



DRX2: Privacy-by-design Digital Rights Exchange

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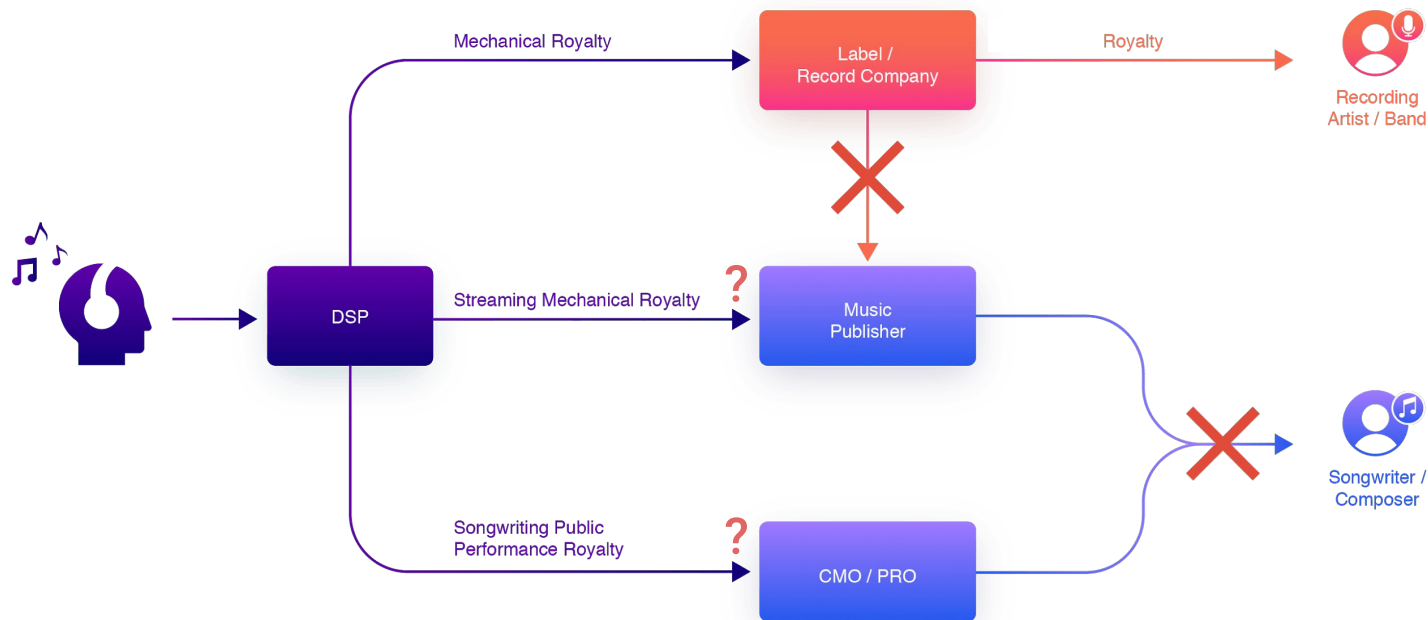
Copyright Delta

January 27, 2022

Outline

- **Major problem in music industry (also for Web3/NFTs)**
- **Experiment description**
- **Project results**
- **Feedback**
- **Business impact**

Problem: Did you know that streaming providers often don't know who owns or wrote a song?



■ Spotify, Youtube, iTunes, etc.

■ Sound Recording

■ Composition

This results in major pain points

Music Managers,
Artist & Authors



Did I get paid correctly?

Record Labels,
Music Publishers & Societies



Did I pay correctly?
If not I can lose IP in EU.

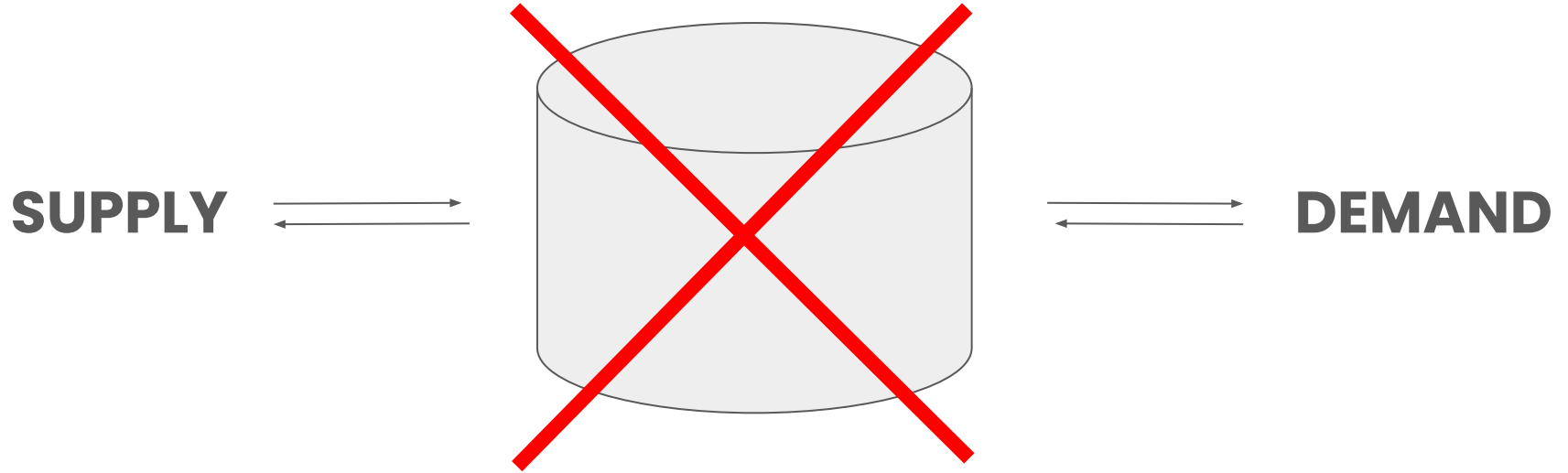
Digital Streaming Platforms,
NFT Platforms & Metaverses.



Who do I need to pay?

Need for all: how can I make more money?

A giant database in the middle hasn't worked since no multi-party trust or provenance.

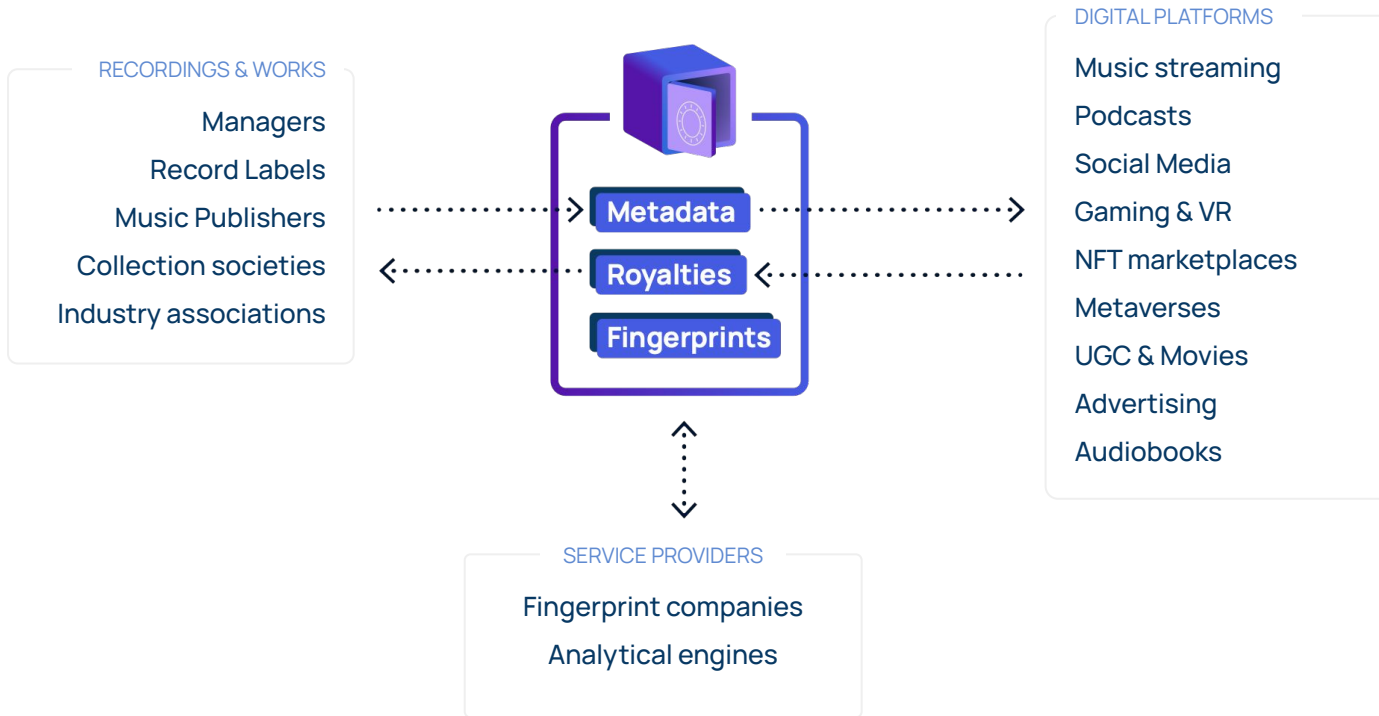


**Many believe that blockchains can help solve this.
But which one? Bitcoin? IBM? A banking consortium?**



Industry and EU want Data Sovereignty and GDPR

Built on banking blockchain technologies at the core, users store their data within royalty vaults.











This results in interlinked royalty vaults.

Rights owners decide what to share and with whom: "Controlled Visibility with Layers of Transparency".

Rights owners can also sign legal contracts (we have integrated the same PDF-technologies behind DocuSign).

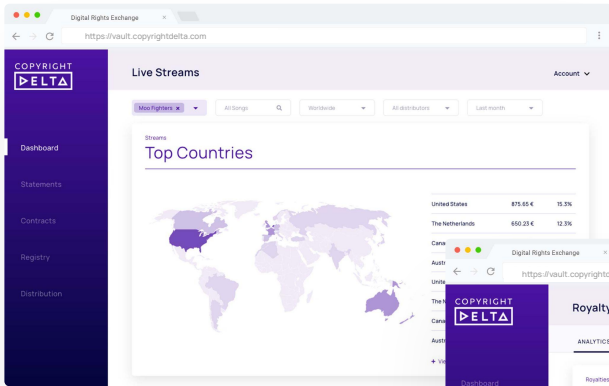


Applies to

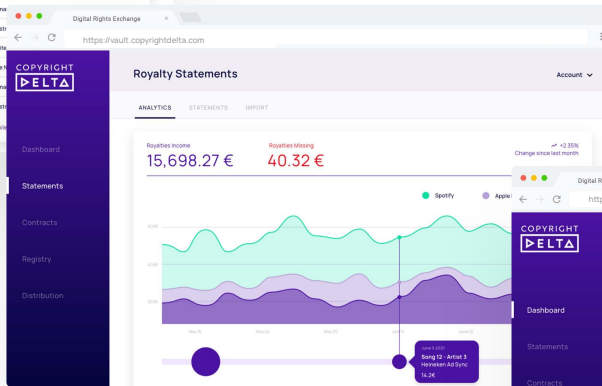
-  Music
-  NFTs
-  Gaming & VR
-  Metaverses
-  Social & UGC
-  Podcasts
-  TV & VOD
-  Advertising

But how to kickstart a data sovereign ecosystem? Design and build high-in-demand products (demo).

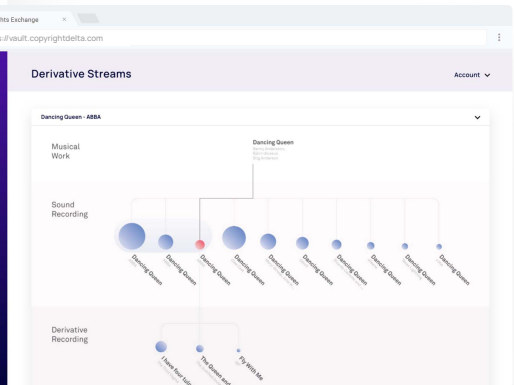
1. WHERE IS MY FAN?
HOW MUCH DID I
EARN PER COUNTRY?



2. DID I GET PAID CORRECTLY?
AUTOMATED AUDITS & ANALYSIS



3. HOW OFTEN WERE MY LYRICS STREAMED?
PUBLISHERS & AUTHORS HAVE NEVER BEFORE
RECEIVED INSTANT INSIGHTS & VERIFICATIONS



DRX summary

Background

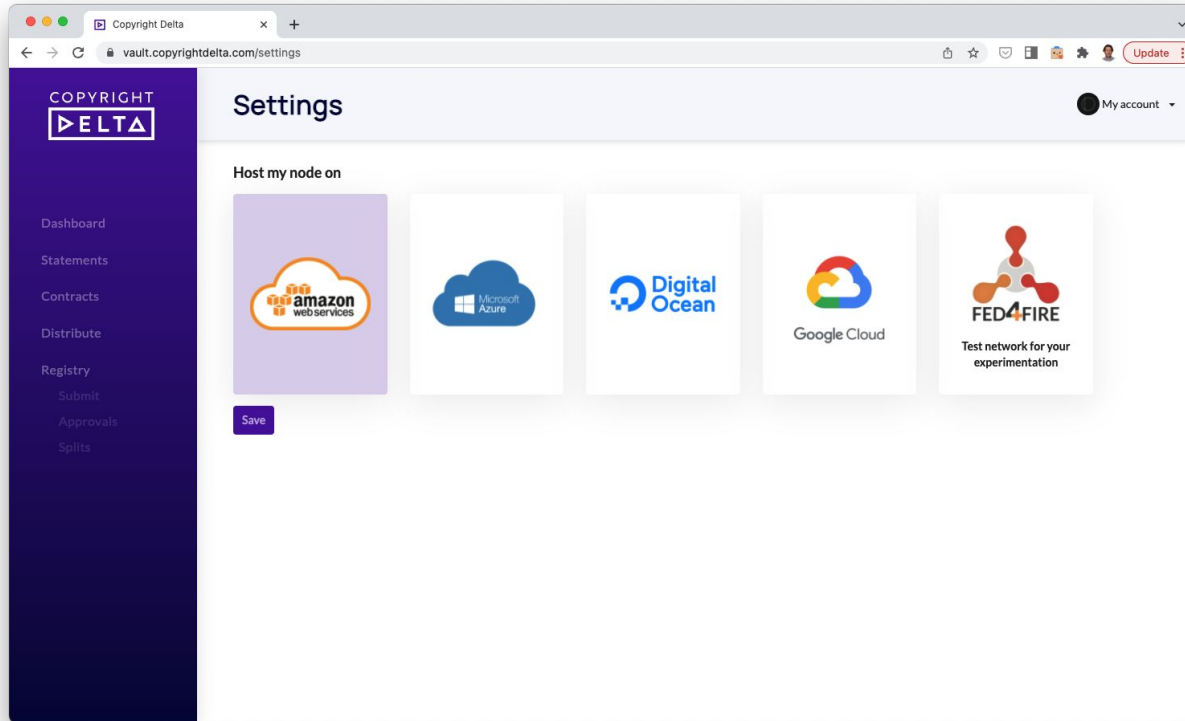
- We are building privacy-by-design services for the media value chain.
- Data interoperability, standards and data sovereignty are key.
- Our core technology is built using banking blockchain technologies. Must run in secure (decentralized) clouds

Motivation

- Music creators & rights owners have to wait up to 12 months before they get their royalties.
- These royalties often come without external verifications
- Creators and owners often don't know if they received every penny there are allowed to.

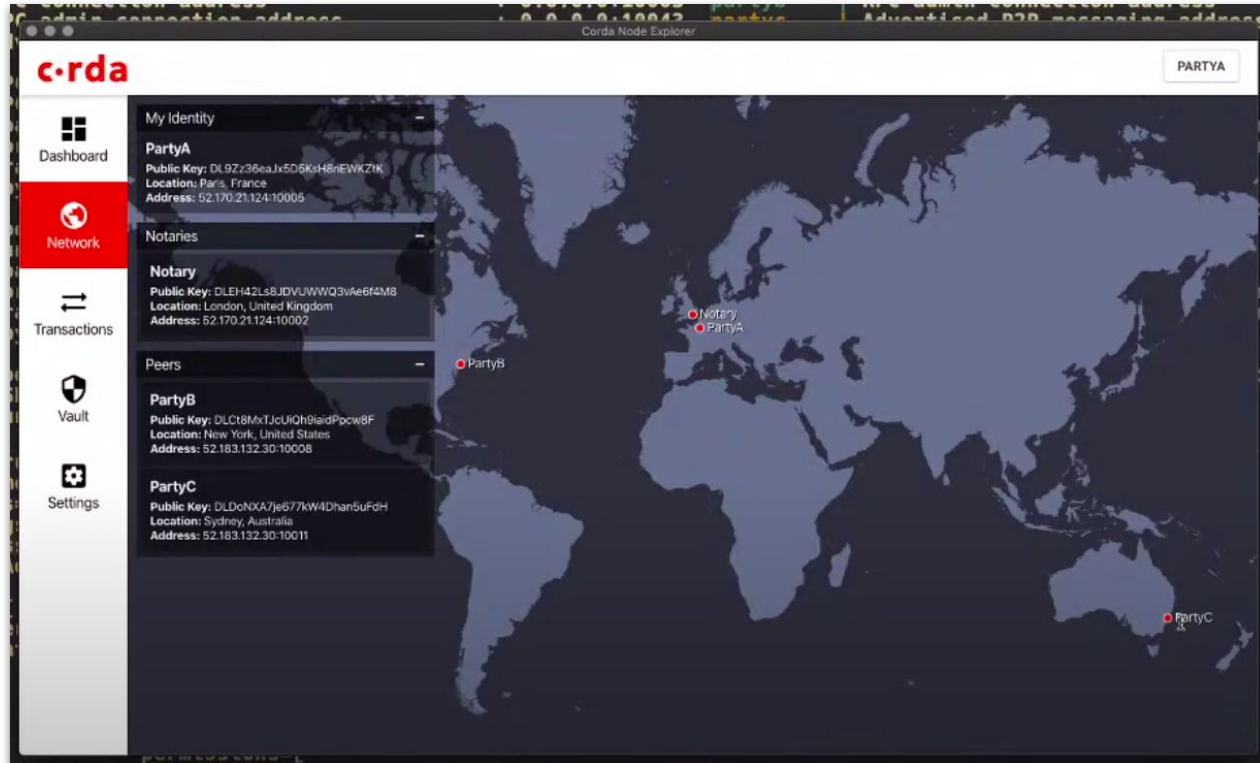
Goal: Data Sovereignty

Next we are building this easy UI-tool for rights owners to select where to host data (eg on which node and/or cloud).



Goal: Data Sovereignty

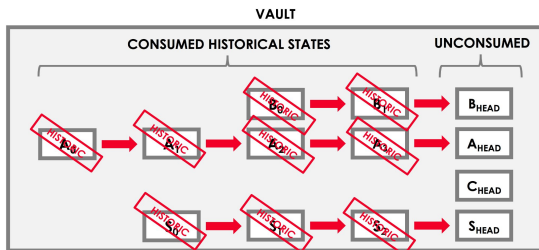
This Corda network map visual illustrates when users can easily decide where to host their data and nodes.



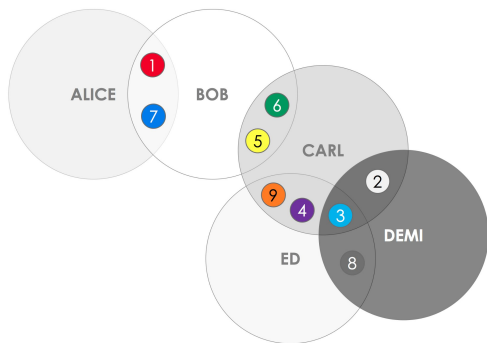
But how to get there? Under the hood:

During F4F we executed a series of technical experiments with regard to design & implementation aspects of data sovereignty

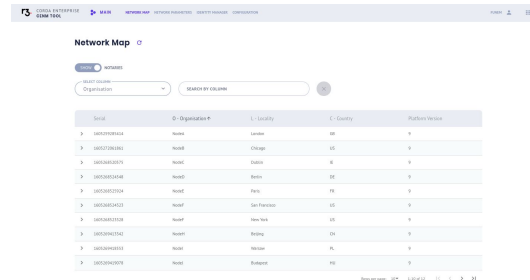
State & History Persistence



Data sovereignty

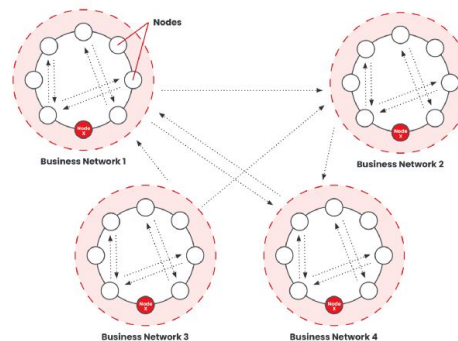


Node connectivity



The screenshot shows a 'Network Map' interface with a search bar and a table of nodes. The table has columns for ID, Organization, Location, Country, and Public Service.

ID	Organization	Location	Country	Public Service
1	ORGANIZATION	London	GB	1
2	ORGANIZATION	Chicago	US	2
3	ORGANIZATION	Paris	FR	3
4	ORGANIZATION	Paris	FR	4
5	ORGANIZATION	San Francisco	US	5
6	ORGANIZATION	New York	US	6
7	ORGANIZATION	Prague	CZ	7
8	ORGANIZATION	Madrid	ES	8
9	ORGANIZATION	Madrid	ES	9



Experiment description

Objectives

Main:

- Test designs for data sovereignty between Corda nodes and servers

Sub:

- Create and deploy experimental permissioned blockchain nodes and notary, all Corda, on F4F
- Experiment easy UI-tool on DRX
- Enable measurements under hood

Concept

Our end goal is data sovereignty for creators, managers, content owners (labels, publishers) etc who can:

- host their own data
- control their rights
- decide who can see data & rights
- decide who can access their data & rights

Experiment description

Experimental set-up

- A multi-node setup with nodes with Docker environments running 3 Corda instances, an instance running a Java/Springboot backend server and a React front-end over a local LAN (virtual wall)
- Flexible Corda node configuration
 - Adjusted on the fly from the node command line interface
 - Adjusted in configuration shell scripts (via github pull)

Project results (1)

Experimental results related to F4F

- Expand knowledge about F4F infrastructure
 - Grid5000
 - Kameleon / Puppet
 - Connectivity between F4F and other providers
- Practical experience, research and experimentation into:
 - Generic instance + node setup
 - Impact of OS versions
 - connection to github (private repositories, NR)
 - Connectivity between F4F and other providers
 - Accessing nodes from the internet

Project results (2)

Experimental results related to DRX

- Practical experience, research and experimentation into:
 - Generic instance + node setup
 - Installing new Corda Smart Contracts onto existing nodes
 - Transferring persistent data between Corda nodes
 - Moving entire Corda nodes between servers
 - Open source Corda versus enterprise
- Create and deploy permissioned blockchain nodes

Main conclusion from experiments:

- When deploying larger networks, especially across clouds, Corda open source doesn't suffice and enterprise is required.

Feedback



- Features to add:
 - Execute shell option in rspec / jfed experimenter toolkit for grid 5000 nodes would facilitate use of grid 5000 nodes in our configuration
 - OS images with Docker/Docker Compose pre-installed
 - Pre-configured Corda blockchain environment nodes
 - Some means of persistent storage between experimental runs (within the platform)

DevOps experiments roadmap



- Data Portability between Corda Nodes, and across Clouds
 - single cloud provider, single node (Phase 1 experiments)
 - single cloud provider, multiple nodes
 - multiple cloud providers, nodes + software managed by CD
 - multiple cloud providers, only software managed by CD
- Open source vs Enterprise Corda

Business impact



Impact on Copyright Delta

- F4F is great safe harbor for innovation startups: experiment within a secure flexible cloud environment.
- This reflects positive on our industry partners since F4F helps them to get into innovation thinking, new business & industry models, to explore pilot together.
- The result benefits the entire media value chain in the EU, like music & content creators with data sovereignty & income. And also web3 and NFTs, since they inherit the same copyright verification problems that the music industry right now has.

Business impact

Value perceived

- F4F allows for multilevel access to the computing infrastructure, eg:
 - Corda on Ubuntu
 - Hardware scaling
- F4F is cloud provider neutral.
- Open infrastructure allows for multi-level experimentation.
- Lucas and his colleagues at INRIA and GRID5000 always and instantly helped us when we needed help.
- It's great to work close with technical cloud experts.
- Great help in on-boarding of a new dev team member.

Our partners and sponsors (all in-kind)





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Thank you!

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