nevermined

Leveraging Blockchain to Unlock Data for Federated Learning

Agenda

- Who we are
- Overview of Nevermined
  - Problem
  - Vision
  - Data Sharing Ecosystem
  - Data In Situ Compute
  - Data Marketplace
  - Metadata
- Code Demo
  - Use Case
  - Federated Learning
- Q & A

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Create Unstoppable Digital Ecosystems

keyko

What is Keyko?

Web3.0 powerhouse with a passion for openness and change.

Keyko is a Swiss based technology company focused on promoting the growth of Digital Ecosystems. We offer unparalleled expertise in the creation and application of large scale data sharing technologies, and are a leader in leveraging decentralized open source platforms like Ethereum, Celo, etc.

Track Record

Since 2019, the Keyko team's track record speaks for itself

価額 着手 収入

3 Major Ecosystem Launches in <18 months

€60M+ Combined Revenue Generated

€800M+ Combined Ecosystem Market Cap

From 6, to 23 people team in 14 months.

+200 y. of combined experience in web3 & data

ocean BIGCHAINDB STRATIO NTT DATA

At Keyko, we believe our world is far from homogeneous, and such is our dōjō.

We are diverse and disparate.
We are young and old.
We are unstoppable and we are bold.
We are the way.
Welcome to our dōjō.

DON GOSSEN

Black Belt in
Execution

AITOR ARGOMANIZ

Black Belt in
Technology Solutions

DIMITRI DE JONGHE, PHD

Black Belt in
Decentralized Systems & Protocols

BRIAN HAACKE

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Operations & Delivery

GIANLUCA BOCCADIFUOCO

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Operations & Growth

OANA IONESCU

Black Belt in
Marketing

CLEMENT BIHOREL

Black Belt in
Product Development

RODOLPHE MARQUES

Black Belt in
Distributed Systems

JAVIER CORTEJOSO
DE ANDRES

Black Belt in
DevOps & OpSec

SAMI MÄKELÄ, PHD

Black Belt in
Formal Verification

PEDRO GUTIÉRREZ

Black Belt in
Frontend Architecture

MARK MESSOW

Black Belt in
Strategy & Entrepreneurial
Innovation

JOSE PABLO FERNÁNDEZ

Black Belt in
Big Data Architecture

SEBASTIAN GERSKE

Black Belt in
Blockchain

ENRIQUE RUIZ GARCIA

Black Belt in
Big Data

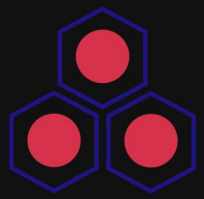
JERNEJ PREGELJ

Black Belt in
Software & Gamification

Swiss-knife web3 services

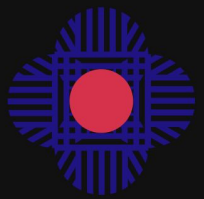
Project Delivery & Mainnet Launch

We support project pipeline delivery for network implementation and launch



Network Operation, Maintenance & Support

We build and maintain critical network infrastructure components



Network Adoption & Token Use Cases

We generate compelling use cases and develop d'Apps

We work with:

celo OV Bancor mSTABLE ODYSSEY Kryha Blockchain Solutions

Our Products

Keyko was created with the idea in mind of building kick-ass product to fill the gap between web2 and web3.

We incubate interesting innovative ideas.

nevermined

Nevermined: the world's first enterprise-grade Data Interoperability platform.

Now fundraising Seed Funding

Dōjō

Company governance tool to democratize collective decisions

Building and Testing internally

Intro

Overview of Nevermined

Problem

- Inaccessible Data: A third party dataset may help grow your business, but you don't know it exists or can't access it
- Compliance Issues: Data Sharing inside or outside your organization creates significant legal & regulatory problems
- No Interoperability: Different datasets & information systems make it difficult & expensive for companies to work together

Vision

Nevermined is a product that provides Data Sharing & Data In Situ Computation solutions to unlock value with actionable insights through 3 main building blocks

- Data Sharing Ecosystem
- Data In Situ Compute (DISC)
- Data Marketplace

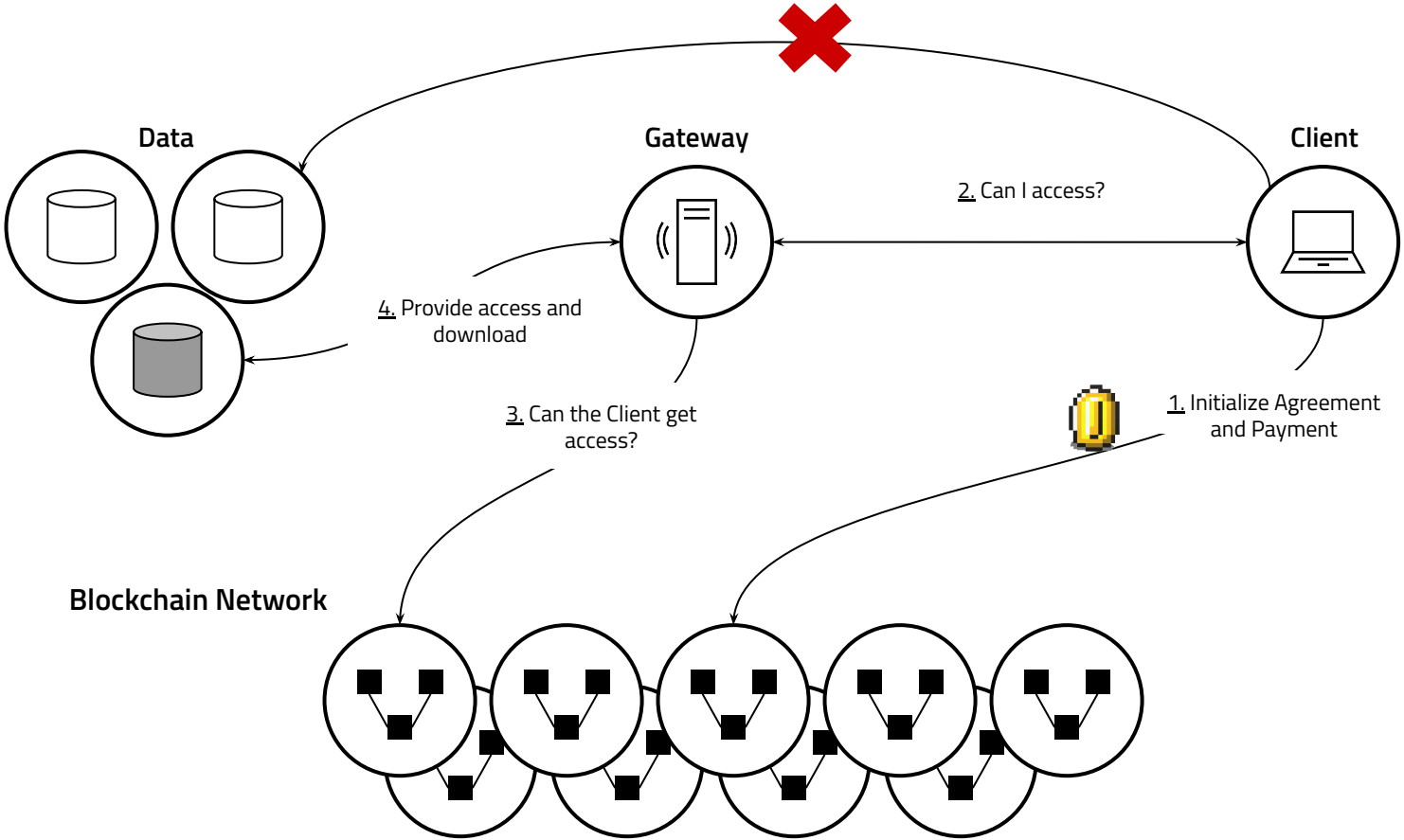
Data Sharing Ecosystem

Enables the data sharing between untrusted parties

- Allows data monetization
- Data Publishing and Consuming
- Decentralized Access Control
- Free or paid access supported
- Data Provenance
- Public or Private blockchain networks

More info in the Nevermined ACCESS Specifications.

Data Sharing Ecosystem



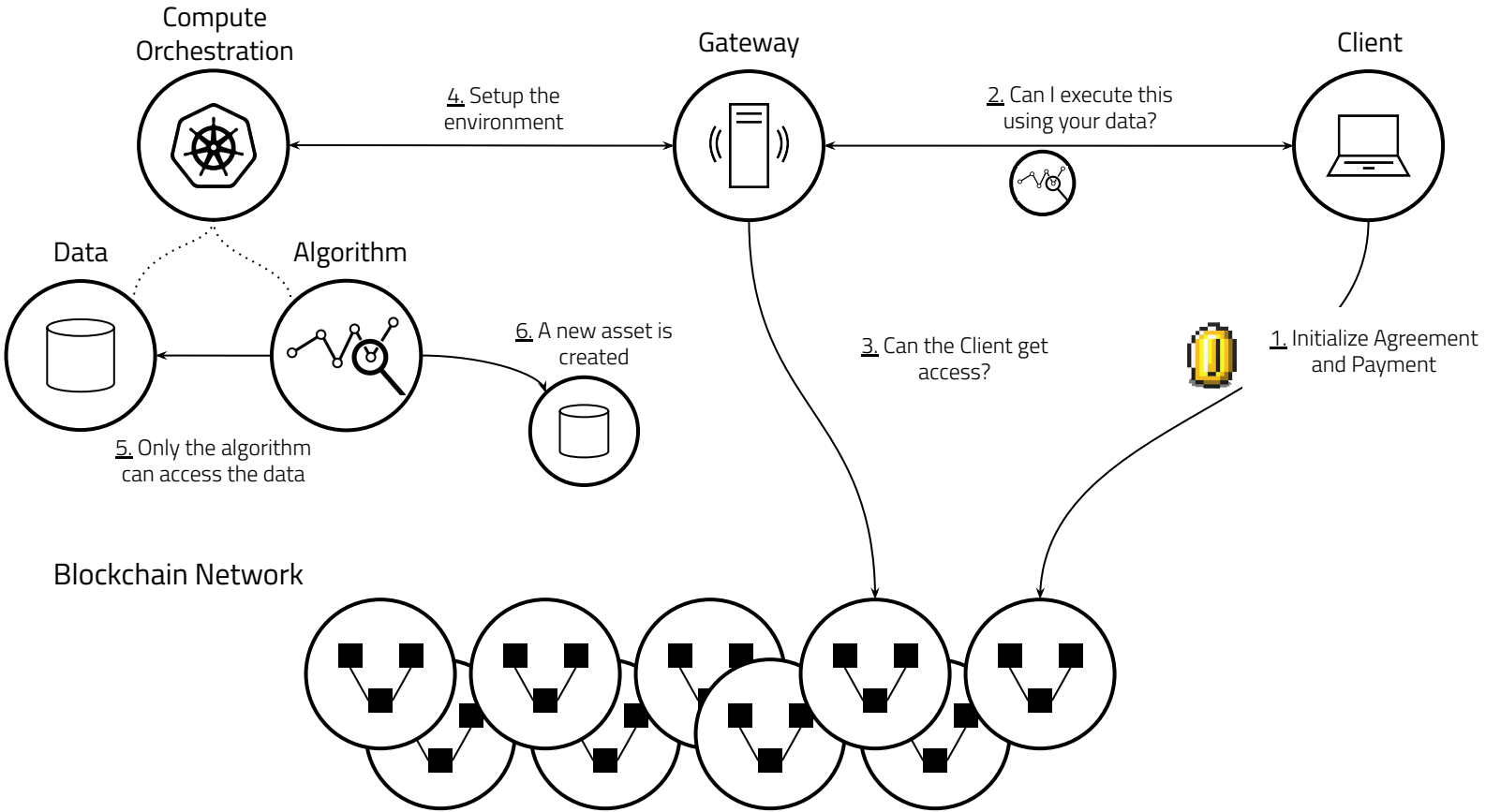
Data In Situ Compute (DISC)

Allows execution of algorithms without moving the data

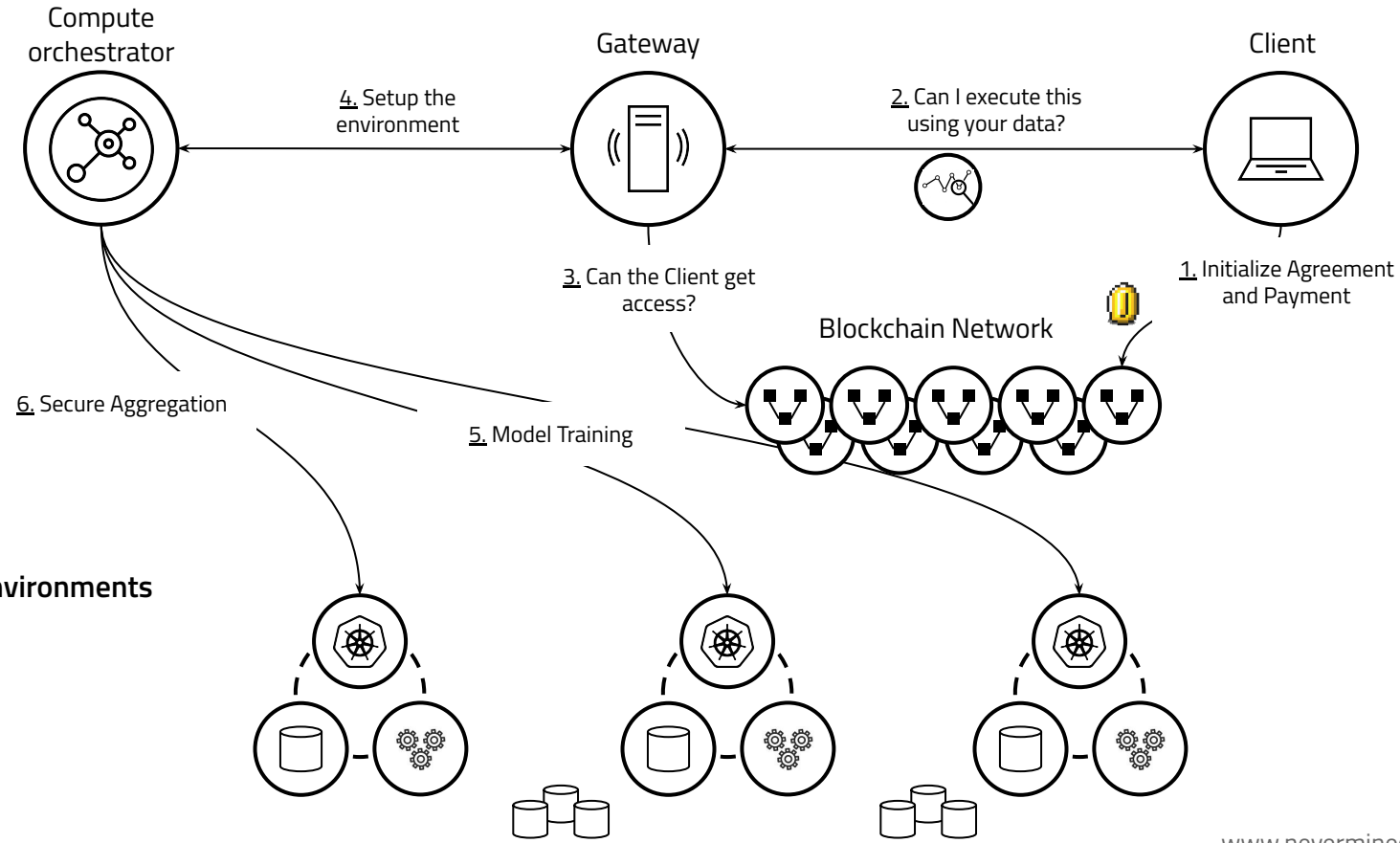
- Supports Federated Learning and Kubernetes workflows
- Data never moves, algorithm goes where data is
- Consumer never get access to the real data
- Orchestration of computing pipelines
- Integration with flexible service agreements
- Can be run in cloud providers or on-premise
- Workflow execution monitoring

More info in the Nevermined COMPUTE and FEDERATED LEARNING Specifications

Data In Situ Computation



Federated learning & compute workflows



Data Marketplace

Facilitates the interaction with the data ecosystem

- Improved User Experience
- Data Governance
- Search and discovery
- Integration with the data sharing and compute to the data
- Data catalog
- Tokenization and incentives

More info in the Nevermined PROVENANCE and METADATA Specifications.

Metadata

Every asset (dataset, algorithm) in Nevermined has an associated:

- Decentralized Identifier (DID): A DID is a unique identifier that can be resolved or de-referenced to a standard resource describing the entity (a DID Document or DDO)

- DID document / DID Descriptor Object (DDO). If a DID is the index key in a key-value pair, then the DID Document is the value to which the index key points. The combination of a DID and its associated DID Document forms the root record for a decentralized identifier.

More info in the Nevermined METADATA and DID Specifications.

Other Notable features

- Provenance: Asset Data Provenance in Nevermined platform based on the W3C Provenance specification.
- Identity Management: Nevermined integration with existing identity management solutions like LDAP for more fine grained access control
- Non Fungible Tokens (NFT)
- Split Rewards

Demo:

Use Case

Use Case: Creditcard Fraud Detection

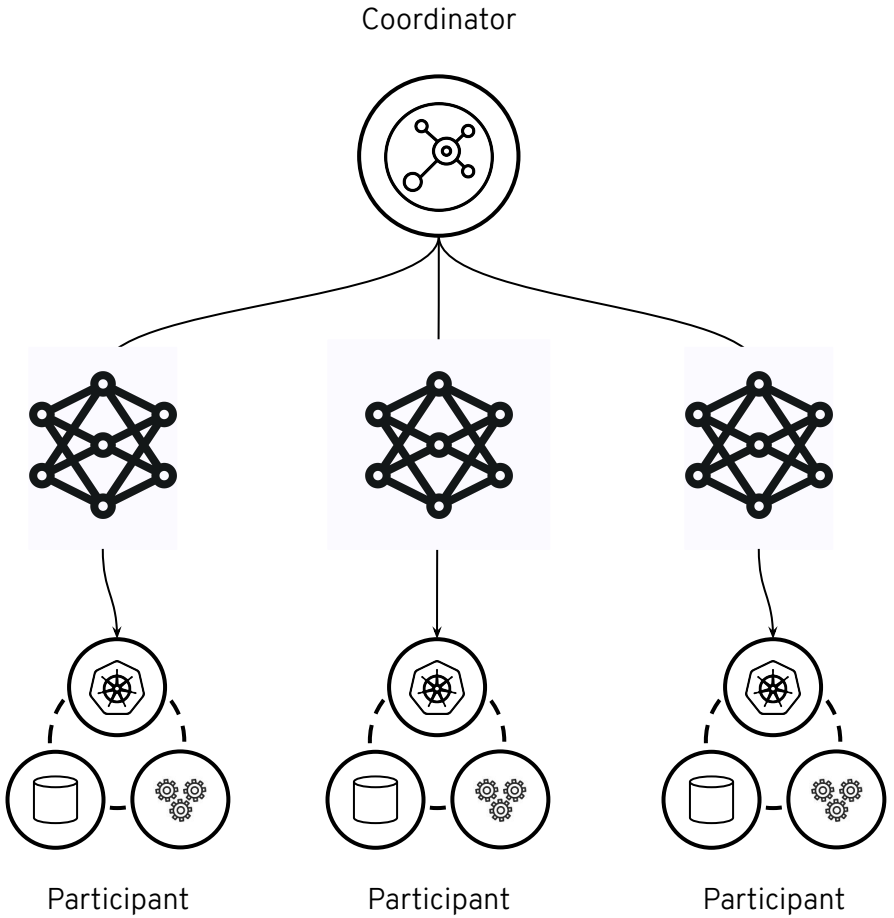
- Federated Learning - Using two different datasets describing multiple aspects of creditcard transactions train a model to detect fraudulent transactions.

- Data In-Situ Computation - Bring the model to the data so that the data can remain private.

- Demo Use Case:
  - 2 Data Providers publish their respective datasets
  - Data Scientist discovers assets and purchases access to them
  - Data Scientist publishes algorithm and make it discoverable to each data provider
  - Data providers download the algorithm, sets up the execution environment, and begins training
  - Trained models are then aggregated by the coordinator
  - Final trained model is published and consumable by the Data Scientist

Federated Learning

- Collaborative Machine Learning without centralized training data
- Federated Learning enables a set of participants to collaboratively learn a shared prediction model by bringing model training to the data. All the training data remains on premise
- Participants download the current model, improve it by learning from data on premise, and then summarize the changes as a small focused update. This is immediately averaged with other participant updates to improve the shared model.



Demo

Q & A

- Website: nevermined.io
- Github: nevermined-io
  - Nevermined SDK JS - JavaScript version of the Nevermined SDK to be integrated with front-end applications.
  - Nevermined SDK PY - Python version of the Nevermined SDK to be integrated with back-end applications. The primary users are data scientists.
  - Nevermined SDK JAVA - Java version of the Nevermined SDK to be integrated with JVM applications. The primary users are data engineers.
- Documentation: docs.nevermined.io
- Discord: https://discord.gg/GZju2qScKq