



FRIS IT-Infrastructure

Service description

Date: 27/07/2022

Version: 2.0

1 Document history

| Version | Date | Author | Summary of changes |
|-------------|------------|------------------------------|---|
| 1.0 | 02/09/2014 | Brian Plauborg (Atira) | Initial version of document including basic structure, web service how-to's and service descriptions. |
| 1.1 | 08/10/2014 | Brian Plauborg (Atira) | Added journal service chapter. |
| 1.1 | 3/11/2014 | CdG | Added some comments on Journal Service + updated "content" |
| 1.2 | 11/12/2014 | Brian Plauborg (Atira) | Added section on research output. Updated project & journal sections. |
| 1.3 | 19/05/2015 | Brian Plauborg (Elsevier) | Added FRIS XML versions of entity web services. |
| 1.4 | 09/07/2015 | Brian Plauborg (Elsevier) | Added chapter on classification scheme service. |
| 1.5 | 17/07/2015 | Brian Plauborg (Elsevier) | Updated document with new bulk operation and new endpoints. |
| 1.6 | 15/07/2016 | Brian Plauborg (Elsevier) | Miscellaneous updates including changes service and funding code service. |
| 1.7 | 16/01/2018 | CdG | PersonService afgeschermd voor privacy issues |
| 1.8 | 15/03/2018 | CdG | PersonService weer open na analyse van DPO |
| 1.9 | 08/06/2018 | Brian Plauborg (Elsevier) | Added data model section. |
| 1.10 | 28/06/2018 | CdG (EWI) | Modified example GetRO with Journal info |
| 1.11 | 05/04/2019 | Brian Plauborg (Elsevier) | Updated service descriptions documentation. Added Portal REST descriptions. |
| 1.12 | 21/05/2019 | Yves Hellemans | Review SOAP documentation |
| 1.13 | 15/06/2021 | Tom Wuyts | Addition for infrastructure, review of the document |
| 1.14 | 10/09/2021 | Jochen Deferme | Corrections and comments |
| 1.15 | 05/07/2022 | Tom Wuyts | Update FRIS data model |
| 1.16 | 15/07/2022 | Tom Wuyts | Added example requests |
| 2.0 | 27/07/2022 | Niko Verbeke | Review |

Contents

| | |
|--|-----------|
| 1 Document history..... | 2 |
| 2 Accessing the FRIS web services | 5 |
| 2.1 Entity Access Services | 5 |
| 2.2 Paging in FRIS | 6 |
| 2.2.1 Session ID | 7 |
| 2.2.2 Liveliness of the session ID..... | 7 |
| 3 Ingestion service..... | 8 |
| 3.1 Current service status..... | 8 |
| 3.2 Service operations | 8 |
| 3.2.1 Operation: ingest..... | 8 |
| 3.2.2 Operation: ingestBulk..... | 9 |
| 3.2.3 Operation: getBulkResponse | 9 |
| 3.2.4 Operation: delete*entity*(ByUUID) | 9 |
| 3.2.5 IngestResponseType response format..... | 9 |
| 3.2.6 Operation: transform | 11 |
| 3.3 Service security constraints..... | 14 |
| 4 UIDS ingestion and consumer service | 17 |
| 5 Changes service..... | 18 |
| 5.1 Current service status..... | 18 |
| 5.2 Service operations | 18 |
| 5.2.1 Operation: getChanges request documentation | 18 |
| 5.2.2 Operation: getChanges XML response documentation | 18 |
| 6 Organisation service..... | 21 |
| 6.1 Current service status..... | 21 |
| 6.2 Service operations | 21 |
| 6.2.1 Operation: getOrganisations request documentation..... | 22 |
| 6.2.2 Operation: getOrganisations CERIF response documentation | 24 |
| 6.2.3 Operation: getOrganisations FRIS XML response documentation..... | 26 |
| 7 Person service..... | 30 |
| 7.1 Current service status..... | 30 |
| 7.2 Service operations | 30 |
| 7.2.1 Operation: getPersons request | 30 |
| 7.2.2 Operation: getPersons CERIF response documentation | 32 |
| 7.2.3 Operation: getPersons FRIS XML response documentation | 35 |
| 8 Infrastructure service | 36 |
| 8.1 Current service status..... | 36 |
| 8.2 Service operations | 36 |
| 8.2.1 Operation: getInfrastructures request..... | 36 |
| 8.2.2 Operation: getInfrastructures CERIF response documentation | 37 |
| 8.2.3 Operation: getPersons FRIS XML response documentation | 40 |
| 9 Project service..... | 42 |
| 9.1 Current service status..... | 42 |
| 9.2 Service operations | 42 |
| 9.2.1 Operation: getProjects | 43 |
| 9.2.2 Operation: getProjects CERIF response documentation | 45 |

| | | |
|--------------|--|------------|
| 9.2.3 | Operation: getProjects FRIS XML response documentation..... | 47 |
| 10 | Research output service..... | 49 |
| 10.1 | Current service status | 49 |
| 10.2 | Service operations | 49 |
| 10.2.1 | Operation: getResearchOutput | 49 |
| 10.2.2 | Operation: getResearchOutput CERIF response documentation | 52 |
| 10.2.3 | Operation: getResearchOutput FRIS XML response documentation | 54 |
| 11 | Journal Service | 56 |
| 11.1 | Current service status | 56 |
| 11.2 | Service operations | 56 |
| 11.2.1 | Operation: getJournals..... | 57 |
| 11.2.2 | GetJournals response..... | 59 |
| 12 | Datasets | 64 |
| 12.1 | Current service status | 64 |
| 12.2 | Service operations | 64 |
| 12.2.1 | Operation: getDatasets | 64 |
| 12.2.2 | Operation: GetDatasets response..... | 66 |
| 12.2.3 | Operation: getDatasets FRIS XML response documentation | 68 |
| 13 | Classification Scheme Service | 70 |
| 13.1 | Current service status | 70 |
| 13.2 | Service operations | 70 |
| 13.2.1 | Operation: getClassificationSchemes FRIS XML response documentation 71 | |
| 13.2.2 | Operation: getClassificationSchemes CERIF XML response documentation 73 | |
| 14 | Funding code service | 75 |
| 14.1 | Current service status | 75 |
| 14.2 | Service operations | 75 |
| 14.2.1 | Operation: getFundingCodes FRIS XML request documentation..... | 75 |
| 15 | FRIS Data Model..... | 78 |
| 15.1 | Introduction | 78 |
| 15.2 | Abstract Entity..... | 80 |
| 15.3 | Organisation | 82 |
| 15.4 | Person..... | 85 |
| 15.5 | Infrastructure..... | 88 |
| 15.6 | Project..... | 92 |
| 15.7 | Journal..... | 98 |
| 15.8 | Research output..... | 101 |
| 15.9 | Classification Scheme & Classification..... | 108 |
| 15.10 | Physical Address | 109 |
| 15.11 | Electronic Address..... | 110 |
| 15.12 | Source..... | 111 |
| 15.13 | Localized Keywords..... | 112 |

2 Accessing the FRIS web services

The set of FRIS web services is comprised of a secured ingestion service where all data modification is handled and a number of public entity centric web services where all data access is handled. The content returned from the public web services is restricted to entities and relations to entities that are not marked confidential or hidden. The entity centric web services are available in two versions, one that delivers a CERIF¹ document and one that delivers a number of FRIS XML entities as response.

In addition to the SOAP/XML based web services targeted at general use we have a small number of REST/JSON services targeted at and restricted to the FRIS portal application.

The CERIF versions of the web services use version 1.5 of the standard with a significant number of FRIS specific extensions and interpretations. Please request a copy of the “Integration Guide FRIS R4” if you need to use the CERIF based services.

The FRIS XML versions of the web services deliver XML representations of the underlying FRIS domain model and will for most service users be easier to parse and understand. The FRIS domain model is documented in chapter 15.

All of the web services are SOAP document literal services and the current WSDL for the services is always available at the endpoint root:

| Environment | Endpoint root |
|-------------|--|
| Staging | https://stfrisr4.researchportal.be/ws/ |
| Production | https://app-acceptance.r4.researchportal.be/ws/ (alternative DNS-name) |

All of the FRIS web services support the FastInfoSet XML protocol and it is strongly recommended that this be used due to its superior performance characteristics.

2.1 Entity Access Services

All of the self-contained entities will have a specific web service that allows data access for that entity. Each of these will have a basic search operation called getOrganisations, getPersons, etc. which accepts a criteria object with entity specific limitations. A sample request:

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
    <soap:Body>
        <ns1:getOrganisations xmlns:ns1="http://fris.ewi.be/">
            <organisationCriteria xmlns="http://fris.ewi.be/criteria">
                <window>
                    <pageSize>10</pageSize>
                    <pageNumber>0</pageNumber>
                    <orderings>
                        <order>
                            <id>entity.created</id>
                            <direction>DESCENDING</direction>
                        </order>
                    </orderings>
                </window>
                <uids>
                    <identifier>c0669985-967c-47b7-8dfc-
d8610bd36606</identifier>
                    <identifier>1fc77569-3778-4828-8c38-
195cb51584c6</identifier>
                </uids>
            </organisationCriteria>
        </ns1:getOrganisations>
    </soap:Body>
</soap:Envelope>
```

¹ [Common European Research Information Format](#)

```

        </organisationCriteria>
    </ns1:getOrganisations>
</soap:Body>
</soap:Envelope>
```

The window element is optional, but if omitted the service will default to a page size of 10 and start with page number 0 (page number is zero-indexed). Valid order id's for a particular entity will be available on the relevant entity web service through a separate operation called getOrderings.

The result element from a search contains, besides the actual entities, information on the total number of results, the chosen page size and number. A sample response from a CERIF entity service:

```

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
    <soap:Body>
        <ns1:getOrganisationsResponse xmlns:ns1="http://fris.ewi.be/">
            <queryResult xmlns="http://fris.ewi.be/response">
                <totalResults>4</totalResults>
                <pageSize>10</pageSize>
                <pageNumber>0</pageNumber>
                <CERIF xmlns="urn:xmlns:org:eurocris:cerif-1.5-1"
release="1.5" date="2013-09-27+02:00" sourceDatabase="fris">
                    ...
                </CERIF>
            </queryResult>
        </ns1:getOrganisationsResponse>
    </soap:Body>
</soap:Envelope>
```

The returned CERIF format is described in the "Integration Guide FRIS R4" document.

Each entity service also provides a number of operations designed to make it easy to discover which values are valid options in the associated criteria.

2.2 *Paging in FRIS*

Below we describe some properties of the paging at FRIS. First the impact of the session ID is discussed, afterwards a note about the liveliness.

2.2.1

2.2.1 Session ID

When a user (or requester in this case) queries FRIS over multiple pages, the system is going over a linked list. As a result, no pages can be skipped and the system needs to know that the next request is a follow up of the previous request.

The system determines this based on the session ID. This allows parallel querying of FRIS from the same machine. So if a user starts querying FRIS over multiple pages, the session ID that is returned after the first request, needs to be sent with each following request. Otherwise the first 10 results will be returned, although the user is asking for one of the next pages.

A practical explanation with 2 programs:

- SOAP-UI: This program has the advantage of generating empty requests out of a WSDL. You can easily send a request to FRIS, but SOAP-UI doesn't save the session ID after the first request. This means that if you manually start querying FRIS with SOAP-UI, by default, you will always get the 10 same results back, although you are requesting page 1, 2, 3, ...
- Postman: you can also send a message to a service and get a response. The advantage of postman is that it automatically saves the session ID. So by manually sending some requests and increasing the page number, you will get the correct results.

2.2.2 Liveliness of the session ID

The session ID lives for 12 hours. This means that if you start querying the service, the paging mechanism will keep your session for 12 hours, after that, session ID will be removed and if you didn't finish querying FRIS, you will get the first 10 results back.

3 Ingestion service

The SOAP ingestion service is responsible for all data modification requests. All interaction with the ingestion services must be over https and all requests are authenticated through a published WS Security Policy².

The FRIS ingestion service supports the FastInfoSet XML protocol and it is strongly recommended that this be used due to its superior performance characteristics.

A detailed description of the ingestion service format is available in the “Integration Guide FRIS R4” document.

3.1 Current service status

| Environment | Endpoint WSDL |
|-------------|---|
| Staging | https://stfrisr4.researchportal.be/ws/IngestionService?wsdl |
| Production | https://frisr4.researchportal.be/ws/IngestionService?wsdl |

3.2 Service operations

| Operation | Input | Output |
|-----------------------------------|----------------------------|------------------------------------|
| ingest | ingest | ingestResponse |
| ingestBulk | ingestBulk | correlationId |
| getBulkResponse | getBulkResponse | ingestBulkresponse |
| deleteOrganisation | deleteOrganisation | deleteOrganisationResponse |
| deleteOrganisationByUuid | deleteOrganisationByUuid | deleteOrganisationByUuidResponse |
| deletePerson | deletePerson | deletePersonResponse |
| deletePersonByUuid | deletePersonByUuid | deletePersonByUuidResponse |
| deleteProject | deleteProject | deleteProjectResponse |
| deleteProjectByUuid | deleteProjectByUuid | deleteProjectByUuidResponse |
| deleteResearchOutput | deleteResearchOutput | deleteResearchOutputResponse |
| deleteResearchOutputByUuid | deleteResearchOutputByUuid | deleteResearchOutputByUuidResponse |
| deleteInfrastructure | deleteInfrastructure | deleteInfrastructureResponse |
| deleteInfrastructureByUuid | deleteInfrastructureByUuid | deleteInfrastructureByUuidResponse |
| transform | transform | transformResponse |

The formal format specification is published as a part of the WSDL.

All response documents (except the correlationId) are of the IngestResultType and include operation status and error messages. The response format is described in more detail in chapter 3.2.5.

3.2.1 Operation: ingest

The “ingest” operation is used in an incremental update scenario to create or modify a managed entity as described in the “Integration Guide FRIS R4” document.

The “ingest” request document includes a CERIF representation of the entity to create or update.

² [WS Policy](#), [WS Security Policy](#)

The “ingest” response documents details whether the operation succeeded and if not, the reasons for its failure.

3.2.2 Operation: ingestBulk

The “ingestBulk” operation is used in a bulk update scenario to initialise the entire set of data managed by this data provider. Any existing data is replaced or deleted depending on the incoming data set. Note that the use of this operation is restricted and will fail if not pre-approved by a FRIS administrator.

The “ingestBulk” request document includes a full CERIF representation of the entire managed data set.

The response from the “ingestBulk” operation is a correlation id that is to be used when polling the “getBulkResponse” operation for an ingestion result, please refer to the “Ingestion guide FRIS R4” document for a detailed description on this setup.

3.2.3 Operation: getBulkResponse

This operation returns the result for a scheduled bulk ingestion, until the ingestion processing has completed the response status of the document will be “ONGOING”.

When the processing has completed this status will change to either “FAILED” or “SUCCESS” and the document will detail any reasons for its failure if applicable.

3.2.4 Operation: delete*entity*(ByUUID)

The delete operation does the same for all delete methods:

- deleteOrganisation(ByUUID)
- deletePerson(ByUUID)
- deleteInfrastructure(ByUUID)
- deleteProject(ByUUID)
- deleteResearchOutput(ByUUID)

The “delete*Entity*” operation is used in the incremental update scenario to delete a managed entity. The delete is performed with cascade semantics where associations on dependent entities will be removed. If this results in entities that cannot validate any longer, the delete will fail and validation messages detailing the blocking dependent objects will be returned.

The “delete*Entity*” request document includes the local identifier of the entity to be deleted. The “delete*Entity*ByUUID” request document includes the FRIS UUID of the organisation to be deleted.

The “delete*Entity*” response documents details whether the operation succeeded and if not, the reasons for its failure.

3.2.5 IngestResponseType response format

All operations in the ingestion service respond with an instance of a IngestResponseType document.

The error messages can contain the following different types of messages:

| Type | Description |
|----------|--|
| SECURITY | If the data provider could not be resolved based on the supplied user or if the data provider is not allowed to perform bulk ingestion. Authentication errors will result in a SOAP Fault. |
| XSD | The submitted CERIF is checked against the XSD for validity. All violations will be returned as discrete error messages. |

| | |
|----------------|---|
| REFERENTIAL | The submitted entity identifiers are checked for referential integrity. If referred entities do not exist either in the submitted set or in the existing FRIS entities (only for incremental) all violations will be returned as discrete error messages. |
| INTERNAL_CHECK | The submitted set is checked against the set of FRIS business rules. All violations will be returned as discrete error messages. These rules are always active and checked internally in the FRIS system. |
| BUSINESS_RULE | The submitted set is checked against the set of FRIS business rules. All violations will be returned as discrete error messages. These rules are checked in DataFlux and are dependant of the business rule template associated with the dataprovider. |

The different message types shown above all correspond to the action performed against the submitted document and is performed in the order shown in the table.

At each stage we will process the entire set, thus returning all pertinent messages at a given stage. But since there is a natural progression between the stages the processing will stop after any erroneous stage and the messages collected up until that point are returned in the response.

Security error example:

```
<messages>
  <source>SECURITY</source>
  <level>FATAL</level>
  <message>Could not resolve data-provider for the user</message>
</messages>
```

XSD error example:

```
<messages>
  <source>XSD</source>
  <level>ERROR</level>
  <message>line 0: string value 'X' is not a valid enumeration value for cfTrans__Type in
namespace urn:xmlNs:org:eurocris:cerif-1.5-1</message>
</messages>
```

The XSD error messages are taken directly from the XML processor.

Referential error example:

```
<messages>
  <source>REFERENTIAL</source>
  <level>ERROR</level>
  <message>Organisation(Data provider ID: <local id>): Associated Organisation (Data provider
ID:<unknown identifier>)(@relatedOrganisations.relatedTo) was unknown</message>
</messages>
```

Referential errors are, when an entity is referred to for example in an embedded cfOrgUnitOrgUnit element, but the supplied identifier was not present in the incoming set (bulk & incremental) or already present in the FRIS database (incremental only). The messages always start with the owner object and its identifier in the submitted set, after that the actual problem is stated; in this case that the organisation referred to was unknown. As a part of the message there is typically a section that describes the FRIS property path to the problem object (@?), this can be used to pinpoint exactly which relation is referred to in case there are multiple paths to the entity type.

Business rule error example:

```
<messages>
```

```

<source>BUSINESS_RULE</source>
<level>ERROR</level>
<message>Person (Data provider ID: <local id>): (@scienceDomains) Invalid number of
elements in collection, expected min 1 element(s)</message>
</messages>

```

Example 2:

```

<res:messages entity-type="PROJECT" entity-id="51435279">
    <res:source>BUSINESS_RULE</res:source>
    <res:level>ERROR</res:level>
    <res:message>Project heeft geen subject area code</res:message>
</res:messages>

```

The business rule validation messages are very similar to the referential error messages in structure. In the above example, the problem is that the specified person did not have at least one science domain code assigned.

3.2.6 Operation: transform

FRIS accepts data in the CERIF-format for ingestion. Internally FRIS has its own data model. The transform operation accepts CERIF and returns the data in FRIS-format, without saving the sent information.

Data will be returned in a CDATA-tag and authentication is required.

Example:

```

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
    <soap:Body>
        <ns1:transformResponse xmlns:ns1="http://fris.ewi.be/">
            <ns1:return><![CDATA[<fris:ingestionRequest
xmlns:fris="http://fris.ewi.be/">
<fris:organisations>
    <fris:organisation>
        <fris:state>PUBLIC</fris:state>
        <fris:external>false</fris:external>
        <fris:hidden>false</fris:hidden>
        <fris:dataProvider>ECOOM</fris:dataProvider>
        <fris:dataProviderId>0</fris:dataProviderId>
        <fris:sources>
            <fris:source authorityScheme="Identifier Authority Type"
authority="VKBO ID">0445 450 823</fris:source>
        </fris:sources>
        <fris:aliases/>
        <fris:name>
            <fris:texts>
                <fris:text locale="en">Alamire Foundation</fris:text>
                <fris:text locale="nl">Alamire Foundation</fris:text>
            </fris:texts>
        </fris:name>
        <fris:acronyms/>
        <fris:startDate>1991-07-15T00:00:00Z</fris:startDate>
        <fris:organisationType schemeId="Organisation Type"
term="Research Center"/>
        <fris:organisationActivityTypes>

```

```

        <fris:type schemeId="Organisation Activity Type"
term="Root"/>
    </fris:organisationActivityTypes>
    <fris:nameVariants/>
    <fris:relatedOrganisations/>
    <fris:physicalAddresses>
        <fris:addressAssociation>
            <fris:associationType schemeId="Physical Address to
Organisation Role" term="Postal Address"/>
            <fris:physicalAddress>
                <fris:dataProvider>ECOOM</fris:dataProvider>

<fris:dataProviderId>212947189</fris:dataProviderId>
                <fris:addressLine2>Mariapoort - Huis van de
Polyfonie</fris:addressLine2>
                <fris:addressLine3>Abdij van Park
1</fris:addressLine3>
                <fris:city>Heverlee (Leuven)</fris:city>
                <fris:postalCode>3001</fris:postalCode>
                <fris:country schemeId="ISO 3166-1 alpha 2
Country Code" term="BE"/>
                </fris:physicalAddress>
                <fris:startDate>2011-07-01T00:00:00Z</fris:startDate>
            </fris:addressAssociation>
        </fris:physicalAddresses>
        <fris:electronicAddresses>
            <fris:addressAssociation>
                <fris:associationType schemeId="Electronic Address to
Organisation Role" term="Contact Address"/>
                <fris:electronicAddress>
                    <fris:addressType schemeId="Electronic Address
Type" term="E-mail"/>

<fris:value>contact@alamirefoundation.org</fris:value>
                </fris:electronicAddress>
            </fris:addressAssociation>
            <fris:addressAssociation>
                <fris:associationType schemeId="Electronic Address to
Organisation Role" term="Contact Address"/>
                <fris:electronicAddress>
                    <fris:addressType schemeId="Electronic Address
Type" term="Telephone"/>
                    <fris:value>+32 16328750</fris:value>
                </fris:electronicAddress>
            </fris:addressAssociation>
            <fris:addressAssociation>
                <fris:associationType schemeId="Electronic Address to
Organisation Role" term="Contact Address"/>
                <fris:electronicAddress>
                    <fris:addressType schemeId="Electronic Address
Type" term="URL"/>

<fris:value>www.alamirefoundation.org</fris:value>
                </fris:electronicAddress>
            </fris:addressAssociation>
        </fris:electronicAddresses>
        <fris:classifications/>
        <fris:researchActivity>
            <fris:texts>

```

<fris:text locale="en">Internation Centre of Excellence for the Study of Music in the Low Countries. The Alamire Foundation was founded in 1991 as a co-operative association between the University of Leuven (KU Leuven, Musicology Research Unit) and the non-profit organisation Musica (Impulse Centre for Music). Its mission is to undertake, stimulate, and co-ordinate innovative research on music and musical life in the Low Countries from the early Middle Ages until 1800. It uses state-of-the art methods, including digital preservation. The Foundation's research results appear as monographs, critical editions, facsimile publications, and articles in leading journals.</fris:text>

<fris:text locale="nl"><p>Internationaal Centrum voor de Studie van de Muziek in de Lage Landen. De Alamire Foundation werd in 1991 opgericht als een samenwerkingsverband tussen KU Leuven, Onderzoekseenheid Musicologie en Musica, Impulscentrum voor Muziek. Als internationaal studiecentrum stelt de Alamire Foundation zich tot doel wetenschappelijk en praktijkonderzoek te stimuleren, te coördineren en uit te voeren. Daarbij concentreert zij zich specifiek op de muziek en het muziekleven in de Nederlanden van de middeleeuwen tot 1800. </p></fris:text>

</fris:texts>

</fris:researchActivity>

<fris:flemishDisciplines>

- <fris:flemishDisciplines schemeId="Flemish Research Disciplines" term="06040307"/>
- <fris:flemishDisciplines schemeId="Flemish Research Disciplines" term="06040313"/>
- <fris:flemishDisciplines schemeId="Flemish Research Disciplines" term="06041009"/>
- <fris:flemishDisciplines schemeId="Flemish Research Disciplines" term="06041001"/>
- <fris:flemishDisciplines schemeId="Flemish Research Disciplines" term="06041003"/>
- <fris:flemishDisciplines schemeId="Flemish Research Disciplines" term="06041006"/>
- <fris:flemishDisciplines schemeId="Flemish Research Disciplines" term="06041007"/>
- <fris:flemishDisciplines schemeId="Flemish Research Disciplines" term="06040505"/>
- <fris:flemishDisciplines schemeId="Flemish Research Disciplines" term="06040599"/>

</fris:flemishDisciplines>

<fris:subjectAreas/>

<fris:keywords>

- <fris:keyword locale="nl">Muziek</fris:keyword>
- <fris:keyword locale="nl">Musicologie</fris:keyword>
- <fris:keyword locale="nl">Handschriften</fris:keyword>
- <fris:keyword locale="nl">Lage landen</fris:keyword>
- <fris:keyword locale="en">Liturgy</fris:keyword>
- <fris:keyword locale="en">Codex</fris:keyword>
- <fris:keyword locale="en">Musical life</fris:keyword>
- <fris:keyword locale="en">Accoustics</fris:keyword>
- <fris:keyword locale="en">Music transcription</fris:keyword>
- <fris:keyword locale="en">Early Music</fris:keyword>

</fris:keywords>

</fris:organisation>

</fris:organisations>

<fris:persons/>

<fris:projects/>

```

<fris:physicalAddresses>
    <fris:physicalAddress>
        <fris:dataProvider>ECOOM</fris:dataProvider>
        <fris:dataProviderId>212947189</fris:dataProviderId>
        <fris:addressLine2>Mariapoort - Huis van de
Polyfonie</fris:addressLine2>
        <fris:addressLine3>Abdij van Park 1</fris:addressLine3>
        <fris:city>Heverlee (Leuven)</fris:city>
        <fris:postalCode>3001</fris:postalCode>
        <fris:country schemeId="ISO 3166-1 alpha 2 Country Code"
term="BE"/>
    </fris:physicalAddress>
    <fris:physicalAddress>
        <fris:dataProvider>ECOOM</fris:dataProvider>
        <fris:dataProviderId>1</fris:dataProviderId>
        <fris:addressLine3>Abdij van Park 1</fris:addressLine3>
        <fris:city>Heverlee (Leuven)</fris:city>
        <fris:postalCode>3001</fris:postalCode>
        <fris:country schemeId="ISO 3166-1 alpha 2 Country Code"
term="BE"/>
    </fris:physicalAddress>
</fris:physicalAddresses>
<fris:researchOutputList/>
<fris:journals/>
<fris:infrastructures/>
<fris:datasets/>
</fris:ingestionRequest>]]></ns1:return>
</ns1:transformResponse>
</soap:Body>
</soap:Envelope>

```

3.3 Service security constraints

The formal security policy definition is (also included in the service WSDL):

```

<wsp:Policy wsu:Id="UP_policy"
    xmlns:sp="http://docs.oasis-open.org/ws-sx/ws-securitypolicy/200702"
    xmlns:wsp="http://www.w3.org/ns/ws-policy"
    xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-
wssecurity-utility-1.0.xsd"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://docs.oasis-open.org/ws-sx/ws-
securitypolicy/200702 http://docs.oasis-open.org/ws-sx/ws-
securitypolicy/v1.2/errata01/os/schemas/ws-securitypolicy-1.2.xsd">
    <wsp:ExactlyOne>
        <wsp:All>
            <sp:TransportBinding xmlns:sp="http://docs.oasis-open.org/ws-
sx/ws-securitypolicy/200702">
                <wsp:Policy>
                    <sp:TransportToken>
                        <wsp:Policy>
                            <sp:HttpsToken>
                                <wsp:Policy/>
                            </sp:HttpsToken>
                        </wsp:Policy>
                    </sp:TransportToken>
                    <sp:AlgorithmSuite>
                        <wsp:Policy>
                            <sp:Basic256/>

```

```

        </wsp:Policy>
    </sp:AlgorithmSuite>
    <sp:Layout>
        <wsp:Policy>
            <sp:Lax/>
        </wsp:Policy>
    </sp:Layout>
    </wsp:Policy>
</sp:TransportBinding>
<sp:SupportingTokens>
    <wsp:Policy>
        <sp:UsernameToken sp:IncludeToken="http://docs.oasis-
open.org/ws-sx/ws-securitypolicy/200702/IncludeToken/AlwaysToRecipient">
            <wsp:Policy>
                <sp:HashPassword/>
            </wsp:Policy>
        </sp:UsernameToken>
    </wsp:Policy>
</sp:SupportingTokens>
</wsp:All>
</wsp:ExactlyOne>
</wsp:Policy>

```

Which amounts to a username/password authenticated scheme over HTTPS where the password is a SHA1 hash of the timestamp, nonce and password. The combination of SSL transport level security and the username/password authentication sufficiently ensures, that a third party cannot intercept potentially confidential data, impersonate a data-provider or perform replay attacks against the FRIS systems.

With this policy in place a sample ingestion request would look like the following:

```

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
    <SOAP-ENV:Header xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
        <wsse:Security xmlns:wsse="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd"
            xmlns:wsu="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-utility-1.0.xsd"
            soap:mustUnderstand="1">
            <wsse:UsernameToken wsu:Id="UsernameToken-7">
                <wsse:Username>internalProvider</wsse:Username>
                <wsse:Password Type="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-username-token-profile-
1.0#PasswordDigest">+vY88B2b1yle7C45eN6nhruHbmc=</wsse:Password>
                <wsse:Nonce EncodingType="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-soap-message-security-
1.0#Base64Binary">MzAleXl/khsisVPZ483nFQ==</wsse:Nonce>
                <wsu:Created>2013-09-27T09:05:36.870Z</wsu:Created>
            </wsse:UsernameToken>
        </wsse:Security>
    </SOAP-ENV:Header>
    <soap:Body>
        <ns1:ingestBulk xmlns:ns1="http://fris.ewi.be/">
            <CERIF xmlns="urn:xmlns:org:eurocris:cerif-1.5-1" date="2013-
09-27+02:00" release="1.5" sourceDatabase="ignored">
                ...
            </CERIF>
        </ns1:ingestBulk>
    </soap:Body>
</soap:Envelope>

```

And a sample delete organisation request:

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <SOAP-ENV:Header xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/">
    <wsse:Security xmlns:wsse="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-1.0.xsd"
      xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-
      wssecurity-utility-1.0.xsd" soap:mustUnderstand="1">
      <wsse:UsernameToken wsu:Id="UsernameToken-3">
        <wsse:Username>pureProvider</wsse:Username>
        <wsse:Password Type="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-username-token-profile-
1.0#PasswordDigest">NV/qsZe8Y5ijt7rCC4DZrlUai7c=</wsse:Password>
        <wsse:Nonce EncodingType="http://docs.oasis-
open.org/wss/2004/01/oasis-200401-wss-soap-message-security-
1.0#Base64Binary">/ZgogbYMk/bEP+21MIP3vQ==</wsse:Nonce>
        <wsu:Created>2013-11-28T14:45:44.111Z</wsu:Created>
      </wsse:UsernameToken>
    </wsse:Security>
  </SOAP-ENV:Header>
  <soap:Body>
    <ns1:deleteOrganisation xmlns:ns1="http://fris.ewi.be/">
      <ns1:identifier>81785c7c-17f7-4101-8350-
49df035bc825</ns1:identifier>
      </ns1:deleteOrganisation>
    </soap:Body>
  </soap:Envelope>
```

4 UUIDS ingestion and consumer service

The previous chapter describes the ingestion service for FRIS. The next chapters will describe the consumer services for FRIS:

- Changes service
- Organisation service
- Person service
- Infrastructure service
- Project service
- Research output service
- Journal service
- Classification service
- Funding code service

As stated before, the SOAP ingestion service is responsible for all data modification requests. These modification requests come from the data provider, and will contain the uuids from the data provider. Also future requests will also contain the uid from the data provider.

The consumer services, all listed above, will return the uuids from FRIS. To give an example for the ingestion of an organisation, this will contain the data provider id as cfOrgUnitId:

```
<fris:ingest>
    <CERIF release="1.5" date="2020-01-16Z" sourceDatabase="fris"
    xmlns="urn:xmlns:org:eurocris:cerif-1.5-1-FRIS">
        <cfOrgUnit>
            <cfOrgUnitId xmlns="urn:xmlns:org:eurocris:cerif-1.5-1">data provider id</cfOrgUnitId>
```

In contrast to the ingestion service, if the organisation is searched by the Organisation Service, the fris uuid is returned instead of the data provider id:

```
<queryResult xmlns="http://fris.ewi.be/response">
    <totalResults>1</totalResults>
    <pageSize>10</pageSize>
    <pageNumber>0</pageNumber>
    <CERIF release="1.5" date="2021-08-24Z" sourceDatabase="fris"
    xmlns="urn:xmlns:org:eurocris:cerif-1.5-1-FRIS">
        <cfOrgUnit>
            <cfOrgUnitId xmlns="urn:xmlns:org:eurocris:cerif-1.5-1">5be8c1ab-fb22-4ed8-89b6-dea4f88a4509</cfOrgUnitId>
```

5 Changes service

The FRIS R4 SOAP Changes Service is responsible for exposing the changes to entities in the FRIS system. The FRIS system only stores change events for three months, if you need to synchronise a data set that is older than that a full resynchronisation using the entity centric SOAP services will be needed.

The changes service is inspired by the OAI-PMH protocol; each response will provide a resumption token that should be used on the next request. In addition, each request is automatically paged with a page size of 10.000 change events per request.

5.1 Current service status

| Environment | Endpoint WSDL |
|-------------|---|
| Staging | https://stfrisr4.researchportal.be/ws/ChangesService?wsdl |
| Production | https://frisr4.researchportal.be/ws/ChangesService?wsdl |

5.2 Service operations

| Operation | Input | Output |
|-------------------|------------|--------------------|
| getChanges | getChanges | getChangesResponse |

The formal format specification is published as a part of the WSDL.

5.2.1 Operation: getChanges request documentation

The getChanges operation retrieves changes in the FRIS data set based on the supplied request criteria. The following tables will detail the parameters of the request document. If no limit is specified it will start from the beginning of the stored changes.

| Element path | Type | Notes |
|----------------------|----------------|--|
| resumeToken | string | The resumptionToken from the previous response |
| from | xs:dateTime | If no responseToken is supplied, a standard date time string can be supplied as the starting point for the first request |
| dataProviders | identifierList | Filter changes based on data provider names, can be negated |
| uuids | identifierList | Filter changes based on content UUID's. can be negated |
| changeType | changeType | Filter changes based on change type, can be one of: <i>CREATE, UPDATE, DELETE</i> |
| entityType | entityType | Filter changes based on entity type, can be one of: <i>ORGANISATION, PERSON, PROJECT, JOURNAL, RESEARCH_OUTPUT, INFRASTRUCTURE, FUNDING_CODE, CLASSIFICATION_SCHEME, DATA_PROVIDER</i> |

5.2.2 Operation: getChanges XML response documentation

The XML query response document will contain the following elements:

| Element path | Type | Notes |
|---|-------------|---|
| changesResponse/@resumptionToken | string | The resumption token |
| change/@id | int | The change id |
| change/occurredOn | xs:dateTime | The date and time the change occurred on. |
| change/changeType | enum | The type of change, can be: CREATE, UPDATE or DELETE |
| change/entityType | enum | The entity type, can be: ORGANISATION, PERSON, PROJECT, JOURNAL, RESEARCH_OUTPUT or CLASSIFICATION_SCHEME |
| change/identifier | string | The FRIS identifier of the entity |
| change/dataProvider | string | The FRIS data provider name that owns the entity |

Empty request for querying the change service:

```

<soapenv:Envelope
  xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:fris="http://fris.ewi.be/"
  xmlns:crit="http://fris.ewi.be/criteria">
  <soapenv:Header/>
  <soapenv:Body>
    <fris:getChanges>
      <!--Optional:-->
      <changesCriteria>
        <!--Optional:-->
        <crit:resumeToken?></crit:resumeToken>
        <!--Optional:-->
        <crit:from inclusive="?"?></crit:from>
        <!--Optional:-->
        <crit:dataProviders negated="?"?>
          <!--1 or more repetitions:-->
          <crit:identifier?></crit:identifier>
        </crit:dataProviders>
        <!--Optional:-->
        <crit:uuids negated="?"?>
          <!--1 or more repetitions:-->
          <crit:identifier?></crit:identifier>
        </crit:uuids>
        <!--Optional:-->
        <crit:changeType?></crit:changeType>
        <!--Optional:-->
        <crit:entityType?></crit:entityType>
      </changesCriteria>
    </fris:getChanges>
  </soapenv:Body>
</soapenv:Envelope>
```

Sample request for retrieving all changes from a data provider (i.c. KULeuven):

```

<soapenv:Envelope
  xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
```

```

xmlns:fris="http://fris.ewi.be/"
xmlns:crit="http://fris.ewi.be/criteria">
<soapenv:Header/>
<soapenv:Body>
    <fris:getChanges>
        <changesCriteria>
            <crit:dataProviders negated="?">
                <crit:identifier>KULeuven</crit:identifier>
            </crit:dataProviders>
        </changesCriteria>
    </fris:getChanges>
</soapenv:Body>
</soapenv:Envelope>

```

Sample response for one creation in a Journal :

```

<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
    <soap:Body>
        <fris:getChangesResponse xmlns:crit="http://fris.ewi.be/criteria"
            xmlns:resp="http://fris.ewi.be/response"
            xmlns:fris="http://fris.ewi.be/">
            <resp:changesResponse resumptionToken="76692931">
                <fris:change id="76660514">
                    <fris:occurredOn>2016-06-
10T07:35:21.212Z</fris:occurredOn>
                    <fris:changeType>CREATE</fris:changeType>
                    <fris:entityType>JOURNAL</fris:entityType>
                    <fris:identifier>0aa7603b-defd-4633-8d5d-
4b08652ad6c9</fris:identifier>
                    <fris:dataProvider>test_NA1</fris:dataProvider>
                </fris:change>
            </resp:changesResponse>
        </fris:getChangesResponse>
    </soap:Body>
</soap:Envelope>

```

6 Organisation service

The FRIS R4 SOAP Organisation Services is responsible for exposing public organisation data from the FRIS system. The organisation service is publicly accessible and will not expose any entities that have not been marked as public or any relations to such entities.

The FRIS organisation service supports the FastInfoSet XML protocol and it is strongly recommended that this be used due to its superior performance characteristics.

6.1 Current service status

The organisation service is currently available at:

| Environment | Response | Endpoint WSDL |
|-------------|----------|---|
| Staging | CERIF | https://stfrisr4.researchportal.be/ws/OrganisationService?wsdl |
| Staging | FRIS XML | https://stfrisr4.researchportal.be/ws/OrganisationServiceFRIS?wsdl |
| Production | CERIF | https://frisr4.researchportal.be/ws/OrganisationService?wsdl |
| Production | FRIS XML | https://frisr4.researchportal.be/ws/OrganisationServiceFRIS?wsdl |

6.2 Service operations

Both versions have identical operations and request documents.

| Operation | Input | Output |
|--|---|---|
| getOrganisations | getOrganisations | getOrganisationsResponse |
| getOrderings | getOrderings | getOrderingsResponse |
| getDataProviders | getDataProviders | getDataProvidersResponse |
| getOrganisationTypeClassifications | getOrganisationTypeClassifications | getOrganisationTypeClassificationsResponse |
| getOrganisationActivityTypeClassifications | getOrganisationActivityTypeClassifications | getOrganisationActivityTypeClassificationsResponse |
| getAuthorityClassifications | getAuthorityClassifications | getAuthorityClassificationsResponse |
| getDisciplineClassifications | getDisciplineClassifications | getDisciplineClassificationsResponse |
| getElectronicAddressTypeClassifications | getElectronicAddressTypeClassifications | getElectronicAddressTypeClassificationsResponse |
| getPhysicalAddressCountryClassifications | getPhysicalAddressCountryClassifications | getPhysicalAddressCountryClassificationsResponse |
| getSubjectAreaClassifications | getSubjectAreaClassifications | getSubjectAreaClassificationsResponse |
| getFlemishResearchDisciplineClassifications | getFlemishResearchDisciplineClassifications | getFlemishResearchDisciplineClassificationsResponse |

The formal format specification is published as a part of the WSDL.

All other operations than "getOrganisations" will not be described in detail since they're trivial helper operations that do not accept any parameters.

6.2.1 Operation: getOrganisations request documentation

The getOrganisations operation retrieves organisations in the FRIS data set based on the supplied request criteria. The following tables will detail the parameters of the request document. An organisation must satisfy all specified limits to be returned, though if a single limit supports multiple values any match will satisfy that particular limit.

| Element path | Type | Notes |
|----------------------------------|--------------------|--|
| window/pageSize | int | The number of results returned, defaults to 10. |
| window/pageNumber | int | The zero-indexed page number, defaults to 0. |
| window/orderings/order | order | A number of orderings. |
| window/orderings/order/id | string | The ordering id. The getOrderings operation provides the valid order id values. |
| window/orderings/order/locale | locale | The ordering locale, only applicable for order on localised entity properties, like organisation title. Only "nl_BE" and "en_GB" values are allowed. |
| window/orderings/order/direction | enumeration | The order direction, either "ASCENDING" or "DESCENDING", defaults to "ASCENDING". |
| search.search | string | Free text search, accepts Lucene query syntax. Will search in Organisation name, acronym, data provider id and sources. |
| search.locale | locale | Optional locale, if no valid locale is supplied all localisations will be searched. |
| state | enumeration | Not applicable in the web service interface. |
| uuids | identifierList | A list of FRIS Organisation UUID values. Can be negated. |
| sources | sourceList | A number of authority/identifier limits against the entity external identifiers. The getAuthorityClassifications operation provides the valid authority values. |
| dataProviders | identifierList | A list of data provider names. Can be negated. The getDataProviders operation provides the valid data provider values. |
| dataProviderIds | identifierList | A list of data provider identifiers. Can be negated. |
| lastModifiedDate | Date | A start and end date can be given. |
| external | Boolean | Filtering on internal or external organisations. |
| name | textSearchCriteria | Free text search in the Organisation name property. |

| | | |
|---|------------------------|---|
| acronym | string | Exact match on one of the organisation acronyms. |
| associatedOrganisations | identifierList | A list of related FRIS Organisation UUID's. Can be negated. |
| typeClassification | classificationCriteria | <p>One or more Organisation type terms. Scheme id is optional. Can be hierarchical.</p> <p>The getOrganisationTypeClassifications operation provides the valid type values.</p> |
| activityTypeClassification | classificationCriteria | <p>One or more Organisation Activity type terms. Scheme id is optional. Can be hierarchical.</p> <p>The getOrganisationActivityTypeClassifications operation provides the valid type values.</p> |
| discipline | classificationCriteria | <p>One or more discipline terms. Scheme id is optional. Can be hierarchical.</p> <p>The getDisciplineClassifications operation provides the valid discipline values.</p> |
| subjectArea | classificationCriteria | <p>One or more subject area terms. Scheme id is optional. Can be hierarchical.</p> <p>The getSubjectAreaClassifications operation provides the valid subject area values.</p> |
| classified | classificationCriteria | <p>One or more generic terms. Scheme id is required. Currently NACE classifications are supported.</p> |
| electronicAddress/value | string | The exact electronic address value. |
| electronicAddress/ electronicAddressType | classificationCriteria | <p>One or more electronic address type terms. Scheme id is optional. Can be hierarchical.</p> <p>The getElectronicAddressTypeClassifications operation provides the valid electronic address type values.</p> |
| physicalAddress/address | string | The exact street & building number. |
| physicalAddress/city | string | The exact city. |
| physicalAddress/country | classificationCriteria | <p>One or more country terms. Scheme id is optional.</p> <p>The getPhysicalAddressCountryClassifications operation provides the valid electronic address type values.</p> |
| keyword | textSearchCriteria | Free text search in the Organisation keywords property. |
| showPersonAssociations | Boolean | Shows association with persons. |

6.2.2 Operation: getOrganisations CERIF response documentation

The CERIF XML query response document will contain the following elements:

| Element path | Type | Notes |
|---------------------------------|-------|--|
| queryResult/totalResults | int | The total number of matching entities. |
| queryResult/pageSize | int | The requested page size. |
| queryResult/pageNumber | int | The requested zero-indexed page number. |
| queryResult/cerif | CERIF | The requested window of matching entities represented as CERIF elements. |

The organisation CERIF XML representation is documented in the “Integration Guide FRIS R4” document.

An empty request :

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
    <soapenv:Header/>
    <soapenv:Body>
        <fris:getOrganisations>
            <!--Optional:-->
            <crit:organisationCriteria>
                <!--Optional:-->
                <crit>window>
                    <crit:pageSize>?</crit:pageSize>
                    <crit:pageNumber>?</crit:pageNumber>
                    <crit:orderings>
                        <!--1 or more repetitions:-->
                        <crit:order>
                            <crit:id>?</crit:id>
                            <crit:locale>?</crit:locale>
                            <crit:direction>?</crit:direction>
                        </crit:order>
                    </crit:orderings>
                </crit>window>
            <!--Optional:-->
            <crit:search>
                <crit:search>?</crit:search>
                <!--Optional:-->
                <crit:locale>?</crit:locale>
            </crit:search>
            <!--Optional:-->
            <crit:state>?</crit:state>
            <!--Optional:-->
            <crit:uids negated="false">
                <!--1 or more repetitions:-->
                <crit:identifier>?</crit:identifier>
            </crit:uids>
            <!--Optional:-->
            <crit:sources>
                <!--1 or more repetitions:-->
                <crit:source>
                    <!--Optional:-->
                    <crit:authority>?</crit:authority>
                    <!--Optional:-->
                    <crit:identifier>?</crit:identifier>
                </crit:source>
            </crit:sources>
            <!--Optional:-->
            <crit:dataProvider negated="false">
                <!--1 or more repetitions:-->
                <crit:identifier>?</crit:identifier>
            </crit:dataProvider>
        </fris:getOrganisations>
    </soapenv:Body>
</soapenv:Envelope>
```

```

</crit:dataProviders>
<!--Optional:-->
<crit:dataProviderIds negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier?></crit:identifier>
</crit:dataProviderIds>
<!--Optional:-->
<crit:lastModifiedDate>
    <!--Optional:-->
    <crit:start inclusive="false"?></crit:start>
    <!--Optional:-->
    <crit:end inclusive="false"?></crit:end>
</crit:lastModifiedDate>
<!--Optional:-->
<crit:external>?</crit:external>
<!--Optional:-->
<crit:name>
    <crit:search?></crit:search>
    <!--Optional:-->
    <crit:locale?></crit:locale>
</crit:name>
<!--Zero or more repetitions:-->
<crit:acronym?></crit:acronym>
<!--Optional:-->
<crit:associatedOrganisations negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier?></crit:identifier>
</crit:associatedOrganisations>
<!--Optional:-->
<crit:typeClassification>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:typeClassification>
<!--Optional:-->
<crit:activityTypeClassification>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:activityTypeClassification>
<!--Optional:-->
<crit:discipline>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:discipline>
<!--Optional:-->
<crit:subjectArea>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:subjectArea>
<!--Optional:-->
<crit:classified>

```

```

<!--1 or more repetitions:-->
<crit:term>?</crit:term>
<!--Optional:-->
<crit:schemeId>?</crit:schemeId>
<!--Optional:-->
<crit:hierarchical>false</crit:hierarchical>
<!--Optional:-->
<crit:empty>false</crit:empty>
</crit:classified>
<!--Optional:-->
<crit:electronicAddress>
  <!--Optional:-->
  <crit:value>?</crit:value>
  <!--Optional:-->
<crit:electronicAddressType>
  <!--1 or more repetitions:-->
  <crit:term>?</crit:term>
  <!--Optional:-->
  <crit:schemeId>?</crit:schemeId>
  <!--Optional:-->
  <crit:hierarchical>false</crit:hierarchical>
  <!--Optional:-->
  <crit:empty>false</crit:empty>
</crit:electronicAddressType>
</crit:electronicAddress>
<!--Optional:-->
<crit:physicalAddress>
  <!--Optional:-->
  <crit:address>?</crit:address>
  <!--Optional:-->
  <crit:city>?</crit:city>
  <!--Optional:-->
<crit:country>
  <!--1 or more repetitions:-->
  <crit:term>?</crit:term>
  <!--Optional:-->
  <crit:schemeId>?</crit:schemeId>
  <!--Optional:-->
  <crit:hierarchical>false</crit:hierarchical>
  <!--Optional:-->
  <crit:empty>false</crit:empty>
</crit:country>
</crit:physicalAddress>
<!--Optional:-->
<crit:keyword>
  <crit:search>?</crit:search>
  <!--Optional:-->
  <crit:locale>?</crit:locale>
</crit:keyword>
<!--Optional:-->
<crit:showPersonAssociations>?</crit:showPersonAssociations>
</crit:organisationCriteria>
</fris:getOrganisations>
</soapenv:Body>
</soapenv:Envelope>

```

6.2.3 Operation: getOrganisations FRIS XML response documentation

The FRIS XML query response document will contain the following elements:

| Element path | Type | Notes |
|----------------------------------|------|---|
| queryResult/@totalResults | int | The total number of matching entities. |
| queryResult/@pageSize | int | The requested page size. |
| queryResult/@pageNumber | int | The requested zero-indexed page number. |

| | | |
|---------------------------------|----------|---|
| queryResult/organisation | FRIS XML | The requested window of matching entities represented as FRIS XML elements. |
|---------------------------------|----------|---|

The FRIS XML format is documented in chapter 15.3. Empty request to consult organisations:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
    <soapenv:Header/>
    <soapenv:Body>
        <fris:getOrganisations>
            <!--Optional:-->
            <criteria>
                <!--Optional:-->
                <crit:window>
                    <crit:pageSize?></crit:pageSize>
                    <crit:pageNumber?></crit:pageNumber>
                    <crit:orderings>
                        <!--1 or more repetitions:-->
                        <crit:order>
                            <crit:id?></crit:id>
                            <crit:locale?></crit:locale>
                            <crit:direction?></crit:direction>
                        </crit:order>
                    </crit:orderings>
                </crit:window>
            <!--Optional:-->
            <crit:search>
                <crit:search?></crit:search>
                <!--Optional:-->
                <crit:locale?></crit:locale>
            </crit:search>
            <!--Optional:-->
            <crit:state?></crit:state>
            <!--Optional:-->
            <crit:uids negated="?">
                <!--1 or more repetitions:-->
                <crit:identifier?></crit:identifier>
            </crit:uids>
            <!--Optional:-->
            <crit:sources>
                <!--1 or more repetitions:-->
                <crit:source>
                    <!--Optional:-->
                    <crit:authority?></crit:authority>
                    <!--Optional:-->
                    <crit:identifier?></crit:identifier>
                </crit:source>
            </crit:sources>
            <!--Optional:-->
            <crit:dataProviders negated="?">
                <!--1 or more repetitions:-->
                <crit:identifier?></crit:identifier>
            </crit:dataProviders>
            <!--Optional:-->
            <crit:dataProviderIds negated="?">
                <!--1 or more repetitions:-->
                <crit:identifier?></crit:identifier>
            </crit:dataProviderIds>
            <!--Optional:-->
            <crit:lastModifiedDate>
                <!--Optional:-->
                <crit:start inclusive="?"></crit:start>
                <!--Optional:-->
                <crit:end inclusive="?"></crit:end>
            </crit:lastModifiedDate>
            <!--Optional:-->
            <crit:external?></crit:external>
            <!--Optional:-->
            <crit:name>
                <crit:search?></crit:search>

```

```

        <!--Optional:-->
        <crit:locale?></crit:locale>
</crit:name>
<!--Zero or more repetitions:-->
<crit:acronym?></crit:acronym>
<!--Optional:-->
<crit:associatedOrganisations negated="?">
    <!--1 or more repetitions:-->
    <crit:identifier?></crit:identifier>
</crit:associatedOrganisations>
<!--Optional:-->
<crit:typeClassification>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
</crit:typeClassification>
<!--Optional:-->
<crit:activityTypeClassification>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
</crit:activityTypeClassification>
<!--Optional:-->
<crit:discipline>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
</crit:discipline>
<!--Optional:-->
<crit:classified>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
</crit:classified>
<!--Optional:-->
<crit:electronicAddress>
    <!--Optional:-->
    <crit:value?></crit:value>
    <!--Optional:-->
    <crit:electronicAddressType>
        <!--1 or more repetitions:-->
        <crit:term?></crit:term>
        <!--Optional:-->
        <crit:schemeId?></crit:schemeId>
        <!--Optional:-->
        <crit:hierarchical>false</crit:hierarchical>
    </crit:electronicAddressType>
</crit:electronicAddress>
<!--Optional:-->
<crit:physicalAddress>
    <!--Optional:-->
    <crit:address?></crit:address>
    <!--Optional:-->
    <crit:city?></crit:city>
    <!--Optional:-->
    <crit:country>
        <!--1 or more repetitions:-->
        <crit:term?></crit:term>
        <!--Optional:-->
        <crit:schemeId?></crit:schemeId>
        <!--Optional:-->
        <crit:hierarchical>false</crit:hierarchical>

```

```

        </crit:country>
    </crit:physicalAddress>
    <!--Optional:-->
    <crit:keyword>
        <crit:search>?</crit:search>
        <!--Optional:-->
        <crit:locale>?</crit:locale>
    </crit:keyword>
    <!--Optional:-->
    <crit:subjectArea>
        <!--1 or more repetitions:-->
        <crit:term>?</crit:term>
        <!--Optional:-->
        <crit:schemeId>?</crit:schemeId>
        <!--Optional:-->
        <crit:hierarchical>false</crit:hierarchical>
    </crit:subjectArea>
    <!--Optional:-->
    <crit:showPersonAssociations>?</crit:showPersonAssociations>
</crit:criteria>
</fris:getOrganisations>
</soapenv:Body>
</soapenv:Envelope>

```

Sample request to get this information:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
    <soapenv:Header/>
    <soapenv:Body>
        <fris:getOrganisations>
            <crit:criteria>
                <crit:uuids negated="false">
                    <crit:identifier>c665a2a0-ecab-42f2-91f0-09aca788bd01</crit:identifier>
                </crit:uuids>
            </crit:criteria>
        </fris:getOrganisations>
    </soapenv:Body>
</soapenv:Envelope>

```

7 Person service

The FRIS R4 SOAP Person Service is responsible for exposing public person data from the FRIS system. The person service is publicly accessible and will not expose any entities that have not been marked as public or any relations to such entities.

The FRIS person service supports the FastInfoSet XML protocol and it is strongly recommended that this be used due to its superior performance characteristics.

7.1 Current service status

The person service is currently available at:

| Environment | Response | Endpoint WSDL |
|-------------|----------|---|
| Staging | CERIF | https://stfrisr4.researchportal.be/ws/PersonService?wsdl |
| Staging | FRIS XML | https://stfrisr4.researchportal.be/ws/PersonServiceFRIS?wsdl |
| Production | CERIF | https://frisr4.researchportal.be/ws/PersonService?wsdl |
| Production | FRIS XML | https://frisr4.researchportal.be/ws/PersonServiceFRIS?wsdl |

7.2 Service operations

Both versions have identical operations and request documents.

| Operation | Input | Output |
|--|---|--|
| getPersons | getPersons | getPersonsResponse |
| getOrderings | getOrderings | getOrderingsResponse |
| getDataProviders | getDataProviders | getDataProvidersResponse |
| getAuthorityClassifications | getAuthorityClassifications | getAuthorityClassificationsResponse |
| getScienceDomainClassifications | getScienceDomainClassifications | getScienceDomainClassificationResponse |
| getElectronicAddressTypeClassifications | getElectronicAddressTypeClassifications | getElectronicAddressTypeClassificationsResponse |
| getPhysicalAddressCountryClassifications | getPhysicalAddressCountryClassifications | getPhysicalAddressCountryClassificationsResponse |
| getSubjectAreaClassifications | getSubjectAreaClassifications | getSubjectAreaClassificationsResponse |
| getFlemishResearchDisciplineClassifications | getFlemishResearchDisciplineClassifications | getFlemishResearchDisciplineClassifications |

The formal format specification is published as a part of the WSDL.

All other operations than "getPersons" will not be described in detail since they're trivial helper operations that do not accept any parameters.

7.2.1 Operation: getPersons request

The getPersons operation retrieves persons in the FRIS data set based on the supplied request criteria. The following tables will detail the parameters of the request document. A person must satisfy all specified limits to be returned, though if a single limit supports multiple values any match will satisfy that particular limit.

| Element path | Type | Notes |
|--------------|------|-------|
|--------------|------|-------|

| | | |
|---|--------------------|--|
| window/pageSize | int | The number of results returned, defaults to 10. |
| window/pageNumber | int | The zero-indexed page number, defaults to 0. |
| window/orderings/order | order | A number of orderings. |
| window/orderings/order/id | string | The ordering id. The getOrderings operation provides the valid order id values. |
| window/orderings/order/locale | locale | The ordering locale. Only applicable for order on localised entity properties, currently no person orderings require a locale. Only "nl_BE" and "en_GB" values are allowed. |
| window/orderings/order/direction | enumeration | The order direction, either "ASCENDING" or "DESCENDING", defaults to "ASCENDING". |
| search.search | string | Free text search, accepts Lucene query syntax. Will search in Person name, data provider id and sources. |
| search.locale | locale | Optional locale, if no valid locale is supplied all localisations will be searched. |
| state | enumeration | Not applicable in the web service interface. |
| uuids | identifierList | A list of FRIS Person UUID values. Can be negated. |
| sources | sourceList | A number of authority/identifier limits against the entity external identifiers. The getAuthorityClassifications operation provides the valid authority values. |
| dataProviders | identifierList | A list of data provider names. Can be negated. The getDataProviders operation provides the valid data provider values. |
| dataProviderIds | identifierList | A list of data provider identifiers. Can be negated. |
| lastModifiedDate | Date | A start and end date can be given for filtering. |
| external | Boolean | Filtering on internal or external persons. |
| name | textSearchCriteria | Free text search in the Person name property. |

| | | |
|---|------------------------|--|
| gender | enumeration | Person gender. Note that not all data providers supply gender information, in which case it is set to "UNKNOWN". Can be either of "FEMALE", "MALE" or "UNKNOWN". |
| associatedOrganisations | identifierList | A list of related FRIS Organisation UUID's. Can be negated. |
| associatedPersons | identifierList | A list of related FRIS Person UUID's. Can be negated. |
| electronicAddress/value | string | The exact electronic address value. |
| electronicAddress/ electronicAddressType | classificationCriteria | One or more electronic address type terms. Scheme id is optional. Can be hierarchical. The getElectronicAddressTypeClassifications operation provides the valid electronic address type values. |
| physicalAddress/address | string | The exact street & building number. |
| physicalAddress/city | string | The exact city. |
| physicalAddress/country | classificationCriteria | One or more country terms. Scheme id is optional. The getPhysicalAddressCountryClassifications operation provides the valid electronic address type values. |
| keyword | textSearchCriteria | Free text search in the Person keywords property. |
| classified | classificationCriteria | One or more generic terms. Scheme id is required. Currently there are no supported person classifications for this property. |
| scienceDomain | classificationCriteria | One or more science domain terms. Scheme id is optional. Can be hierarchical. The getScienceDomainClassifications operation provides the valid science domain values. |
| subjectArea | classificationCriteria | One or more subject area terms. Scheme id is optional. Can be hierarchical. The getSubjectAreaClassifications operation provides the valid subject area values. |

7.2.2 Operation: **getPersons CERIF response documentation**

The CERIF XML query response document will contain the following elements:

| Element path | Type | Notes |
|---------------------------------|-------|--|
| queryResult/totalResults | int | The total number of matching entities. |
| queryResult/pageSize | int | The requested page size. |
| queryResult/pageNumber | int | The requested zero-indexed page number. |
| queryResult/cerif | CERIF | The requested window of matching entities represented as CERIF elements. |

The person CERIF XML representation is documented in the “Integration Guide FRIS R4” document.

An empty request to retrieve a person:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" 
  xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
  <soapenv:Header/>
  <soapenv:Body>
    <fris:getPersons>
      <!--Optional:-->
      <crit:personCriteria>
        <!--Optional:-->
        <crit>window>
          <crit:pageSize?></crit:pageSize>
          <crit:pageNumber?></crit:pageNumber>
          <crit:orderings>
            <!--1 or more repetitions:-->
            <crit:order>
              <crit:id?></crit:id>
              <crit:locale?></crit:locale>
              <crit:direction?></crit:direction>
            </crit:order>
          </crit:orderings>
        </crit>window>
        <!--Optional:-->
        <crit:search>
          <crit:search?></crit:search>
          <!--Optional:-->
          <crit:locale?></crit:locale>
        </crit:search>
        <!--Optional:-->
        <crit:state?></crit:state>
        <!--Optional:-->
        <crit:uuids negated="false">
          <!--1 or more repetitions:-->
          <crit:identifier?></crit:identifier>
        </crit:uuids>
        <!--Optional:-->
        <crit:sources>
          <!--1 or more repetitions:-->
          <crit:source>
            <!--Optional:-->
            <crit:authority?></crit:authority>
            <!--Optional:-->
            <crit:identifier?></crit:identifier>
          </crit:source>
        </crit:sources>
        <!--Optional:-->
        <crit:dataProvider negated="false">
          <!--1 or more repetitions:-->
          <crit:identifier?></crit:identifier>
        </crit:dataProvider>
        <!--Optional:-->
        <crit:dataProviderIds negated="false">
          <!--1 or more repetitions:-->
          <crit:identifier?></crit:identifier>
        </crit:dataProviderIds>
    </fris:getPersons>
  </soapenv:Body>
</soapenv:Envelope>
```

```

<!--Optional:-->
<crit:lastModifiedDate>
    <!--Optional:-->
    <crit:start inclusive="false">?</crit:start>
    <!--Optional:-->
    <crit:end inclusive="false">?</crit:end>
</crit:lastModifiedDate>
<!--Optional:-->
<crit:external>?</crit:external>
<!--Optional:-->
<crit:name>
    <crit:search>?</crit:search>
    <!--Optional:-->
    <crit:locale>?</crit:locale>
</crit:name>
<!--Optional:-->
<crit:gender>?</crit:gender>
<!--Optional:-->
<crit:associatedOrganisations negated="false" hierarchical="false">
    <!--1 or more repetitions:-->
    <crit:identifier>?</crit:identifier>
</crit:associatedOrganisations>
<!--Optional:-->
<crit:associatedPersons negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier>?</crit:identifier>
</crit:associatedPersons>
<!--Optional:-->
<crit:electronicAddress>
    <!--Optional:-->
    <crit:value>?</crit:value>
    <!--Optional:-->
    <crit:electronicAddressType>
        <!--1 or more repetitions:-->
        <crit:term>?</crit:term>
        <!--Optional:-->
        <crit:schemeId>?</crit:schemeId>
        <!--Optional:-->
        <crit:hierarchical>false</crit:hierarchical>
        <!--Optional:-->
        <crit:empty>false</crit:empty>
    </crit:electronicAddressType>
</crit:electronicAddress>
<!--Optional:-->
<crit:physicalAddress>
    <!--Optional:-->
    <crit:address>?</crit:address>
    <!--Optional:-->
    <crit:city>?</crit:city>
    <!--Optional:-->
    <crit:country>
        <!--1 or more repetitions:-->
        <crit:term>?</crit:term>
        <!--Optional:-->
        <crit:schemeId>?</crit:schemeId>
        <!--Optional:-->
        <crit:hierarchical>false</crit:hierarchical>
        <!--Optional:-->
        <crit:empty>false</crit:empty>
    </crit:country>
</crit:physicalAddress>
<!--Optional:-->
<crit:keyword>
    <crit:search>?</crit:search>
    <!--Optional:-->
    <crit:locale>?</crit:locale>
</crit:keyword>
<!--Optional:-->
<crit:classified>
    <!--1 or more repetitions:-->
    <crit:term>?</crit:term>
    <!--Optional:-->
    <crit:schemeId>?</crit:schemeId>
    <!--Optional:-->

```

```

        <crit:hierarchical>false</crit:hierarchical>
        <!--Optional:-->
        <crit:empty>false</crit:empty>
    </crit:classified>
    <!--Optional:-->
    <crit:scienceDomain>
        <!--1 or more repetitions:>
        <crit:term>?</crit:term>
        <!--Optional:-->
        <crit:schemeId>?</crit:schemeId>
        <!--Optional:-->
        <crit:hierarchical>false</crit:hierarchical>
        <!--Optional:-->
        <crit:empty>false</crit:empty>
    </crit:scienceDomain>
    <!--Optional:-->
    <crit:subjectArea>
        <!--1 or more repetitions:>
        <crit:term>?</crit:term>
        <!--Optional:-->
        <crit:schemeId>?</crit:schemeId>
        <!--Optional:-->
        <crit:hierarchical>false</crit:hierarchical>
        <!--Optional:-->
        <crit:empty>false</crit:empty>
    </crit:subjectArea>
    </crit:personCriteria>
</fris:getPersons>
</soapenv:Body>
</soapenv:Envelope>

```

7.2.3 Operation: getPersons FRIS XML response documentation

The FRIS XML query response document will contain the following elements:

| Element path | Type | Notes |
|----------------------------------|----------|---|
| queryResult/@totalResults | int | The total number of matching entities. |
| queryResult/@pageSize | int | The requested page size. |
| queryResult/@pageNumber | int | The requested zero-indexed page number. |
| queryResult/person | FRIS XML | The requested window of matching entities represented as FRIS XML elements. |

The FRIS XML format is documented in chapter 15.4.

Sample request to use for retrieving this information based upon a data provider id of a person:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" 
xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
    <soapenv:Header/>
    <soapenv:Body>
        <fris:getPersons>
            <criteria>
                <crit:dataProviderIds negated="false">
                    <crit:identifier>5b492aeb-aalc-11eb-a94d-4dde4edd5830</crit:identifier>
                </crit:dataProviderIds>
            </criteria>
        </fris:getPersons>
    </soapenv:Body>
</soapenv:Envelope>

```

8 Infrastructure service

The FRIS R4 SOAP Infrastructure Service is responsible for exposing public infrastructure data from the FRIS system. The infrastructure service is publicly accessible and will not expose any entities that have not been marked as public or any relations to such entities.

The FRIS infrastructure service supports the FastInfoSet XML protocol and it is strongly recommended that this be used due to its superior performance characteristics.

8.1 Current service status

The person service is currently available at:

| Environment | Response | Endpoint WSDL |
|-------------|----------|---|
| Staging | CERIF | https://stfrisr4.researchportal.be/ws/InfrastructureService?wsdl |
| Staging | FRIS XML | https://stfrisr4.researchportal.be/ws/InfrastructureServiceFRIS?wsdl |
| Production | CERIF | https://frisr4.researchportal.be/ws/InfrastructureService?wsdl |
| Production | FRIS XML | https://frisr4.researchportal.be/ws/InfrastructureServiceFRIS?wsdl |

8.2 Service operations

Both versions have identical operations and request documents.

| Operation | Input | Output |
|--|---|---|
| getInfrastructures | getInfrastructures | getInfrastructuresResponse |
| getOrderings | getOrderings | getOrderings |
| getDataProviders | getDataProviders | getDataProvidersResponse |
| getAuthorityClassifications | getAuthorityClassifications | getAuthorityClassificationsResponse |
| getInfrastructureTypeClassifications | getInfrastructureTypeClassifications | getInfrastructureTypeClassificationsResponse |
| getTechnologyCodeClassifications | getTechnologyCodeClassifications | getTechnologyCodeClassificationsResponse |
| getFlemishResearchDisciplineClassifications | getFlemishResearchDisciplineClassifications | getFlemishResearchDisciplineClassificationsResponse |

The formal format specification is published as a part of the WSDL.

All other operations than "getInfrastructures" will not be described in detail since they're trivial helper operations that do not accept any parameters.

8.2.1 Operation: getInfrastructures request

The getInfrastructures operation retrieves persons in the FRIS data set based on the supplied request criteria. The following tables will detail the parameters of the request document. An Infrastructure must satisfy all specified limits to be returned, though if a single limit supports multiple values any match will satisfy that particular limit.

| Element path | Type | Notes |
|--------------------------|------|---|
| window/pageSize | int | The number of results returned, defaults to 10. |
| window/pageNumber | int | The zero-indexed page number, defaults to 0. |

| | | |
|---|--------------------|--|
| window/orderings/order | order | A number of orderings. |
| window/orderings/order/id | string | The ordering id. The getOrderings operation provides the valid order id values. |
| window/orderings/order/locale | locale | The ordering locale. Only applicable for order on localised entity properties, currently no person orderings require a locale. Only "nl_BE" and "en_GB" values are allowed. |
| window/orderings/order/direction | enumeration | The order direction, either "ASCENDING" or "DESCENDING", defaults to "ASCENDING". |
| search.search | string | Free text search, accepts Lucene query syntax. Will search in Person name, data provider id and sources. |
| search.locale | locale | Optional locale, if no valid locale is supplied all localisations will be searched. |
| uuids | identifierList | A list of FRIS Person UUID values. Can be negated. |
| sources | sourceList | A number of authority/identifier limits against the entity external identifiers. The getAuthorityClassifications operation provides the valid authority values. |
| dataProviders | identifierList | A list of data provider names. Can be negated. The getDataProviders operation provides the valid data provider values. |
| dataProviderIds | identifierList | A list of data provider identifiers. Can be negated. |
| name | textSearchCriteria | Free text search in the Person name property. |
| associatedOrganisations | identifierList | A list of related FRIS Organisation UUID's. Can be negated. |
| associatedPersons | identifierList | A list of related FRIS Person UUID's. Can be negated. |
| keyword | textSearchCriteria | Free text search in the Person keywords property. |
| | | |
| | | |

8.2.2 Operation: **getInfrastructures CERIF response documentation**

The CERIF XML query response document will contain the following elements:

| Element path | Type | Notes |
|---------------------------------|------|--|
| queryResult/totalResults | int | The total number of matching entities. |

| | | |
|-------------------------------|-------|--|
| queryResult/pageSize | int | The requested page size. |
| queryResult/pageNumber | int | The requested zero-indexed page number. |
| queryResult/cerif | CERIF | The requested window of matching entities represented as CERIF elements. |

The Infrastructure CERIF XML representation is documented in the “Integration Guide FRIS R4” document.

An empty request message:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" 
xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
  <soapenv:Header/>
  <soapenv:Body>
    <fris:getInfrastructures>
      <!--Optional:-->
      <crit:infrastructureCriteria>
        <!--Optional:-->
        <crit>window>
          <crit:pageSize?</crit:pageSize>
          <crit:pageNumber?</crit:pageNumber>
          <crit:orderings>
            <!--1 or more repetitions:-->
            <crit:order>
              <crit:id?</crit:id>
              <crit:locale?</crit:locale>
              <crit:direction?</crit:direction>
            </crit:order>
          </crit:orderings>
        </crit>window>
        <!--Optional:-->
        <crit:search>
          <crit:search?</crit:search>
          <!--Optional:-->
          <crit:locale?</crit:locale>
        </crit:search>
        <!--Optional:-->
        <crit:state?</crit:state>
        <!--Optional:-->
        <crit:uids negated="false">
          <!--1 or more repetitions:-->
          <crit:identifier?</crit:identifier>
        </crit:uids>
        <!--Optional:-->
        <crit:sources>
          <!--1 or more repetitions:-->
          <crit:source>
            <!--Optional:-->
            <crit:authority?</crit:authority>
            <!--Optional:-->
            <crit:identifier?</crit:identifier>
          </crit:source>
        </crit:sources>
        <!--Optional:-->
        <crit:dataProviders negated="false">
          <!--1 or more repetitions:-->
          <crit:identifier?</crit:identifier>
        </crit:dataProviders>
        <!--Optional:-->
        <crit:dataProviderIds negated="false">
          <!--1 or more repetitions:-->
          <crit:identifier?</crit:identifier>
        </crit:dataProviderIds>
        <!--Optional:-->
        <crit:lastModifiedDate>
          <!--Optional:-->
          <crit:start inclusive="false"?</crit:start>

```

```

        <!--Optional:-->
        <crit:end inclusive="false">?</crit:end>
</crit:lastModifiedDate>
<!--Optional:-->
<crit:external>?</crit:external>
<!--Optional:-->
<crit:acronym>?</crit:acronym>
<!--Optional:-->
<crit:isCoordinator>?</crit:isCoordinator>
<!--Optional:-->
<crit:webSite>?</crit:webSite>
<!--Optional:-->
<crit:Resource>?</crit:eResource>
<!--Optional:-->
<crit:name>
    <crit:search>?</crit:search>
    <!--Optional:-->
    <crit:locale>?</crit:locale>
</crit:name>
<!--Optional:-->
<crit:userModalities>
    <crit:search>?</crit:search>
    <!--Optional:-->
    <crit:locale>?</crit:locale>
</crit:userModalities>
<!--Optional:-->
<crit:description>
    <crit:search>?</crit:search>
    <!--Optional:-->
    <crit:locale>?</crit:locale>
</crit:description>
<!--Optional:-->
<crit:keyword>
    <crit:search>?</crit:search>
    <!--Optional:-->
    <crit:locale>?</crit:locale>
</crit:keyword>
<!--Optional:-->
<crit:locationType>
    <!--1 or more repetitions:-->
    <crit:term>?</crit:term>
    <!--Optional:-->
    <crit:schemeId>?</crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:locationType>
<!--Optional:-->
<crit:infrastructureType>
    <!--1 or more repetitions:-->
    <crit:term>?</crit:term>
    <!--Optional:-->
    <crit:schemeId>?</crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:infrastructureType>
<!--Optional:-->
<crit:accessibility>
    <!--1 or more repetitions:-->
    <crit:term>?</crit:term>
    <!--Optional:-->
    <crit:schemeId>?</crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:accessibility>
<!--Optional:-->
<crit:technologyCode>
    <!--1 or more repetitions:-->
    <crit:term>?</crit:term>

```

```

<!--Optional:-->
<crit:schemeId>?</crit:schemeId>
<!--Optional:-->
<crit:hierarchical>false</crit:hierarchical>
<!--Optional:-->
<crit:empty>false</crit:empty>
</crit:technologyCode>
<!--Optional:-->
<crit:flemishDiscipline>
    <!--1 or more repetitions:-->
    <crit:term>?</crit:term>
    <!--Optional:-->
    <crit:schemeId>?</crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:flemishDiscipline>
<!--Optional:-->
<crit:physicalAddress>
    <!--Optional:-->
    <crit:address>?</crit:address>
    <!--Optional:-->
    <crit:city>?</crit:city>
    <!--Optional:-->
    <crit:country>
        <!--1 or more repetitions:-->
        <crit:term>?</crit:term>
        <!--Optional:-->
        <crit:schemeId>?</crit:schemeId>
        <!--Optional:-->
        <crit:hierarchical>false</crit:hierarchical>
        <!--Optional:-->
        <crit:empty>false</crit:empty>
    </crit:country>
</crit:physicalAddress>
<!--Optional:-->
<crit:associatedPersons negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier>?</crit:identifier>
</crit:associatedPersons>
<!--Optional:-->
<crit:associatedOrganisations negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier>?</crit:identifier>
</crit:associatedOrganisations>
<!--Optional:-->
<crit:associatedInfrastructures negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier>?</crit:identifier>
</crit:associatedInfrastructures>
</crit:infrastructureCriteria>
</fris:getInfrastructures>
</soapenv:Body>
</soapenv:Envelope>

```

8.2.3 Operation: getPersons FRIS XML response documentation

The FRIS XML query response document will contain the following elements:

| Element path | Type | Notes |
|-----------------------------------|----------|---|
| queryResult/@totalResults | int | The total number of matching entities. |
| queryResult/@pageSize | int | The requested page size. |
| queryResult/@pageNumber | int | The requested zero-indexed page number. |
| queryResult/infrastructure | FRIS XML | The requested window of matching entities represented as FRIS XML elements. |

The FRIS XML format is documented in chapter 15.4. Sample request for an infrastructure based upon a data provider id:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"  
    xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">  
    <soapenv:Header/>  
    <soapenv:Body>  
        <fris:getInfrastructures>  
            <criteria>  
                <crit:dataProviderIds negated="false">  
                    <crit:identifier>5b492aeb-aalc-11eb-a94d-4dde4edd5830</crit:identifier>  
                </crit:dataProviderIds>  
            </criteria>  
        </fris:getInfrastructures>  
    </soapenv:Body>  
</soapenv:Envelope>
```

9 Project service

The FRIS R4 SOAP Project service is responsible for exposing public project data from the FRIS system. The project service is publicly accessible and will not expose any entities that have not been marked as public or any relations to such entities.

The FRIS project service supports the FastInfoSet XML protocol and it is strongly recommended that this be used due to its superior performance characteristics.

9.1 Current service status

The project service is currently available at:

| Environment | Response | Endpoint WSDL |
|-------------|----------|---|
| Staging | CERIF | https://stfrisr4.researchportal.be/ws/ProjectService?wsdl |
| Staging | FRIS XML | https://stfrisr4.researchportal.be/ws/ProjectServiceFRIS?wsdl |
| Production | CERIF | https://frisr4.researchportal.be/ws/ProjectService?wsdl |
| Production | FRIS XML | https://frisr4.researchportal.be/ws/ProjectServiceFRIS?wsdl |

9.2 Service operations

Both versions have identical operations and request documents.

| Operation | Input | Output |
|--|---|---|
| getProjects | getProjects | getProjectsResponse |
| getOrderings | getOrderings | getOrderings |
| getDataProviders | getDataProviders | getDataProvidersResponse |
| getAuthorityClassifications | getAuthorityClassifications | getAuthorityClassificationsResponse |
| getProjectTypeClassifications | getProjectTypeClassifications | getProjectTypeClassificationsResponse |
| getScienceDomainClassifications | getScienceDomainClassifications | getScienceDomainClassificationsResponse |
| getDisciplineClassifications | getDisciplineClassifications | getDisciplineClassificationsResponse |
| getApplicationCodeClassifications | getApplicationCodeClassifications | getApplicationCodeClassificationsResponse |
| getTechnologyCodeclassifications | getTechnologyCodeclassifications | getTechnologyCodeclassificationsResponse |
| getFundingCodeClassifications | getFundingCodeClassifications | getFundingCodeClassificationsResponse |
| getSubjectAreaClassifications | getSubjectAreaClassifications | getSubjectAreaClassificationsResponse |
| getFlemishResearchDisciplineClassifications | getFlemishResearchDisciplineClassifications | getFlemishResearchDisciplineClassificationsResponse |

The formal format specification is published as a part of the WSDL.

All other operations than "getProjects" will not be described in detail since they're trivial helper operations that do not accept any parameters.

9.2.1 Operation: getProjects

The getProjects operation retrieves projects in the FRIS data set based on the supplied request criteria. The following tables will detail the parameters of the request document. A project must satisfy all specified limits to be returned, though if a single limit supports multiple values any match will satisfy that particular limit.

| Element path | Type | Notes |
|----------------------------------|----------------|--|
| window/pageSize | int | The number of results returned, defaults to 10. |
| window/pageNumber | int | The zero-indexed page number, defaults to 0. |
| window/orderings/order | order | A number of orderings. |
| window/orderings/order/id | string | The ordering id. The getOrderings operation provides the valid order id values. |
| window/orderings/order/locale | locale | The ordering locale. Only applicable for order on localised entity properties, currently only the "project.name" ordering requires a locale. Only "nl_BE" and "en_GB" values are allowed. |
| window/orderings/order/direction | enumeration | The order direction, either "ASCENDING" or "DESCENDING", defaults to "ASCENDING". |
| search.search | string | Free text search, accepts Lucene query syntax. Will search in Project name, data provider id and sources. |
| search.locale | locale | Optional locale, if no valid locale is supplied all localisations will be searched. |
| state | enumeration | Not applicable in the web service interface. |
| uuids | identifierList | A list of FRIS Project UUID values. Can be negated. |
| sources | sourceList | A number of authority/identifier limits against the entity external identifiers. The getAuthorityClassifications operation provides the valid authority values. |
| dataProviders | identifierList | A list of data provider names. Can be negated. The getDataProviders operation provides the valid data provider values. |
| dataProviderIds | identifierList | A list of data provider identifiers. Can be negated. |
| lastModifiedDate | Date | A start and end date can be given for filtering. |

| | | |
|--------------------------------|------------------------|--|
| external | Boolean | Filtering on internal or external persons. |
| name | textSearchCriteria | Free text search in the Project name property. |
| acronym | string | The exact project acronym. |
| typeClassification | classificationCriteria | <p>One or more Organisation type terms. Scheme id is optional. Can be hierarchical.</p> <p>The <code>getOrganisationTypeClassifications</code> operation provides the valid type values.</p> |
| associatedOrganisations | identifierList | A list of related FRIS Organisation UUID's. Can be negated. |
| associatedPersons | identifierList | A list of related FRIS Person UUID's, will match against both external and internal person associations. Can be negated. |
| associatedProjects | identifierList | A list of related FRIS Project UUID's. Can be negated. |
| keyword | textSearchCriteria | Free text search in the Project keywords property. |
| discipline | classificationCriteria | <p>One or more discipline terms. Scheme id is optional. Can be hierarchical.</p> <p>The <code>getDisciplineClassifications</code> operation provides the valid discipline values.</p> |
| applicationCode | classificationCriteria | <p>One or more application codes. Scheme id is optional. Can be hierarchical.</p> <p>The <code>getApplicationCodeClassifications</code> operation provides the valid application codes.</p> |
| technologyCode | classificationCriteria | <p>One or more technology codes. Scheme id is optional.</p> <p>The <code>getTechnologyCodeClassifications</code> operation provides the valid technology codes.</p> |
| fundingCode | classificationCriteria | <p>One or more funding code terms. Scheme id is optional. Can be hierarchical.</p> <p>The <code>getFundingCodeClassifications</code> operation provides the valid funding code values.</p> |

| | | |
|---------------------------|------------------------|--|
| fundingIdentifiers | sourceList | One or more sources can be added. A source will consist of an authority and an identifier. |
| subjectArea | classificationCriteria | One or more subject area terms. Scheme id is optional. Can be hierarchical. The getSubjectAreaClassifications operation provides the valid subject area values. |

9.2.2 Operation: getProjects CERIF response documentation

The CERIF XML query response document will contain the following elements:

| Element path | Type | Notes |
|---------------------------------|-------|--|
| queryResult/totalResults | int | The total number of matching entities. |
| queryResult/pageSize | int | The requested page size. |
| queryResult/pageNumber | int | The requested zero-indexed page number. |
| queryResult/cerif | CERIF | The requested window of matching entities represented as CERIF elements. |

The project CERIF XML representation is documented in the “Integration Guide FRIS R4” document.

An empty request message:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" 
xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
    <soapenv:Header>
    <soapenv:Body>
        <fris:getProjects>
            <!--Optional:-->
            <crit:projectCriteria>
                <!--Optional:-->
                <crit>window>
                    <crit:pageSize?></crit:pageSize>
                    <crit:pageNumber?></crit:pageNumber>
                    <crit:orderings>
                        <!--1 or more repetitions:-->
                        <crit:order>
                            <crit:id?></crit:id>
                            <crit:locale?></crit:locale>
                            <crit:direction?></crit:direction>
                        </crit:order>
                    </crit:orderings>
                </crit>window>
            <!--Optional:-->
            <crit:search>
                <crit:search?></crit:search>
            <!--Optional:-->
            <crit:locale?></crit:locale>
        </crit:search>
        <!--Optional:-->
        <crit:state?></crit:state>
        <!--Optional:-->
        <crit:uuids negated="false">
            <!--1 or more repetitions:-->
            <crit:identifier?></crit:identifier>
        </crit:uuids>
    </fris:getProjects>
</soapenv:Body>
</soapenv:Envelope>
```

```

<!--Optional:-->
<crit:sources>
    <!--1 or more repetitions:-->
    <crit:source>
        <!--Optional:-->
        <crit:authority?></crit:authority>
        <!--Optional:-->
        <crit:identifier?></crit:identifier>
    </crit:source>
</crit:sources>
<!--Optional:-->
<crit:dataProviders negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier?></crit:identifier>
</crit:dataProviders>
<!--Optional:-->
<crit:dataProviderIds negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier?></crit:identifier>
</crit:dataProviderIds>
<!--Optional:-->
<crit:lastModifiedDate>
    <!--Optional:-->
    <crit:start inclusive="false"?></crit:start>
    <!--Optional:-->
    <crit:end inclusive="false"?></crit:end>
</crit:lastModifiedDate>
<!--Optional:-->
<crit:external?></crit:external>
<!--Optional:-->
<crit:name>
    <crit:search?></crit:search>
    <!--Optional:-->
    <crit:locale?></crit:locale>
</crit:name>
<!--Optional:-->
<crit:acronym?></crit:acronym>
<!--Optional:-->
<crit:typeClassification>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:typeClassification>
<!--Optional:-->
<crit:associatedOrganisations negated="false" hierarchical="false">
    <!--1 or more repetitions:-->
    <crit:identifier?></crit:identifier>
</crit:associatedOrganisations>
<!--Optional:-->
<crit:associatedPersons negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier?></crit:identifier>
</crit:associatedPersons>
<!--Optional:-->
<crit:associatedProjects negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier?></crit:identifier>
</crit:associatedProjects>
<!--Optional:-->
<crit:keyword>
    <crit:search?></crit:search>
    <!--Optional:-->
    <crit:locale?></crit:locale>
</crit:keyword>
<!--Optional:-->
<crit:discipline>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->

```

```

<crit:schemeId?></crit:schemeId>
<!--Optional:-->
<crit:hierarchical>false</crit:hierarchical>
<!--Optional:-->
<crit:empty>false</crit:empty>
</crit:discipline>
<!--Optional:-->
<crit:applicationCode>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:applicationCode>
<!--Optional:-->
<crit:technologyCode>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:technologyCode>
<!--Optional:-->
<crit:fundingCode>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:fundingCode>
<!--Optional:-->
<crit:fundingIdentifiers>
    <!--1 or more repetitions:-->
    <crit:source>
        <!--Optional:-->
        <crit:authority?></crit:authority>
        <!--Optional:-->
        <crit:identifier?></crit:identifier>
    </crit:source>
</crit:fundingIdentifiers>
<!--Optional:-->
<crit:subjectArea>
    <!--1 or more repetitions:-->
    <crit:term?></crit:term>
    <!--Optional:-->
    <crit:schemeId?></crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:subjectArea>
</crit:projectCriteria>
</fris:getProjects>
</soapenv:Body>
</soapenv:Envelope>

```

9.2.3 Operation: getProjects FRIS XML response documentation

The FRIS XML query response document will contain the following elements:

| Element path | Type | Notes |
|--|------|--|
| <code>queryResult/@totalResults</code> | int | The total number of matching entities. |

| | | |
|--------------------------------|----------|---|
| queryResult/@pageSize | int | The requested page size. |
| queryResult/@pageNumber | int | The requested zero-indexed page number. |
| queryResult/project | FRIS XML | The requested window of matching entities represented as FRIS XML elements. |

The FRIS XML format is documented in chapter 15.6. Sample request:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
    <soapenv:Header/>
    <soapenv:Body>
        <fris:getProjects>
            <crit:projectCriteria>
                <crit:window>
                    <crit:pageSize>10</crit:pageSize>
                    <crit:pageNumber>0</crit:pageNumber>
                </crit:window>
                <crit:uids negated="false">
                    <crit:identifier>3fc081b5-eca8-4f46-9265-5b865c8aa31b</crit:identifier>
                </crit:uids>
            </crit:projectCriteria>
        </fris:getProjects>
    </soapenv:Body>
</soapenv:Envelope>

```

10 Research output service

The FRIS R4 SOAP Research output service is responsible for exposing public research output data from the FRIS system. The research output service is publicly accessible and will not expose any entities that have not been marked as public or any relations to such entities.

The research output service also returns patents through SOAP-xml. If only patents are required, a filter can be applied.

The FRIS research output service supports the FastInfoSet XML protocol and it is strongly recommended that this be used due to its superior performance characteristics.

10.1 Current service status

The project service is currently available at:

| Environment | Response | Endpoint WSDL |
|-------------|----------|---|
| Staging | CERIF | https://stfrisr4.researchportal.be/ws/ResearchOutputService?wsdl |
| Staging | FRIS XML | https://stfrisr4.researchportal.be/ws/ResearchOutputServiceFRIS?wsdl |
| Production | CERIF | https://frisr4.researchportal.be/ws/ResearchOutputService?wsdl |
| Production | FRIS XML | https://frisr4.researchportal.be/ws/ResearchOutputServiceFRIS?wsdl |

10.2 Service operations

| Operation | Input | Output |
|---|--------------------------------------|--|
| getResearchOutput | getResearchOutput | getResearchOutputResponse |
| getOrderings | getOrderings | getOrderings |
| getDataProviders | getDataProviders | getDataProvidersResponse |
| getAuthorityClassifications | getAuthorityClassifications | getAuthorityClassificationsResponse |
| getResearchOutputTypeClassifications | getResearchOutputTypeClassifications | getResearchOutputTypeClassificationsResponse |
| getDisciplineClassifications | getDisciplineClassifications | getDisciplineClassificationsResponse |
| getEvaluationPanelClassifications | getEvaluationPanelClassifications | getEvaluationPanelClassificationsResponse |
| getRefereeTypeClassifications | getRefereeTypeClassifications | getRefereeTypeClassificationsResponse |
| getSubjectAreaClassifications | getSubjectAreaClassifications | getSubjectAreaClassificationsResponse |

The formal format specification is published as a part of the WSDL.

All other operations than "getResearchOutput" will not be described in detail since they're trivial helper operations that do not accept any parameters.

10.2.1 Operation: getResearchOutput

The getResearchOutput operation retrieves projects in the FRIS data set based on the supplied request criteria. The following tables will detail the parameters of the request document. A research output must satisfy all specified limits to be returned, though if a single limit supports multiple values any match will satisfy that particular limit.

| Element path | Type | Notes |
|---|----------------|--|
| window/pageSize | int | The number of results returned, defaults to 10. |
| window/pageNumber | int | The zero-indexed page number, defaults to 0. |
| window/orderings/order | order | A number of orderings. |
| window/orderings/order/id | string | The ordering id. The getOrderings operation provides the valid order id values. |
| window/orderings/order/locale | locale | The ordering locale. Only applicable for order on localised entity properties, currently only the "researchOutput.title" ordering requires a locale. Only "nl_BE" and "en_GB" values are allowed. |
| window/orderings/order/direction | enumeration | The order direction, either "ASCENDING" or "DESCENDING", defaults to "ASCENDING". |
| search.search | string | Free text search, accepts Lucene query syntax. Will search in research output title, data provider id and sources. |
| search.locale | locale | Optional locale, if no valid locale is supplied all localisations will be searched. |
| state | enumeration | Not applicable in the web service interface. |
| uuids | identifierList | A list of FRIS Research output UUID values. Can be negated. |
| sources | sourceList | A number of authority/identifier limits against the entity external identifiers. The getAuthorityClassifications operation provides the valid authority values. |
| dataProviders | identifierList | A list of data provider names. Can be negated. The getDataProviders operation provides the valid data provider values. |
| dataProviderIds | identifierList | A list of data provider identifiers. Can be negated. |
| lastModifiedDate | Date | A start and end date can be given for filtering. |
| external | Boolean | Filtering on internal or external persons. |

| | | |
|--------------------------------|------------------------|---|
| title | textSearchCriteria | Free text search in the Research output title property. |
| type | classificationCriteria | <p>One or more research output taxonomy type terms. Scheme id is optional. Can be hierarchical.</p> <p>The getResearchOutputTypeClassifications operation provides the valid research output type values.</p> |
| associatedOrganisations | identifierList | A list of related FRIS Organisation UUID's. Can be negated. |
| associatedPersons | identifierList | A list of related FRIS Person UUID's, will match against both external and internal person associations. Can be negated. |
| associatedProjects | identifierList | A list of related FRIS Project UUID's. Can be negated. |
| associatedJournals | identifierList | A list of related FRIS Journals UUID's. Can be negated. |
| discipline | classificationCriteria | <p>One or more discipline terms. Scheme id is optional. Can be hierarchical.</p> <p>The getDisciplineClassifications operation provides the valid discipline values.</p> |
| subjectArea | classificationCriteria | <p>One or more subject area terms. Scheme id is optional. Can be hierarchical.</p> <p>The getSubjectAreaClassifications operation provides the valid subject area values.</p> |
| evaluationPanel | classificationCriteria | <p>One or more evaluation panel terms. Scheme id is optional. Can be hierarchical.</p> <p>The getEvaluationPanelClassifications operation provides the valid discipline values.</p> |
| refereeType | classificationCriteria | <p>One or more referee type terms. Scheme id is optional.</p> <p>The getRefereeTypeClassifications operation provides the valid discipline values.</p> |
| artistic | Xs:boolean | Whether the research output is marked artistic or not |
| keyword | textSearchCriteria | Free text search in the research output keywords property. |

10.2.2 Operation: getResearchOutput CERIF response documentation

The CERIF XML query response document will contain the following elements:

| Element path | Type | Notes |
|---------------------------------|-------|--|
| queryResult/totalResults | int | The total number of matching entities. |
| queryResult/pageSize | int | The requested page size. |
| queryResult/pageNumber | int | The requested zero-indexed page number. |
| queryResult/cerif | CERIF | The requested window of matching entities represented as CERIF elements. |

The research output CERIF XML representation is documented in the “Integration Guide FRIS R4” document.

An empty request message:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
    <soapenv:Header/>
    <soapenv:Body>
        <fris:getResearchOutput>
            <!--Optional:-->
            <crit:researchOutputCriteria>
                <!--Optional:-->
                <crit:window>
                    <crit:pageSize?></crit:pageSize>
                    <crit:pageNumber?></crit:pageNumber>
                    <crit:orderings>
                        <!--1 or more repetitions:-->
                        <crit:order>
                            <crit:id?></crit:id>
                            <crit:locale?></crit:locale>
                            <crit:direction?></crit:direction>
                        </crit:order>
                    </crit:orderings>
                </crit:window>
                <!--Optional:-->
                <crit:search>
                    <crit:search?></crit:search>
                    <!--Optional:-->
                    <crit:locale?></crit:locale>
                </crit:search>
                <!--Optional:-->
                <crit:state?></crit:state>
                <!--Optional:-->
                <crit:uuids negated="false">
                    <!--1 or more repetitions:-->
                    <crit:identifier?></crit:identifier>
                </crit:uuids>
                <!--Optional:-->
                <crit:sources>
                    <!--1 or more repetitions:-->
                    <crit:source>
                        <!--Optional:-->
                        <crit:authority?></crit:authority>
                        <!--Optional:-->
                        <crit:identifier?></crit:identifier>
                    </crit:source>
                </crit:sources>
                <!--Optional:-->
                <crit:dataProviders negated="false">
                    <!--1 or more repetitions:-->
                    <crit:identifier?></crit:identifier>
                </crit:dataProviders>
                <!--Optional:-->
            </crit:researchOutputCriteria>
        </fris:getResearchOutput>
    </soapenv:Body>
</soapenv:Envelope>
```

```

<crit:dataProviderIds negated="false">
  <!--1 or more repetitions:-->
  <crit:identifier>?</crit:identifier>
</crit:dataProviderIds>
<!--Optional:-->
<crit:lastModifiedDate>
  <!--Optional:-->
  <crit:start inclusive="false">?</crit:start>
  <!--Optional:-->
  <crit:end inclusive="false">?</crit:end>
</crit:lastModifiedDate>
<!--Optional:-->
<crit:external>?</crit:external>
<!--Optional:-->
<crit:title>
  <crit:search>?</crit:search>
  <!--Optional:-->
  <crit:locale>?</crit:locale>
</crit:title>
<!--Optional:-->
<crit:typeClassification>
  <!--1 or more repetitions:-->
  <crit:term>?</crit:term>
  <!--Optional:-->
  <crit:schemeId>?</crit:schemeId>
  <!--Optional:-->
  <crit:hierarchical>false</crit:hierarchical>
  <!--Optional:-->
  <crit:empty>false</crit:empty>
</crit:typeClassification>
<!--Optional:-->
<crit:evaluationPanel>
  <!--1 or more repetitions:-->
  <crit:term>?</crit:term>
  <!--Optional:-->
  <crit:schemeId>?</crit:schemeId>
  <!--Optional:-->
  <crit:hierarchical>false</crit:hierarchical>
  <!--Optional:-->
  <crit:empty>false</crit:empty>
</crit:evaluationPanel>
<!--Optional:-->
<crit:refereeType>
  <!--1 or more repetitions:-->
  <crit:term>?</crit:term>
  <!--Optional:-->
  <crit:schemeId>?</crit:schemeId>
  <!--Optional:-->
  <crit:hierarchical>false</crit:hierarchical>
  <!--Optional:-->
  <crit:empty>false</crit:empty>
</crit:refereeType>
<!--Optional:-->
<crit:artistic>?</crit:artistic>
<!--Optional:-->
<crit:associatedOrganisations negated="false" hierarchical="false">
  <!--1 or more repetitions:-->
  <crit:identifier>?</crit:identifier>
</crit:associatedOrganisations>
<!--Optional:-->
<crit:associatedPersons negated="false">
  <!--1 or more repetitions:-->
  <crit:identifier>?</crit:identifier>
</crit:associatedPersons>
<!--Optional:-->
<crit:associatedProjects negated="false">
  <!--1 or more repetitions:-->
  <crit:identifier>?</crit:identifier>
</crit:associatedProjects>
<!--Optional:-->
<crit:associatedJournals negated="false">
  <!--1 or more repetitions:-->
  <crit:identifier>?</crit:identifier>
</crit:associatedJournals>

```

```

<!--Optional:-->
<crit:keyword>
    <crit:search>?</crit:search>
    <!--Optional:-->
    <crit:locale>?</crit:locale>
</crit:keyword>
<!--Optional:-->
<crit:discipline>
    <!--1 or more repetitions:-->
    <crit:term>?</crit:term>
    <!--Optional:-->
    <crit:schemeId>?</crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:discipline>
<!--Optional:-->
<crit:subjectArea>
    <!--1 or more repetitions:-->
    <crit:term>?</crit:term>
    <!--Optional:-->
    <crit:schemeId>?</crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:subjectArea>
</crit:researchOutputCriteria>
</fris:getResearchOutput>
</soapenv:Body>
</soapenv:Envelope>

```

10.2.3 Operation: getResearchOutput FRIS XML response documentation

The FRIS XML query response document will contain the following elements:

| Element path | Type | Notes |
|---|----------|---|
| queryResult/@totalResults | int | The total number of matching entities. |
| queryResult/@pageSize | int | The requested page size. |
| queryResult/@pageNumber | int | The requested zero-indexed page number. |
| queryResult/book queryResult/book-contribution queryResult/journal-contribution queryResult/non-written queryResult/patent | FRIS XML | <p>The requested window of matching entities represented as FRIS XML elements.</p> <p>Note that each research output type has a separated element name and structure.</p> |

2.2.2.1 Example request for journal contribution with uuid

The FRIS XML format is documented in chapter 15.8. Sample journal article conference contribution request (result will not show the other research output types):

```

<?xml version="1.0"?>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
    <soapenv:Header/>
    <soapenv:Body>
        <fris:getResearchOutput>
            <crit:researchOutputCriteria>
                <crit:window>
                    <crit:pageSize>10</crit:pageSize>
                    <crit:pageNumber>0</crit:pageNumber>

```

```

<crit:orderings>
  <crit:order>
    <crit:id>entity.created</crit:id>
    <crit:locale>en_GB</crit:locale>
    <crit:direction>ASCENDING</crit:direction>
  </crit:order>
</crit:orderings>
</crit>window>
<crit:uuids negated="false">
  <crit:identifier>dbfef786-ca5c-4ald-80da-681c92ad9ffd</crit:identifier>
</crit:uuids>
<crit:dataProvider negated="false">
  <crit:identifier>test_UG</crit:identifier>
</crit:dataProvider>
<crit:typeClassification>
  <crit:term>Journal Article Conference Contribution</crit:term>
  <crit:schemeId>Research Output Taxonomy Type</crit:schemeId>
  <crit:hierarchical>false</crit:hierarchical>
</crit:typeClassification>
</crit:researchOutputCriteria>
</fris:getResearchOutput>
</soapenv:Body>
</soapenv:Envelope>

```

2.2.2.2 Example request for patent

Below a request for patent is given, since this is a specific case of research output.

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" 
  xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
  <soapenv:Header/>
  <soapenv:Body>
    <fris:getResearchOutput>
      <crit:researchOutputCriteria>
        <crit:dataProvider negated="false">
          <crit:identifier>test_KUL</crit:identifier>
        </crit:dataProvider>
        <crit:typeClassification>
          <crit:term>Patent</crit:term>
        </crit:typeClassification>
      </crit:researchOutputCriteria>
    </fris:getResearchOutput>
  </soapenv:Body>
</soapenv:Envelope>

```

11 Journal Service

The FRIS R4 SOAP Journal service is responsible for exposing journal data from the FRIS system. The Journal Service itself are actually 3 different services, which return only orbi journals:

| Service | Description |
|----------------------|---|
| JournalServicePublic | The public journal service, delivers less information than the normal/private JournalService (see line below) |
| JournalService | The normal/prive JournalService, delivers all available information and needs authentication |
| JournalServiceFRIS | Same as the JournalService, also needs authentication, format of the helper method and response documents is wrong. |

Services are described more in detail below.

- The JournalServicePublic: We have a publicly accessible version of the Journal service, that serves a very limited journal representation.
- The JournalService is not publicly accessible and usage of the Journal master data requires approval by EWI since it includes licensed and copyrighted information from a number of sources. All interaction with the journal service must be over https and all requests are authenticated through a published WS Security Policy³. See chapter 3.3 for details on the service security constraints.
- The JournalServiceFRIS supports the FastInfoSet XML protocol and it is strongly recommended that this be used due to its superior performance characteristics. As the journal service will deliver a FRIS XML representation the response format will be documented in this chapter.

The difference between the JournalService and the JournalServiceFRIS is limited, since Journal is not a CERIF-element. Both services are almost identical, the only difference is the format of the helper method response documents.

11.1 Current service status

The journal service is currently available at:

| Environment | Response | Authentication | Endpoint WSDL |
|-------------|----------|----------------|---|
| Staging | CERIF | Yes | https://stfrisr4.researchportal.be/ws/JournalService?wsdl |
| Staging | FRIS XML | Yes | https://stfrisr4.researchportal.be/ws/JournalServiceFRIS?wsdl |
| Staging | FRIS XML | No | https://stfrisr4.researchportal.be/ws/JournalServicePublic?wsdl |
| Production | CERIF | Yes | https://frisr4.researchportal.be/ws/JournalService?wsdl |
| Production | FRIS XML | Yes | https://frisr4.researchportal.be/ws/JournalServiceFRIS?wsdl |
| Production | FRIS XML | No | https://frisr4.researchportal.be/ws/JournalServicePublic?wsdl |

11.2 Service operations

| Operation | Input | Output |
|-------------|-------------|---------------------|
| getJournals | getJournals | getJournalsResponse |

³ [WS Policy](#), [WS Security Policy](#)

| | | |
|--|--------------------------------|--|
| getOrderings | getOrderings | getOrderings |
| getDataProviders | getDataProviders | getDataProvidersResponse |
| getAuthorityClassifications | getAuthorityClassifications | getAuthorityClassificationsResponse |
| getAsjcClassifications | getAsjcClassifications | getAsjcClassificationsResponse |
| getOpenAccessClassifications (not for JournalServicePublic) | getOpenAccessClassifications | getOpenAccessClassificationsResponse |
| getCountryClassifications (not for JournalServicePublic) | getCountryClassifications | getCountryClassificationsResponse |
| getPeerReviewedClassifications | getPeerReviewedClassifications | getPeerReviewedClassificationsResponse |

The last two operations do not exist in JournalServicePublic. The formal format specification is published as a part of the WSDL.

All other operations than "getJournals" will not be described in detail since they're trivial helper operations that do not accept any parameters.

11.2.1 Operation: **getJournals**

The getJournals operation retrieves journals in the FRIS data set based on the supplied request criteria. The following tables will detail the parameters of the request document. A journal must satisfy all specified limits to be returned, though if a single limit supports multiple values any match will satisfy that particular limit.

| Element path | Type | Notes |
|---|-------------|---|
| window/pageSize | int | The number of results returned, defaults to 10. |
| window/pageNumber | int | The zero-indexed page number, defaults to 0. |
| window/orderings/order | order | A number of orderings. |
| window/orderings/order/id | string | The ordering id. The getOrderings operation provides the valid order id values. |
| window/orderings/order/locale | locale | The ordering locale. Not applicable for any journal ordering. |
| window/orderings/order/direction | enumeration | The order direction, either "ASCENDING" or "DESCENDING", defaults to "ASCENDING". |
| search.search | string | Free text search, accepts Lucene query syntax. Will search in journal title, alternate title, ISSN, electronic ISSN, publisher, data provider id and sources. |
| search.locale | locale | Optional locale. Not applicable since journal has no localised index properties. |
| state | enumeration | Not applicable in the web service interface. |

| | | |
|---------------------------|------------------------|---|
| uuids | identifierList | A list of FRIS Journal UUID values. Can be negated. |
| sources | sourceList | A number of authority/identifier limits against the entity external identifiers. The getAuthorityClassifications operation provides the valid authority values. |
| dataProviders | identifierList | A list of data provider names. Can be negated. The getDataProviders operation provides the valid data provider values. |
| dataProviderIds | identifierList | A list of data provider identifiers. Can be negated. |
| lastModifiedDate | Date | A start and end date can be given. |
| external | Boolean | Filtering on internal or external organisations. |
| title | textSearchCriteria | Free text search in the Journal title and alternate title property. |
| issn | identifierList | A list of ISSN values, will be matched against ISSN and electronic ISSN property. Can be negated. |
| openAccess | classificationCriteria | One or more open access terms. Scheme id is optional. The getOpenAccessClassifications operation provides the valid open access types. |
| peerReviewed | classificationCriteria | One or more referee type terms. Scheme id is optional. The getPeerReviewedClassifications operation provides the valid peer review types. Even though this information is not available in the the public service you can still search on it. |
| Keyword | textSearchCriteria | Free text search in the Journal keywords property. |
| asjc | classificationCriteria | One or more ASJC terms. Scheme id is optional. Can be hierarchical. The getAsjcClassifications operation provides the valid discipline values. |
| publicationCountry | classificationCriteria | One or more country terms. Scheme id is optional. The getCountryClassifications operation provides the valid country values. |

| | | |
|--|--|---|
| | | Even though this information is not available in the the public service you can still search on it. |
|--|--|---|

The query response document will contain the following elements:

| Element path | Type | Notes |
|--------------------------|---------|--|
| queryResult/totalResults | int | The total number of matching entities. |
| queryResult/pageSize | int | The requested page size. |
| queryResult/pageNumber | int | The requested zero-indexed page number. |
| queryResult/journals | Journal | The requested window of matching entities represented as FRIS Journal XML elements. See subsequent chapter for detailed information. |

11.2.2 GetJournals response

Since the CERIF standard does not support a comprehensive journal representation we've chosen to return an XML representation that is based directly on the internal FRIS Journal model. The XSD is available as part of the Journal service WSDL.

An empty request message:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
    <soapenv:Header/>
    <soapenv:Body>
        <fris:getJournals>
            <!--Optional:-->
            <crit:journalCriteria>
                <!--Optional:-->
                <crit:window>
                    <crit:pageSize?</crit:pageSize>
                    <crit:pageNumber?</crit:pageNumber>
                    <crit:orderings>
                        <!--1 or more repetitions:-->
                        <crit:order>
                            <crit:id?</crit:id>
                            <crit:locale?</crit:locale>
                            <crit:direction?</crit:direction>
                        </crit:order>
                    </crit:orderings>
                </crit:window>
                <!--Optional:-->
                <crit:search>
                    <crit:search?</crit:search>
                    <!--Optional:-->
                    <crit:locale?</crit:locale>
                </crit:search>
                <!--Optional:-->
                <crit:state?</crit:state>
                <!--Optional:-->
                <crit:uuids negated="false">
                    <!--1 or more repetitions:-->
                    <crit:identifier?</crit:identifier>
                </crit:uuids>
                <!--Optional:-->
                <crit:sources>
                    <!--1 or more repetitions:-->
                    <crit:source>
                        <!--Optional:-->
                        <crit:authority?</crit:authority>
                    <!--Optional:-->
```

```

        <crit:identifier>?</crit:identifier>
    </crit:source>
</crit:sources>
<!--Optional:-->
<crit:dataProviders negated="false">
    <!--1 or more repetitions:-->
        <crit:identifier>?</crit:identifier>
    </crit:dataProviders>
<!--Optional:-->
<crit:dataProviderIds negated="false">
    <!--1 or more repetitions:-->
        <crit:identifier>?</crit:identifier>
    </crit:dataProviderIds>
<!--Optional:-->
<crit:lastModifiedDate>
    <!--Optional:-->
        <crit:start inclusive="false">?</crit:start>
    <!--Optional:-->
        <crit:end inclusive="false">?</crit:end>
    </crit:lastModifiedDate>
<!--Optional:-->
<crit:external>?</crit:external>
<!--Optional:-->
<crit:title>
    <crit:search>?</crit:search>
    <!--Optional:-->
        <crit:locale>?</crit:locale>
    </crit:title>
<!--Optional:-->
<crit:issn negated="false">
    <!--1 or more repetitions:-->
        <crit:identifier>?</crit:identifier>
    </crit:issn>
<!--Optional:-->
<crit:openAccess>
    <!--1 or more repetitions:-->
        <crit:term>?</crit:term>
    <!--Optional:-->
        <crit:schemeId>?</crit:schemeId>
    <!--Optional:-->
        <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
        <crit:empty>false</crit:empty>
    </crit:openAccess>
<!--Optional:-->
<crit:peerReviewed>
    <!--1 or more repetitions:-->
        <crit:term>?</crit:term>
    <!--Optional:-->
        <crit:schemeId>?</crit:schemeId>
    <!--Optional:-->
        <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
        <crit:empty>false</crit:empty>
    </crit:peerReviewed>
<!--Optional:-->
<crit:keyword>
    <crit:search>?</crit:search>
    <!--Optional:-->
        <crit:locale>?</crit:locale>
    </crit:keyword>
<!--Optional:-->
<crit:asjc>
    <!--1 or more repetitions:-->
        <crit:term>?</crit:term>
    <!--Optional:-->
        <crit:schemeId>?</crit:schemeId>
    <!--Optional:-->
        <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
        <crit:empty>false</crit:empty>
    </crit:asjc>
<!--Optional:-->
<crit:publicationCountry>

```

```

<!--1 or more repetitions:-->
<crit:term>?</crit:term>
<!--Optional:-->
<crit:schemeId>?</crit:schemeId>
<!--Optional:-->
<crit:hierarchical>false</crit:hierarchical>
<!--Optional:-->
<crit:empty>false</crit:empty>
</crit:publicationCountry>
</crit:journalCriteria>
</fris:getJournals>
</soapenv:Body>
</soapenv:Envelope>

```

An example of the request for a full non-public format:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" 
xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
    <soapenv:Header/>
    <soapenv:Body>
        <fris:getJournals>
            <crit:journalCriteria>
                <crit>window>
                    <crit:pageSize>10</crit:pageSize>
                    <crit:pageNumber>0</crit:pageNumber>
                </crit>window>
                <crit:uuids negated="false">
                    <crit:identifier>bdd64474-2cc7-4c18-9699-7f3970a9e57f</crit:identifier>
                    <crit:identifier>164cf664-0468-462f-b7ea-3624e378c909</crit:identifier>
                </crit:uuids>
                <crit:dataProviders negated="false">
                    <crit:identifier>test_UH1</crit:identifier>
                </crit:dataProviders>
            </crit:journalCriteria>
        </fris:getJournals>
    </soapenv:Body>
</soapenv:Envelope>

```

The column “Public” below will state which fields are not available in the JournalServicePublic

| Element path | Public | Type | Notes |
|----------------------------------|--------|-------------|--|
| @uuid | | string | The FRIS UUID of the journal. |
| state | | enumeration | Will always be active for the journals returned from the journal service. |
| external | | boolean | Will always be true for journals returned from the journal service. |
| created | | dateTime | The date and time the entry was created in the FRIS system. |
| lastModified | | dateTime | The date and time the entry was last updated in the FRIS system. |
| dataProvider | | string | The data-provider responsible for this entry. |
| dataProviderId | | string | The data-provider identifier for this entry. |
| sources | | sequence | A number of secondary sources for this entry (the primary source being the dataProvider/dataProviderId). |
| sources/source/@authority | | string | The authority of this source (federated identifier). |

| | | | |
|---|---------------|----------------|---|
| sources/source/@type | | enumeration | The type of this source, may be "IDENTIFIER", "URL" or other. |
| sources/source | | string | The identifier of this source. |
| aliases/alias | | sequence | Any number of FRIS journal UUID's that can be considered aliases of this entry. |
| title | | string | The official title of the journal. |
| alternateTitle | | string | An abbreviated or alternate title of the journal. |
| issn | | string | The ISSN of the journal. |
| electronicIssn | | string | The electronic ISSN of the journal if applicable. |
| journalHomepage | Not available | string | The URL to the journal homepage if applicable. |
| publisher | Not available | string | The name of the publisher |
| publicationLocation | Not available | string | The location this journal is published. |
| publicationCountry | Not available | classification | The country this journal is published. |
| startYear | | int | The year that this journal started publishing, if available. |
| endYear | | int | The year that this journal stopped publishing, if available. |
| sherpaRoMEO | | | The Sherpa RoMEO information of this journal. |
| sherpaRoMEO/color | | classification | The Sherpa RoMEO color. |
| sherpaRoMEO /preprintArchiving | | string | The pre-print archiving information for this journal. |
| sherpaRoMEO /preprintRestrictions | | string | The pre-print restrictions information for this journal. |
| sherpaRoMEO /postprintArchiving | | string | The post-print archiving information for this journal. |
| sherpaRoMEO /postprintRestrictions | | string | The post-print restrictions information for this journal. |
| sherpaRoMEO /postprintConditions | | string | The post-print conditions information for this journal. |
| sherpaRoMEO /postprintCopyright | | string | The post-print copyright information for this journal. |
| peerReviewed | Not available | classification | Peer reviewed type. |
| openAccess | | classification | Open access type. |
| creativeCommonsLicense | | classification | The Creative Commons license if applicable. |
| asjcCodes/asjc | | classification | A number of Scopus ASJC codes describing the subject areas of the journal. |
| localized-keywords /keywords/keyword | | string | A number of free keywords describing the subject areas of the journal. |

| | | | |
|--|--|----------------------------------|---|
| localized-keywords /keywords/@locale | | string | The locale for which the keywords are applicable. |
| metrics | | decimal-metric or integer-metric | Any number of metric values, value is either a decimal or integer |
| decimalmetric/@type integermetric/@type | | classification | The metric type classification term for this metric value |
| decimalmetric/@year integermetric/@type | | int | The year this metric is applicable to |
| decimalmetric/metricValue integermetric/metricValue | | Int/decimal | The value of the metric |

12 Datasets

The FRIS R4 SOAP Dataset output service is responsible for exposing public datasets from the FRIS system. The dataset service is publicly accessible and will not expose any entities that have not been marked as public or any relations to such entities.

The FRIS dataset service supports the FastInfoSet XML protocol and it is strongly recommended that this be used due to its superior performance characteristics.

12.1 Current service status

The dataset service is currently available at:

| Environment | Response | Endpoint WSDL |
|-------------|----------|---|
| Staging | CERIF | https://stfrisr4.researchportal.be/ws/DatasetService?wsdl |
| Staging | FRIS XML | https://stfrisr4.researchportal.be/ws/DatasetServiceFRIS?wsdl |
| Production | FRIS XML | https://frisr4.researchportal.be/ws/DatasetService?wsdl |
| Production | FRIS XML | https://frisr4.researchportal.be/ws/DatasetServiceFRIS?wsdl |

12.2 Service operations

| Operation | Input | Output |
|-------------------------------|-------------------------------|---------------------------------------|
| getDatasets | getDatasets | getDatasetsResponse |
| getOrderings | getOrderings | getOrderingsResponse |
| getDataProviders | getDataProviders | getDataProvidersResponse |
| getAuthorityClassifications | getAuthorityClassifications | getAuthorityClassificationsResponse |
| getAccessRightClassifications | getAccessRightClassifications | getAccessRightClassificationsResponse |
| getOpenAccessClassifications | getOpenAccessClassifications | getOpenAccessClassificationsResponse |

12.2.1 Operation: getDatasets

The getDatasets operation retrieves datasets in the FRIS data set based on the supplied request criteria. The following tables will detail the parameters of the request document. A dataset must satisfy all specified limits to be returned, though if a single limit supports multiple values any match will satisfy that particular limit.

| Element path | Type | Notes |
|---------------------------|--------|--|
| window/pageSize | int | The number of results returned, defaults to 10. |
| window/pageNumber | int | The zero-indexed page number, defaults to 0. |
| window/orderings/order | order | A number of orderings. |
| window/orderings/order/id | string | The ordering id. The getOrderings operation provides the valid order id values. |

| | | |
|---|--------------------|--|
| window/orderings/order/locale | locale | The ordering locale. Not applicable for any journal ordering. |
| window/orderings/order/direction | enumeration | The order direction, either "ASCENDING" or "DESCENDING", defaults to "ASCENDING". |
| search.search | string | Free text search, accepts Lucene query syntax. Will search in journal title, alternate title, ISSN, electronic ISSN, publisher, data provider id and sources. |
| search.locale | locale | Optional locale. Not applicable since journal has no localised index properties. |
| state | enumeration | Not applicable in the web service interface. |
| uuids | identifierList | A list of FRIS Journal UUID values. Can be negated. |
| sources | sourceList | A number of authority/identifier limits against the entity external identifiers. The getAuthorityClassifications operation provides the valid authority values. |
| dataProviders | identifierList | A list of data provider names. Can be negated. The getDataProviders operation provides the valid data provider values. |
| dataProviderIds | identifierList | A list of data provider identifiers. Can be negated. |
| lastModifiedDate | Date | A start and end date can be given. |
| external | Boolean | Filtering on internal or external organisations. |
| title | textSearchCriteria | Free text search in the Journal title and alternate title property. |
| accessRight | | |
| associatedOrganisations | string | A list of associated FRIS Organisation UUID's. Can be negated. |
| associatedPersons | string | A list of associated FRIS Persons UUID's. Can be negated. |
| associatedProjects | string | A list of associated FRIS Project UUID's. Can be negated. |
| associatedInfrastructures | string | A list of associated FRIS Infrastructure UUID's. Can be negated. |

| | | |
|-----------------------------|--------------------|---|
| associatedDatasets | string | A list of associated FRIS Dataset UUID's. Can be negated. |
| publicationYearStart | Integer | Publication year of the dataset at the start, since no dates are allowed. |
| publicationYearEnd | Integer | Publication year of the dataset at the end, since no dates are allowed. |
| Keyword | textSearchCriteria | Free text search in the Journal keywords property. |
| | | |

The query response document will contain the following elements:

| Element path | Type | Notes |
|--------------------------|---------|--|
| queryResult/totalResults | int | The total number of matching entities. |
| queryResult/pageSize | int | The requested page size. |
| queryResult/pageNumber | int | The requested zero-indexed page number. |
| queryResult/datasets | Dataset | The requested window of matching entities represented as FRIS Dataset XML elements. See subsequent chapter for detailed information. |

12.2.2 Operation: GetDatasets response

The CERIF XML query response document will contain the following elements:

| Element path | Type | Notes |
|--------------------------|-------|--|
| queryResult/totalResults | int | The total number of matching entities. |
| queryResult/pageSize | int | The requested page size. |
| queryResult/pageNumber | int | The requested zero-indexed page number. |
| queryResult/cerif | CERIF | The requested window of matching entities represented as CERIF elements. |

The dataset CERIF XML representation is documented in the “Integration Guide FRIS R4” document.

An empty request message:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" 
    xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
    <soapenv:Header/>
    <soapenv:Body>
        <fris:getDatasets>
            <!--Optional:-->
            <crit:datasetCriteria>
                <!--Optional:-->
                <crit>window>
                    <crit:pageSize>?</crit:pageSize>
                    <crit:pageNumber>?</crit:pageNumber>
                    <crit:orderings>
                        <!--1 or more repetitions:-->

```

```

        <crit:order>
            <crit:id>?</crit:id>
            <crit:locale>?</crit:locale>
            <crit:direction>?</crit:direction>
        </crit:order>
    </crit:orderings>
</crit>window>
<!--Optional:-->
<crit:search>
    <crit:search>?</crit:search>
    <!--Optional:-->
    <crit:locale>?</crit:locale>
</crit:search>
<!--Optional:-->
<crit:state>?</crit:state>
<!--Optional:-->
<crit:uuids negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier>?</crit:identifier>
</crit:uuids>
<!--Optional:-->
<crit:sources>
    <!--1 or more repetitions:-->
    <crit:source>
        <!--Optional:-->
        <crit:authority>?</crit:authority>
        <!--Optional:-->
        <crit:identifier>?</crit:identifier>
    </crit:source>
</crit:sources>
<!--Optional:-->
<crit:dataProviders negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier>?</crit:identifier>
</crit:dataProviders>
<!--Optional:-->
<crit:dataProviderIds negated="false">
    <!--1 or more repetitions:-->
    <crit:identifier>?</crit:identifier>
</crit:dataProviderIds>
<!--Optional:-->
<crit:lastModifiedDate>
    <!--Optional:-->
    <crit:start inclusive="false">?</crit:start>
    <!--Optional:-->
    <crit:end inclusive="false">?</crit:end>
</crit:lastModifiedDate>
<!--Optional:-->
<crit:external>?</crit:external>
<!--Optional:-->
<crit:title>
    <crit:search>?</crit:search>
    <!--Optional:-->
    <crit:locale>?</crit:locale>
</crit:title>
<!--Optional:-->
<crit:accessRight>
    <!--1 or more repetitions:-->
    <crit:term>?</crit:term>
    <!--Optional:-->
    <crit:schemeId>?</crit:schemeId>
    <!--Optional:-->
    <crit:hierarchical>false</crit:hierarchical>
    <!--Optional:-->
    <crit:empty>false</crit:empty>
</crit:accessRight>
<!--Optional:-->
<crit:associatedOrganisations negated="false" hierarchical="false">
    <!--1 or more repetitions:-->
    <crit:identifier>?</crit:identifier>
</crit:associatedOrganisations>
<!--Optional:-->
<crit:associatedPersons negated="false">
    <!--1 or more repetitions:-->

```

```

        <crit:identifier>?</crit:identifier>
    </crit:associatedPersons>
    <!--Optional:-->
    <crit:associatedProjects negated="false">
        <!--1 or more repetitions:-->
        <crit:identifier>?</crit:identifier>
    </crit:associatedProjects>
    <!--Optional:-->
    <crit:associatedInfrastructures negated="false">
        <!--1 or more repetitions:-->
        <crit:identifier>?</crit:identifier>
    </crit:associatedInfrastructures>
    <!--Optional:-->
    <crit:associatedDatasets negated="false">
        <!--1 or more repetitions:-->
        <crit:identifier>?</crit:identifier>
    </crit:associatedDatasets>
    <!--Optional:-->
    <crit:publicationYearStart>?</crit:publicationYearStart>
    <!--Optional:-->
    <crit:publicationYearEnd>?</crit:publicationYearEnd>
    <!--Optional:-->
    <crit:keyword>
        <crit:search>?</crit:search>
        <!--Optional:-->
        <crit:locale>?</crit:locale>
    </crit:keyword>
</crit:datasetCriteria>
</fris:getDatasets>
</soapenv:Body>
</soapenv:Envelope>

```

12.2.3 Operation: getDatasets FRIS XML response documentation

The FRIS XML query response document will contain the following elements:

| Element path | Type | Notes |
|----------------------------------|----------|---|
| queryResult/@totalResults | int | The total number of matching entities. |
| queryResult/@pageSize | int | The requested page size. |
| queryResult/@pageNumber | int | The requested zero-indexed page number. |
| queryResult/dataset | FRIS XML | The requested window of matching entities represented as FRIS XML elements. |

The FRIS XML format is documented in chapter 15.6. Sample request for retrieving datasets:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" 
    xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
    <soapenv:Header>
    <soapenv:Body>
        <fris:getDatasets>
            <crit:datasetCriteria>
                <crit:window>
                    <crit:pageSize>10</crit:pageSize>
                    <crit:pageNumber>0</crit:pageNumber>
                    <crit:orderings>
                        <crit:order>
                            <crit:id>entity.created</crit:id>
                            <crit:locale>en_GB</crit:locale>
                            <crit:direction>ASCENDING</crit:direction>
                        </crit:order>
                    </crit:orderings>
                </crit:window>
            </crit:datasetCriteria>
        </fris:getDatasets>
    </soapenv:Body>

```

</soapenv:Envelope>

13 Classification Scheme Service

The FRIS R4 SOAP Classification Scheme service is responsible for exposing classification data from the FRIS system. There are two versions of the Classification Scheme service, the difference being what format the response is delivered in, either CERIF XML or FRIS XML.

The FRIS Classification Scheme service supports the FastInfoSet XML protocol and it is strongly recommended that this be used due to its superior performance characteristics.

13.1 Current service status

The classification scheme service is currently available at:

| Environment | Response | Endpoint WSDL |
|-------------|----------|---|
| Staging | CERIF | https://stfrisr4.researchportal.be/ws/ClassificationSchemeService?wsdl |
| Staging | FRIS XML | https://stfrisr4.researchportal.be/ws/ClassificationSchemeServiceFRIS?wsdl |
| Production | CERIF | https://frisr4.researchportal.be/ws/ClassificationSchemeService?wsdl |
| Production | FRIS XML | https://frisr4.researchportal.be/ws/ClassificationSchemeServiceFRIS?wsdl |

13.2 Service operations

| Operation | Input | Output |
|------------------------------------|-----------------------------|-------------------------------------|
| getClassificationSchemes | getClassificationSchemes | getClassificationSchemesResponse |
| getAllClassificationSchemes | getAllClassificationSchemes | getAllClassificationSchemesResponse |
| getOrderings | getOrderings | getOrderingsResponse |

The formal format specification is published as a part of the WSDL.

In the subsequent chapters we will only detail the `getClassificationSchemes` operation since the other two are trivial.

An empty request message:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"  
    xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">  
    <soapenv:Header>  
    <soapenv:Body>  
        <fris:getClassificationSchemes>  
            <!--Optional:-->  
            <crit:classificationSchemeCriteria>  
                <!--Optional:-->  
                <crit>window>  
                    <crit:pageSize>?</crit:pageSize>  
                    <crit:pageNumber>?</crit:pageNumber>  
                    <crit:orderings>  
                        <!--1 or more repetitions:-->  
                        <crit:order>  
                            <crit:id>?</crit:id>  
                            <crit:locale>?</crit:locale>  
                            <crit:direction>?</crit:direction>  
                        </crit:order>  
                    </crit:orderings>  
                </crit>window>  
                <!--Optional:-->  
                <crit:schemeId>?</crit:schemeId>  
                <!--Optional:-->  
                <crit:term>?</crit:term>  
            </crit:classificationSchemeCriteria>  
        </fris:getClassificationSchemes>  
    </soapenv:Body>  
</soapenv:Envelope>
```

13.2.1 Operation: getClassificationSchemes FRIS XML response documentation

The FRIS getClassificationSchemes operation retrieves classification scheme information based on the supplied request criteria. The following tables will detail the parameters of the request document. A classification scheme must satisfy all specified limits to be returned, though if a single limit supports multiple values any match will satisfy that particular limit.

| Element path | Type | Notes |
|----------------------------------|-------------|--|
| window/pageSize | int | The number of results returned, defaults to 10. |
| window/pageNumber | int | The zero-indexed page number, defaults to 0. |
| window/orderings/order | order | A number of orderings. |
| window/orderings/order/id | string | The ordering id. The getOrderings operation provides the valid order id values. |
| window/orderings/order/locale | locale | The ordering locale. Not applicable for any classification scheme ordering. |
| window/orderings/order/direction | enumeration | The order direction, either "ASCENDING" or "DESCENDING", defaults to "ASCENDING". |
| schemeld | string | Any classification scheme with the specified schemeld. |
| term | string | Any classification scheme that contains a classification with the specified term. |

The query response document will contain the following elements:

| Element path | Type | Notes |
|----------------------------------|----------------------|--|
| queryResult/totalResults | int | The total number of matching entities. |
| queryResult/pageSize | int | The requested page size. |
| queryResult/pageNumber | int | The requested zero-indexed page number. |
| queryResult/classificationScheme | ClassificationScheme | The requested window of matching entities represented as FRIS Classification Scheme XML elements. See subsequent chapter for detailed information. |

The FRIS Classification Scheme XSD is available as part of the Classification Scheme service WSDL. An example of the format:

```
<fris:classificationScheme id="id of scheme">
    <fris:dataProviderId>id of data provider</fris:dataProviderId>
    <fris:description id="3353">
        <fris:texts>
            <fris:text locale="en">Scheme description text</fris:text>
            <fris:text locale="nl">Scheme description text</fris:text>
```

```

        </fris:texts>
    </fris:description>
    <fris:schemeId> External scheme identifier </fris:schemeId>
    <fris:containedClassifications>
        <fris:classification id="353377" term="parent term">
            <fris:allowedValue>true</fris:allowedValue>
            <fris:definition id="331450576">
                <fris:texts>
                    <fris:text locale="en"/>
                    <fris:text locale="nl"/>
                </fris:texts>
            </fris:definition>
            <fris:description id="331450577">
                <fris:texts>
                    <fris:text locale="en">Child description text</fris:text>
                    <fris:text locale="nl">Child description text</fris:text>
                </fris:texts>
            </fris:description>
        </fris:classification>
    </fris:containedClassifications>

```

| Element path | Type | Notes |
|---|---------|---|
| classificationScheme/@id | string | The external scheme identifier of the classification scheme. |
| dataProviderId | string | The id of the data provider |
| description/texts/text/@locale | string | The locale for which the classification scheme description text is applicable. |
| description/texts/text | string | The classification scheme description text. |
| schemeId | string | The id of the scheme |
| containedClassifications | | The contained classifications for the classification scheme. |
| containedClassifications/classification/@term | string | The contained classification term. |
| containedClassifications/classification/allowedValue | boolean | Boolean indicating if the value is still allowed or not. |
| containedClassifications/classification/description/texts/text/@locale | string | The locale for which the contained classification description text is applicable. |
| containedClassifications/classification/description/texts/text/ | string | The contained classification description text. |
| containedClassifications/classification/parent | string | The contained classification parent term. Optional |

13.2.2 Operation: getClassificationSchemes CERIF XML response documentation

The CERIF getClassificationSchemes operation retrieves classification scheme information based on the supplied request criteria. The following tables will detail the parameters of the request document. A classification scheme must satisfy all specified limits to be returned, though if a single limit supports multiple values any match will satisfy that particular limit.

| Element path | Type | Notes |
|----------------------------------|-------------|--|
| window/pageSize | int | The number of results returned, defaults to 10. |
| window/pageNumber | int | The zero-indexed page number, defaults to 0. |
| window/orderings/order | order | A number of orderings. |
| window/orderings/order/id | string | The ordering id. The getOrderings operation provides the valid order id values. |
| window/orderings/order/locale | locale | The ordering locale. Not applicable for any classification scheme ordering. |
| window/orderings/order/direction | enumeration | The order direction, either "ASCENDING" or "DESCENDING", defaults to "ASCENDING". |
| schemeld | string | Any classification scheme with the specified schemeld. |
| term | string | Any classification scheme that contains a classification with the specified term. |

The query response document will contain the following elements:

| Element path | Type | Notes |
|--------------------------|-------|--|
| queryResult/totalResults | int | The total number of matching entities. |
| queryResult/pageSize | int | The requested page size. |
| queryResult/pageNumber | int | The requested zero-indexed page number. |
| queryResult/CERIF | CERIF | The requested window of matching entities represented as CERIF cfClassScheme XML elements. |

The FRIS Classification Scheme XSD is available as part of the Classification Scheme service WSDL. An example of the format:

```
<CERIF release="1.5" date="2015-07-09+02:00" sourceDatabase="fris"
targetNamespace="urn:xmlns:org:eurocris:cerif-1.5-1-FRIS">
    <cfClassScheme>
        <cfClassSchemeId>External scheme identifier</cfClassSchemeId>
        <cfDescr cfTrans="o" cfLangCode="en">Scheme description
text</cfDescr>
        <cfDescr cfTrans="o" cfLangCode="nl">Scheme description
text</cfDescr>
```

```

<cfClass>
    <cfClassId>parent term</cfClassId>
    <cfDescr cfTrans="o" cfLangCode="nl">Contained parent
classification description text</cfDescr>
    <cfDescr cfTrans="o" cfLangCode="en">Contained parent
classification description text</cfDescr>
</cfClass>
<cfClass>
    <cfClassId>child term</cfClassId>
    <cfDescr cfTrans="o" cfLangCode="nl">Contained child
classification description text</cfDescr>
    <cfDescr cfTrans="o" cfLangCode="en">Contained child
classification description text</cfDescr>
    <cfClass_Class>
        <cfClassId2>parent term</cfClassId2>
        <cfClassSchemeId2>External scheme
identifier</cfClassSchemeId2>
        <cfClassId1>child term</cfClassId1>
        <cfClassSchemeId1>External scheme
identifier</cfClassSchemeId1>
        <cfClassId>broadr</cfClassId>
        <cfClassSchemeId>iso25964-1</cfClassSchemeId>
    </cfClass_Class>
</cfClass>
</cfClassScheme>
</CERIF>

```

| Element path | Type | Notes |
|---|--------|---|
| cfClassSchemeId | string | The schemeld of the classification scheme. |
| cfDescr /@cfLangCode | string | The locale for which the classification scheme description text is applicable. |
| cfDescr | string | The classification scheme description text. |
| cfClass | | The contained classifications for the classification scheme. |
| cfClass/cfClassId | string | The contained classification term. |
| cfClass/cfDescr/@cfLangcode | string | The locale for which the contained classification description text is applicable. |
| cfClass/cfDescr/ | string | The contained classification description text. |
| cfClass/cfClass_Class/cfClassId2 | string | The contained classification parent term. |

14 Funding code service

The FRIS R4 SOAP Funding Code service is responsible for exposing funding code data from the FRIS system. There is only one version of the funding code service delivering FRIS XML.

The FRIS Funding code service supports the FastInfoSet XML protocol and it is strongly recommended that this be used due to its superior performance characteristics.

14.1 Current service status

| Environment | Response | Endpoint WSDL |
|-------------|----------|---|
| Staging | FRIS XML | https://stfrisr4.researchportal.be/ws/FundingCodeServiceFRIS?wsdl |
| Production | FRIS XML | https://frisr4.researchportal.be/ws/FundingCodeServiceFRIS?wsdl |

14.2 Service operations

| Operation | Input | Output |
|------------------------------|------------------------------|--------------------------------------|
| <code>getFundingCodes</code> | <code>getFundingCodes</code> | <code>getFundingCodesResponse</code> |
| <code>getOrderings</code> | <code>getOrderings</code> | <code>getOrderingsResponse</code> |

The formal format specification is published as a part of the WSDL.

14.2.1 Operation: `getFundingCodes` FRIS XML request documentation

The FRIS getClassificationSchemes operation retrieves classification scheme information based on the supplied request criteria. The following tables will detail the parameters of the request document. A classification scheme must satisfy all specified limits to be returned, though if a single limit supports multiple values any match will satisfy that particular limit.

| Element path | Type | Notes |
|---|-------------|---|
| <code>window/pageSize</code> | int | The number of results returned, defaults to 10. |
| <code>window/pageNumber</code> | int | The zero-indexed page number, defaults to 0. |
| <code>window/orderings/order</code> | order | A number of orderings. |
| <code>window/orderings/order/id</code> | string | The ordering id. The getOrderings operation provides the valid order id values. |
| <code>window/orderings/order/locale</code> | locale | The ordering locale. Not applicable for any funding code ordering. |
| <code>window/orderings/order/direction</code> | enumeration | The order direction, either "ASCENDING" or "DESCENDING", defaults to "ASCENDING". |
| <code>search</code> | | Free text search, accepts Lucene query syntax. Will search in funding code, acronym, description, definition and example. |
| <code>codes/identifier</code> | string | A list of funding codes. Can be negated. |

| | | |
|---|--------|--|
| associatedOrganisations/identifier | string | A list of associated FRIS Organisation UUID's. Can be negated. |
|---|--------|--|

The query response document will contain the following elements:

| Element path | Type | Notes |
|--------------------|-------------|---|
| @total | int | The total number of matching entities. |
| @pageSize | int | The requested page size. |
| @pageNumber | int | The requested zero-indexed page number. |
| fundingCode | FundingCode | The requested window of matching entities represented as FRIS Funding Code XML elements. See subsequent chapter for detailed information. |

The FRIS Funding Code XSD is available as part of the Funding Code service WSDL.

An empty request message:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" 
  xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">
  <soapenv:Header/>
  <soapenv:Body>
    <fris:getFundingCodes>
      <!--Optional:-->
      <criteria>
        <!--Optional:-->
        <crit>window>
          <crit:pageSize>?</crit:pageSize>
          <crit:pageNumber>?</crit:pageNumber>
          <crit:orderings>
            <!--1 or more repetitions:-->
            <crit:order>
              <crit:id>?</crit:id>
              <crit:locale>?</crit:locale>
              <crit:direction>?</crit:direction>
            </crit:order>
          </crit:orderings>
        </crit>window>
        <!--Optional:-->
        <crit:search>
          <crit:search>?</crit:search>
          <!--Optional:-->
          <crit:locale>?</crit:locale>
        </crit:search>
        <!--Optional:-->
        <crit:codes negated="?">
          <!--1 or more repetitions:-->
          <crit:identifier>?</crit:identifier>
        </crit:codes>
        <!--Optional:-->
        <crit:associatedOrganisations negated="?">
          <!--1 or more repetitions:-->
          <crit:identifier>?</crit:identifier>
        </crit:associatedOrganisations>
      </criteria>
    </fris:getFundingCodes>
  </soapenv:Body>
</soapenv:Envelope>
```

All funding codes can be retrieve with a simple request:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"  
xmlns:fris="http://fris.ewi.be/" xmlns:crit="http://fris.ewi.be/criteria">  
    <soapenv:Header/>  
    <soapenv:Body>  
        <fris:getFundingCodes>  
            <criteria>  
                <crit>window>  
                    <crit:pageSize>10</crit:pageSize>  
                    <crit:pageNumber>0</crit:pageNumber>  
                </crit>window>  
            </criteria>  
        </fris:getFundingCodes>  
    </soapenv:Body>  
</soapenv:Envelope>
```

15FRIS Data Model

15.1 Introduction

In order to document the resulting model in a clear and expressive manner we use a UML Class diagram as the primary data model documentation. Using an object-oriented modelling approach enables us to describe a model that reflects the real-world entities more accurately and less verbose than the existing CERIF data models.

One of the main considerations in the current research domain in Flanders is the existence of data silos, each research organisation is ultimately responsible for the scope and quality of the data that they submit to the FRIS system. When considering these relatively isolated data sets in a region wide context it follows that we have a number of scenarios in how the broader relationships between entities are expressed. There are basically five scenarios:

1. Relations between entities from the same data-provider.
2. A logical unique entity that is managed by multiple data-providers, for example a researcher that is or has been associated with multiple data-providers will be present with multiple representations even though they're logically the same person.
3. Entities and relations to entities that are not part of the domain of a data-provider but are otherwise known. For example, a relation to a collaborating researcher from a foreign university.
4. Entities and relations to entities that are not part of the domain of a data-provider. For example, a relation to a collaborating researcher that is only expressed as a name reference.

In the first scenario it is trivial to determine which entities are referred in a given relation, assuming of-course that the identities are consistent within the set supplied by the data-provider.

In the second scenario we view each entity representation as a valid facet of the logical entity and link these representations as aliases of each other. This approach is similar to the owl:sameAs concept from the “OWL Web Ontology Language”. It is up to the service user to handle this situation appropriately.

In the third and fourth scenario we have representations of “known” and “unknown” entities, in both cases the entity is not part of the dataset managed by the data-provider, for example a collaborating author from a foreign university. The amount of information known about these unmanaged entities is typically much less than the equivalent managed representation.

External entities (scenarios 3 & 4) will use the same model structure as their internal counterparts, whether an entity is external or not will be expressed through the “external” Boolean attribute. In scenario 4 no object will exist but only the name of that person as a research or project participant.

In the FRIS system have several main entities that are managed; organisations, persons, projects and research output with the addition in 2021 of infrastructures and datasets.

In addition, we have associated entities that are managed individually, but are not the main focus of the system; classifications, journals and funding codes.

The model entities make extensive use of classification instances, service users can easily look up the full set of valid classification values using the classification scheme web service and the scheme identifiers listed in the data dictionary tables.

In order to facilitate unambiguous integration, the FRIS model is designed to avoid circular and bi-directional relation paths. This means that inter-entity relations are unidirectional and always refer to entities higher in the hierarchy.

Each of the shown entity types contains all of the associated information needed to describe that entity, as opposed to the more fragmented CERIF representations.

In the following chapters we will describe the model for the main entity concepts. Note that the shown UML Class diagrams are extracted directly from the Java model and not all properties are available in the XML representation. The data dictionary tables will document the available properties

15.2 Abstract Entity

The AbstractEntity class contains all attributes that are common to all main entities and any system-attributes that are necessary.

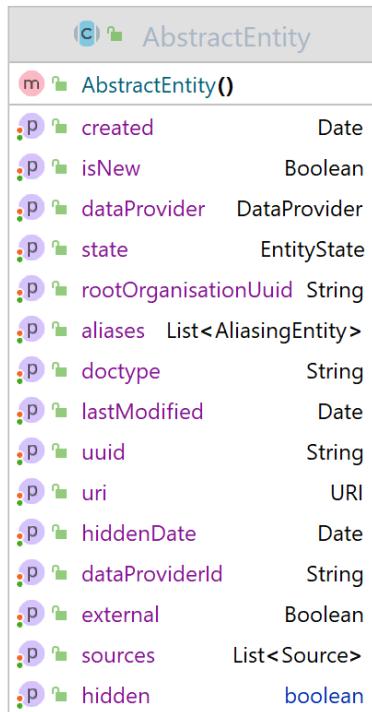


Figure 1 AbstractEntity UML class diagram

Abstract entity attributes, i.e. common to all “first-level” entities:

| Attribute | Data-type | Description |
|---------------------|----------------------|---|
| uuid | 128-bit level 4 UUID | All FRIS entities are assigned an UUID when first created in the system |
| created | Timestamp | Entity creation timestamp (for reporting/auditing purposes) |
| lastModified | Timestamp | Entity last modification timestamp (for reporting/auditing purposes) |
| state | Enumeration | ACTIVE – An entity is public CONFIDENTIAL – An entity is confidential and is not discoverable by the public or other data-providers BACKEND_ONLY – An entity is not discoverable by the public CAMPUS – An entity is not discoverable by the public. |

| | | |
|-----------------------|---------------------------|---|
| dataProvider | A DataProvider reference | A reference to the data-provider responsible for this entity. |
| dataProviderId | String | The local, data-provider identifier |
| external | Boolean | Whether this entity representation is to be regarded as an externally managed entity for this data-provider |
| hidden | Boolean | Whether an entity has been hidden by a FRIS administrator |
| aliases | List of UUID's | List of UUID's that are aliases to this entity, assumed to be of the same entity type |
| sources | List of Source references | The sources attribute is a collection of identity authority – identity mappings, including the authority (often the data provider), an identifier type and the identifier value. All local identifiers and aliases are persisted in this attribute. (see chapter 15.12) |

Table 1 Abstract entity properties

15.3 Organisation

In the following diagram we've shown the UML class diagram for the classes that encapsulate the organisation concept. See chapter 15.2 for detailed information on the abstract entity class.

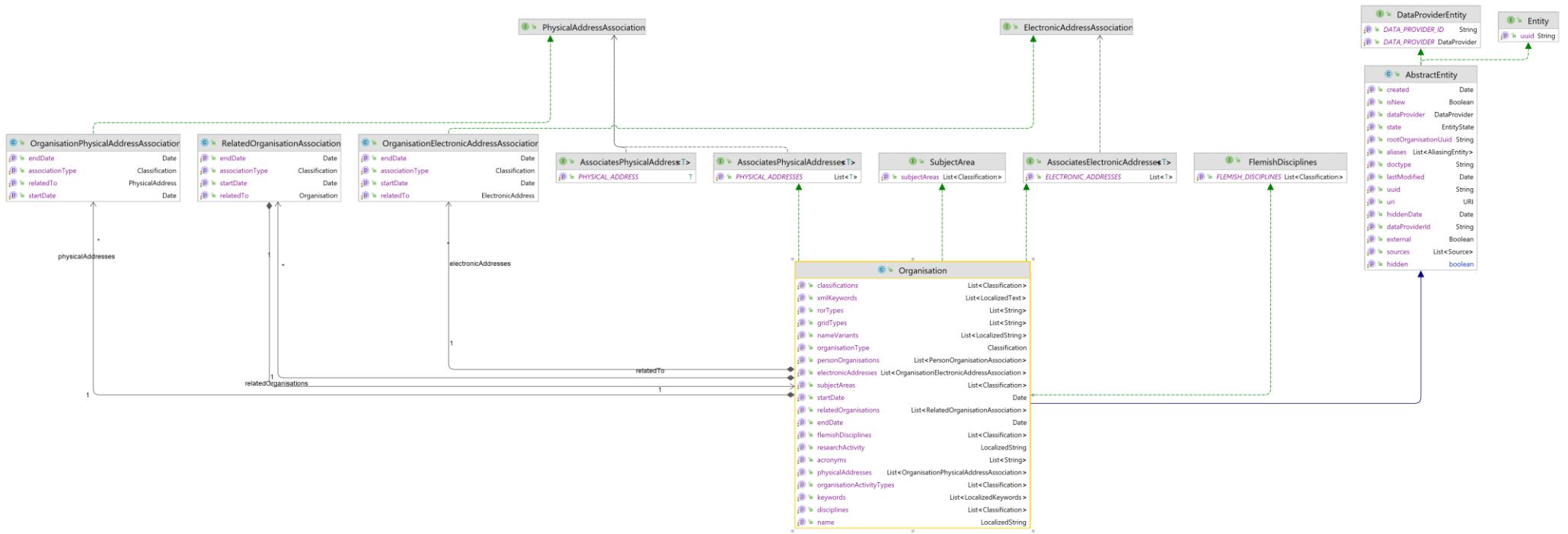


Figure 2 Organisation UML class diagram

The Organisation concept consists of the “Organisation” class and its “RelatedOrganisationAssociation”, “OrganisationPhysicalAddressAssociation” and “OrganisationElectronicAddressAssociation” association objects which are detailed below:

The Organisation implementation attributes:

| Attribute | Data-type | Description |
|----------------------------------|--|--|
| name | LocalizedString | The primary, localized name of the organisation |
| acronym | List of Strings | The organisation acronym is intended as a short organisation specific abbreviation |
| organisationType | Classification | The organisation type, mapped to ORGANISATION_TYPE scheme |
| organisationActivityTypes | List of Classification | Any number of organisation activity types, mapped to the ORGANISATION_ACTIVITY_TYPE scheme |
| startDate | Timestamp | Organisation lifecycle start date |
| endDate | Timestamp | Organisation lifecycle end date |
| classifications | List of Classification | This is a generic store of classification relations intended for purely descriptive classifications, like NACE codes |
| researchActivity | LocalizedString | A localized, free-text description of the research activity of the organisation |
| disciplines | List of Classification | Any number of discipline codes, mapped to the DISCIPLINE scheme. |
| subjectArea | List of Classification | Any number of subject area codes, mapped to the SUBJECT_AREA scheme. |
| flemishDisciplines | List of Classification | Any number of Flemish discipline codes, mapped to the FLEMISH_DISCIPLINE_CODE scheme. |
| keywords | List of LocalizedKeywords | Any number of free keywords (see chapter 15.13) |
| physicalAddresses | List of PhysicalAddressAssociation | An organisation may have any number of physical address associations (see chapter 15.10) |
| electronicAddresses | List of ElectronicAddressAssociation | An organisation may have any number of electronic address associations (see chapter 15.11) |
| relatedOrganisations | List of RelatedOrganisationAssociation | An organisation may have any number of related organisations |

Table 2 Organisation properties

There are a number of ways organisations might relate to each other:

1. Formal hierarchical organisation structure (parent-child)
2. “Virtual” cross-cutting hierarchies for specific science areas
3. “Taken over by” if an organisation is merged into another

These relations are expressed through the related organisations association, the semantics of the relation being specified by the associated classification.

The “RelatedOrganisationAssociation” implementation properties:

| Attribute | Data-type | Description |
|------------------------|----------------|--|
| relatedTo | Organisation | The related organisation |
| associationType | Classification | The association type, mapped to the ORGANISATION_RELATION scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 3 Related organisation association properties

An organisation may have any number of physical and electronic addresses.

The “OrganisationPhysicalAddressAssociation” implementation properties:

| Attribute | Data-type | Description |
|------------------------|-------------------|--|
| relatedTo | PhysicalAddresses | The related physical address |
| associationType | Classification | The association type, mapped to the ORGANISATION_PHYSICAL_ADDRESS_ASSOCIATION scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 4 Organisation physical address association properties

The “OrganisationElectronicAddressAssociation” implementation properties:

| Attribute | Data-type | Description |
|------------------------|-------------------|--|
| relatedTo | ElectronicAddress | The related electronic address |
| associationType | Classification | The association type, mapped to the ORGANISATION_ELECTRONIC_ADDRESS_ASSOCIATION scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 5 Organisation electronic address association properties

15.4 Person

In the following diagram we've shown the UML class diagram for the classes that encapsulate the person concept. See chapter 15.2 for detailed information on the abstract entity class.

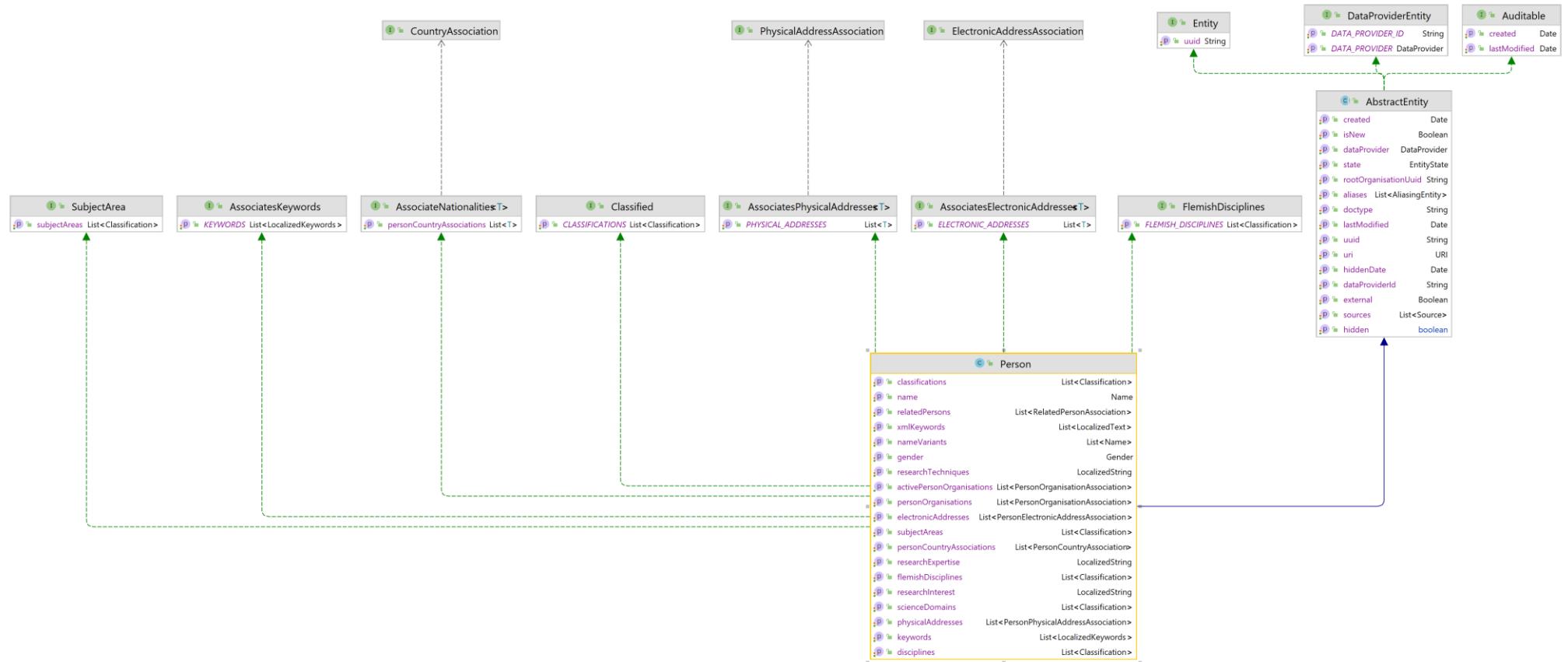


Figure 3 Person UML class diagram

The Person concept consists of the “Person” class and its “RelatedPersonAssociation”, “PersonOrganisationAssociation”, “PersonPhysicalAddressAssociation” and “PersonElectronicAddressAssociation” association objects which are detailed below:

The Person implementation properties:

| Attribute | Data-type | Description |
|----------------------------|---------------------------------------|--|
| name | Name | The name of the person |
| nameVariants | List of Name | Any alternate names of the person. The intention is that name variants are primarily used when querying against the data set for example through the person web service or when ingesting person data. |
| gender | Enumeration | “MALE”, “FEMALE” or “UNKNOWN” |
| researchInterest | LocalizedString | A localized, free description of the person research interests |
| researchExpertise | LocalizedString | A localized, free description of the person research expertise |
| researchTechniques | LocalizedString | A localized, free description of the person research techniques |
| scienceDomains | List of Classification | Any number of IWETO science code classifications relevant for the person, mapped to the SCIENCE_DOMAIN scheme |
| disciplines | List of Classification | Any number of discipline codes, mapped to the DISCIPLINE scheme |
| keywords | List of LocalizedKeywords | Any number of free keywords (see chapter 15.13) |
| personOrganisations | List of PersonOrganisationAssociation | Any number of person organisation associations (assignments) |
| relatedPersons | List of RelatedPersonAssociation | Any number of related person associations |
| physicalAddresses | List of PhysicalAddressAssociation | A person may have any number of physical address associations (see chapter 15.10) |
| electronicAddresses | List of ElectronicAddressAssociation | A person may have any number of electronic address |

| | | |
|--|--|----------------------------------|
| | | associations (see chapter 15.11) |
|--|--|----------------------------------|

Table 6 Person properties

The relation between organisation and person is represented by a PersonOrganisationAssociation object in order to capture all the applicable relation attributes. Person-organisation associations, also known as assignments are a bit special in that they are the only association type object that are expected to have a persistent identifier in the data provider systems.

| Attribute | Data-type | Description |
|------------------------|--------------------------|---|
| relatedTo | Organisation | The related organisation |
| associationType | Classification | The association type, mapped to the PERSON_ORGANISATION_RELATION scheme |
| dataProvider | A DataProvider reference | A reference to the data-provider responsible for this entity |
| dataProviderId | String | The local, data-provider identifier |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 7 Person organisation association properties

The person-to-person relation is intended to capture direct relationships like “supervisor-of/student-of” and the like. The leader-of relation is expressed indirectly, through which person is classified as an organisation leader on the PersonOrganisationAssociation.

| Attribute | Data-type | Description |
|------------------------|----------------|--|
| relatedTo | Person | The related person |
| associationType | Classification | The association type, mapped to the PERSON_RELATION scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 8 Related person association properties

A person may have any number of physical and electronic addresses.

| Attribute | Data-type | Description |
|------------------------|-----------------|--|
| relatedTo | PhysicalAddress | The related physical address |
| associationType | Classification | The association type, mapped to the PERSON_PHYSICAL_ADDRESS_ASSOCIATION scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 9 Person physical address association properties

| Attribute | Data-type | Description |
|------------------|-------------------|--------------------------------|
| relatedTo | ElectronicAddress | The related electronic address |

| | | |
|------------------------|----------------|--|
| associationType | Classification | The association type, mapped to the PERSON_ELECTRONIC_ADDRESS_ASSOCIATION scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 10 Person electronic address association properties

15.5 Infrastructure

In the following diagram we've shown the UML class diagram for the classes that encapsulate the infrastructure concept. See chapter 15.2 for detailed information on the abstract entity class.

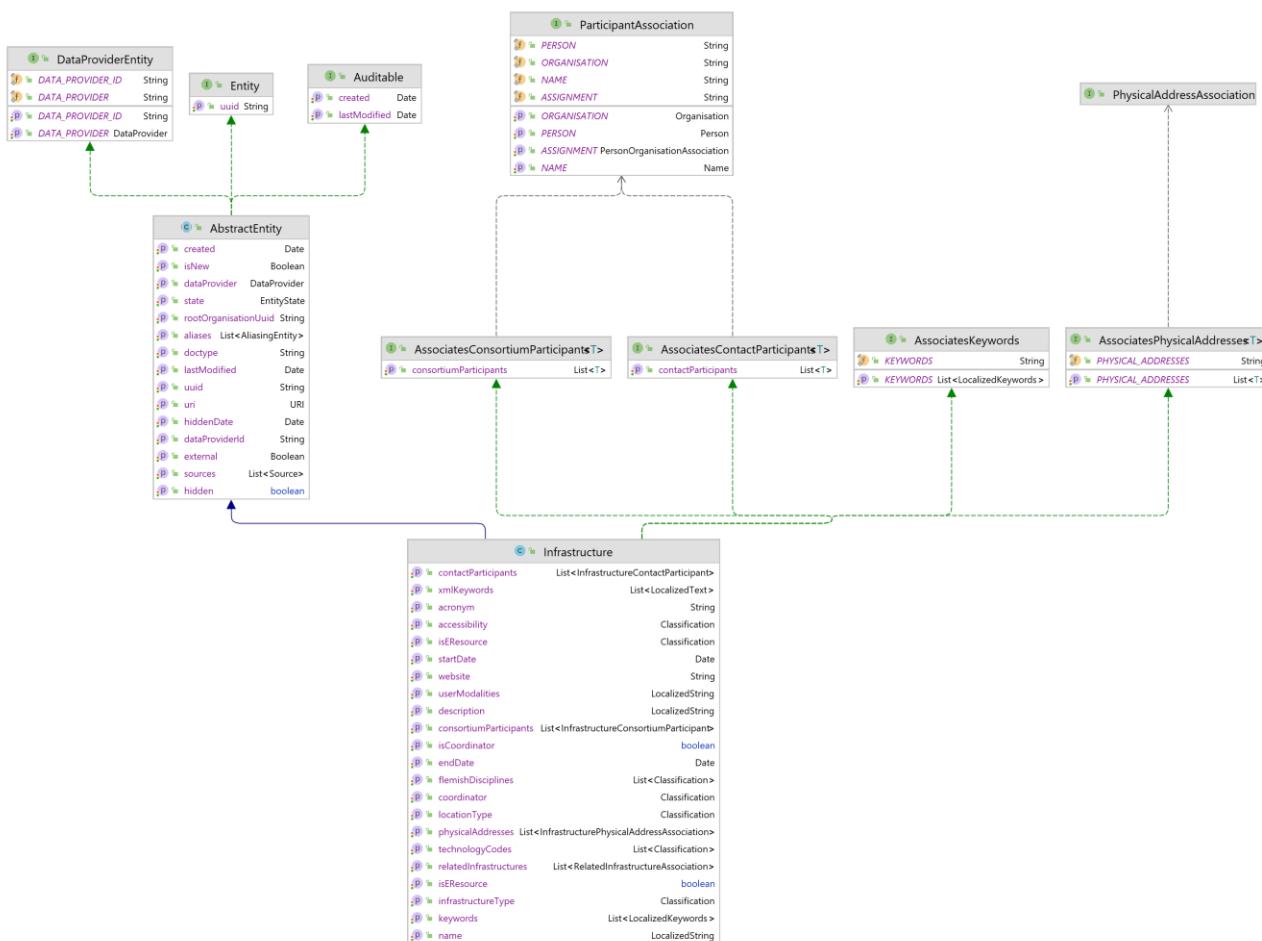


Figure 4 Infrastructure UML class diagram

The Infrastructure concept consists of the “Infrastructure” class and its “AssociatesConsortiumParticipants”, “AssociatesContactParticipants”, “AssociatesPhysicalAddresses” association objects which are detailed below:

The Information implementation properties:

| Attribute | Data-type | Description |
|-----------|-----------|-------------|
|-----------|-----------|-------------|

| | | |
|-------------------------------|---|--|
| contactParticipants | List of AssociatesContactParticipants | Any number of associated contact associations (only persons, no organisations) |
| xmlKeywords | String | Not used |
| acronym | String | The acronym of the infrastructure |
| accessibility | Classification | The accessibility type, mapped to the INFRASTRUCTURE_ACCESSIBILITY scheme |
| isEResource | Classification | The infrastructure type, mapped to the INFRASTRUCTURE_TYPE scheme. Transient value, actual value is stored in the Boolean. |
| startDate | Date | The date the infrastructure is used (or will be used in the future). |
| website | String | link to the website of the infrastructure |
| userModalities | String | Description of the procedure on how and who can use the infrastructure under which conditions. |
| description | String | Description of the infrastructure |
| consortiumParticipants | List of AssociatesConsortiumParticipants | Any number of associated consortium associations |
| isCoordinator | Classification | The coordinator type, mapped to the INFRASTRUCTURE_CONSORTIUM_PERSON_PARTICIPANT_ROLE scheme |
| endDate | Date | The date at which the infrastructure is stopped being used |
| flemishDisciplines | Classification | The flemish discipline code, mapped to the FLEMISH_DISCIPLINE_CODE scheme |
| coordinator | Classification | The coordinator type, mapped to the INFRASTRUCTURE_CONSORTIUM_PERSON_PARTICIPANT_ROLE scheme |
| locationType | Classification | The location type, mapped to the INFRASTRUCTURE_LOCATION_TYPE scheme |
| physicalAddresses | List of PhysicalAddressAssociation | A infrastructure may have any number of physical address associations (see chapter 15.10) |

| | | |
|-------------------------------|---|--|
| technologyCodes | Classification | One or more Fraunhofer technology codes mapped to the FRAUNHOFER35_CODE scheme |
| relatedInfrastructures | List of RelatedInfrastructuresAssociation | Any number of related infrastructure associations |
| isEResource | Boolean | The infrastructure type, mapped to the INFRASTRUCTURE_TYPE scheme |
| infrastructureType | Classification | The entity infrastructure type, mapped to the ENTITY_INFRASTRUCTURE scheme |
| keywords | String | Keywords attached to the infrastructure |
| name | String | The name of the infrastructure |

Table 11 Infrastructure properties

The infrastructure participant relation captures both internal participants (i.e. managed directly by the data provider) and external participants (i.e. persons from other organisations). Note that “assignment”, “person” and “organisation” are mutually exclusive.

The participant association relation consists of 2 different options:

- Consortium participant: this is an organisation, (external) person or affiliation
- Contact participant : this is an affiliation or person (internal or external), not allowed for organisations

It is discussed for both options in the table below

| Attribute | Data-type | Description |
|------------------------|------------------------|--|
| assignment | ParticipantAssociation | Internal person relation to "assignment" enabling unambiguous organisation & person attribution. |
| person | Person | Person relation directly to person instance, only person will be attributable. |
| organisation | Organisation | Organisation relation directly to organisation instance, only organisation will be attributable |
| associationType | Classification | The association type, mapped to the INFRASTRUCTURE_CONSORTIUM_PERSON_PARTICIPANT_ROLE or INFRASTRUCTURE_CONTACT_PERSON_PARTICIPANT_ROLE scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 122 Infrastructure participant properties

The infrastructure-to-infrastructure relation is intended to capture direct relationships like “is linked with” or “part of”.

| Attribute | Data-type | Description |
|-----------|-----------|-------------|
| | | |

| | | |
|------------------------|----------------|--|
| relatedTo | Infrastructure | The related person |
| associationType | Classification | The association type, mapped to the INFRASTRUCTURE_TO_INFRASTRUCTURE_ROLE scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 13 Related infrastructure association properties

An infrastructure may have any number of physical addresses.

| Attribute | Data-type | Description |
|------------------------|-------------------|--|
| relatedTo | PhysicalAddresses | The related physical address |
| associationType | Classification | The association type, mapped to the INFRASTRUCTURE_PHYSICAL_ADDRESS_ASSOCIATION scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 14 Infrastructure physical address association properties

15.6 Project

In the following diagram, we've shown the UML class diagram for the classes that encapsulate the project concept. See chapter 15.2 for detailed information on the abstract entity class.

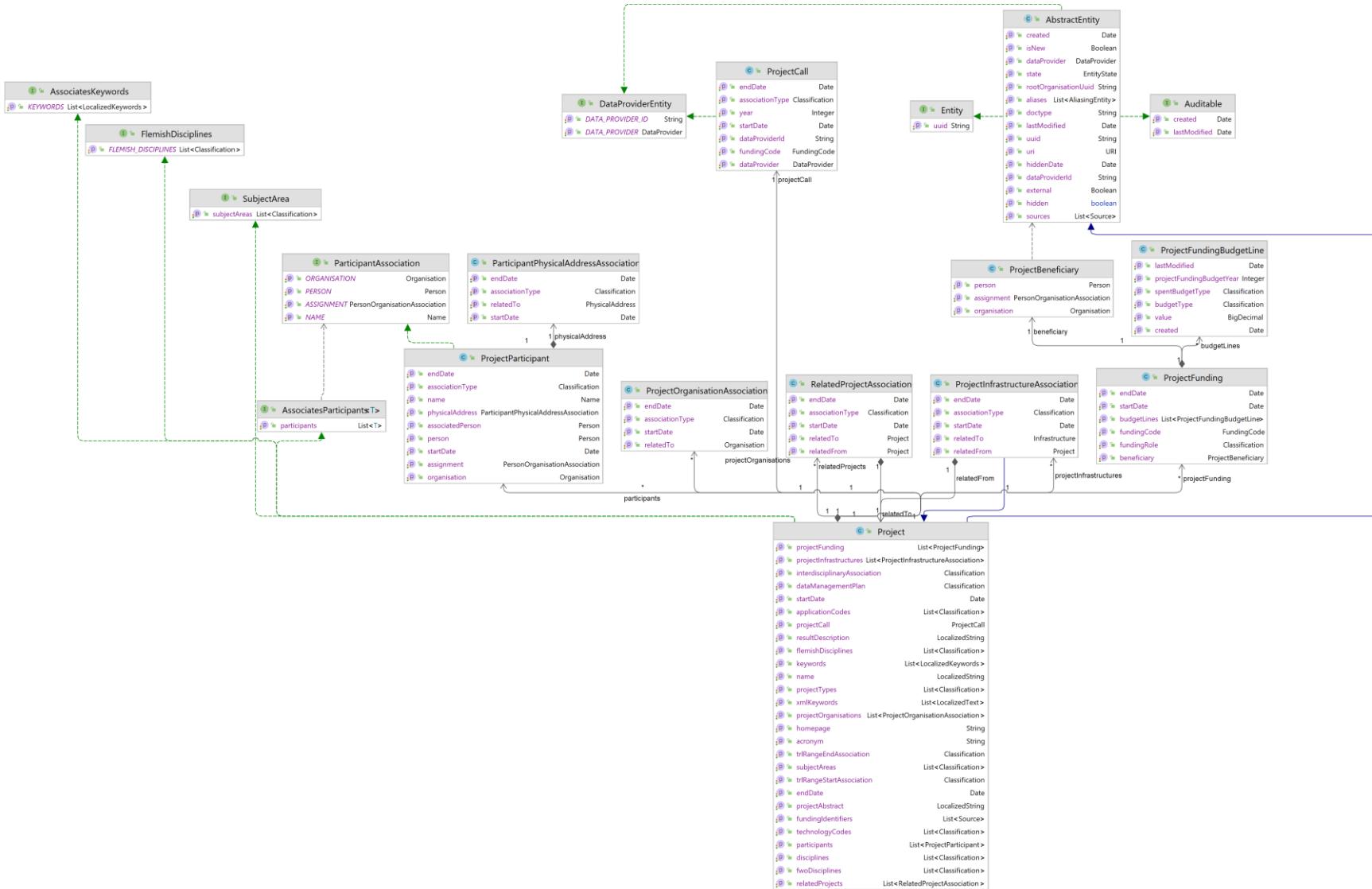


Figure 5 Project UML class diagram

The Project concept consists of the “Project” class, the “Projectfunding” and “ProjectFundingBudgetLine” classes, ProjectCall class and its “RelatedProjectAssociation”, “ProjectOrganisationAssociation”, “ProjectParticipant” and “ProjectInfrastructureAssociation” association objects which are detailed below:

The project implementation properties:

| Attribute | Data-type | Description |
|-----------------------------|--|--|
| name | LocalizedString | The localized name of the project |
| acronym | String | The acronym of the project |
| startDate | Timestamp | The project lifecycle start date |
| endDate | Timestamp | The project lifecycle end date |
| projectTypes | List of Classification | Any number of project type classifications, mapped to the PROJECT_TYPE scheme |
| projectAbstract | LocalizedString | The localized project abstract |
| homepage | String | The project homepage |
| applicationCodes | List of Classification | Any number of IWETO application code classifications relevant for the project, mapped to the APPLICATION_CODE scheme |
| technologyCodes | List of Classification | Any number of IWT technology code classifications relevant for the project, mapped to the TECHNOLOGY_CODE scheme |
| disciplines | List of Classification | Any number of discipline codes relevant for the project, mapped to the DISCIPLINE scheme |
| fwoDisciplines | List of Classification | Any number of FWO discipline codes, mapped to the FWO_DISCIPLINE scheme |
| keywords | List of LocalizedKeywords | Any number of free keywords (see chapter 15.13) |
| projectOrganisations | List of ProjectOrganisationAssociation | Any number of project organisation associations |
| relatedProjects | List of RelatedProjectAssociation | Any number of related project associations |
| participants | List of ProjectParticipant | Any number of project participants |
| projectFunding | List of ProjectFunding | Any number of project funding associations |
| fundingIdentifiers | List of Source | Any number of funding identifiers (f.ex. FWO contract) |

| | | |
|--|--|--|
| | | id), see chapter 15.12 for details. Source authority is mapped to the FUNDING_IDENTIFIER_TYPE scheme |
|--|--|--|

Table 15 Project properties

The project call is an optional object for a project and represented by the ProjectCall class. This mainly used for data provider FWO.

| Attribute | Data-type | Description |
|------------------------|----------------|---|
| associationType | Classification | The association type, mapped to the PROJECT_RELATION scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |
| year | Integer | the year of the project call |
| fundingCode | FundingCode | The funding code of the project call |
| dataProvider | DataProvider | The name of the data provider |
| dataProviderId | String | The id of the data provider |

Table 16 Project call properties

The project beneficiary is a Fellow (Phd-student) which is also the beneficiary of the project. The Beneficiary class

| Attribute | Data-type | Description |
|------------------------|----------------|---|
| associationType | Classification | The association type, mapped to the PERSON_ORGANISATION_ASSOCIATION scheme |
| person | Person | Person relation directly to person instance, only person will be attributable. |
| organisation | Organisation | Organisation relation directly to organisation instance, only organisation will be attributable |

Table 17 Project call properties

The project-to-project relation is represented by a RelatedProjectAssociation object in order to capture all the applicable relation attributes.

| Attribute | Data-type | Description |
|------------------------|----------------|---|
| relatedTo | Project | The related project |
| associationType | Classification | The association type, mapped to the PROJECT_RELATION scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 18 Related project association properties

The project-to-organisation relation is represented by a ProjectOrganisationAssociation object in order to capture all the applicable relation attributes.

| Attribute | Data-type | Description |
|------------------------|----------------|--|
| relatedTo | Organisation | The related organisation |
| associationType | Classification | The association type, mapped to the PROJECT_ORGANISATION_ROLE scheme |

Table 19 Project organisation association properties

The project participant relation captures both internal participants (i.e. managed directly by the data provider) and external participants (i.e. persons from other organisations). Note that "assignment", "person" and "organisation" are mutually exclusive.

| Attribute | Data-type | Description |
|------------------------|-------------------------------|--|
| assignment | PersonOrganisationAssociation | Internal person relation to "assignment" enabling unambiguous organisation & person attribution. |
| person | Person | Person relation directly to person instance, only person will be attributable. |
| organisation | Organisation | Organisation relation directly to organisation instance, only organisation will be attributable |
| associationType | Classification | The association type, mapped to the PROJECT_PARTICIPATION_ROLE scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 20 Project participant properties

The project funding relations capture information on funding.

| Attribute | Data-type | Description |
|--------------------|----------------|---|
| fundingCode | FundingCode | The funding code, see chapter 14 |
| fundingRole | Classification | The funding role, mapped to the FUNDING_ROLE scheme |
| startDate | Timestamp | The funding/budget period start date |
| endDate | Timestamp | The funding/budget period end date |

Table 21 Project funding properties

The project infrastructure relations capture information on the relation between the project and infrastructures.

| Attribute | Data-type | Description |
|--------------------|----------------|----------------------------|
| relatedTo | Infrastructure | The related infrastructure |
| relatedFrom | Project | The related project |

| | | |
|------------------------|----------------|---|
| associationType | Classification | The association type, mapped to the PROJECT_TO_INFRASTRUCTURE_ROLE scheme |
| startDate | Timestamp | The association lifecycle start date |
| endDate | Timestamp | The association lifecycle end date |

Table 22 Project infrastructure relation

15.7 Journal

In the following diagram we've shown the UML class diagram for the classes that encapsulate the journal concept. See chapter 15.2 for detailed information on the abstract entity class.

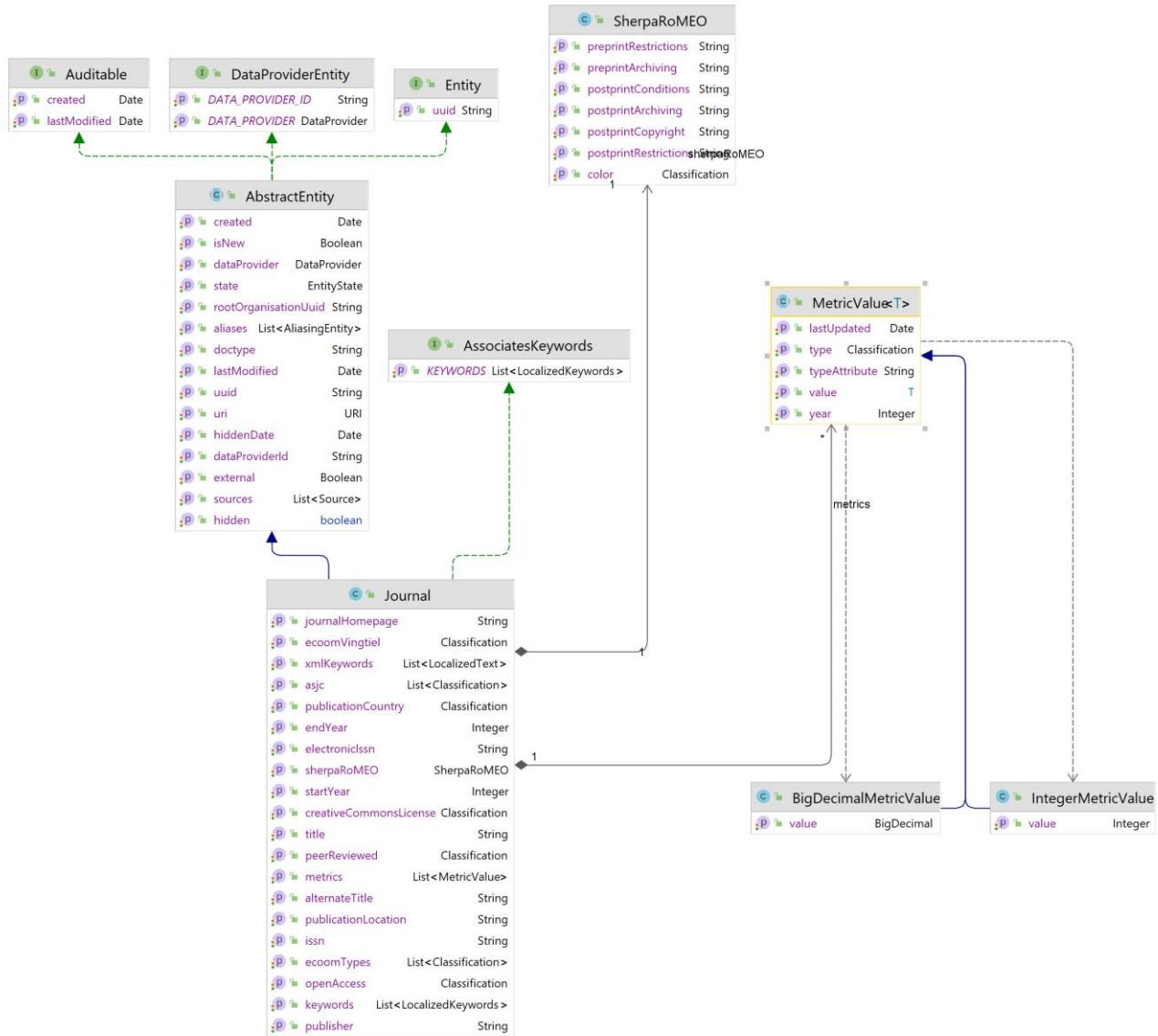


Figure 6 Journal UML class diagram

| Attribute | Data-type | Pub | Description |
|-------------------------------|---------------------------|-----|---|
| title | String | Y | The title of the journal in its original language |
| alternateTitle | String | Y | The alternate title of the journal in its original language |
| issn | String | Y | The print ISSN of the journal |
| electronicIssn | String | Y | The electronic ISSN of the journal |
| journalHomepage | String | Y | The journal homepage URL |
| publisher | String | Y | The journal publisher |
| publicationLocation | String | Y | The publication location, typically a city |
| publicationCountry | Classification | Y | The publication country, mapped to COUNTRY scheme |
| startYear | Integer | Y | The start year of the journal taken from DOAJ journal representation |
| endYear | Integer | Y | The end year of the journal (not populated) |
| peerReviewed | Classification | Y | The peer review status of the journal if known, mapped by the REFEREE_TYPE scheme |
| openAccess | Classification | Y | The open access status of the journal if known, mapped by the OPEN_ACCESS scheme |
| creativeCommonsLicense | Classification | Y | The creative commons license of the journal if known, mapped by the CREATIVE_COMMONS_LICENSE scheme |
| asjc | List of Classification | Y | A number of subjects relevant for the journal, mapped to the ASJC scheme |
| keywords | List of LocalizedKeywords | Y | Any number of free keywords (see chapter 15.13) |
| sherpaRomeo | SherpaRoMEO | Y | Sherpa RoMEO information, see below for details on attributes |
| metrics | List of MetricValue | Y | Any number of MetricValue instances, see below |

Table 23 Journal properties

The Sherpa RoMEO properties are encapsulated in their own object:

| Attribute | Data-type | Description |
|-----------------------------|----------------|--|
| color | Classification | The Sherpa RoMEO colour, mapped to the SHERPA_ROMEO_COLOR scheme |
| preprintArchiving | String | Whether the pre print can be archived |
| preprintRestrictions | String | Any restrictions to the archiving of pre print |

| | | |
|------------------------------|--------|--|
| postprintArchiving | String | Whether the post print can be archived |
| postprintRestrictions | String | Any restrictions on archiving the post print |
| postprintConditions | String | Any conditions on the post print |
| postprintCopyright | String | Any copyright on the post print |

Table 24 Sherpa RoMEO properties

Journals can have any number of associated metrics, the actual instance varies according to the metric value type, initially there will only be decimal and integer variations.

| Attribute | Data-type | Description |
|--------------------|-----------------------|--|
| type | Classification | The metric type, these classifications follow the same pattern as authority i.e. they express both authority and provenance in one scheme. Mapped to the METRICS_TYPE scheme |
| lastUpdated | Timestamp | Stores when this value was last updated |
| year | Integer | The year for which this metric value is relevant |
| value | Integer or BigDecimal | The actual metric value, data type depends on implementation |

Table 25 MetricValue properties

15.8 Research output

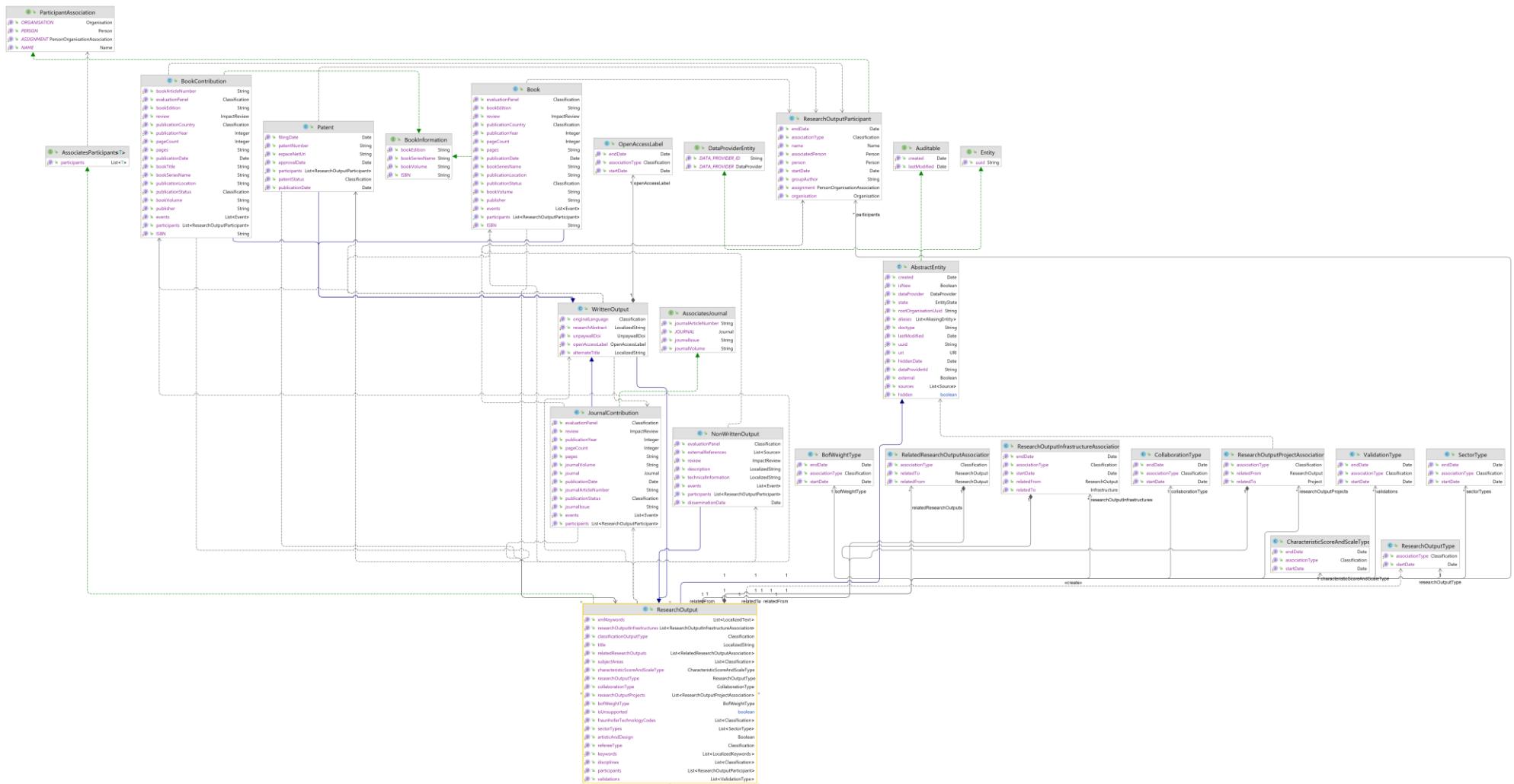


Figure 7 Research output UML class diagram

The research output model in FRIS contains five research output types; book, book contribution, journal contribution, patent and non-written output even only the three first are really used at the moment. The two last are already defined but not used yet (except for testing purposes).

The base properties that all research output instances contain are expressed in the “ResearchOutput” class which is also a super-class to all research output implementations.

| Attribute | Data-type | Description |
|--|---|---|
| title | LocalizedString | The localized title of the output |
| researchOutputType | Classification | The research output type taxonomy classification, mapped to the RESEARCH_OUTPUT_TYPE scheme. This is expected to be a hierarchical scheme with potentially a sub-tree for each individual type. |
| refereeType | Classification | The referee type, mapped to the REFEREE_TYPE scheme |
| artisticAndDesign | boolean | Whether the research output can be designated a artistic or design output |
| keywords | List of LocalizedKeywords | Any number of free keywords |
| researchOutputProjects | List of ResearchOutputProject Association | Any number of related project associations |
| participants | List of ResearchOutputParticipant | Any number of research output participants |
| relatedResearchOutputs | List of RelatedResearchOutput Association | Any number of related research output associations |
| disciplines | List of Classification | Any number of discipline codes |
| researchOutputInfrastructures | List of ResearchOutputInfrastructureAssociation | Any number of related infrastructure associations |
| characteristicScoreAndScaleType | CharacteristicScoreAnd ScaleType | The CSS type, mapped to the RESEARCH_OUTPUT_CHARACTERISTIC_SCORE_AND_SCALE_TYPE scheme |
| collaborationType | CollaborationType | The collaboration type, mapped to the COLLABORATION_TYPE scheme |
| bofWeightType | BofWeightType | The collaboration type, mapped to the RESEARCH_OUTPUT_BOF_WEIGHT_TYPE scheme |
| sectorType | SectorType | The collaboration type, mapped to the RESEARCH_OUTPUT_SECTOR_TYPE scheme |

Table 26 Research output properties

A ResearchOutputProjectAssociation typically expresses relations to any projects that resulted in this output.

| Attribute | Data-type | Description |
|------------------------|----------------|---|
| relatedTo | Project | The related project |
| associationType | Classification | The association type, mapped to the RESEARCH_OUTPUT_PROJECT_RELATION scheme |

Table 27 Research output project association properties

The research participant relation captures both internal participants (i.e. managed directly by the data provider) and external participants (i.e. persons from other organisations).

| Attribute | Data-type | Description |
|------------------------|-------------------------------|---|
| assignment | PersonOrganisationAssociation | Internal person relation to "assignment" enabling un-ambiguous organisation & person attribution. |
| person | Person | Person relation directly to person instance, only person will be attributable. |
| organisation | Organisation | Organisation relation directly to organisation instance, only organisation will be attributable |
| groupAuthor | String | Group author or consortium |
| associationType | Classification | The association type, mapped to the RESEARCH_OUTPUT_PARTICIPATION_ROLE scheme |

Table 28 Research Output participant properties

A RelatedResearchOutputAssociation expresses a relation between two research output instances, for example a book contribution is "part of" a book.

| Attribute | Data-type | Description |
|------------------------|----------------|--|
| relatedTo | ResearchOutput | The related research output |
| associationType | Classification | The association type, mapped to the RESEARCH_OUTPUT_RELATION_TYPE scheme |

Table 29 Related research output association properties

A ResearchOutputInfrastructureAssociation expresses a relation between a research output and an infrastructure.

| Attribute | Data-type | Description |
|------------------------|----------------|---|
| relatedFrom | ResearchOutput | The related research output |
| relatedTo | Infrastructure | The related infrastructure |
| associationType | Classification | The association type, mapped to the RESEARCH_OUTPUT_TO_INFRASTRUCTURE_ROLE scheme |
| startDate | Date | The start date |
| endDate | Date | The end date |

Table 30 Infrastructure research output association properties

The WrittenOutput specialisation is the super-class for all of the traditional published scholarly output, namely Book, BookContribution, JournalContribution and Patent.

| Attribute | Data-type | Description |
|-------------------------|------------------------|--|
| alternateTitle | LocalizedString | The localized alternate or sub title of the output |
| originalLanguage | Classification | The original language of the output, mapped to the LANGUAGE scheme |
| researchAbstract | LocalizedString | The localized abstract or description of the output |
| UnpaywallDoi | UnpaywallDoi | DOI identifier |
| OpenAccessLabel | OpenAccessLabel | Open access label |

Table 31 Written Output properties

The AssociatesBook and its super-type BookInformation encapsulate properties that are particular to a book (BookInformation) or book reference (AssociatesBook).

| Attribute | Data-type | Description |
|-----------------------|-----------|---|
| ISBN | String | The ISBN of the book or referred book |
| bookEdition | String | The edition of the book or referred book |
| bookVolume | String | The volume of the book or referred book |
| bookSeriesName | String | The series name of the book or referred book |
| bookTitle | String | The title of the referred book (only applicable for AssociatesBook) |

Table 32 Associates book and book information properties

The AssociatesEvent interface encapsulates properties that pertain to an event association.

| Attribute | Data-type | Description |
|---------------|---------------|---------------------------------|
| events | List of Event | Any number of associated Events |

Table 33 Associates event property

The Event properties are:

| Attribute | Data-type | Description |
|------------------|----------------|---|
| name | String | The name of the event |
| eventType | Classification | The type of event |
| location | String | The location or city of the event, mapped to the EVENT_TYPE scheme |
| country | Classification | The country classification of the event, mapped to the COUNTRY scheme |
| startDate | Date | The start date of the event |
| endDate | Date | The end date of the event |

Table 34 Event properties

The AssociatesJournal interface encapsulates properties that pertain to a contribution to a journal association.

| Attribute | Data-type | Description |
|---------------------|-----------|---|
| journalIssue | String | The issue that this contribution was published in |

| | | |
|----------------------|---------|---|
| journalVolume | String | The volume that this contribution was published in |
| journal | Journal | The journal that this contribution was published in |

Table 35 Associates journal properties

The AssociatesPublisher interface encapsulates properties that pertain to the publisher of a published work (specifically properties needed for a correct output reference).

| Attribute | Data-type | Description |
|----------------------------|----------------|---|
| publisher | String | The name of the publisher |
| publicationLocation | String | The location or city where this work was published |
| publicationCountry | Classification | The country classification of the country where this work was published, mapped to the COUNTRY scheme |

Table 36 Associates publisher properties

The Pages interface encapsulates paging information for a contribution.

| Attribute | Data-type | Description |
|------------------|-----------|---|
| pages | String | The pages where the contribution can be found, note that this may not be contiguous or numeric, hence the generic pages field instead of a start/end page field |
| pageCount | Integer | The number of pages contributed |

Table 37 Pages properties

The PublicationLifecycle interface contains a couple of properties relating to the lifecycle of a published work.

| Attribute | Data-type | Description |
|-------------------------|----------------|---|
| publicationDate | Date | The date a work was published |
| publicationState | Classification | The publication state of a work, for example "In press" or "Published". mapped to the PUBLICATION_STATUS scheme |

Table 38 Publication lifecycle properties

The EvaluationPanel interface contains a single property.

| Attribute | Data-type | Description |
|------------------------|----------------|--|
| evaluationPanel | Classification | The evaluation panel of an output, mapped to the EVALUATION_PANEL scheme |

Table 39 Evaluation panel property

The PeerReviewed interface contains a single property.

| Attribute | Data-type | Description |
|--------------------|----------------|---|
| refereeType | Classification | The peer review or referee status of an output, mapped to the REFEREE_TYPE scheme |

Table 40 Peer reviewed property

One or more of the preceding concepts composes each of the research output types; this composition is outlined in the table below for each type:

| Output type composition | Book | Book Contribution | Journal Contribution | Patent | Non Written Output |
|---|------|-------------------|----------------------|--------|--------------------|
| Research output (Table 26) | Yes | Yes | Yes | Yes | Yes |
| Written Output (Table 31) | Yes | Yes | Yes | Yes | |
| Book information (Table 32) | Yes | | | | |
| Associates book (Table 32) | | Yes | | | |
| Associates event (Table 33 & Table 34) | Yes | Yes | Yes | | Yes |
| Associates journal (Table 35) | | | Yes | | |
| Associates publisher (Table 36) | Yes | Yes | | | |
| Pages (Table 37) | Yes | Yes | Yes | | |
| Publication lifecycle (Table 38) | Yes | Yes | Yes | | |
| Evaluation panel (Table 39) | Yes | Yes | Yes | | Yes |
| Peer reviewed (Table 40) | Yes | Yes | Yes | Yes | Yes |

Table 41 Research output type compositions

The Patent type has a number of properties that are particular to the type (in addition to the properties inherited the traits listed in Table 41):

| Attribute | Data-type | Description |
|----------------------|----------------|--|
| filingDate | Date | The date the patent was filed at the patent office |
| approvalDate | Date | The date the patent was approved |
| patentNumber | String | The patent number |
| patentCountry | Classification | The country classification of the country of the patent office, mapped to the COUNTRY scheme |
| espaceNetUri | String | Espacenet URL |
| patentStatus | Classificaton | Patent status for example: Published |

Table 42 Patent type properties

The NonWrittenOutput class contains the following properties (in addition to the properties inherited the traits listed in Table 41):

| Attribute | Data-type | Description |
|-----------------------------|------------------|---|
| disseminationDate | Date | The date this output was disseminated |
| description | LocalizedString | A localized description of the output |
| technicalInformation | LocalizedString | A localized technical information description |
| review | ImpactReview | The impact review of this output |
| externalReferences | List of Source | The external references of this output. The source authority is mapped to the EXTERNAL_REFERENCE_AUTHORITY scheme |

Table 43 NonWrittenOutput properties

The ImpactReview properties:

| Attribute | Data-type | Description |
|--------------------------|------------------|---|
| impactDescription | LocalizedString | A localized impact description |
| researchContext | LocalizedString | A localized description of the research context |
| impactReferences | List of Source | The impact references of this output. The source authority is mapped to the IMPACT_REFERENCE_AUTHORITY scheme |

Table 44 ImpactReview properties

15.9 Classification Scheme & Classification

Each classification scheme consists of a number of associated hierarchical classifications. We've chosen to model classifications as inherently hierarchical since this is a fairly common usage and using classifications to describe this behaviour is very inefficient even though the recursive nature is appealing from a modelling perspective.

We've chosen a simple representation of classifications and schemes; the main reason for this is that any additional information from classifying both classifications and schemes is not needed in the FRIS system, even though that information makes sense in a modelling environment.

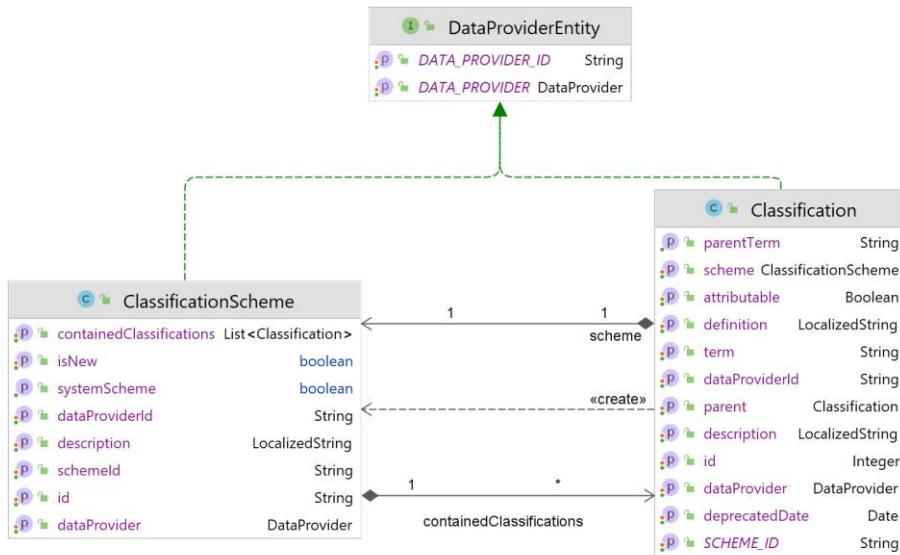


Figure 8 Classification scheme & classification UML class diagram

A classification scheme is equivalent to a SKOS⁴ ConceptScheme and is a container for a collection of related classifications. Both entities have a surrogate identifier in order to allow changes in the natural identifiers without upsetting any object references.

| Attribute | Data-type | Description |
|-----------------------|--------------|--|
| id | String | The classification scheme id, for all of the expected schemes this is identical to the scheme mapping name, i.e. COUNTRY, PROJECT_TYPE, etc. |
| dataProvider | DataProvider | A reference to the data-provider responsible for this entity |
| dataProviderId | String | The local, data-provider identifier |
| schemeld | String | The classification scheme id is a contextual scheme identifier, for example "iwDisciplineCode" in the case of the |

⁴ <http://www.w3.org/2004/02/skos/> Simple Knowledge Organisation System

| | | |
|---------------------------------|------------------------|--|
| | | IWETO discipline code classification scheme. |
| description | LocalizedString | The scheme description is a short textual description of the meaning of the classification scheme, similar to the SKOS definition element. |
| containedClassifications | List of Classification | The list of classifications contained in this scheme |

Table 45 Classification scheme attributes

A classification is equivalent to a SKOS Concept and typically expresses some form of formal categorisation.

| Attribute | Data-type | Description |
|-----------------------|----------------------|---|
| id | Integer | The managed entity id |
| dataProvider | DataProvider | A reference to the data-provider responsible for this entity |
| dataProviderId | String | The local, data-provider identifier |
| term | String | Classification term is a contextual meaningful identifier that is unique within the scope of the classification scheme; this identifier may be equivalent to a SKOS notation or a single word label. For example “B001” in the case of the “General biomedical sciences” IWETO discipline code. |
| description | LocalizedString | Description of the classification, for example “General biomedical sciences”. |
| scheme | ClassificationScheme | The scheme that this classification is part of |
| parent | Classification | The parent classification |
| attributable | Boolean | Specifies whether a particular classification is attributable/selectable. |
| parentTerm | String | Reference to parent classification |
| definition | LocalizedString | Short description |
| deprecatedDate | Date | End date regarding the validity of the classification |

Table 46 Classification attributes

15.10 Physical Address

Physical address entities may be created and managed independently of the entity relating to the physical address, though only via the web service ingestion service.

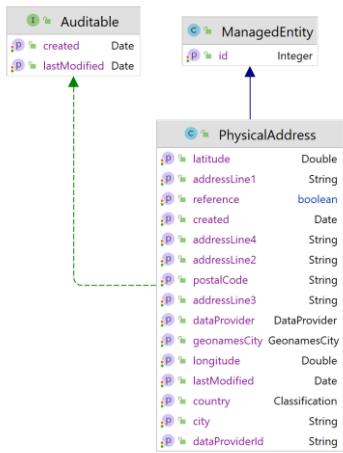


Figure 9 Physical address UML class diagram

| Attribute | Data-type | Description |
|-----------------------|----------------|--|
| id | Integer | The managed entity id |
| dataProvider | DataProvider | A reference to the data-provider responsible for this entity |
| dataProviderId | String | The local, data-provider identifier |
| addressLine1 | String | Must contain the campus |
| addressLine2 | String | Must contain the building |
| addressLine3 | String | Must contain the street and number |
| addressLine4 | String | Not used |
| postalCode | String | The post code |
| city | String | The city |
| country | Classification | The country classification, mapped to the COUNTRY scheme |
| created | Date | The date the address was created |
| lastModified | Date | The date the address was last changed |
| Latitude | Double | Latitude coordinate |
| Longitude | Double | Longituded coordinate |
| geonamesCity | GeonamesCity | GeonamesCity identifier |

Table 47 Physical address attributes

15.11 Electronic Address

Electronic address entities are solely created and managed as part of the owning entity.

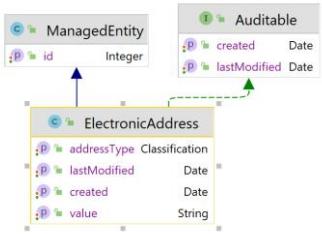


Figure 10 Electronic address UML class diagram

| Attribute | Data-type | Description |
|---------------------|----------------|---|
| id | Integer | The managed entity id |
| addressType | Classification | The address type, mapped to the ELECTRONIC_ADDRESS scheme |
| value | String | The electronic address value |
| created | Date | The date the address was created |
| lastModified | Date | The date the address was last changed |

Table 48 Electronic address association attributes

15.12 Source

The source concept encapsulates an alternate identity or representation of the entity.

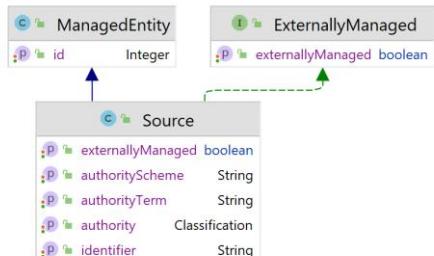


Figure 11 Source UML class diagram

| Attribute | Data-type | Description |
|--------------------------|----------------|--|
| id | Integer | The managed entity id |
| authority | Classification | The authority classification that signifies this data-provider, mapped to the AUTHORITY scheme (unless overridden) |
| identifier | String | The external identifier |
| externallyManaged | Boolean | Whether a source instance is managed directly by a data-provider (true) or added by the FRIS system (false) |

Table 49 Source attributes

15.13 Localized Keywords



Figure 12 LocalizedKeywords UML class diagram

| Attribute | Data-type | Description |
|-----------------|----------------|--|
| id | Integer | The managed entity id |
| locale | Locale | The locale for which the keywords are applicable |
| keywords | List of String | A list of free keywords |