
RAIDAR

Rights & Asset Information in Decentralized, Authoritative Repositories

a joint project of
MIT &
Berklee College of Music

agenda

problems • Background

- Use cases

principles • Key design constraints & objectives

architecture • High-level functions & key APIs

roadmap • Scope of v1 & beyond

next steps

RAIDAR functional scope (v1):

- Record authoritative information about rights associated with music.
- Accept inquiries from the public.
- Return a comprehensive response to those inquiries; e.g., to allow interested parties to license use of the music.

- v1 limits
- Controlled compositions: all rights held equally by same person(s)
 - Do not contain derivative works; e.g., samples of other music
 - Do not involve 3rd party licenses; e.g., publishers, record labels

Data scope (v1):

asset	• Musical work, or
description	• Link(s) to authoritative source(s) containing the work
asset	Examples:
metadata	• Title
examples	• Date/time of creation
	• Creator identity, pseudonym(s)
right	Examples:
description	mechanical right, performance right
right	Examples:
metadata	• Right-holder(s) identity
	• Geographical scope of right

Design principles

- decentralized • Do not rely on a single source for any essential function; e.g., data attestation, authentication, identity.
 - Example: multiple methods may identify a recorded composition (ISRC, ISWC, HFA #, self-sovereign GUID)
- authoritative, comprehensive • Includes provenance, source expertise & reliability
 - Triangulate; include conflicting claims & resolution
 - 1 query to any repo yields comprehensive reply from data held by all repos
- future-tolerant • technology-agnostic: for each function (e.g., database, immutable ledger, interface, proof of identity), allow implementation with a variety of technologies equivalent in ability and performance
 - allow replacement or upgrade while maintaining compatibility with previous implementations.

Design principles

easy to use • Inexpensive

- Simple to integrate with other music tools; e.g., DAW, recording gig tracker apps

international • support multilingual data and user interfaces

- accommodate asset rights as defined in different regulatory/legal regimes.

open interface • publish all interface specifications

open source software • publish exemplary s/w for each side of every open interface (MIT license)

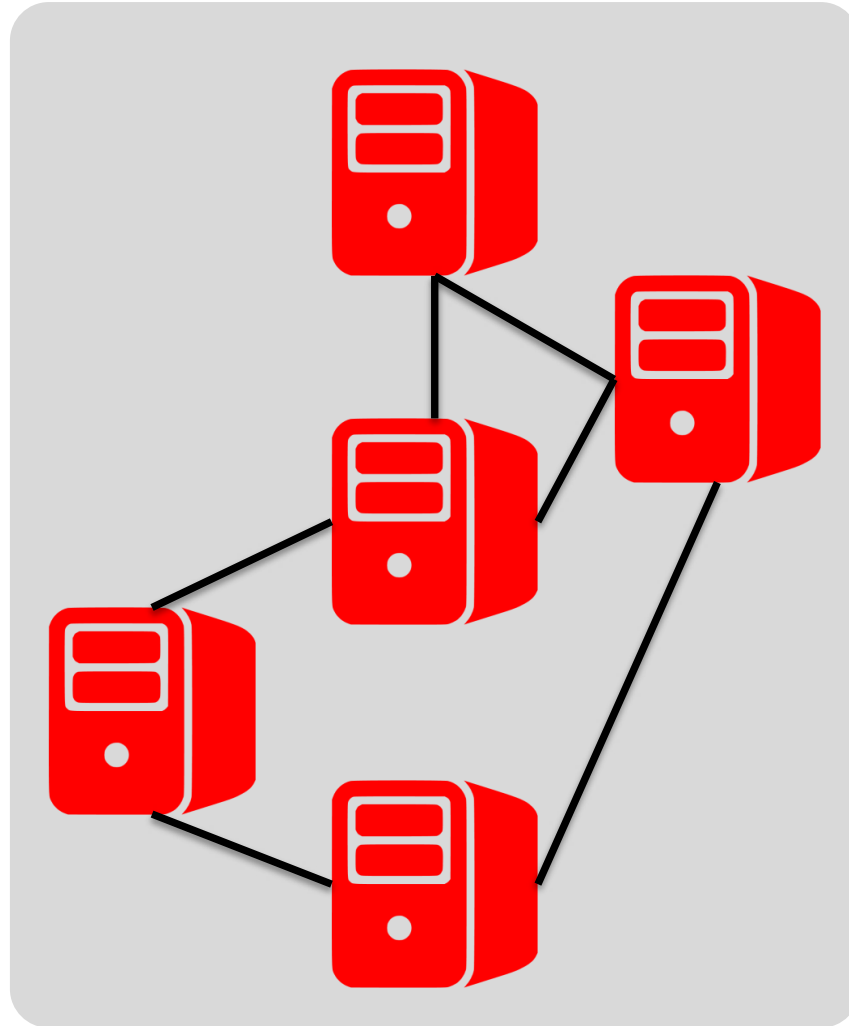
standards • use relevant, published standards which:

- meet functional requirements
- have license terms equivalent to MIT license

Performance

availability, repeatability • Similar to that of the internet, telephone network, and electric power grid in technically-advanced parts of the world.

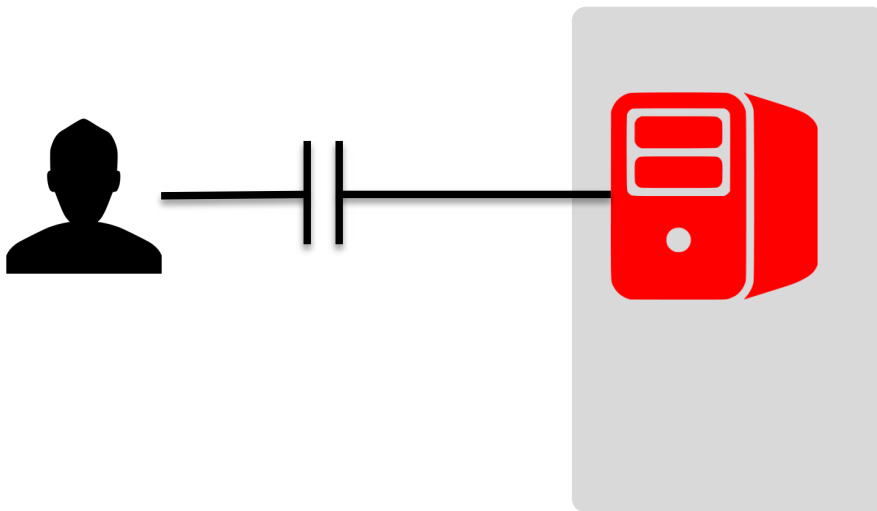
Architecture



Partial mesh of RAIDAR servers (“repo”)

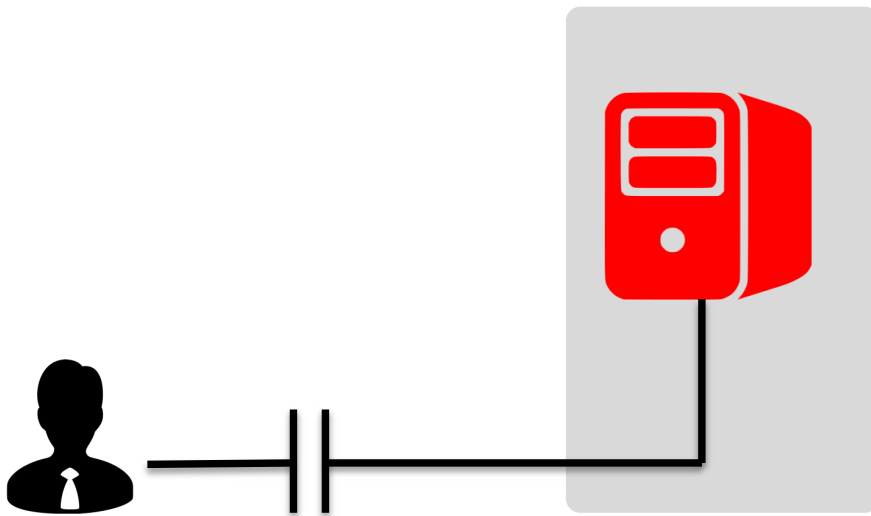
Architecture

User (client) app ↔ subscribed repo (server)
interface (RESTful).



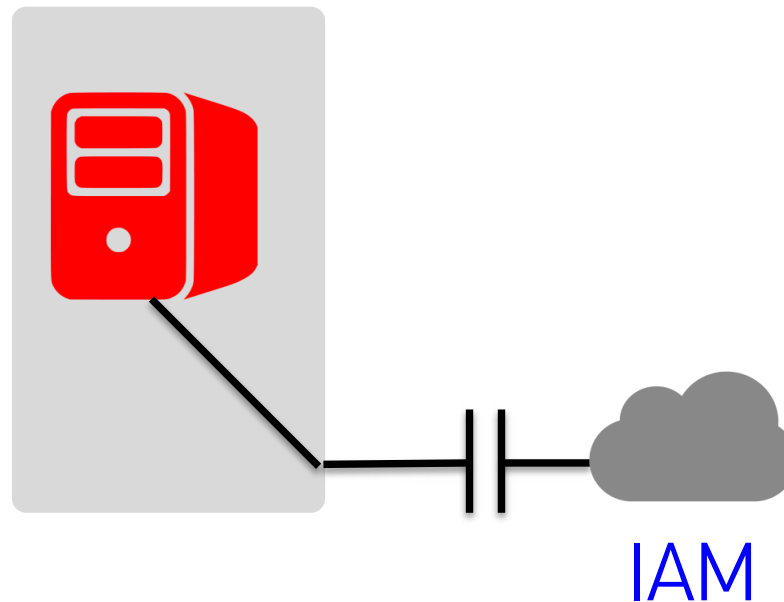
Architecture

Admin client app to manage subscriptions & authorizations.



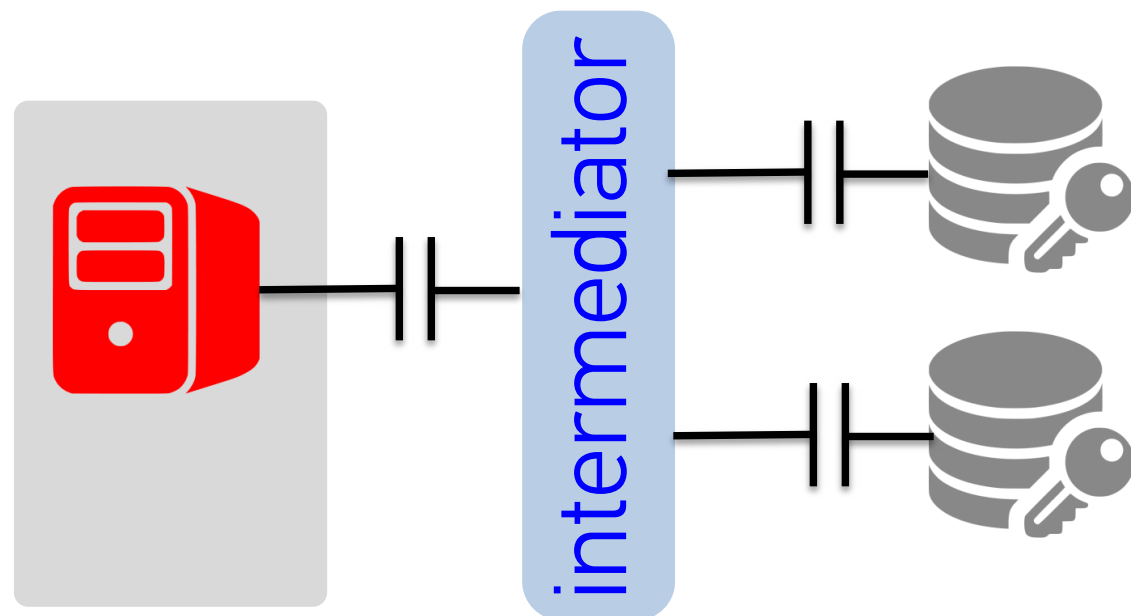
Architecture

Repo employs external identity & access management (IAM) service; e.g., OIDC.

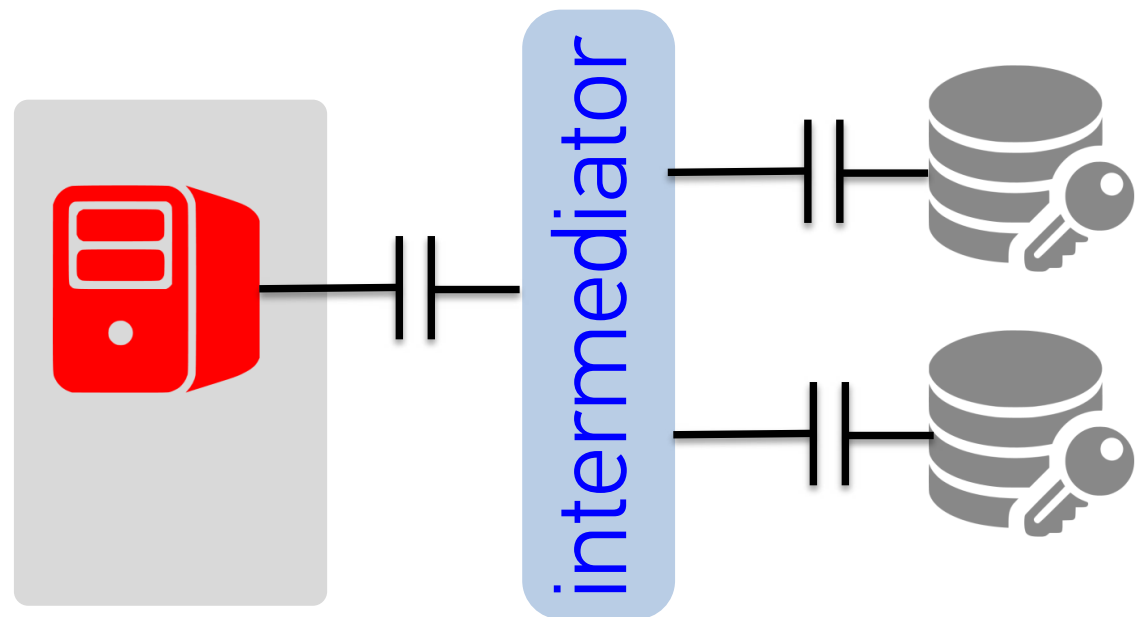


Architecture

Repo records data
signed by authorized sources
to redundant secure data storage service(s).

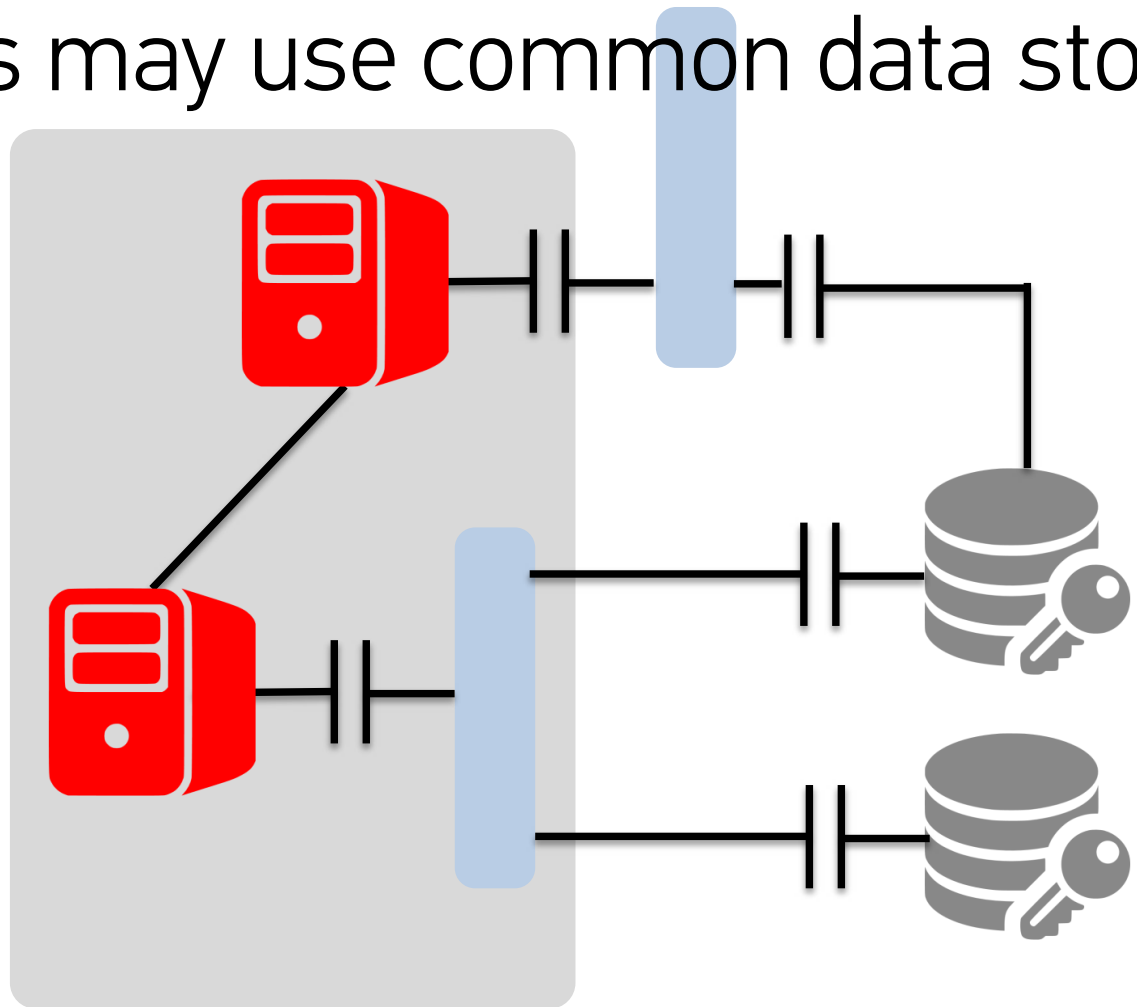


Intermediation presents uniform API to repo.

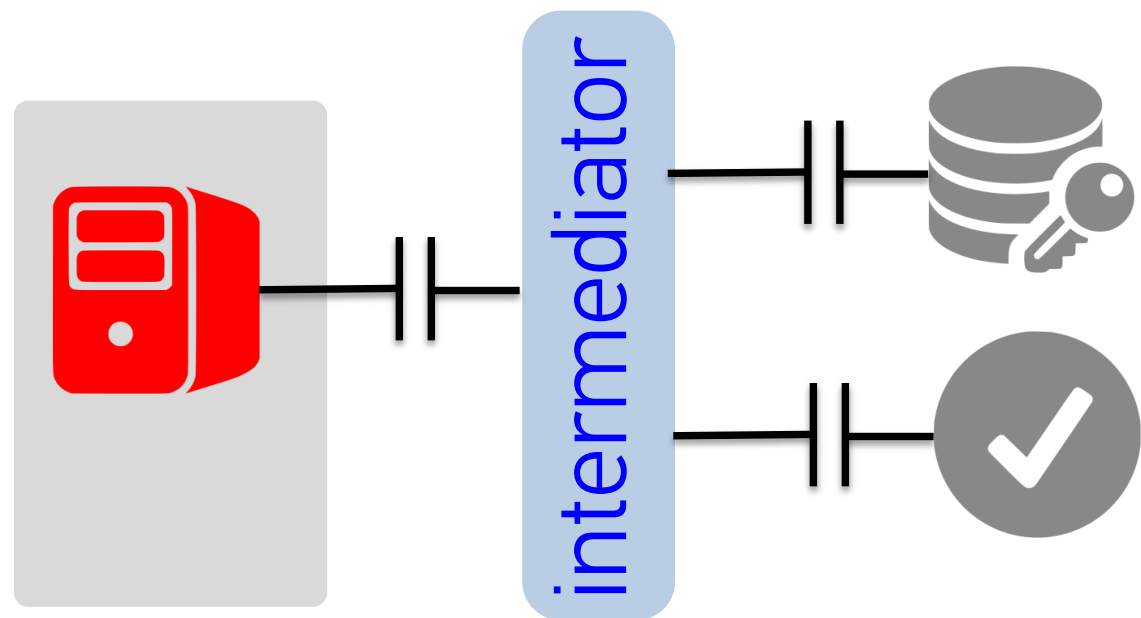


Architecture

Multiple repos may use common data stores.



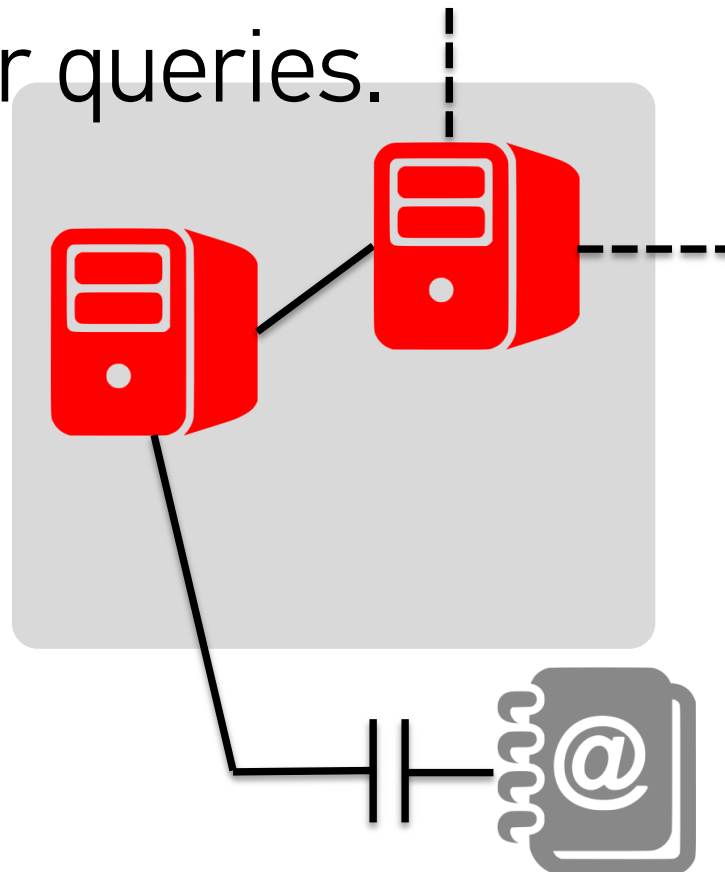
Intermediator delivers proof of correctness with retrieved data; e.g., ledger verification.



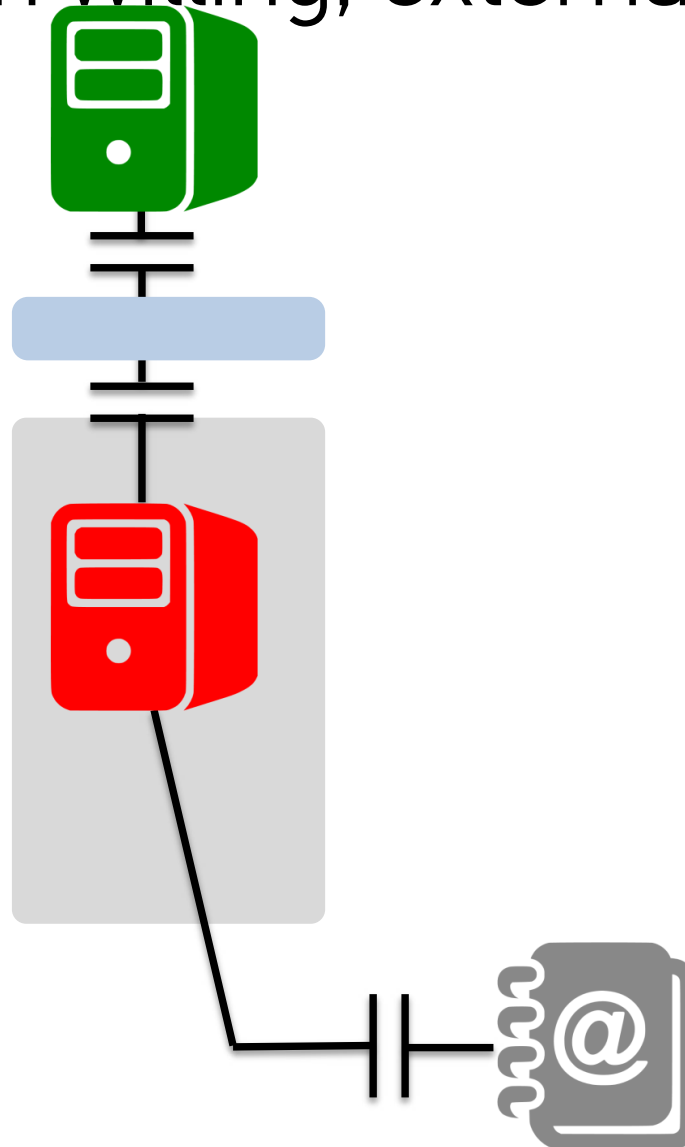
Architecture

No repo contains all data.

Look-up services (e.g., content addressing) & inter-hub queries support comprehensive replied to user queries.

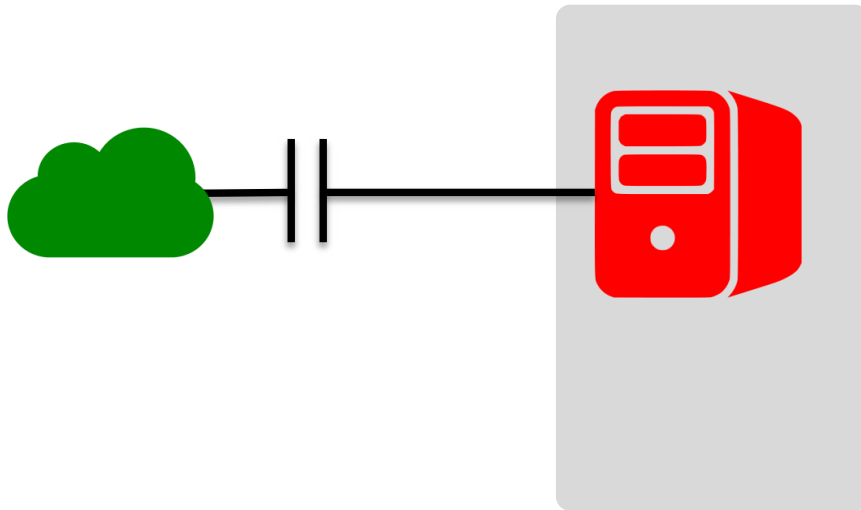


Interwork with willing, external data sources...

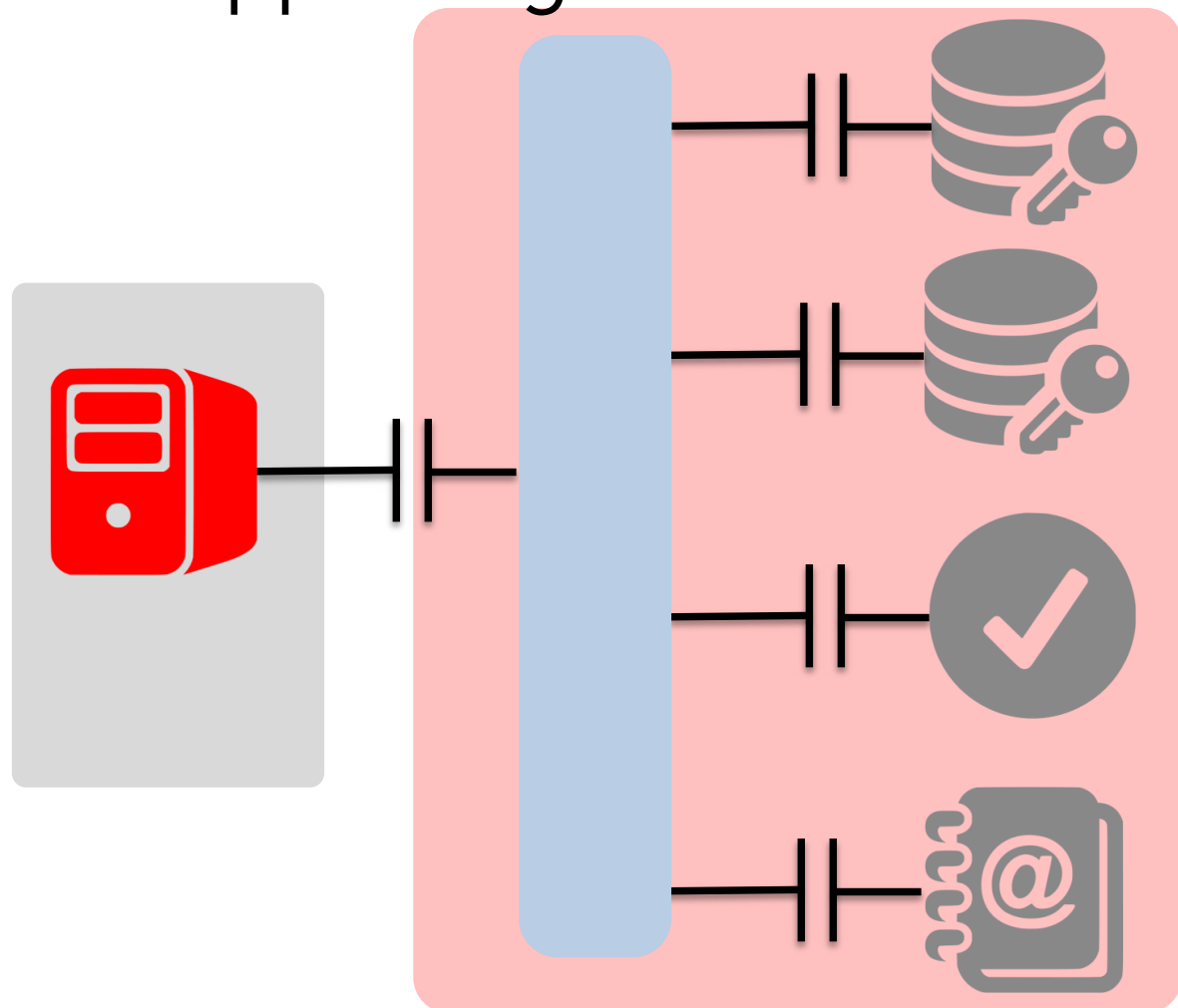


Architecture

... and with external query sources & uploaders via client API.



New open-source services (e.g., IPFS) may provide multiple supporting functions.



Key design task for each API shown above:

- definition of message flow & contents.



Road map to v1

- API design • data structures, messages employed by multiple APIs
- user-repo
 - intra-repo
 - generic data store service mediation
 - generic verification service mediation
 - generic lookup for non-local content
 - generic identity & access management service mediation
-
- generic interworking with other data sources & query sources

Road map to v1

implement • artist user app

- searcher (e.g., publisher, streaming service) app
- 3-4 repo instances: not fully connected, partially-overlapped data
- with simple DB, dummy ledger, dummy IAM
- add 1, then 2 compliant DB alternatives (SQL, noSQL, IPFS)
- add 1, then 2 compliant ledger services
- add 1, then 2 compliant IAM services
- bulk-loader app

load • subset of Berklee data (large, well-researched)
• full Riptide Music Group data set (50k works)

operate • open for use by Berklee students

Beyond v1

- | | |
|-------------|---|
| open usage | • Open to other users |
| increase | • Open to additional repo instances |
| number of | • Add interfaces to other data sources |
| repos | |
| expand data | • Uncontrolled compositions: different rights held by |
| scope | different person(s) |
| | • Derivative works |
| | • Licenses |
| | • Licenses by 3 rd parties |
| | • Royalty events |
| expand | |
| asset types | • Multi-media works |

You can help

- Architects/designers
- Software developers
- Open source alternatives to key functions to:
 - prove technical agnosticism
 - provide redundancy
- Funding