

Digital Object Architecture

RDA Plenary 17

Breakout 8

Data Fabric Interest Group

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What Problem is Digital Object Architecture (DOA) Intending to Solve?

The General Problem

- Enormous increases in computing and network capacities should make more data available for more purposes to enhance the common good
- This has happened in many areas, but sub-optimally
 - Overwhelming amounts of data
 - Many systems oriented to slow humans who will never catch up
 - Opacity makes the common good elusive – who has the data and what are they doing with it?
 - Fragility of complex systems lead to security problems

What Problem is Digital Object Architecture (DOA) Intending to Solve?

The Research Data Problem

- Ability to make data and methods directly available, instead of just the results, should lead to increased trust and re-use but
 - Fragmentation of systems, many domain and lab specific silos
 - Interoperability remains elusive
 - Reproducibility crisis
 - Funding issues
 - Who gets credit issues
 - More time spent on data than on science
- FAIR provides guidelines to address these issues
 - Publications – low hanging fruit
 - Lab work remains a FAIR challenge – must get to FAIR at data source, e.g., work flows
- Need to turn the challenge into an opportunity, change the problem of too much hard to use/find/understand data to the advantage of lots of accessible and understandable data

DOA Approach to the General and Research Data Problems

- Add a level of abstraction to current information management systems and methods to create a set of persistently identified and uniformly addressable digital objects
- For basic information management tasks every object can be treated the same, regardless of information content
 - Every object has a globally unique and actionable identifier
 - Every object is typed
 - Every object has tightly associated metadata
 - Every object has a queryable set of operations that can be requested of it
 - Every object can be addressed via a Digital Object Interface Protocol

DOA Approach to the General and Research Data Problems

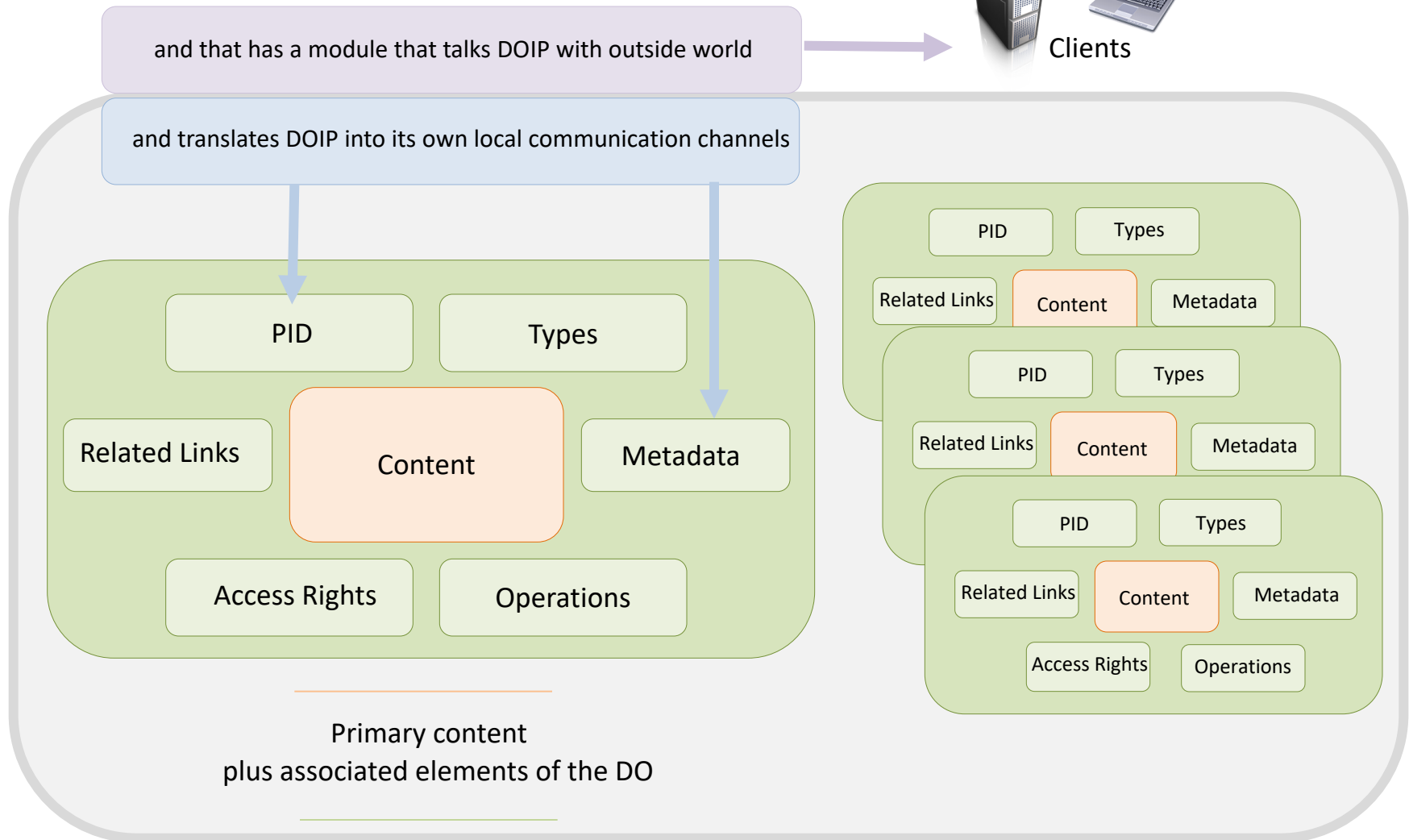
- Start with the minimal set of components and services that enable the DO model
 - Identifiers + Resolution System
 - Types + Type Registries
 - DO Repositories, aka Object Servers, including repositories of metadata, aka, Registries
 - Mapping/brokering software & services to map existing data storage and management systems to DOs
 - Digital Object Interface Protocol, implemented by DO Repositories
- Open the environment to as many use cases as possible to hone the core infrastructural pieces

DOA Approach to the General and Research Data Problems: Why is this a Good Idea?

The Digital Object Model Simplifies the Solution Space

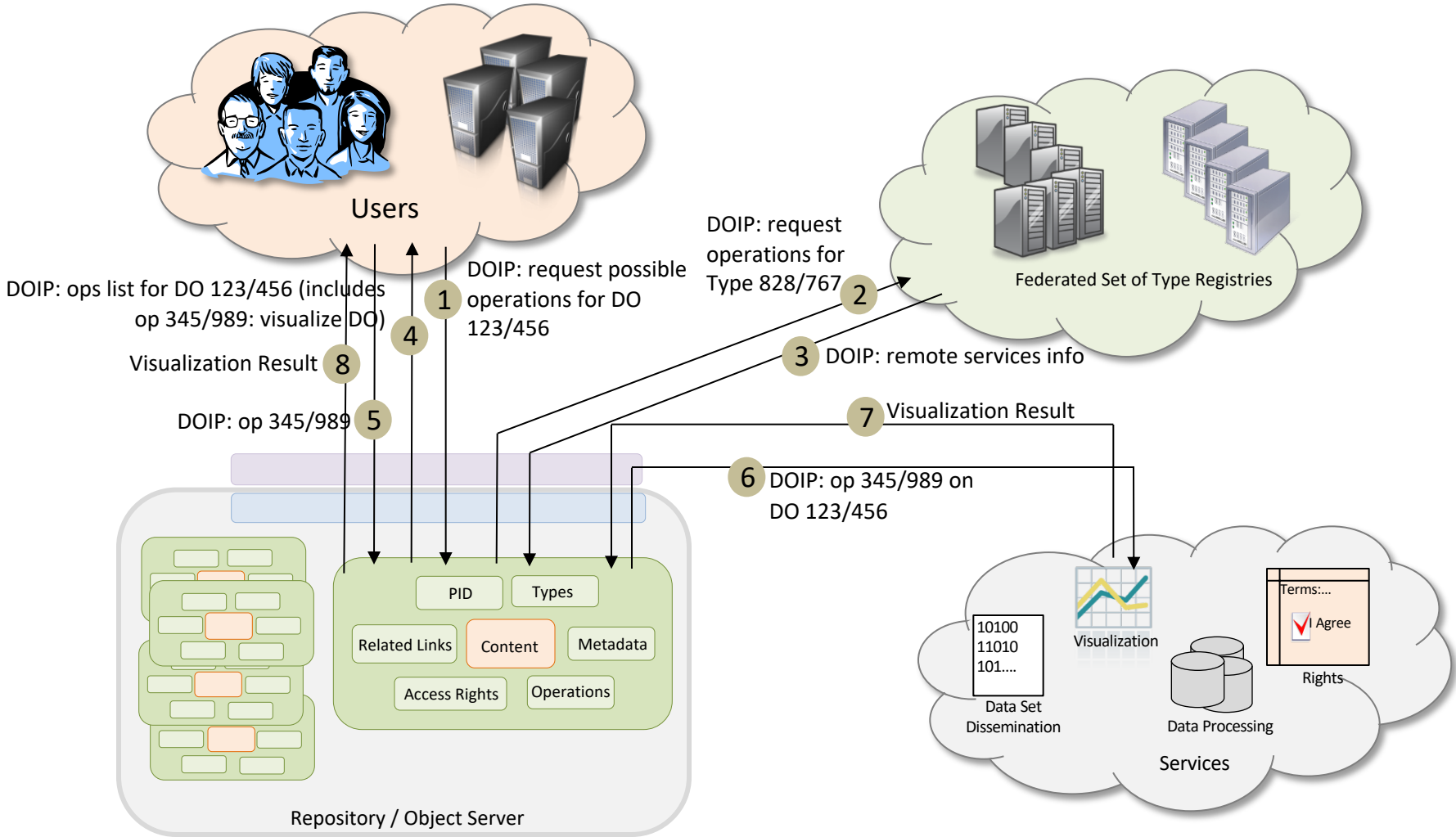
- Treat every information object the same until you have to differentiate among them to accomplish your purpose
- Push the current cacophony of information management and storage systems down a level of abstraction
- Objects are self-describing in that they carry their type and access control information independent of their current system location

Building a Digital Object



is accessed along with other DOs for which the Repository / Object Server is responsible

DOIP Operations Example



Sample Digital Specimen Object: A Cone Snail from the French National Natural History Museum in Paris

20.5000.1025/2030233
70070707075568

PID

OpenDigitalSpecimen

Type

Conus hughmorrisoni
size:20.4
Kavieng Lagoon, PapuaNew Guinea

Metadata



Local id: MNHN-IM-2013-53462

Op 123/456 (return
collection site)

Op 678/098 (return DNA)

Operations

Link to
Collection
Site



Link to DNA
Data



FAIR DO (FDO) Forum

- History
 - GO FAIR Group saw DOA as a promising implementation
 - Meeting in Paris Fall 2019 yielded Joint Statement on FAIR Digital Object Framework (FDOF)
- Quiescent during pandemic, recently rejuvenated
 - Goal is to coordinate efforts and encourage use
- Steering Comm. + Working Groups forming now
 - FDO Core Specification will be early output
- FAIRDO.org is being populated
- 1st International FAIR Digital Objects Conference in planning
 - Spring 2022
 - Somewhere in Europe

Dream Team?

