DLCM Integration Guide

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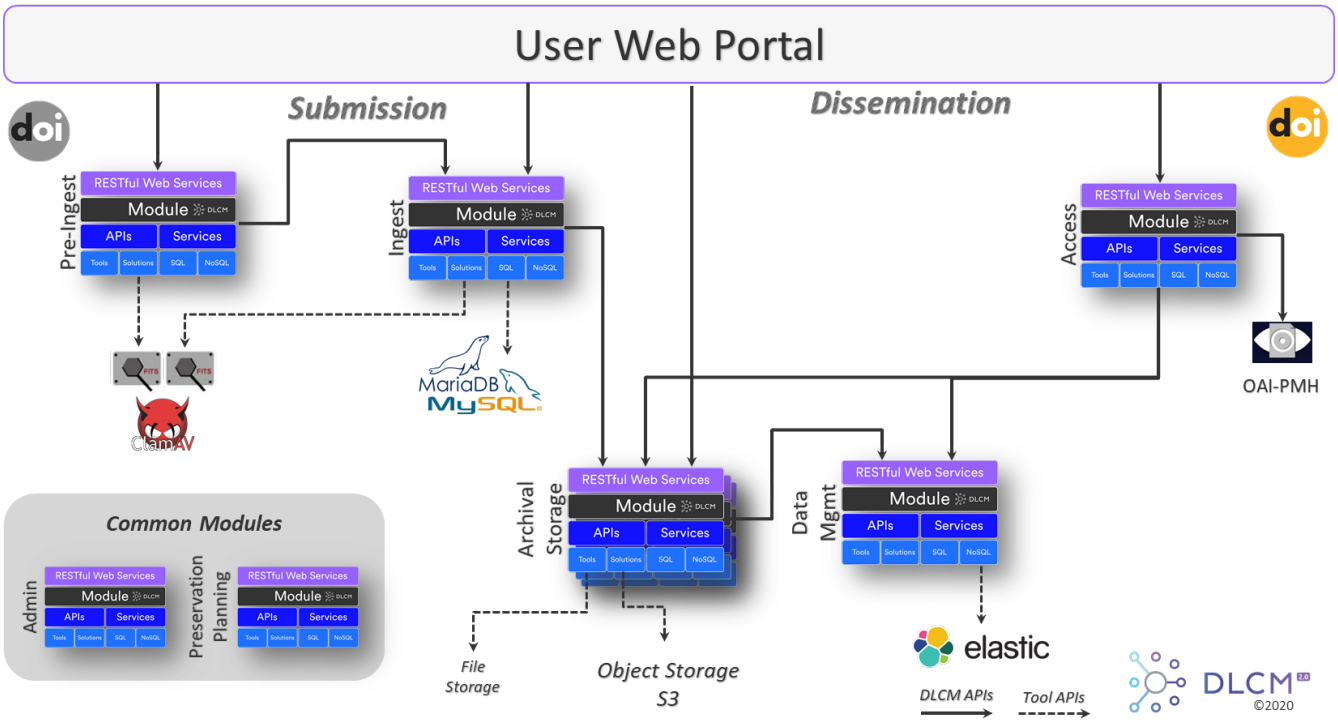
DLCM Solution **v3.1.9**, *2026-07-20*

The current documentation is available in HTML or PDF.

Chapter 1. DLCM Architecture

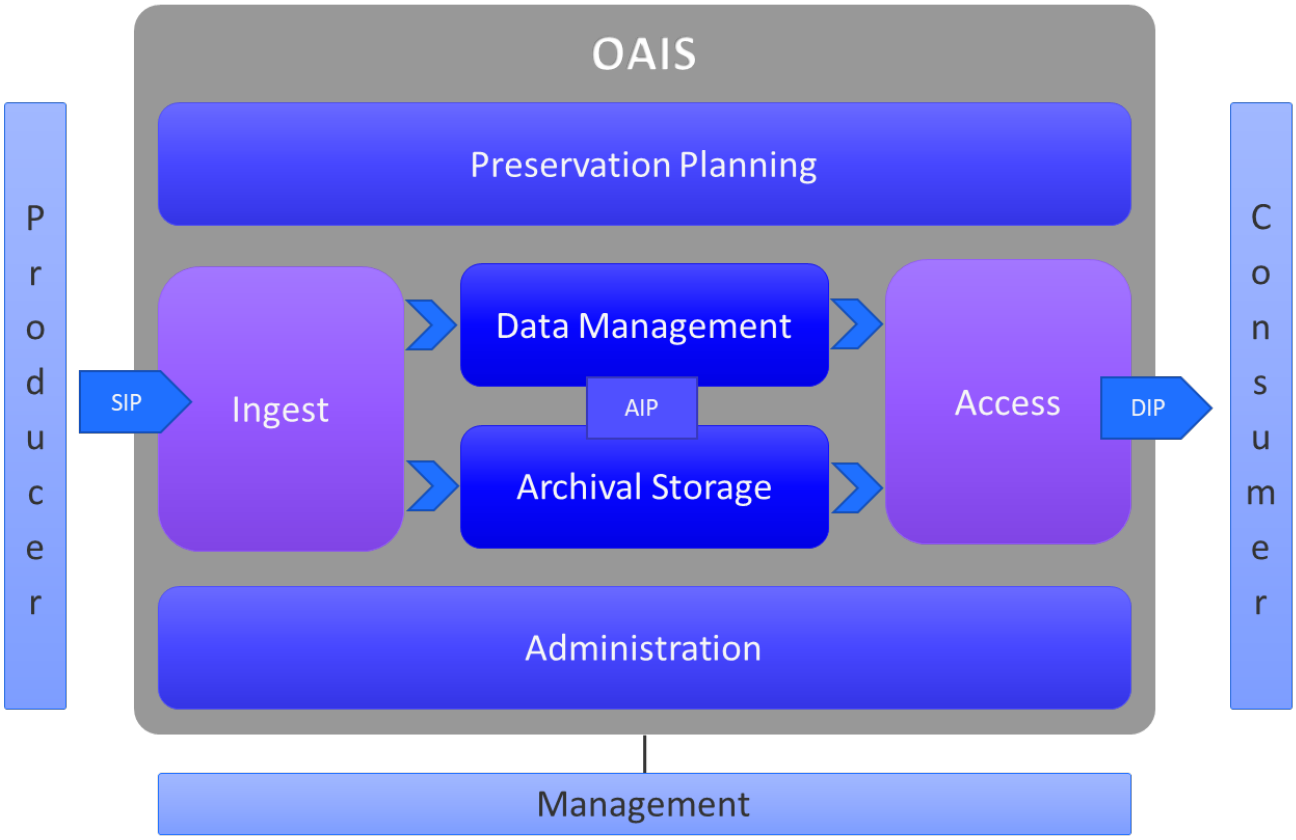
The DLCM solution design is compliant with the OAIS model and follows current best practices of preservation. The solution architecture is open, flexible and modular so as to be scalable, sustainable, and to facilitate its integration with other information systems. How such integrations can be performed constitutes the topic of this document.

1.1. DLCM Solution



1.2. OAIS Model

Open **A**rchival **I**nformation **S**ystem
ISO 14721



Chapter 2. Integration Points

2.1. For Submission

There are three ways to deposit data files into the DLCM system:

1. By submitting individual data files
2. By using a package containing one or several data files
3. Based on a SIP (Submission Information Package)

See the details in Submission Integration section.

2.2. For Dissemination

Once the data files have been submitted and archived, the research community can access them:

1. By getting directly an archive with its ID
2. By searching on archive metadata
3. By exporting the AIP (Archival Information Package) through a DIP (Dissemination Information Package)
4. By exporting metadata with OAI-PMH protocol

See the details in Dissemination Integration section.

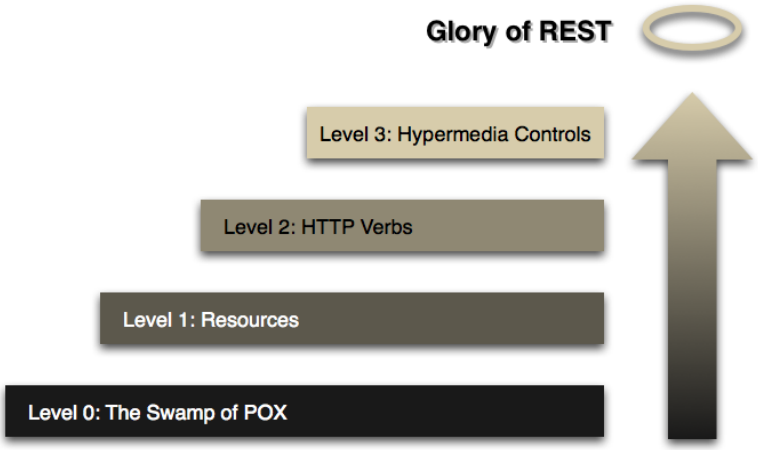
2.3. For Developers

- All web services are detailed in API Documentation.
- The API are available in OpenAPI format. See OpenAPI Tools. The definition is available in link:
  - DLCM OpenAPI Specification v3.0
  - DLCM OpenAPI Specification v3.1
- The DLCM tools is a batch tool. The documentation is available in DLCM Tools Documentation.

Chapter 3. REST Web Services

3.1. Overview

The DLCM APIs are RESTful web services based on the best practices. The implementation corresponds to the third level of Leonard Richardson's Maturity Model:

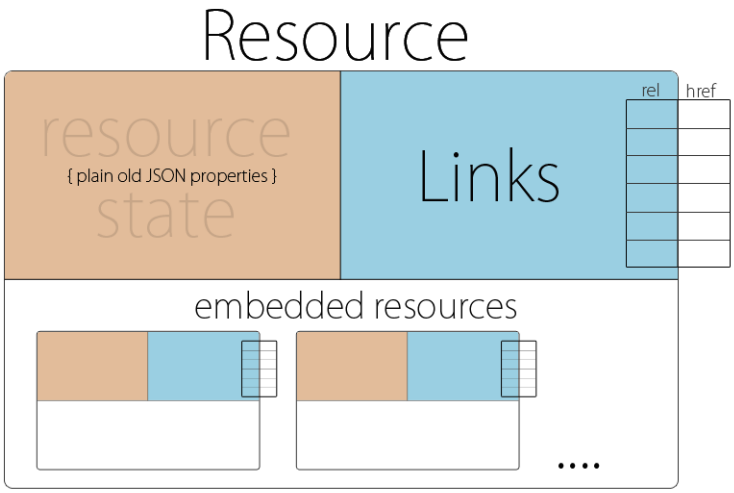


Source : (crummy.com, 2008)

More details about these concepts are available on the following links:

- https://spring.io/guides/tutorials/bookmarks/
- https://martinfowler.com/articles/richardsonMaturityModel.html

The data format of the web service is JSON,with HATEOAS & HAL support:



Source : (stateless.co, 2011)

3.1.1. URL Structure

The URL of each REST resource is constructed according to the following rule:

`http(s)://<root context>/<module>/<things>`

Where:

- `http(s)` is the protocol which can be secured depending on the installation configuration.
- `<root context>` is the root context of the application, defined in the configuration.
- `<module>` is the functional module (see DLCM Architecture): the different module names are detailed in the DLCM Modules section in the Annexes.
- `<things>` is the name of the REST resource: it must be a **noun in plural form**.

The naming convention, applied only for `<things>`, respects the camel case syntax, with a lower case character for the first one.

There are some examples of root contexts in the *demo* environment

3.1.2. CRUD Operations

By default, for each REST resource, the CRUD actions are available like this:

HTTP verb	CRUD action	Collection	Instance
`POST`	Create *Used to create a new resource*	□	□
`GET`	Read *Used to retrieve a resource or resource list*	□	□
`PATCH`	Update *No creation* *Used to update an existing resource, including partial updates*	□	□
`DELETE`	Delete *Used to delete an existing resource*	□	□

The HTTP verb for an action on a resource is `POST`:
`http(s)://<root context>/<module>/<things>/<thingID>/<action>`.

3.1.3. HTTP Status Codes

RESTful notes tries to adhere as closely as possible to standard HTTP and REST conventions in its use of HTTP status codes.

Status code	Usage
`200 OK`	The request completed successfully
`201 Created`	A new resource has been created successfully. The resource's URI is available from the response's `Location` header
`204 No Content`	An update to an existing resource has been applied successfully
`400 Bad Request`	The request was malformed. The response body will include an error providing further information

Status code	Usage
`401 Unauthorized`	Authentication is required to access to this resource
`403 Forbidden`	You are not allowed to access to this method for this resource
`404 Not Found`	The requested resource did not exist
`405 Method Not Allowed`	The requested method is not supported for this resource

https://en.wikipedia.org/wiki/List_of_HTTP_status_codes

3.1.4. Error Details

```
{
    "path": "http(s)://<root context>/<module>/<things>",
    "status": "BAD_REQUEST",
    "error": "Type of error",
    "message": "Message to explain the issue",
    "timeStamp": "DDD MMM YY hh:mm:ss CEST YYYY",
    "statusCode": 400
}
```

Contains the malformed request information, which describes the problem on the request:

- The ***path*** field is the url of the resource concerned by the problem.
- The ***status*** field is the status of the request (always 'BAD_REQUEST' in this case).
- The ***error*** field is the error that occurs on the request.
- The ***message*** field is the message that details the problem.
- The ***timeStamp*** field is the time at which the error occurred.
- The ***statusCode*** field is the status code of the request (always '400' in this case) .

In the case in which a body object is provided, the ***validationErrors*** field is also added to the fields above. The value of this field is an array that contains for each malformed field:

- The ***fieldName*** field that contains the name of the malformed field.
- The ***errorMessages*** field array that contains the list of errors in this field.

Example of a deposit submission with a malformed body = {}

```
{
    "path": "http(s)://<root context>/<module>/<things>",
    "status": "BAD_REQUEST",
    "error": "None",
    "message": "Validation failed",
    "timeStamp": "Fri May 17 11:39:15 CEST 2019",
    "validationErrors": [
        {
```

```
            "fieldName": "title",
            "errorMessages": [
                "can't be null"
            ]
        },
        {
            "fieldName": "description",
            "errorMessages": [
                "can't be null"
            ]
        },
        {
            "fieldName": "organizationalUnitId",
            "errorMessages": [
                "can't be null"
            ]
        }
    ],
    "statusCode": 400
}
```

Example of a malformed deposit submission with no body

```
{
    "path": "http(s)://<root context>/<module>/<things>",
    "status": "BAD_REQUEST",
    "error": "Required request body is missing: ...",
    "message": "Request not readable",
    "timeStamp": "Fri May 17 12:53:29 CEST 2019",
    "statusCode": 400
}
```

Example of a malformed deposit submission with a body = []

```
{
    "path": "http(s)://<root context>/<module>/<things>",
    "status": "BAD_REQUEST",
    "error": "JSON parse error: ...",
    "message": "Request not readable",
    "timeStamp": "Fri May 17 13:04:39 CEST 2019",
    "statusCode": 400
}
```

3.2. Collection

A collection of REST resources is a list of JSON objects. The list has its own structure, is paginated,

filterable and sortable.

The *collection* URL is:

`http(s)://<root context>/<module>/<things>`.

3.2.1. Structure

```
{
  "_data" : [
    { "object" : "#1" },
    { "object" : "#2" },
    { "object" : "#3" },
    { "object" : "#4" }
  ],
  "_page": {
    "currentPage" : 0,
    "sizePage" : 20,
    "totalPages" : 1,
    "totalItems" : 4
  },
  "_links" :  {
    "self" : {
      "href" : "URL of the collection"
    },
    "module" : {
      "href" : "URL of the DLCM module"
    }
  }
}
```

Data Section

The *Data* section contains an array of JSON representations, corresponding to business objects (i.e. *things*). The details of these objects can be found in the technical documentation (i.e. API Documentation) provided with the DLCM solution.

Page Section

The *Page* section contains the pagination information, which describes the current position:

- The ***currentPage*** field is the page number of the current page: it starts at 0.
- The ***sizePage*** field is the size of each page: the default is set to 20, the max value is 2000.
- The ***totalPages*** field is the total number of pages for the current page size.
- The ***totalItems*** field is the total number of objects for the current selection.

Links Section

The *Links* section contains the links corresponding to the current collection. This list is dynamic and depends on the state of the collection:

- The ***self*** link is the current URL: it is *always* present.
- The ***module*** link is the URL to access the current module.
- The ***next*** link is the URL to go to the next page, available only if it exists.
- The ***previous*** link is the URL to go to the previous page, available only if it exists.
- The ***lastCreated*** link is the URL to get the list sorted by creation date in descending order.
- The ***lastUpdated*** link is the URL to get the list sorted by last update date in descending order.
- Some other links could be available depending on the current resource: these links are detailed in the API documentation of the resource.

Example of institution list


```
{
  _data : [
    {
      resId :  "7f9df7bb-5eab-4823-98a0-abb668731de5",
      name : "UNIGE",
      description : "Université de Genève",
    },
    {
      resId : "18284eb1-de0b-427e-9e8c-c541cb35e818",
      name : "EPFL",
      description : "Ecole Polytechnique Fédérale de Lausanne",
    },
    {
      resId : "e8a9b74d-7b84-4958-be62-9b0b1d83a360",
      name : "ETH",
      description : "ETH Zürich",
    }
  ],
  _page : {
    currentPage : 0,
    sizePage : 20,
    totalPages: 1,
    totalItems: 4
  },
  _links: {
    self : {
      href : "http://localhost:16105/dlcm/admin/institutions"
    },
    module : {
      href :  "http://localhost:16105/dlcm/admin"
    },
```

```
    lastCreated : {
      href : "http://localhost:16105/dlcm/admin/institutions?sort=creation.when,desc"
    },
    lastUpdated : {
      href :
"http://localhost:16105/dlcm/admin/institutions?sort=lastUpdate.when,desc"
    }
  }
}
```

3.2.2. Usage

To get a list of things

The different parameters can be used individually or together.

Request	`http(s)://<root context>/<module>/<things>`	
Verb	GET	
Parameter(s)	***Name***	***Description***
	`size=<page size>`	The page size
	`page=<page number>`	The current page number
	`<field name>=<field value>`	To apply a filter on a field if the field is embedded in a sub structure, the field name must be fully named with "." for each level:+ `<sub structure name>.<field name>`
	`sort=<field name>[,desc]`	To sort a field By default, the sort is ascending. desc option permits to have descending order.
Expected Return Code	`200`	*Success*
Return Object	JSON Collection object	See Structure

Examples

1. To filter by creation date:
   `http(s)://<root context>/<module>/<things>?sort=creation.when`
2. To sort by most recent objects:
   `http(s)://<root context>/<module>/<things>?sort=creation.when,desc`
3. To get page 10 composed of 5 elements:
   `http(s)://<root context>/<module>/<things>?page=10&size=5`

3.3. Instance

The instance of REST resource is the instance of an object with its fields.

The instance URL is:

`http(s)://<root context>/<module>/<things>/<thingID>`.

3.3.1. Structure

```
{
  "creation" : {
    "when" : "Creation date & time",
    "who" : "Creation user"
  },
  "lastUpdate" : {
    "when" : "Last update date & time",
    "who" : "Last update user"
  },
  "resId" : "Object ID",
  "fields" : "Object fields...",
  "_links" : {
    "self" : {
      "href" : "URL of the object"
    },
    "list" : {
      "href" : "URL of the object collection"
    },
    "module" : {
      "href" : "URL of the DLCM module"
    },
    "Other link" : {
      "href" :  "Others links of the object"
    }
  }
}
```

The field list elements are:

- The ***creation*** and ***lastUpdate*** fields, containing the information of the action:
  - The ***when*** field is the date and the time, with milliseconds of the action (ex : 2018-03-08T17:42:30.733+0100).
  - The ***who*** field is the user id of the user who has done the action.
- The ***resId*** field is the identifier of the object: it is a UUID.
- Some other fields complete the object description: these fields are detailed in the technical documentation of the resource.

Links Section

The *links* section contains a list of links of the object:

- The ***self*** link is the URL of the current object.

- The ***list*** link is the URL pointing to the object collection.
- The ***module*** link is the URL to access the current module.
- Some other links could be available depending on the object: these links are detailed in the technical documentation of the resource.

Example of an institution


```
{
  "creation" : {
    "when" : "2018-03-08T17:42:30.733+0100",
    "who" : "user id of user xxxxxx"
  },
  "lastUpdate" : {
    "when" : "2018-03-08T17:42:30.733+0100",
    "who" : "user id of user yyyyyyy"
  },
  "resId" : "7f9df7bb-5eab-4823-98a0-abb668731de5",
  "name" : "UNIGE",
  "description" : "Université de Genève",
  "_links" : {
    "self" : {
      "href" : "http://localhost:16105/dlcm/admin/institutions/7f9df7bb-5eab-4823-
98a0-abb668731de5"
    },
    "list" : {
      "href" : "http://localhost:16105/dlcm/admin/institutions"
    },
    "module" : {
      "href" : "http://localhost:16105/dlcm/admin"
    },
    "people" : {
      "href" : "http://localhost:16105/dlcm/admin/institutions/7f9df7bb-5eab-4823-
98a0-abb668731de5/people"
    },
    "organizationalUnit" : {
      "href" : "http://localhost:16105/dlcm/admin/institutions/7f9df7bb-5eab-4823-
98a0-abb668731de5/organizationelUnits"
    }
  }
}
```


3.3.2. Usage

To get a resource

Request	`http(s)://<root context>/<module>/<things>/<thingID>`
Verb	GET

Parameter(s)	***Name***	***Description***
	`None`	-
Expected Return Code	`200`	Success
	`404`	Not found
Return Object	JSON object	See Structure

To create a new resource

Request	`http(s)://<root context>/<module>/<things>`	
Verb	POST	
Parameter(s)	***Name***	***Description***
	`JSON Object with fields to set`	Object in JSON format. The fields and the structure depend on the type: see API Documentation
Expected Return Code	`201`	Created
Return Object	`JSON Object`	See Structure

To update a resource

The resource must already exist.

Request	`http(s)://<root context>/<module>/<things>/<thingID>`	
Verb	PATCH	
Parameter(s)	***Name***	***Description***
	`JSON Object with field to update`	Object in JSON format. The fields and the structure depend on its type: see API Documentation
Expected Return Code	`200`	Modified
	`304`	Not modified
	`404`	Not found
Return Object	`JSON Object with updated fields`	See Structure

To delete a resource

Request	`http(s)://<root context>/<module>/<things>/<thingID>`	
Verb	DELETE	
Parameter(s)	***Name***	***Description***
	`None`	-

Expected Return Code	`200`	Deleted
	`404`	Not found
	`410`	Gone
Return Object	`String: "OK"`	If success

3.4. Security

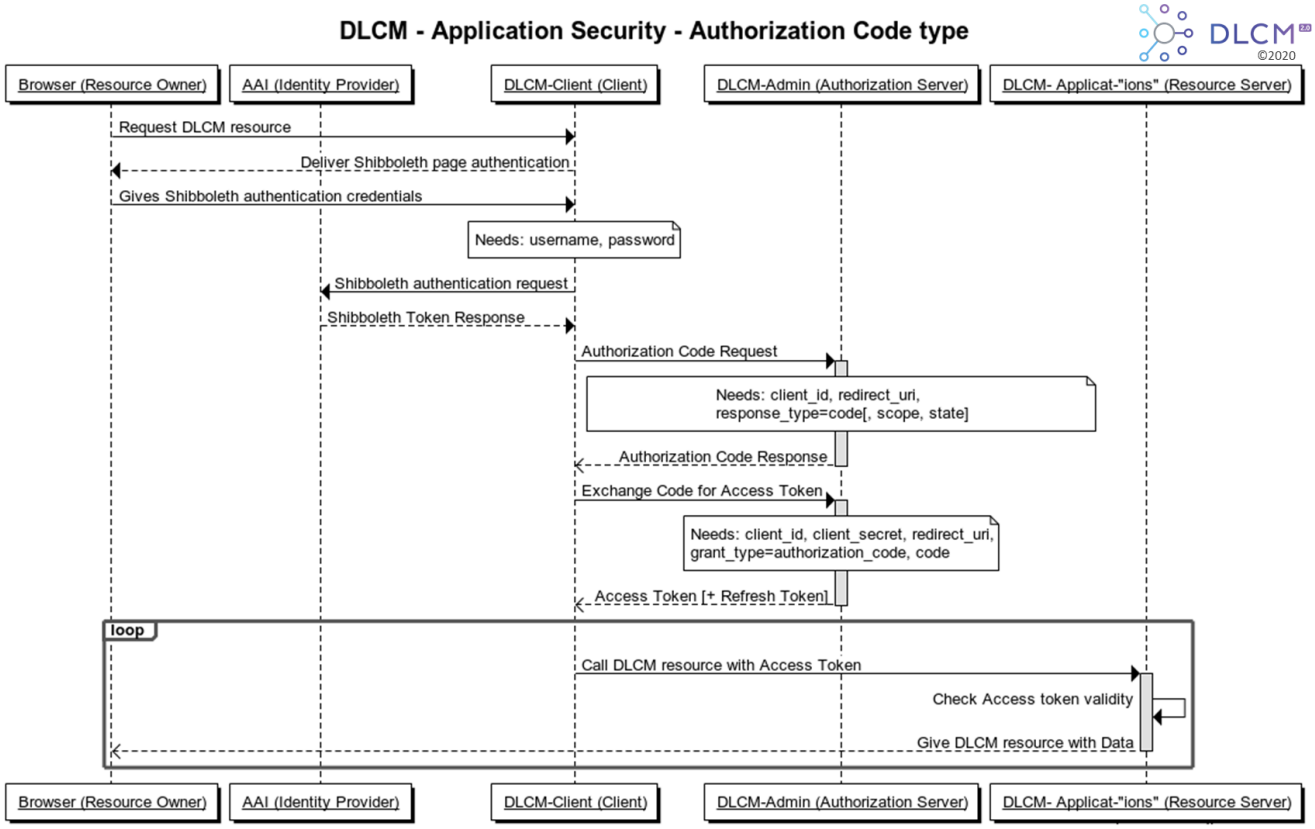
3.4.1. Authentication

All web services are secured and require authentication.

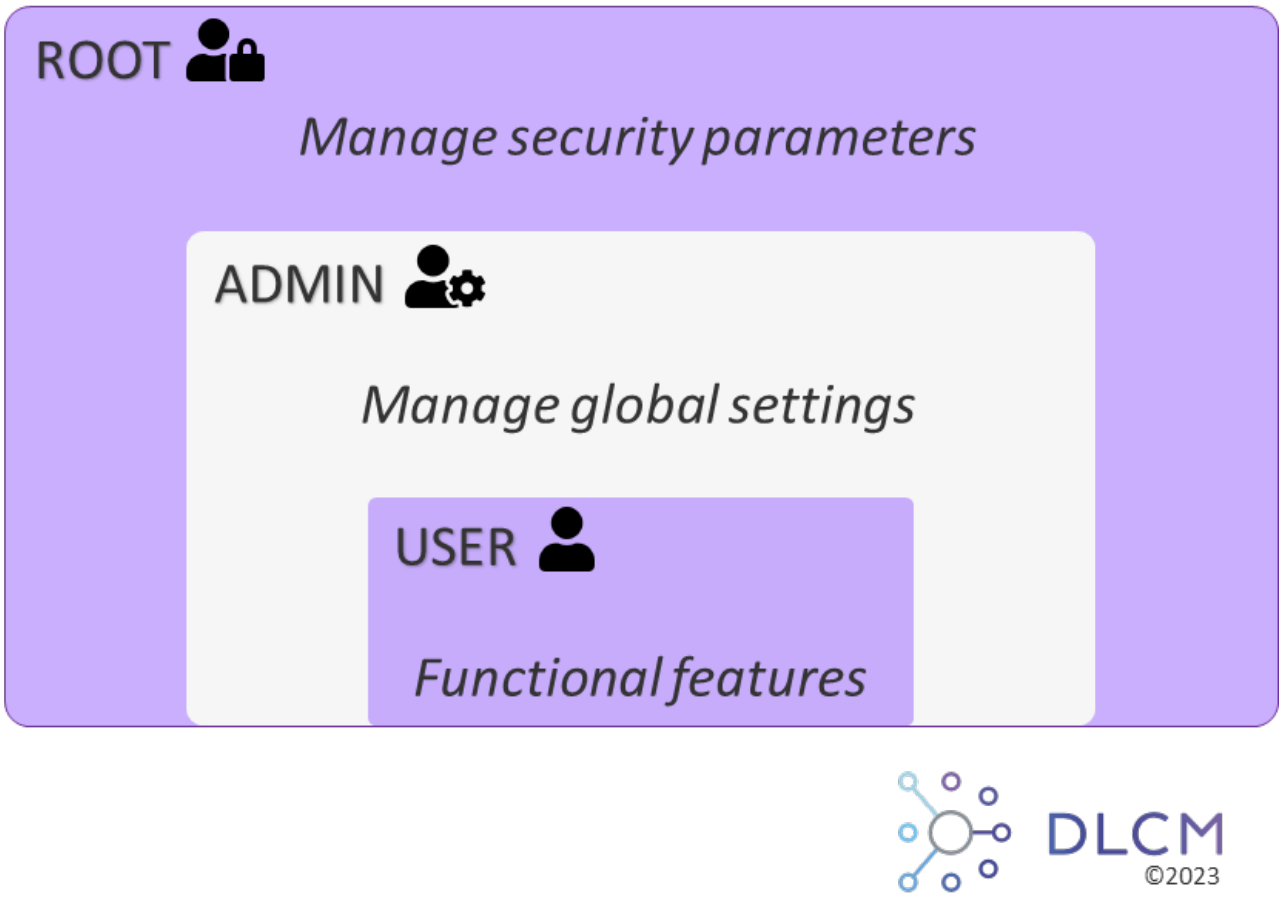
User authentication relies on Switch AAI which is a Single Sign-On (SSO), based on Shibboleth.

Access to Web services relies on OAuth 2.0 access delegation.

OAuth 2.0 is a protocol allowing third-party applications to grant limited access to an HTTP service, either on behalf of a resource or by allowing the third-party application to obtain access on its own. It uses the authorization code grant implementation.



3.4.2. Application Roles

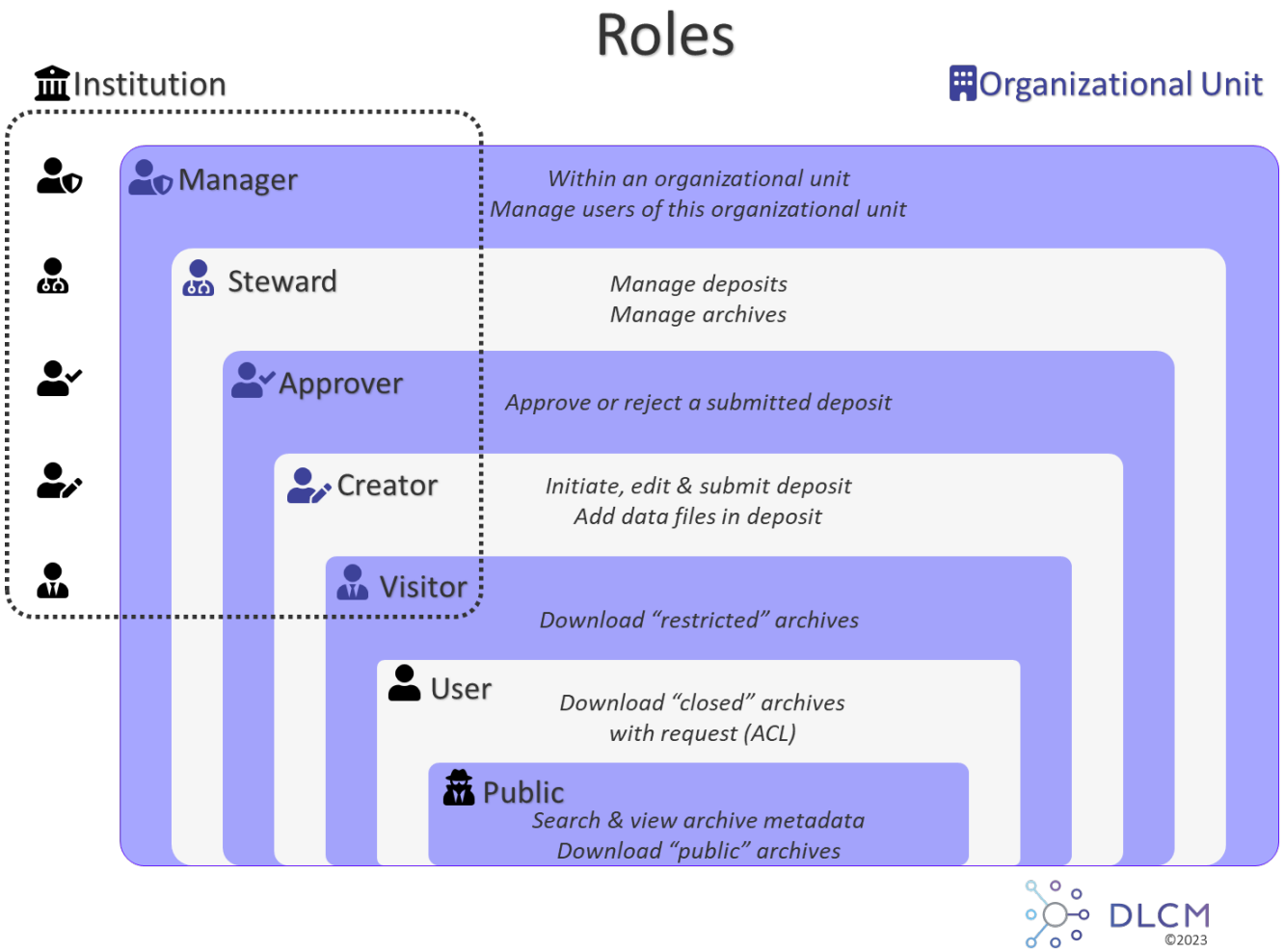


The features are organized in:

- Functional features list for an user
  - Organizational Units, Deposits, Search, etc…
- Global settings list for an administrator
  - Organizational units, People, Institutions, Funding agencies, Submission policies, Preservation policies, Licenses, etc…
- Security parameters list for a root
  - System Configuration, User Roles, Users, etc…

See details in Application Roles.

3.4.3. Roles



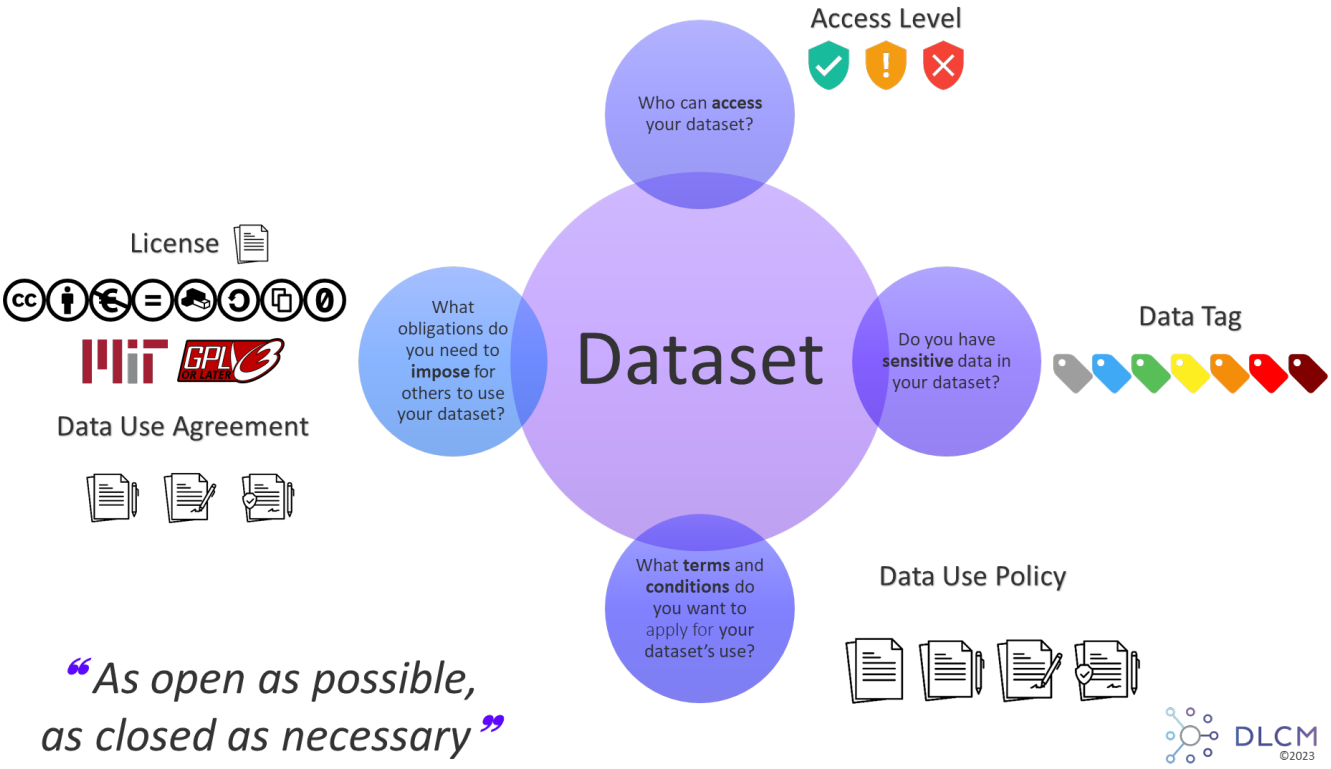
A role can be inherited from an institution if an organizational unit is linked to this institution. For example, if an manager of an institution or an administrator gives the `steward` role to an user, this user will became the steward of all organizational units of this institution.

See details in Roles.

Organizational Unit Definition

- An organizational unit is a logical entity where managers can define security rules:
  - Who can submit deposits?
  - Who can download archives?
- Could be a research project, a laboratory, a department or any other organizational group of researchers.

Chapter 4. Data Access



When data must be archived, at the ingestion, some questions must be answered:

① Who can access the archive? ⇒ Define the correct level of Access Levels

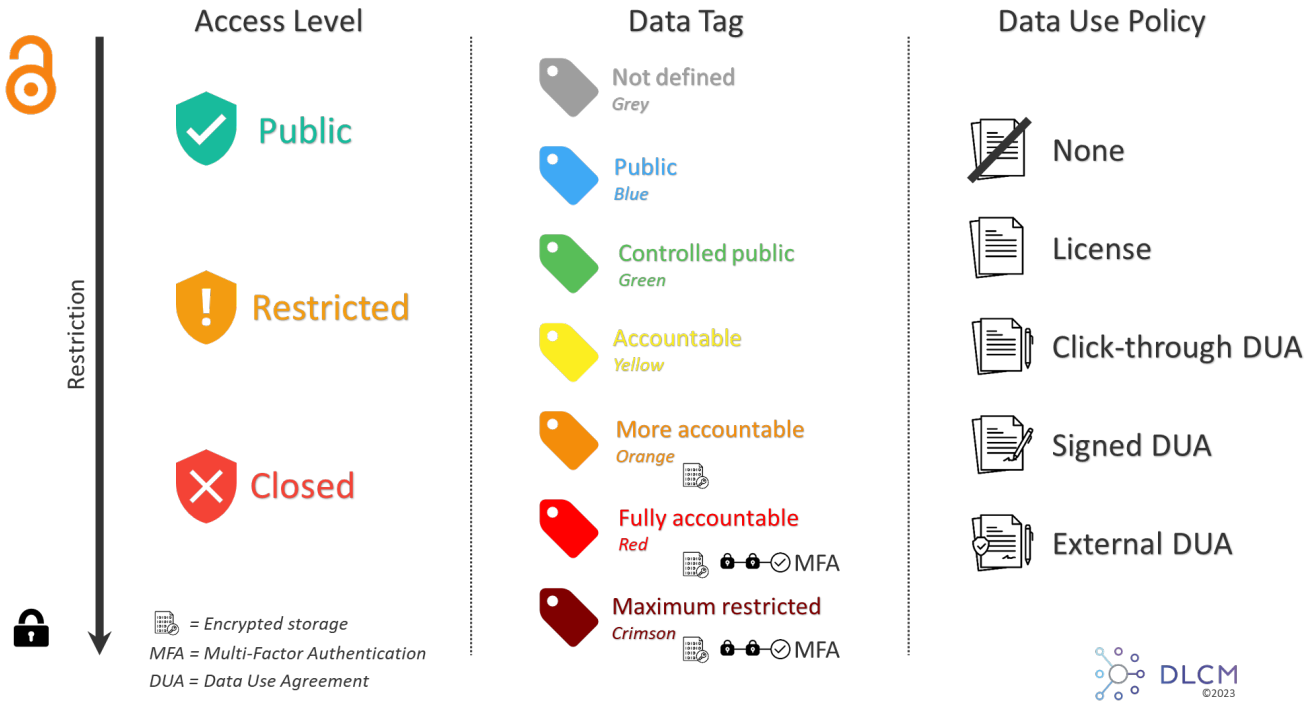
② Are there sensitive data in the archive? ⇒ Define the correct tag of Data Tags

③ What are terms & conditions to use the archive? ⇒ Define the correct policy of Data Use Policies

④ What are obligations to impose for using the archive? ⇒ Choose the *license* or specify the *data use agreement*

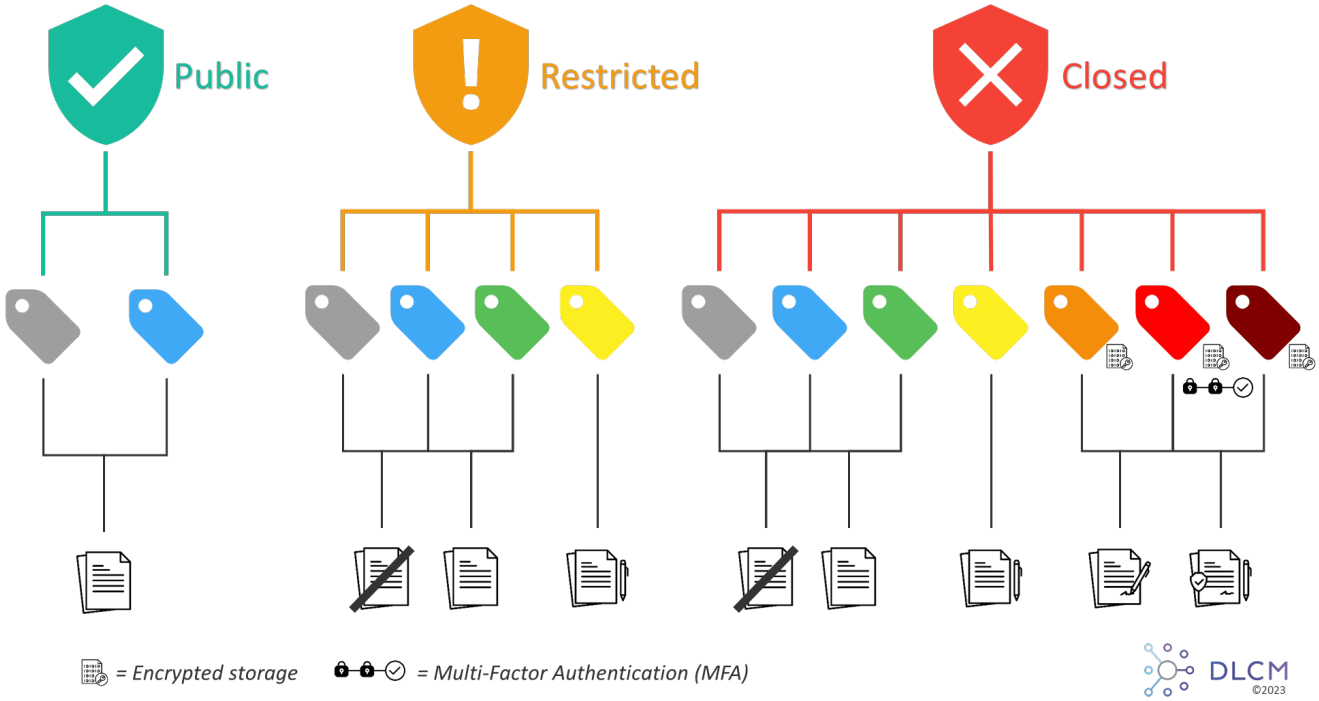
4.1. Data Access Scales

Each concept (access level, data tag or data use policy) have a restriction scale to control the access to the archives: from less to more restrictive.



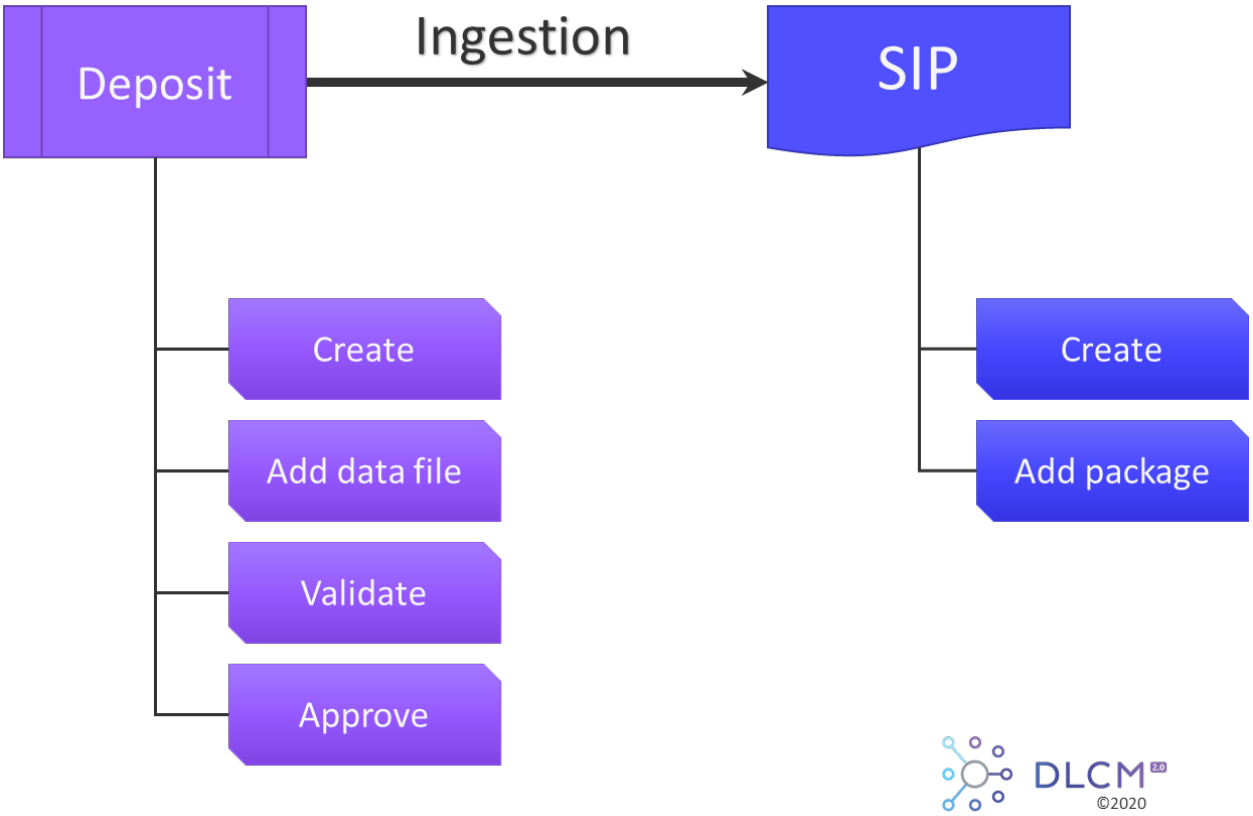
4.2. Data Access Compatibility

The compatibility between those concepts are described in the following matrix.



Chapter 5. Submission Integration

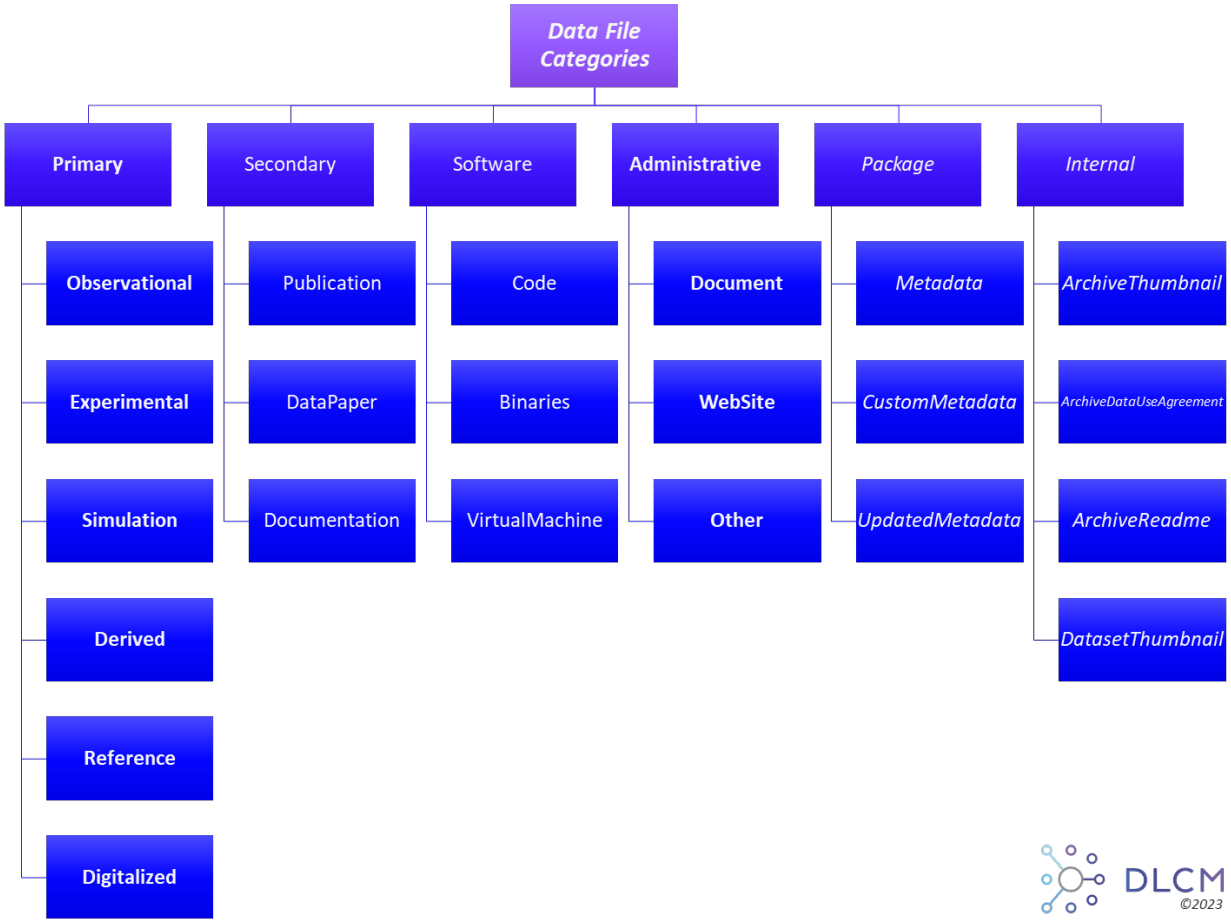
5.1. Overview



The ingestion process consists either in the creation of a deposit based on a wizard-like assisted approach, or in using a *ready-to-use* SIP.

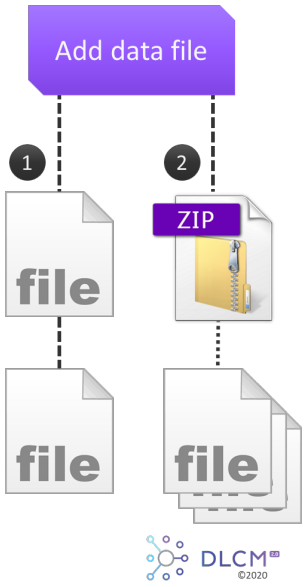
5.2. Wizard-like assisted deposit

The deposit operation consists in gathering all data files and the information necessary to create a SIP package. The objective of the wizard is to structure the deposit and to categorize each data file:



The description of each category is detailed at the Data File Categories section in the Annexes.

The data file assignment to a deposit can be done file-by-file (mode) or by batch (mode):



5.2.1. To create a deposit

Request	`http(s)://<root context>/preingest/deposits`
Verb	POST

Parameter(s)	*Name*	*Description*
	`Deposit JSON Object`	See *Deposit* section in API Documentation
Expected Return Code	`201`	Created
Return Object	`Deposit JSON Object`	See *Deposit* section in API Documentation
Roles	Creator (see Roles)	

Deposit example

The minimal set of information for a deposit is:

```
{
  "organizationalUnitId" : "Organizational unit ID of the data set",
  "title" : "Data set title",
  "year" : 2018,
  "description" : "Data set description"
}
```

5.2.2. To deposit data files

To add data files to a deposit, the first option (mode) is to deposit them one-by-one.

By creating an URI

It's possible to provide a URI (useful for large files).

Request	`http(s)://<root context>/preingest/deposits/<DepositID>/data`	
Verb	POST	
Parameter(s)	*Name*	*Description*
	`Data File JSON Object`	See *Data File* section in API Documentation
Expected Return Code	`201`	Created
Return Object	`Data File JSON Object`	See *Data File* section in API Documentation
Roles	Creator (see Roles)	

The effective download of the referenced data (see API Documentation) is done asynchronously by the "Pre-Ingest" module, which supports the file (for files on local file systems), http and https protocols.

By uploading a file

Request	`http(s)://<root context>/preingest/deposits/<DepositID>/upload`	
Verb	POST	
Content-type	`multipart/form-data`	
Parameter(s)	***Name***	***Description***
	`file`	Data file to upload
	`category` **(*optional*)**	Data file category (see Data File Categories section in the Annexes)
	`type` **(*optional*)**	Data file sub-category (see Data File Categories section in the Annexes)
	`folder` **(*optional*)**	Sub-folders of data file
Expected Return Code	`201`	Created
Return Object	`Data File JSON Object`	See *Data File* section in API Documentation
Roles	Creator (see Roles)	

If the data file is the descriptive metadata of the dataset, it must respect the deposit metadata schema. If not, the data file will have a status `In-Error`.

5.2.3. To deposit a data files package

The second option (mode) is to add data files in a deposit by batches. The batch mode supports zip files, containing all the data files to upload, including sub-folders.

Request	`http(s)://<root context>/preingest/deposits/<DepositID>/upload-archive`	
Verb	POST	
Content-type	`multipart/form-data`	
Parameter(s)	***Name***	***Description***
	`file`	Zip file which contains data files
	`category` **(*optional*)**	Data file category (see Data File Categories section in the Annexes)
	`type` **(*optional*)**	Data file sub-category (see Data File Categories section in the Annexes)
Expected Return Code	`201`	Created
Return Object	`Array of Data file JSON Object`	See *Data File* section in API Documentation
Roles	Creator (see Roles)	

5.2.4. To get the deposit metadata schema

Request	`http(s)://<root context>/preingest/deposit/schema`	
Verb	GET	
Parameter(s)	***Name***	***Description***
	`None`	-
Expected Return Code	`200`	Success
Return Object	`Descriptive Metadata XML schema`	XML schema file
Roles	All (see Roles)	

5.2.5. To submit a deposit for approval

This step is optional. It depends of submission policy if an approval is expected.

Request	`http(s)://<root context>/preingest/deposits/<DepositID>/submit-for-approval`	
Verb	POST	
Parameter(s)	***Name***	***Description***
	`None`	-
Expected Return Code	`200`	Modified
	`304`	Not modified
	`404`	Not found

Return Object	`Result JSON`	Action result
		`{`
		`"message": "Deposit status changed successfully",`
		`"resId": "<DepositID>",`
		`"status": "EXECUTED"`
		`}`

Roles	Creator (see Roles)	

5.2.6. To approve a deposit

Request	`http(s)://<root context>/preingest/deposits/<DepositID>/approve`	
Verb	POST	
Parameter(s)	***Name***	***Description***
	`None`	-

Expected Return Code	`200`	Modified
	`304`	Not modified
	`404`	Not found

Return Object	`Result JSON`	Action result
		`{`
		`"message": "Deposit status changed successfully",`
		`"resId": "<DepositID>",`
		`"status": "EXECUTED"`
		`}`

Roles	Approver (see Roles)	

5.3. By using a SIP

5.3.1. To create a SIP

Request	`http(s)://<root context>/ingest/sip`	
Verb	POST	
Parameter(s)	***Name***	***Description***
	`SIP JSON Object`	See *SIP* section in API Documentation
Expected Return Code	`201`	Created
Return Object	`SIP JSON Object`	See *SIP* section in API Documentation
Roles	Creator (see Roles)	

SIP example

The minimal set of information for an SIP is:

```
{
  "info" : {
    organizationalUnitId" : "Organizational unit ID of the SIP",
    "name" : "Name of the SIP",
    "description" : "Description of the SIP"
  }
}
```

5.3.2. To submit a SIP package

Request	`http(s)://<root context>/ingest/sip/<sipID>/upload`
Verb	POST

Content-type	`multipart/form-data`	
Parameter(s)	***Name***	***Description***
	`Zip file`	The Zip file must contain a metadata XML file and at least one data file.
Expected Return Code	`201`	Created
Return Object	`Data File JSON Object`	See *Data File* section in API Documentation
Roles	Creator (see Roles)	

The SIP metadata file must be in XML and respect the SIP metadata schema.

5.3.3. To get SIP metadata schema

Request	`http(s)://<root context>/ingest/sip/schema`	
Verb	GET	
Parameter(s)	***Name***	***Description***
	`None`	-
Expected Return Code	`200`	Success
Return Object	`SIP DLCM Metadata XML schema`	XML schema file
Roles	All (see Roles)	

Chapter 6. Dissemination Integration

6.1. To search archives

Request	`http(s)://<root context>/access/metadata/search?query=<query>`	
Verb	GET	
Parameter(s)	***Name***	***Description***
	`Query`	Query criteria
Expected Return Code	`200`	Success
Return Object	`Collection JSON Object`	List of Archive information & DataCite metadata (see [archive-example]) with pagination
Roles	Public (see Roles)	

Query examples:

- `criterion1 criterion2` ⇒ criterion1 **or** criterion2
- `criterion1 AND criterion2` ⇒ criterion1 **and** criterion2

6.2. To get an archive

6.2.1. By archive ID

Request	`http(s)://<root context>/access/metadata/<archiveID>`	
Verb	GET	
Parameter(s)	***Name***	***Description***
	`None`	-
Expected Return Code	`200`	Success
Return Object	`Archive Public Metadata JSON Object`	Archive information & DataCite metadata (see [archive-example])
Roles	Public (see Roles)	

Archive public metadata example

```
{
    "resId": "<archiveID>",
    "index": "<index name>",
    "type": "metadata",
    "metadata": {
```

```
        "aip-disposition-approval": "<true/false>",
        "aip-organizational-unit": "<organizational unit ID>",
        "aip-retention": "<retention duration in days",
        "aip-retention-end": "<retention end date>",
        "aip-unit": "<true/false>",
        "aip-size": "<archive size>",
        "creation": "<creation date>"
        "datacite.xml": "<DataCite XML>",
        "aip-container": "BAG_IT",
        "datacite": {
            <DataCite JSON>
        }
    }
}
```

6.2.2. By DOI

Request	`http(s)://<root context>/access/metadata/search-doi?doi=<DOI>`	
Verb	GET	
Parameter(s)	***Name***	***Description***
	`DOI`	DOI to search
Expected Return Code	`200`	Success
Return Object	`Archive Public Metadata JSON Object`	Archive information & DataCite metadata (see [archive-example])
Roles	Public (see Roles)	

6.3. To download an archive

To download an archive, several steps are needed:

1. To check if a download request exists and to know its status: To get download status
2. To create a download request: To prepare download
3. To download the archive: To download archive content

6.3.1. To get download status

Request	`http(s)://<root context>/access/metadata/<archiveID>/download-status`	
Verb	GET	
Parameter(s)	***Name***	***Description***
	`None`	-

Expected Return Code	`200`	Success
	`404`	Not found ⇒ To prepare download
Return Object	`Download Status`	`SUBMITTED` Download query created `IN_ERROR` Download query in error `IN_PREPARATION` Preparing download query `DOWNLOADING` Downloading AIP `IN_DISSEMINATION_PREPARATION` Preparing DIP `READY` Download query completed ⇒ To download archive content
Roles	Public (see Roles)	

6.3.2. To prepare download

Request	`http(s)://<root context>/access/metadata/<archiveID>/prepare-download`	
Verb	POST	
Parameter(s)	***Name***	***Description***
	`None`	-
Expected Return Code	`202`	Accepted
Return Object	-	
Roles	Public (see Roles)	

6.3.3. To download archive content

Request	`http(s)://<root context>/access/metadata/<archiveID>/download`	
Verb	GET	
Parameter(s)	***Name***	***Description***
	`None`	-
Expected Return Code	`200`	Success
Return Object	`Archive File`	
Roles	Public (see Roles)	

6.4. To export metadata with OAI-PMH

The OAI-PMH provider of DLCM solution supports version 2.0 of the protocol for metadata harvesting. The specifications are detailed on the Open Archives Initiative website.

Request	`http(s)://<root context>/access/oai-provider/oai`	
Verb	GET or POST with content-type application/x-www-form-urlencoded	
Parameter(s)	***Name***	***Description***
	`OAI parameters`	See OAI-PMH specifications.
	`smartView=dlcm_oai2.xsl`	Optional parameter to display OAI XML in a structured way, with XML transformation to generate HTML.
Expected Return Code	`200`	Success
	`503`	Service unavailable, i.e. the Data Management module is not running
Return Object	`OAI-PMH XML data`	OAI-PMH XML data. See OAI-PMH specifications
Roles	Public (see Roles)	

Chapter 7. Annexes

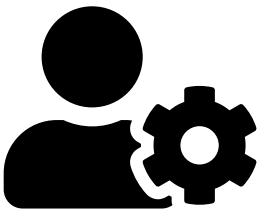
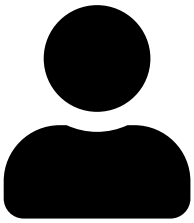
7.1. Glossary

Acronym	Description	Source
AIC	Archival Information Collection	OAIS
AIP	Archival Information Package (i.e. Archive)	OAIS
AIU	Archival Information Unit	OAIS
API	Application Programming Interface	Software
CRUD	Create Read Update Delete	Software
Deposit	Research data deposit	DLCM
DIP	Dissemination Information Package	OAIS
HAL	Hypertext Application Language	Software
HATEOAS	Hypermedia As The Engine Of Application State	Software
IP	Information Package	OAIS
JSON	JavaScript Object Notation	Software
OAIS	Open Archival Information System	OAIS
REST	REpresentational State Transfer	Software
SIP	Submission Information Package	OAIS
SOA	Service Oriented Architecture	Software

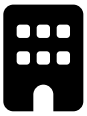
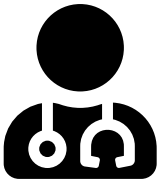
7.2. DLCM Modules

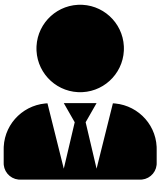
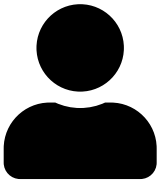
Module	Description	REST Name
Pre-Ingest	*Pre-Ingest* module to prepare a deposit in SIP	preingest
Ingest	*Ingest* module to check an SIP and to transform it into an AIP	ingest
Archival Storage	*Archival Storage* module to check an AIP and to store it	archival-storage
Data Mgmt	*Data Management* module to index metadata	data-mgmt
Access	*Access* module to manage queries/request and to generate a DIP	access
Preservation Planning	*Preservation Planning* module to manage preservation activities	preservation-planning
Admin	*Administration* module to manage general settings	admin

7.3. Application Roles

Icon	Application Role	Description
	`ROOT`	A root is the super administrator of the application. ⇒ He has access to everything.
	`ADMIN`	An administrator can configure the application by defining new parameters, like *license* or *preservation policy*. ⇒ He has access to global settings of the application.
	`USER`	An user is a person who have to use the application. ⇒ He has access to the preservation space, based on the permission he has at institution or organizational unit level.

7.4. Roles

Icon	Role	Within an *institution*	Within an *organizational unit* 
	`Manager`	He can manage users of this institution. He can create organizational units for this institution.	He can manage users of this organizational unit, plus the same rights as a *steward*.
	`Steward`	He has the steward role for all organizational units of the institution.	He has the steward role for the organizational unit. He can manage deposits and archives, plus the same rights as an *approver*.
	`Approver`	He has the approver role for all organizational units of the institution.	He has the approver role for the organizational unit. He can approve or reject a submitted deposit, plus the same rights as a *creator*.

	`Creator`	He has the creator role for all organizational units of the institution.	He has the creator role for the organizational unit. He can initiate, edit & submit deposits, add data files in deposits, plus the same rights as a *visitor*.
	`Visitor`	He has the visitor role for all organizational units of the institution.	He has the visitor role for the organizational unit. He can download *restricted* archives, plus the same rights as *user*.
	`User`	A user is an authenticated person (with a login/password) on the application. He has no permission on any institution.	He has no permission on any organizational unit. He can download *closed* archives, if he asked a access request and a *steward* have accepted the request. plus the same rights as *public*.
	`Public`	A public is not authenticated on the application. He has no permission on any institution.	He has no permission on any organizational unit. He can download *public* archives, which are *Open Access*.

7.5. Access Levels

Icon	Access Level	Description
	PUBLIC	The archive is accessible to everyone ⇒ Open access.
	RESTRICTED	The archive is accessible to team members (i.e., Org. Unit) ⇒ Trusted parties.
	CLOSED	The archive is accessible case by case thank to access control list (ACL) ⇒ Individuals.

7.6. Data Tags

Icon	Tag Type	Description	Transfer	Storage	Access	Requirement Support	Access Level Compatibility
	UNDEFINED	***Not defined*** Data sensitivity not set to support previous archives.	-	-	-	Supported	All
	BLUE	***Public*** Non-confidential information, stored and shared freely.	Clear	Clear	Open	Supported	All
	GREEN	***Controlled public*** Not harmful personal information, shared with some access control.	Clear	Clear	Email, OAuth verified registration	Supported	Restricted and Closed only
	YELLOW	***Accountable*** Potentially harmful personal information, shared with loosely verified and/or approved recipients.	Encrypted	Clear	Password, Registered , Approval, click-through DUA	Supported	Restricted and Closed only
	ORANGE	***More accountable*** Sensitive personal information, shared with verified and/or approved recipients under agreement.	Encrypted	Encrypted	Password, Registered, Approval, signed DUA	Supported *If Encryption is enabled on storage device*	Closed only

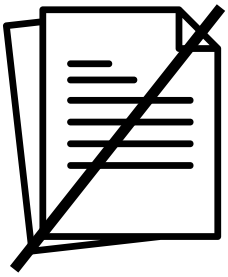
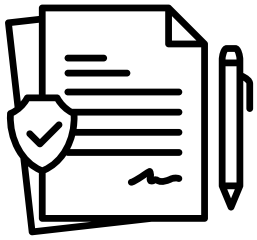
Icon	Tag Type	Description	Transfer	Storage	Access	Requirement Support	Access Level Compatibility
		Fully accountable Very sensitive personal information, shared with strong verification of approved recipients under signed agreement.	`Encrypted`	`Encrypted`	Two-factor Authentication, Registered, Approval, signed DUA	`Supported` *If* `Encryption` *is enabled on storage device*	`Closed` only
		Maximum restricted Maximum sensitive, explicit permission for each transaction, strong verification of approved recipients under signed agreement.	`Encrypted`	`Multi-encrypted`	Two-factor Authentication, Registered, Approval, signed DUA	`Partially Supported` *If* `Encryption` *is enable on storage device* `Multi-encrypted` *not supported yet*	`Closed` only

DUA = Data Use Agreement

Sources:

- Sharing Sensitive Data with Confidence: The Datatags System

7.7. Data Use Policies

Icon	Data Use Policy	Description
	None	No data use policy. No constraint.
	License	A license is mandatory.
	Click-through DUA	A DUA is mandatory. It is stored in the archive and is approved when the user click to request access.
	Signed DUA	A DUA is mandatory. It is stored in the archive. It must be downloaded, signed and provided when the user request access.
	External DUA	A DUA is mandatory. But, it is managed and stored externally, so not in the archive. The control is done outside the application.

DUA = Data Use Agreement

7.8. Deposit Status

Status	Description
APPROVED	The deposit has been approved.
CHECKED	The deposit has been checked.
CLEANED	The deposit has been cleaned: all date files have been purged.
CLEANING	A clean job is currently running.

Status	Description
COMPLETED	The deposit has been archived.
CREATED	The deposit has been created.
IN_ERROR	The deposit is in error. An action must be done to fix the deposit.
IN_PROGRESS	The deposit is open to add data files.
IN_VALIDATION	The deposit must be validated.
REJECTED	The validation process has rejected the deposit.
SUBMITTED	The deposit process is started.

7.9. Data File Categories

Category	*Sub-Category*	Description
Primary	***Primary Data category***	
	Observational	Data captured in real-time, usually irreplaceable. For example, sensor data, survey data, sample data, neuro-images.
	Experimental	Data from lab equipment, often reproducible, but can be expensive to reproduce. For example, gene sequences, chromatograms, and toroid magnetic field data.
	Simulation	Data generated from test models. The model and its parameters are as important as the result and are also part of the data. For example, climate models, economic models, etc.
	Derived	Data derived from other data. Generally reproducible but can also be expensive (for instance parameters of LLM). For example, text and data mining, compiled database, 3D models, etc.
	Reference	A (static or organic) conglomeration or collection of smaller (peer-reviewed) datasets, most probably published and curated. For example, gene sequence databanks, chemical structures, or spatial data portals. It can be expensive to create.
	Digitalized	Digital version of analogue objects. For example, manuscripts, books, audio etc.
Secondary	***Secondary Data category***	

Category	*Sub-Category*	Description
	Publication	Research publication or article
	DataPaper	Research data paper
	Documentation	Other documentation
Software	***Software category***	
	Code	Code or programs
	Binaries	Binaries or executables
	VirtualMachine	Images of virtual machines
Administrative	***Administrative category***	
	Document	All kinds of documents
	WebSite	Web sites
	Other	Others types of files
Package	***DLCM Package category***	
	InformationPackage	DLCM Package (*internal used only*)
	Metadata	DLCM metadata in XML format
	CustomMetadata	Specific metadata of a research in JSON or XML format
	UpdatedMetadata	DLCM updated metadata in XML format
	UpdatePackage	DLCM Updated Package (*internal used only*)
Internal	***DLCM Archive category***	
	DatasetThumbnail	Dataset Thumbnail (for archive version < 3.1)
	ArchiveThumbnail	Archive Thumbnail (for archive version >= 3.1)
	ArchiveReadme	Archive README
	ArchiveDataUseAgreement	Data Use Agreement (DUA) for archives with sensitive data

The categories are dependent on the configuration.

- The categories, ***Primary***, ***Secondary*** & ***Software***, are available if research data archiving is enable.
- The category, ***Administrative***, is available if administrative data archiving is enable.

7.10. Data File Status

Status	Description	Action
CHANGE_DATA_CATEGORY	An update of the data category or of the data type is in progress.	n/a
CHANGE_RELATIVE_LOCATION	An update of the relative location is in progress.	n/a
CLEANED	The data file is purged after a clean job.	n/a
CLEANING	A clean job is currently running.	n/a
CREATED	The data file has been created.	n/a
EXCLUDED_FILE	The data file has a forbidden format.	This data file must be deleted before submitting deposit.
FILE_FORMAT_IDENTIFIED	The file format identification ran successfully.	n/a
FILE_FORMAT_SKIPPED	The file format identification was skipped because of the file size.	n/a
FILE_FORMAT_UNKNOWN	The file format identification failed.	n/a
IGNORED_FILE	The data file has a format which needs a action.	This data file must be deleted or validated before submitting deposit.
IN_ERROR	The data file is in error.	An action must be done to fix the data file.
PROCESSED	The data file has been processed: downloaded or copied.	n/a
READY	The data file processing is completed.	n/a
RECEIVED	The data file is created.	n/a
TO_PROCESS	The data file is created, before to be processed.	n/a
VIRUS_CHECKED	The virus check ran successfully: no virus.	n/a
VIRUS_SKIPPED	The virus check was skipped because of the file size.	n/a