Enterprise Identity on Distributed Ledger Technology

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First Orion Overview

Leader in Call Protection solutions
Carrier customers in the US and Europe, including Tier 1

STIR/SHAKEN Solution Vendor
Full range of capabilities for attestation, verification, key custodianship with both in-network and SaaS implementations today

Leading Call Enhancement Provider
Key Enterprise customers in the US and around the globe

STIR/SHAKEN and RCD
Active in ATIS efforts to help promote and enhance the existing STIR/SHAKEN ecosystem to include RCD and extend it to future technologies

Enterprise Identity
Actively involved in the Enterprise Identity DLT working group and pivotal in building and hosting the technology and interfaces for the Proof of Concept

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Innovating since 2008

Headquartered:
North Little Rock, AR

Offices:
Seattle | London | Dubai | Sao Paulo

ATIS - Advancing Industry Transformation

- *150 Members representing the broad ecosystem for the future*
- *Advancing cooperative solutions between industry and government*
- *Leading 6G 'Next G Alliance' as North American Organizational Partner*
- *ANSI-accredited standards development organization (SDO)*
- *Creating platforms for ICT collaboration with other industries*

ATIS Strategic Initiatives

5G North American Requirements

Smart Cities

Non-Terrestrial Networks

Distributed Ledger Technology

Cybersecurity & Quantum Safe Communications

Unmanned Aerial Vehicles

Evolution to an AI-Enabled Network

Context-Aware Identity Management

Evolution to Content Optimized Networks

ATIS Board Level Members

Distributed Ledger Technology

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What is Blockchain and Distributed Ledger Technology?

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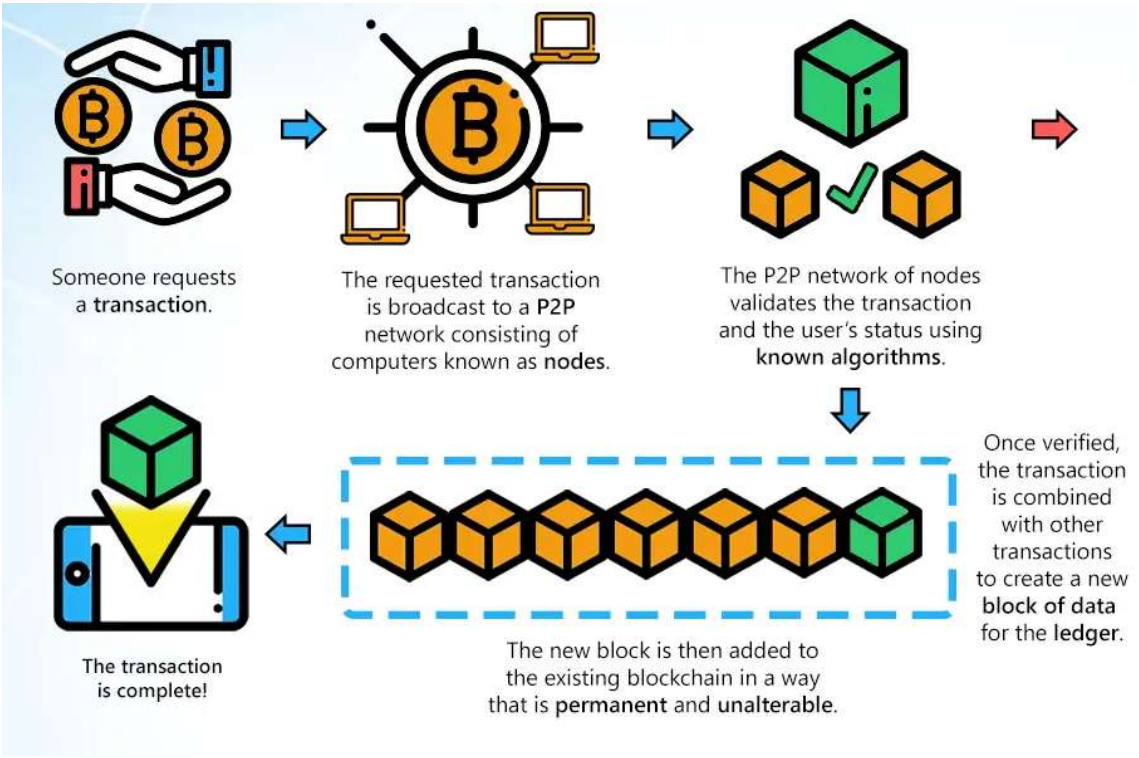
- **Distributed Ledger Technology**
  - Family of technologies that includes blockchain where a ledger is maintained by a group of peers rather than a single central authority
  - Builds on proven technologies including distributed computing, cryptographic encryption, and hashing

- **Blockchain**
  - A type of distributed ledger that organizes data in blocks, and updates the entries using an append-only structure
  - Cryptocurrencies, such as Bitcoin, pioneered blockchain technology



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Public vs Private Blockchain/DLT

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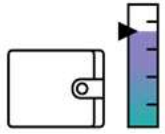
- Blockchain ledgers can be public (“permissionless”), or private (“permissioned”). The distinction between the two is much like the internet versus an intranet.

Public/<u>Permissionless</u> ledgers

- As an example, Bitcoin allows anyone to make transactions and to hold identical copies of the full ledger.
- Anyone can access the network and view all transactions.

Slow Confirmations

Transaction Fees



Consensus Bottleneck

Private/<u>Permissioned</u> ledgers

- Limit contributions to a limited set of users who have been given permission.
- Access to view records can be restricted or public, depending on the settings of the ledger.

Immediate Confirmations

Zero-fee transactions

Highly Scalable

Typical Enterprise DLT implementations

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Examples of DLT being used in Telecom and at Scale

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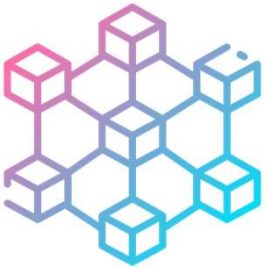

Telecom Enterprise DLT implementations

AT&T

AT&T Business services, providing blockchain technology to help companies transform the way they conduct business.

verizon

VerizonID, Creating a true digital identity (Idm) using blockchain. Users can access their digital and physical identity documents, including credit cards, insurance cards, and educational and professional credentials. The safe is keyed to the user's unique biometrics and resistant to tampering.

COMCAST

New Blockchain consumer insights platform to be developed in collaboration with NBCUniversal, Disney, Altice USA, Channel 4, Cox Communications, Mediaset Italia and TF1 Group.

syniverse.

Real time interconnect Clearing and Settlement using blockchain

Verified.Me

Secure way to help you verify your identity, so you can quickly get access to the services and products you want online, in person and on the phone.

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POLL QUESTION 1

Enterprise Identity Using Distributed Ledger

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ATIS DLT Focus Group
Background

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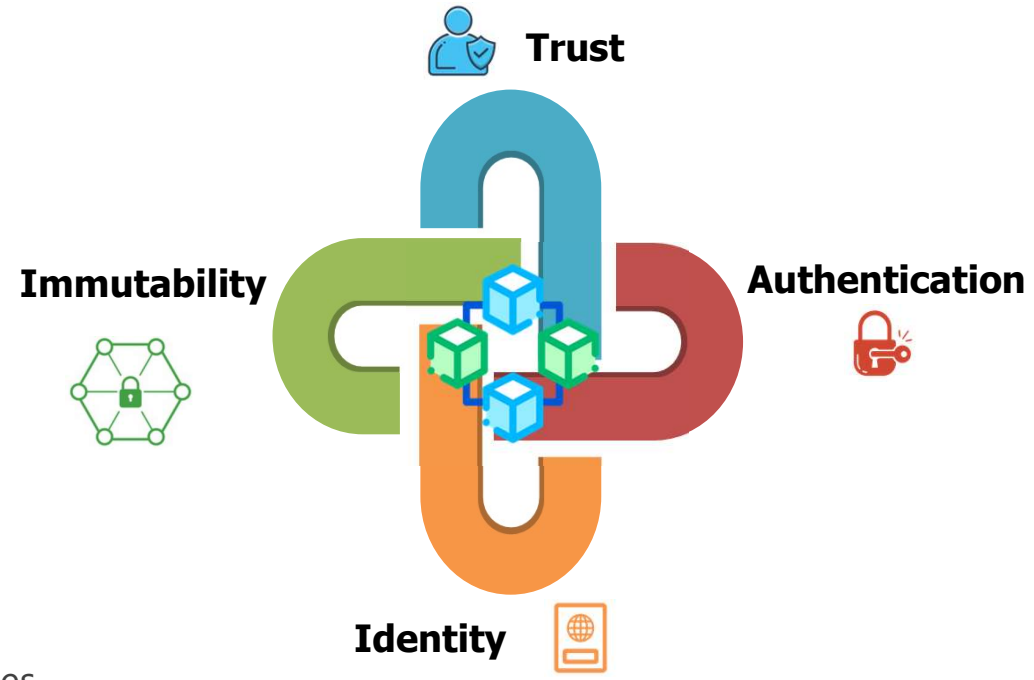
- **DLT Focus Group - Established May 2018**
  - Validate key aspects of distributed ledger technology (DLT) as it applies to real-world challenges facing today's communications industry
- **Objective:**
  - Deep dive of use cases, identify key issues where industry collaboration can benefit from DLT based solution
  - Validate whether a distributed ledger solution can be demonstrated as viable
- **Goal:**
  - Identify a use case for a collaborative Proof of Concept (PoC) related to distributed ledger
  - An effective PoC not only solves problems currently plaguing the industry but can also lead to further business opportunities



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Enterprise Identity & Trusted Telephone Numbers

Use Case – Problem Statement

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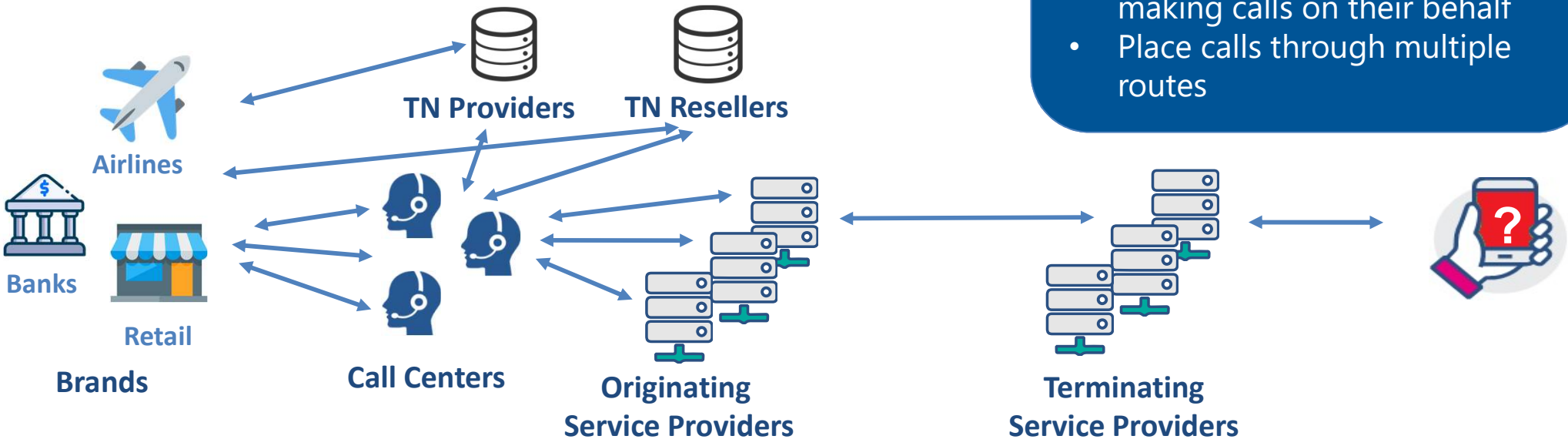
Enterprise Identity :

- Effective vetting of Enterprise creates barrier to entry
- Not a universal process or portable

Difficulty Attesting to a TN:

- TN can be provided from multiple sources
- Brand is the owner; 3rd party making calls on their behalf
- Place calls through multiple routes



Originating Carriers cannot attest to a number they do not own or manage.

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POLL QUESTION 2

DLT Focus Group
Approach to assessing the problem

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Review of business and technical process, to define the service on DLT

- **<u>Create holistic view across the ecosystem of stakeholders</u>**
- Provide definition of the user stories, not only in the call path validation
- Identify functions performed
- Define how functions can be enhanced using DLT
- Leverage and enhance SHAKEN service
- Identify efficiencies and improvements that could be made to the process
- Highlight potential for value generation, new business models

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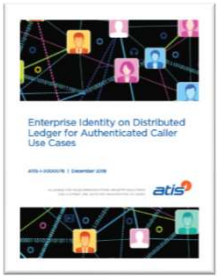

Published Report
ATIS-I-0000076 - Enterprise Identity on Distributed Ledger for Authenticated Caller Use Cases

Enterprise Identity DLT Sub Group
Participating Companies defining the solution

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FIRST ORION	Call signing and validation from enterprise to consumer, Indicating Brand and Intended purpose to the consumer
inteliquent SOMOS	TN Management, allocation / delegation supply chain
IBM IOTA	DLT Platform: Node, Account, TN data integrity
Numeracle	Enterprise KYC Vetting function
T-Mobile Charter COMMUNICATIONS	Carrier perspective, interworking with SHAKEN
metaswitch Microsoft FIRST ORION TNS	Call Reputation based on the attestation level

Collaborated in defining the solution to meet the market needs and scope for a Proof of Concept

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Enterprise Self Sovereign identity & Verifiable Credentials For Proof of Caller Identity and TN Right to Use

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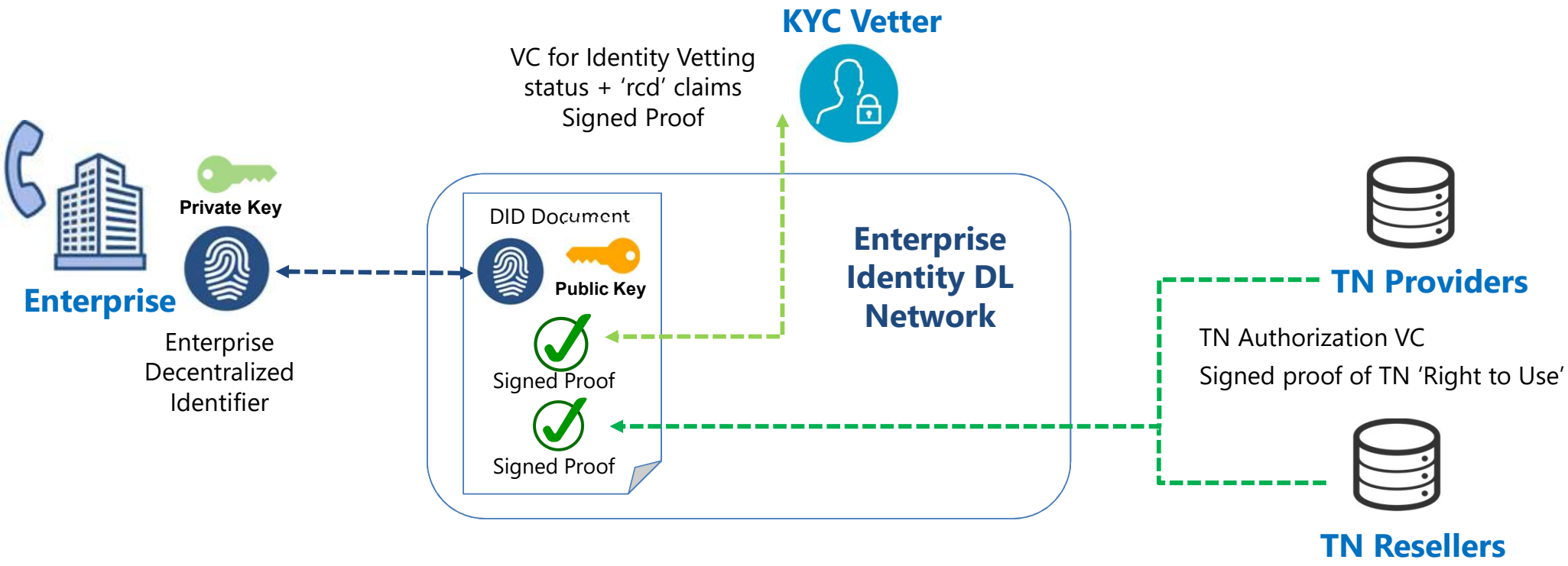

EIDLN implemented using W3C standard for Self sovereign identity

- Enterprise identity is a Decentralized identifier (DID)
- Verifiable Credentials (VC) contain signed proofs
  - KYC vetting status
  - Vetted 'rcd' claims
  - TN right to use

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Enterprise Identity Distributed Ledger Network
Provides a single source of Truth for all stakeholders

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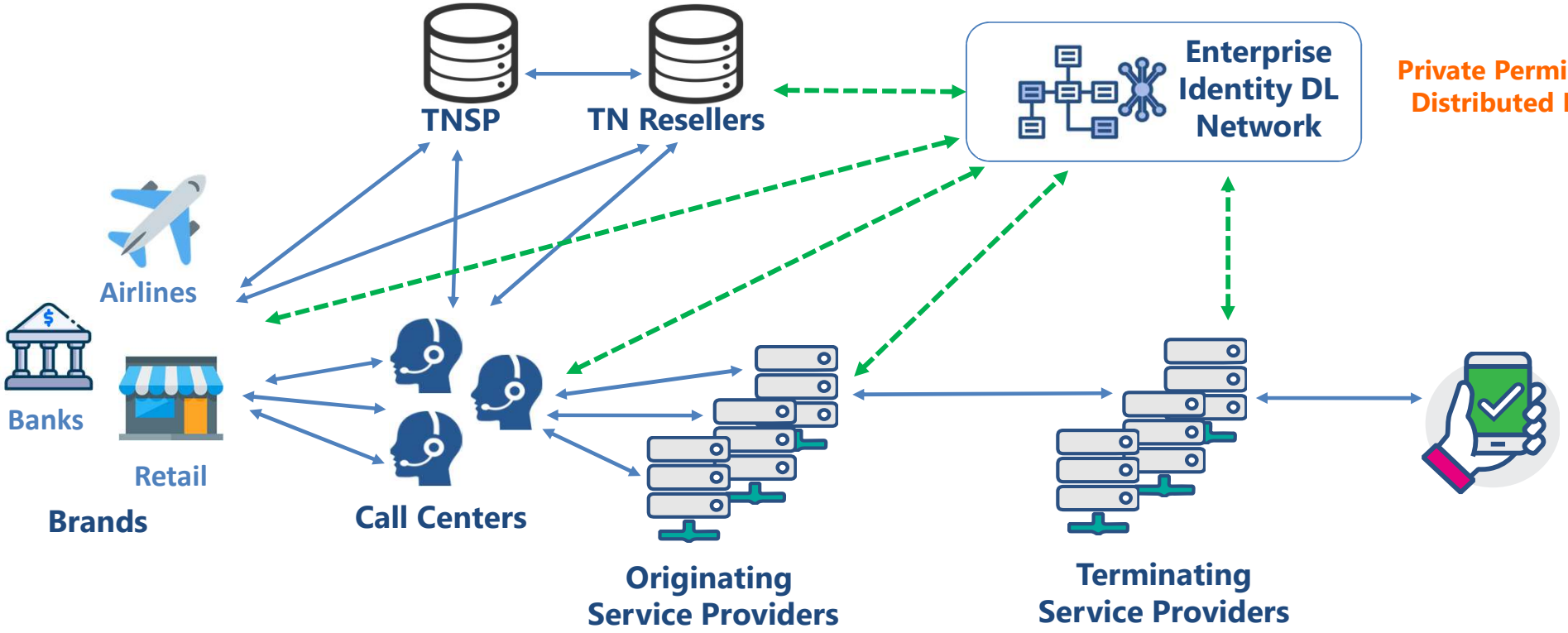

Any stakeholder using the Enterprise Identity DL can authenticate the use of a 'Trusted' TN without the need to have any predefined business arrangement with an Enterprise.

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POLL QUESTION 3

Enterprise Identity Distributed Ledger Network

Business Process Architecture

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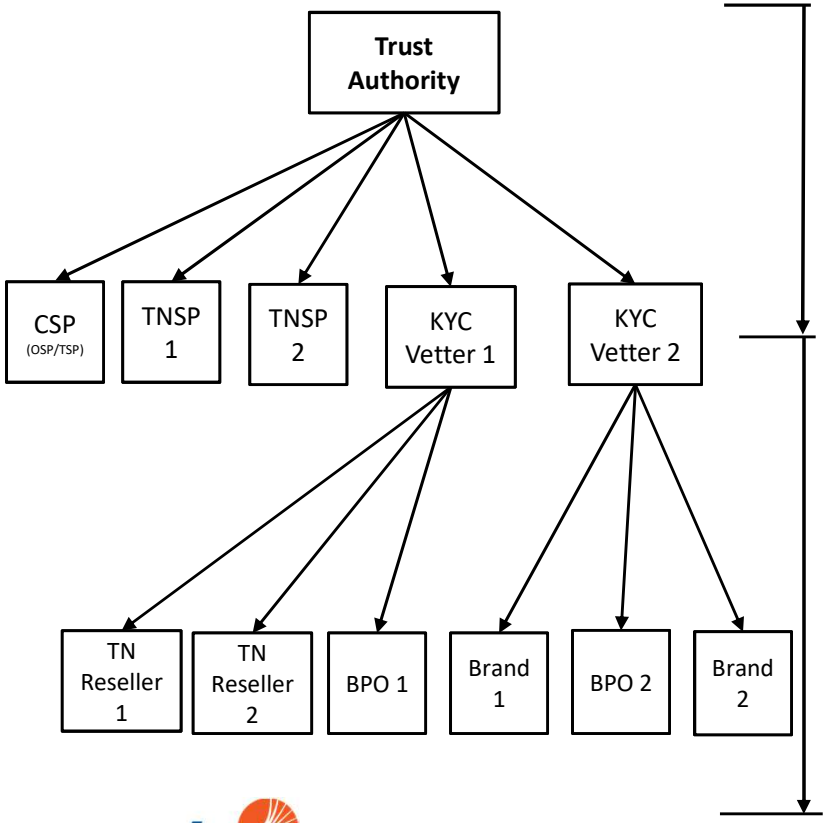
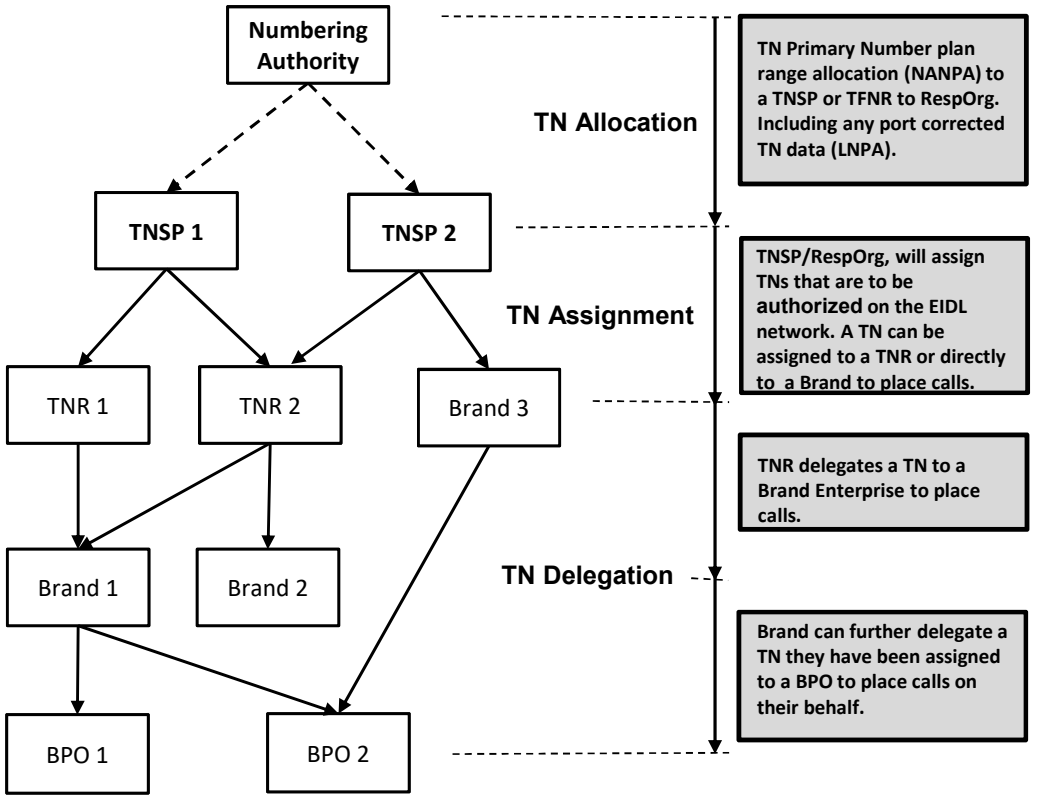
Governance & Trust Hierarchy



Trust Authority
Vets TNSPs & KYC Vetter

KYC Vetter
Vets and Authorizes Enterprise Identity to organizations

TN Authorization Hierarchy



POLL QUESTION 4

Enterprise Identity Distributed Ledger Network

SHAKEN Interworking call flow – 'rcd' example

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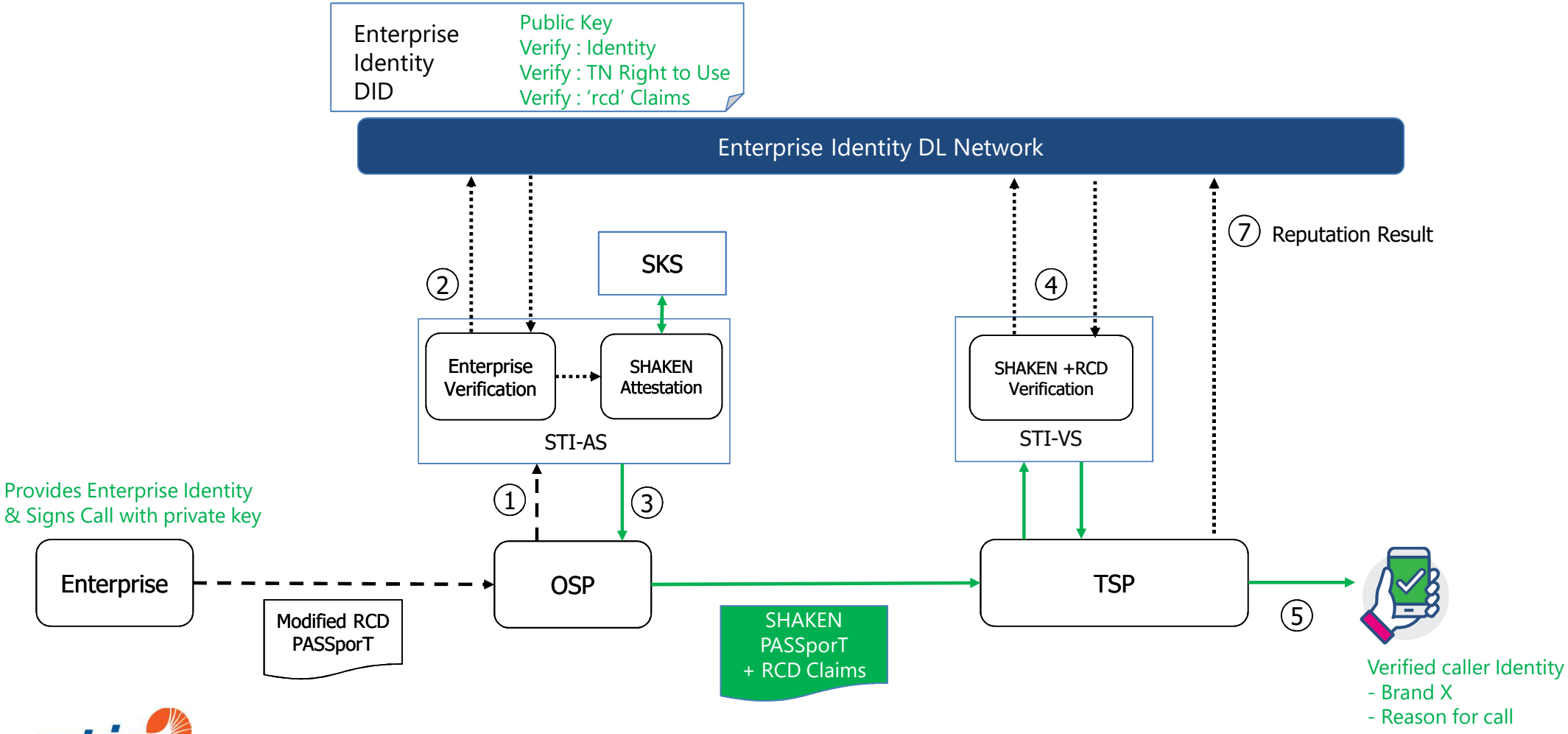

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Enterprise Identity Distributed Ledger Network

Business Value & Advantages

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- Increases TN integrity to mitigate fraud
- Increases the value of the Telephone Number
- Increases enterprise customer acquisition and competitiveness
- Improves network infrastructure & switching efficiencies
- Improved level of trust and regulatory compliance
- Cross Border Interworking Global support

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Reduces the barrier to entry for Enterprise Identity, improving the overall effectiveness of SHAKEN service.

Enterprise Identity Using Distributed Ledger Proof of Concept

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Enterprise Identity Distributed Ledger Network

Integration Architecture with SHAKEN to provide "A" Attestation

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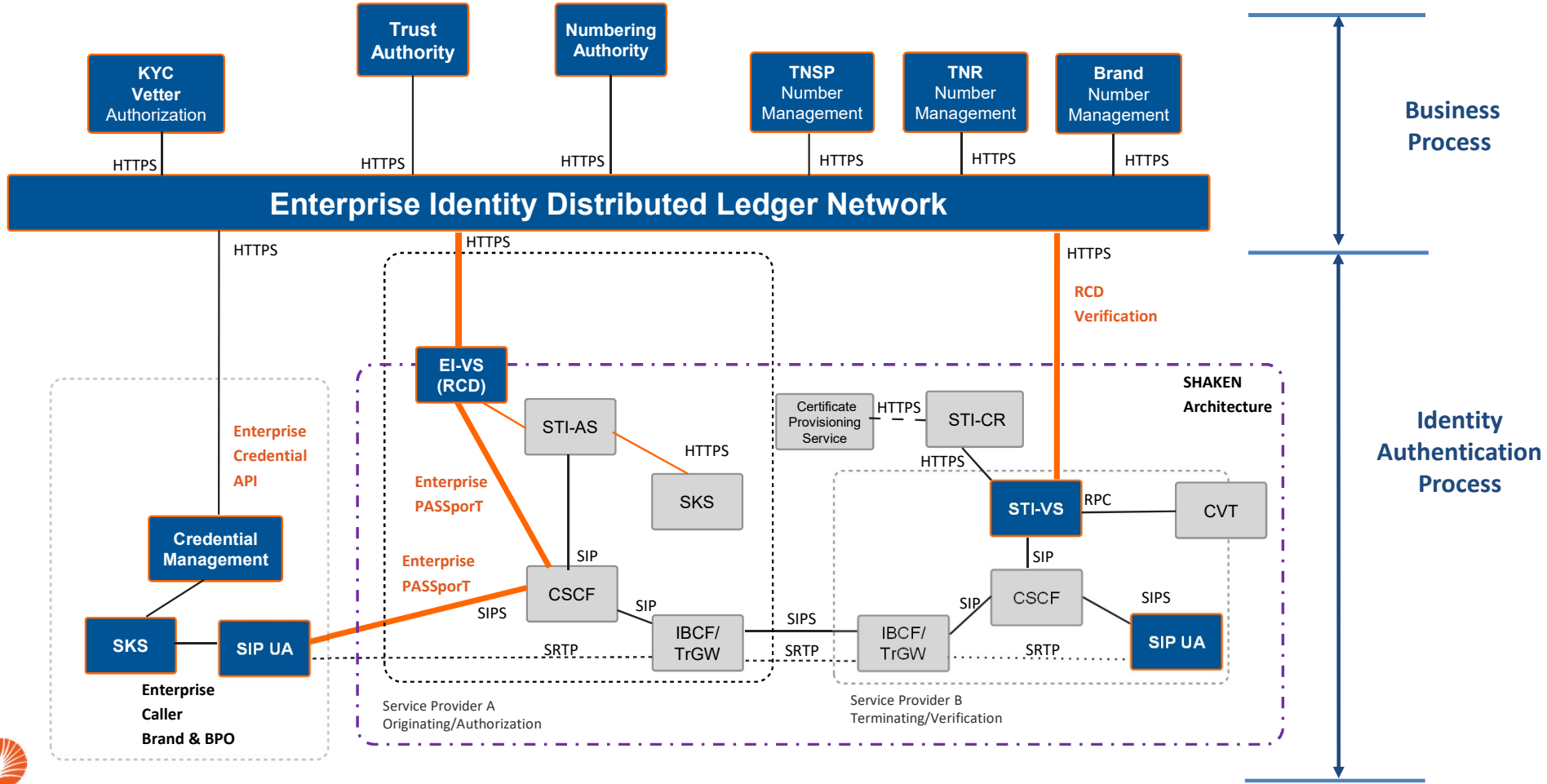

Proof of Concept – Demonstration

EIDLN Proof of Concept Demo
High Level Architecture

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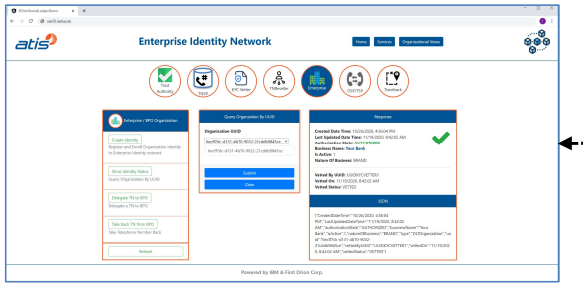
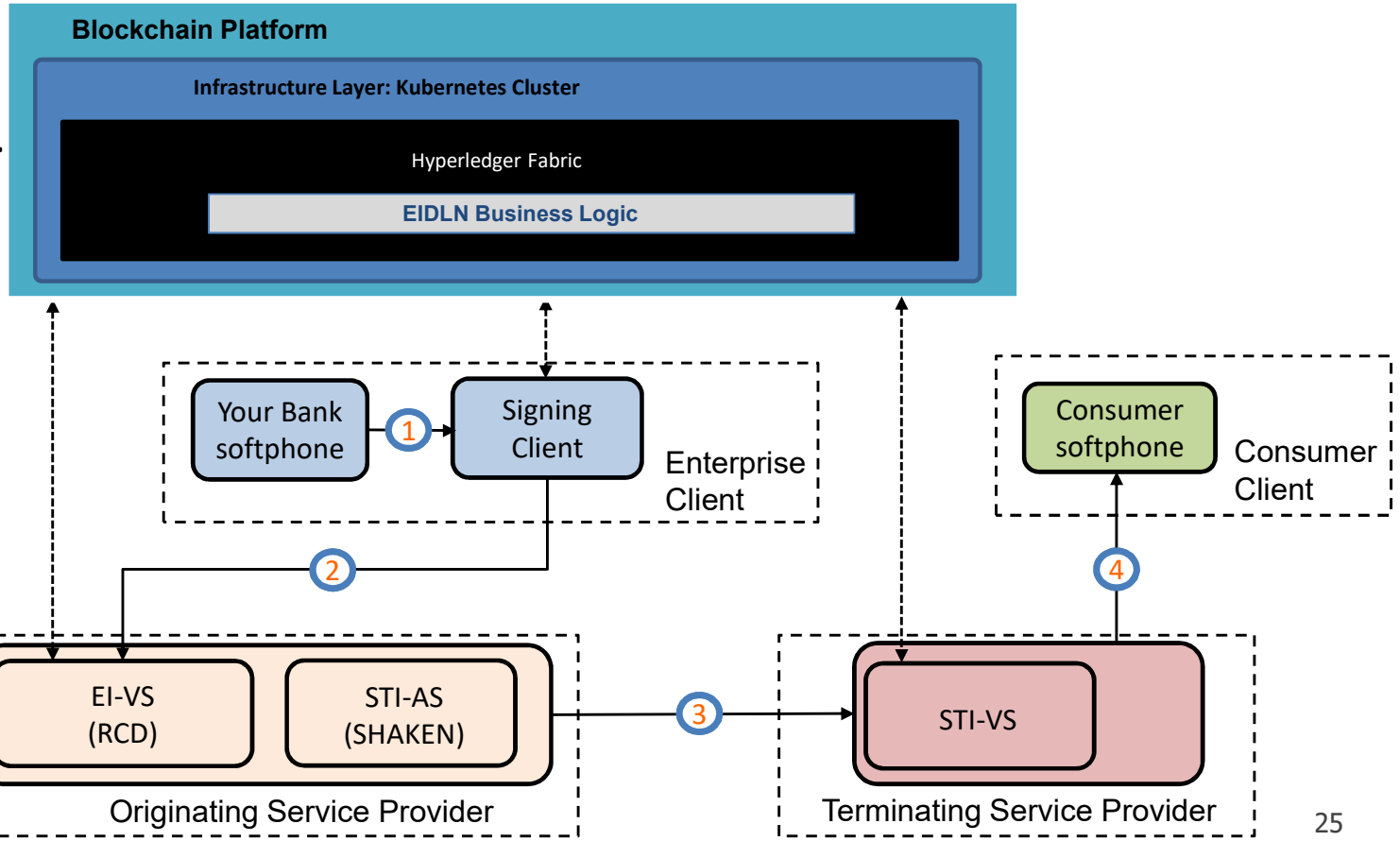
Web UI simulate Actors





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PoC Environment

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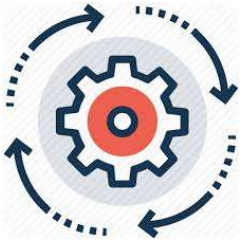

Business Process:

- KYC vetting an Enterprise Identity
- Authorizing 'TN Right to use'
- Take Back 'TN Right To use'
- Revoke KYC vetting status of an Enterprise Identity

Call Scenarios—Identity Authentication Process:

- Brand vetted with authorized 'TN Right to use' – Attestation A
- Brand vetted not authorized to use TN - Attestation B
- Enterprise not vetted – Attestation C

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Enterprise Identity Network PoC Demonstration

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Enterprise Identity Distributed Ledger Network

Progress and Plan

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Research and Specification

Define appropriate technology standards and frameworks for implementation

Use Case specification ATIS I-0000076 Published November 2019

Propose Technology standards (W3C)

ATIS 1000089 Updated to include EIDLN Option

ATIS I-0000084 EIDLN Technical Report

EIDL Implementation Guide

Progress

Proof of Concept Agile Dev Process

Agree Scope for PoC Phase 1 (Smart Contract)

Development of PoC P1

PoC P1 Complete

Demo Available

PoC Phase 2 Implement Standards (W3C)

Demonstrate PoC Phase 2

Validate identity and TN authorization on DLT

Validate interoperability technologies

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Questions ?

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Links and Further Reading

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ATIS DLT Initiative: https://www.atis.org/initiatives/distributed-ledger-technology/

Video: ATIS Enterprise Identity – Stakeholder Benefits

Video: ATIS Enterprise Identity Network Using DLT – How It Works

ATIS White Paper: Enterprise Identity on Distributed Ledger for Authenticated Caller Use Cases

First Orion White Paper: The STIR/SHAKEN Gap Facing Enterprises and How to Address it With Distributed Ledger Technology

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