification processing. Write access is restricted to the role of a **Transaction Author** for both members and non-members.

- Any entity that is the submitter of a write transaction in support of using the ledger for decentralized identity interactions.
- Interacts with a Transaction Endorser for the processing of write requests.
- Must adhere to submitting transaction types outlined in ledger access and ledger data policies.
- Must sign the **Transaction Author Agreement**.



Transaction
Authors

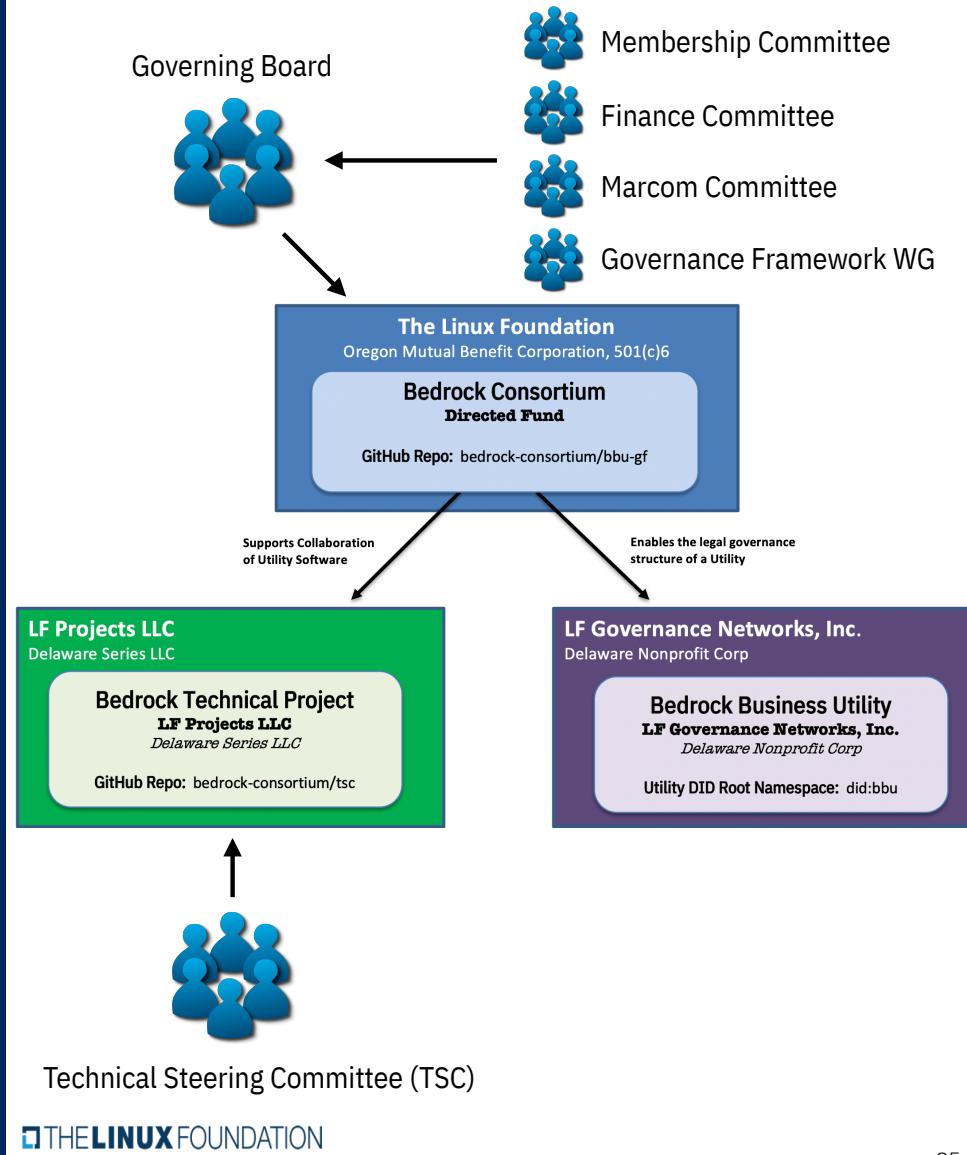
Organizational Structure

- What is the governing body?
- What committees are available?

Governing Bodies

Each legal entity is assigned a governing body.

- Directed Fund
 - Governing Board
 - Membership Committee
 - Finance Committee
 - Marcom Committee
 - Governance Framework Working Group
- Technical Project
 - Steering Committee (TSC)



Participation

- Why join?
- How to join?

Benefits of Membership

ARE YOU INTERESTED IN COLLABORATING WITH LIKEMINDED ORGANIZATIONS IN SHAPING THE DECENTRALIZED IDENTITY MARKET?

BUSINESS BENEFITS



Time/
Cost Savings



Risk Mitigation



Cross-participant
interests



Potential
Revenue Stream



Privacy Regulation/
Permission Writes

- Competitive advantage in shaping the solution vs forced adoption of the solution
- Maintains financial sustainability of the consortium in a non-ICO model

TECHNICAL BENEFITS - GETTING STARTED



Established
Infrastructure



Access



Collaborative
governance
structure

- Pay a Provider OR Position your business as a utility provider
- Access = Contribute and collaborate OR Pay As You Go; access isn't free

HOW TO JOIN

- Respond to the email invitation to request an exploratory briefing
- Review contractual agreements
- Select desired membership type
- DocuSign Agreements

Dependencies

Linux Foundation Membership is a pre-requisite for membership into BBU.

- LF Platinum: \$500,000
- LF Gold: \$100,000
- LF Silver:
 - Under 100 employees: \$5,000;
100-499 employees: \$10,000;
500-4,999 employees: \$15,000;
5,000 or more employees: \$20,000.
- LF Associate membership is available for non-profit, open source, and government entities at no cost.



Membership

Linux Foundation onboarding process allows for simple DocSign activation.

- Join LF, if not an existing member.
- Select Membership Class and sign required agreements:
 - Participation Agreement
 - Utility Agreements
- Pay invoice
- NOTE: Prospective Members receive *First Right of Refusal on Governing Membership* up to a certain date.

| Membership Class | Annual Membership Fees | Node Hosting Requirement | Write Transaction Entitlements |
|--------------------|------------------------|--------------------------|--------------------------------|
| Governing Member | \$15000 | 1 | Unlimited |
| Operational Member | \$25000 | 1 | Unlimited |
| Subscriber Member | \$40000 | 0 | 50 |
| Associate Member | \$0 | 0 | 0 |

Pricing based on Wave 2 estimates of 36 Stewards.

Subscriber membership comes with **50** transaction entitlements per annual membership. Additional transactions can be acquired per annum @ **\$10K / 50**.

While a Subscriber may purchase an unlimited number of entitlement packages, all unused transactions expire at years end without rollover.

Membership: Obligation Example

As our population increases, membership fees decrease. Initial goal is to launch with 36 Stewards.

Participation obligations include resources (people and compute) plus membership fees.

- Out-of-Pocket costs include:

- Node Hosting
- Endorser Hosting
- Annual Membership

- Resource commitments pertain to WG participation and are based on Membership Type:

- Governing: 4 or more
- Operational: 2

- Hosting Options

- 3rd Party Provider
- Self-managed BAF Deployment

Assumptions

| | |
|--------------------------------|----------|
| OOP Node-aaS Cost (annual) | \$65,000 |
| OOP Endorser-aaS Cost (annual) | \$2,000 |

Baseline Membership Fees

| | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 |
|-------------|----------|----------|----------|----------|----------|
| Governing | \$25,000 | \$15,000 | \$15,000 | \$15,000 | \$10,000 |
| Operational | \$35,000 | \$25,000 | \$20,000 | \$20,000 | \$20,000 |
| Subscriber | \$40,000 | \$40,000 | \$40,000 | \$40,000 | \$40,000 |

| Governance Structure | Wave 1 | | | Wave 2 | | |
|-------------------------------------|-----------|-------------|--------------|-----------|-------------|--------------|
| | Governing | Operational | Steward Pool | Governing | Operational | Steward Pool |
| Membership Allocations | 7 | 18 | 25 | 9 | 27 | 36 |
| BoD to Steward Ratio | | | 28% | | | 25% |
| Annual Member OOP Costs (cash only) | \$92,000 | \$102,000 | | \$82,000 | \$97,000 | |
| Mandatory Resource Commitments | 1 Per WG | 2 | | 1 Per WG | 2 | |

Project Launch - Plan of Record

| | August | | | | September | | | | October | | | | November | | | | |
|---|--------|----|----|----|------------------------|--|-------------------|-----------------|----------------------------|-----------------|----------------------------|------------------|-------------------------------|------------------|----|----|--|
| | 10 | 17 | 24 | 31 | 7 | 14 | 21 | 28 | 5 | 12 | 19 | 26 | 2 | 9 | 16 | 23 | |
| BBU Launch Prep and New Member Onboarding | | | | | Launch Prep Activities | | | | | | | | | | | | |
| Launch Summary | TODAY | | | | September 8, 2020 | Hold prospective member exploratory sessions | September 8, 2020 | October 5, 2020 | Deadline for launch signup | October 5, 2020 | Target project launch date | November 2, 2020 | Onboard new members - ONGOING | November 2, 2020 | | | |

We are excited to share the launch preparation dates for the Bedrock Business Utility. Planning efforts have been underway for the last couple months and our formal launch is just around the corner.

Once you have had a chance to hear our briefing video and you are ready to learn more to see if joining the Utility would be right for your business, please schedule a exploratory session with us.

You don't want to miss being part of the formal launch on October 5th, 2020 and being part of the future of decentralized identity!

Thank you

Related resources:

linuxfoundation.org

trustoverip.org

bedrockconsortium.org

[Bedrock GitHub Repo](#)

[Bedrock Governance Framework](#)

