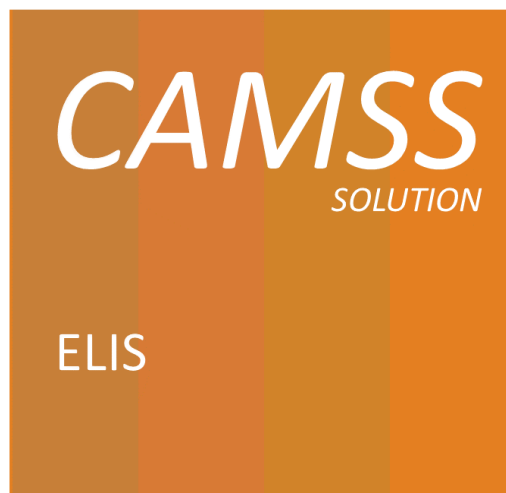


ELIS v5.0.0



Overview

CHANGE CONTROL

Modification	Details
Version 5.0.0	
Current version	
Version 1.1.0	
Previous version	

Disclaimer

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1. INTRODUCTION

This document represents the deliverable requested within Task 04 of the current contract. It consists of the EIRA Library of Interoperability Specifications (ELIS¹) version 5.0.0 expressed using DCAT², as well as a narrative explaining the changes made to the ELIS v1.1.0 to reach v5.0.0 and the specifications added to the ELIS during this project.

It contains the following elements:

- A description of the context in which the EIRA Library of Interoperability Specifications (ELIS) has been developed.
- A description of the analysis performed prior to the population of the ELIS.
- A description of the process for the expression of the ELIS using the Data Catalogue Vocabulary (DCAT).
- The Microsoft Excel and DCAT versions of the ELIS.

The ELIS is a library containing the standards and specifications defining the interoperability aspects of the architectural building blocks (ABBs) contained in the European Interoperability Reference Architecture (EIRA³). The aim of this library is supporting solution architects when modelling using EIRA.

“ELIS is a modelling tool-agnostic library of interoperability specifications. ELIS is not an architecture-agnostic library of interoperability specifications. ELIS is the EIRA library of interoperability specifications”

In the following sections, the context in which the ELIS has been developed is explained, as well as the criteria and methodology followed for the inclusion of specifications in it, and the way it is expressed using DCAT.

2. CONTEXT

The DEP programme (Digital Europe Programme) of the European Commission supports the development of solutions that enable the cross-border delivery of interoperable public services in Europe. In order to ensure the interoperability of those services, the European Interoperability Action (EIA) action works as

¹ EIRA Library of Interoperability Specifications <https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/elis>

² DCAT: <https://www.w3.org/TR/vocab-dcat-3/>

³ EIRA: <https://joinup.ec.europa.eu/collection/european-interoperability-reference-architecture-eira/about>

an integrator between the Member States and other departments of the European Commission for the development of a joint interoperability architecture for public services. The main output of this action is the European Interoperability Reference Architecture (EIRA©), which implements the European Interoperability Framework (EIF) in the Legal, Organisational, Semantic, and Technical (LOST) views of interoperability.

EIRA introduces the concept of “solution specification” and defines it as ‘of the highest possible level of granularity on a Solution Building Block, formulated as an agreed normative statement in the design of a European Public Service’⁴. Additionally, interoperability specifications cover the four levels of interoperability defined in EIRA.

As an element of the EIRA©, the ELIS provides a set of interoperability specifications that can be used to define the different interoperability aspects of European public services. The ELIS will constitute a tool for supporting architects in the process of modelling public services using EIRA, as it defines the interoperability aspects of the ABBs contained in it.

Additionally, it will also allow them, once implemented in a modelling tool, to work simultaneously with other local libraries, allowing the description of the interoperability of the building blocks of any other architecture with the specifications contained in the ELIS.

3. UPDATE OF THE ELIS AND RELEASE OF v5.0.0

The European Library of Interoperability Specifications is the digital library of specifications defining interoperability aspects of the European Interoperability Reference Architecture (EIRA) architectural building blocks (ABBs) and Solution building blocks (SBBs). It is used by solution architects when modelling Detailed Level Solution Architecture Templates (DL SAT). The current version of the ELIS is based on the latest version of [EIRA v5.0.0](#).

This section aims to explain how the new release of the ELIS has been performed. ELIS connects each EIRA ABB to one or more specifications and some specifications to one or more existing CAMSS assessments.

For this purpose, the two CAMSS vocabularies are used:

- The Core Standards and Specifications Vocabulary (CSSV)⁵, and
- The Core Assessment Vocabulary (CAV)⁶.

Also, it is important to remark that the ELIS expression is based on DCAT.

⁴ EIRA v5.0.0 Solution Specification:

https://joinup.ec.europa.eu/taxonomy/term/http_e_f_data_ceuropa_ceu_fdr8_fSolutionSpecification

⁵ CSSV Solution <https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/core-standards-and-specifications-vocabulary-cssv>

⁶ CAV Solution <https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/core-assessment-vocabulary-cav>

Additionally, the ELIS will be available through the OP's CELLAR SPARQL endpoint: <http://publications.europa.eu/webapi/rdf/sparql>. A set of SPARQL queries can be found in Annex I. These queries can be executed in the endpoint to retrieve data from the ELIS.

3.1. The DCAT expression of the ELIS Catalogue

The fact that the catalogue is electronic means that it can be processed by a software application. Thus ELIS is expressed as an electronic catalogue so it can be consumed by software applications like Archi® and other architecture modelling and development tools. For its expression as a machine-readable artefact, the ELIS uses the DCAT specification.

The Data Catalogue Vocabulary (DCAT) is used to describe public sector datasets in Europe. This vocabulary has been developed by the W3C. DCAT can be used to describe any type of asset (treated as a dataset, especially if you consider that metadata is also data).

The figure below shows the summary DCAT classes and properties⁷:

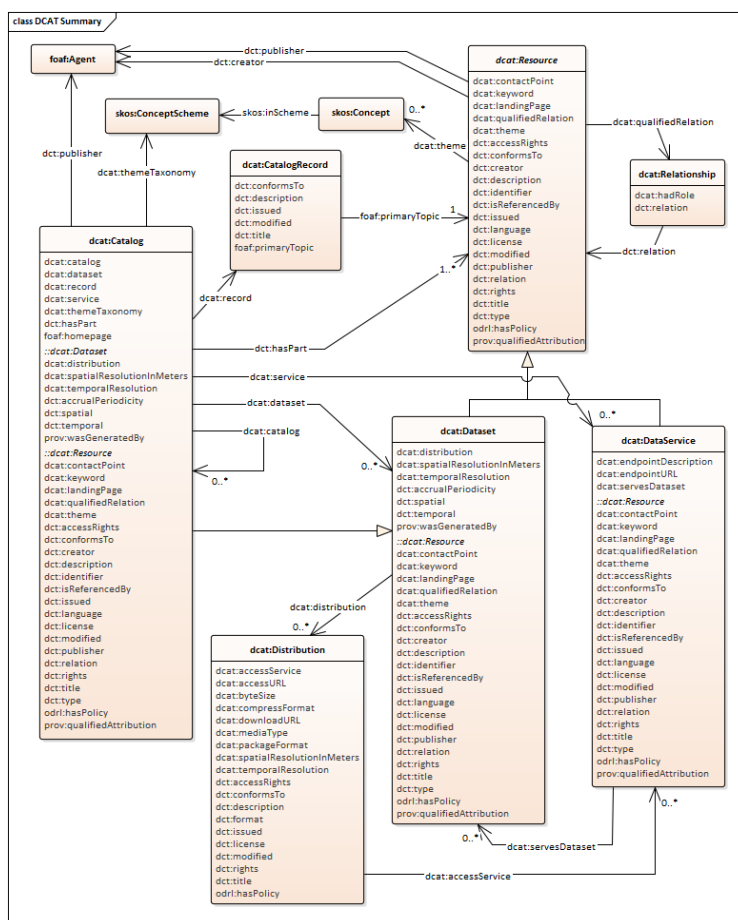


Figure 1 DCAT classes and properties

⁷ DCAT <https://www.w3.org/TR/vocab-dcat-3/>

3.2. The Core Standards and Specifications Vocabulary (CSSV)

The CSSV is the vocabulary used for the information exchange related to standards and specifications amongst software solutions, as well as it is the key element for the development of the new release of the EIRA Library of Interoperability Specifications (ELIS).

The following figure shows the classes and properties that are used or defined in the CSSV and which are part of the new release of the ELIS:

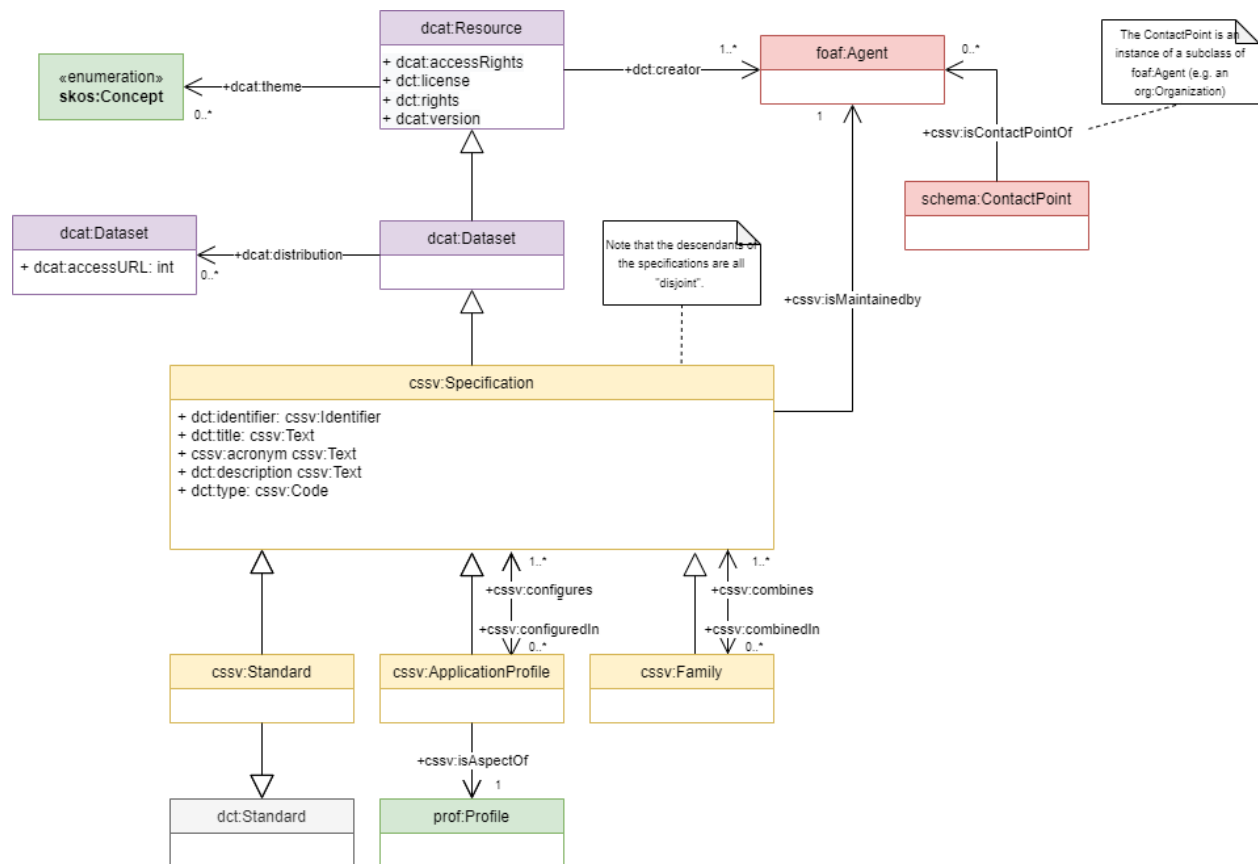


Figure 2 CSSV Data model

The main class of the CSSV model is the "Specification". A Specification is an asset, as it inherits from the *dcat:Dataset*, which inherits from the *dcat:Resource*.

A Specification, additionally, can be a Standard, an ApplicationProfile, a Family, or a collection of other specifications. The CSSV model defines:

- A **Specification** as a set of agreed, descriptive, and normative statements about how a specification should be designed or made.
- A **Standard** as a specification that is largely adopted and possibly endorsed.
- An **ApplicationProfile** as customisation of one or more existing specifications potentially for a given use case or a policy domain adding an end-to-end narrative describing and ensuring the interoperability of its underlying specification(s). By customisation, we understand the "addition

of more specificity by identifying mandatory, recommended, and optional elements, as well as by defining controlled vocabularies to be employed”.

- A **Family** as a collection of interrelated and/or complementary specifications, standards or application profiles and the explanation of how they are combined, used, or both.

A collection of Specifications differs from a Family of Specifications in the fact that the relationship amongst themselves is not explicit. In the CSSV model, a collection of Specifications is an Asset that is related to other Assets and that is realised as an individual of a Specification. In other words, a Specification that reuses the *dct:relation* property of its base class *dcat:Dataset*.

There are occasions where collections of Specifications are applied to a context or a domain in a specific “configuration”. Thus application profiles may conform sets of “themed” specifications. For this, the CSSV model uses the property “configures/includedIn” and the *dcat:theme* property pointing at a *skos:Concept* (i.e. a code, see the DCAT model above).

It is important to note that the descendants of the specifications are all “disjoint”. Thus, ApplicationProfiles and Families are Specifications that refer to or are put together with other Specifications and/or Standards, but cannot themselves be considered Standards.

One Specification, in time, may become a Standard. In these cases, the authority (author) that defined the Specification may be different from the one that creates and maintains artefacts out of the Standard. Think for example of the artefacts produced, maintained, and distributed by the Publications Office of the European Union (OP) in its site EU Vocabularies⁸: all these artefacts are defined by other authorities (e.g. the ISO), whilst the artefacts (e.g. the controlled vocabularies expressed in SKOS, XML, GeneriCode, XML, etc.) are supplied by the OP. For this, the CSSV uses the properties *dct:creator* and *cssv:isMaintainedBy*. Additionally, the *dcat:Dataset* has the property *dct:type* that can be used to state that the Specification is of type “definition, artefact or other”. The DCAT vocabulary also provides the possibility of expressing who is responsible for the publication of the definition or the artefacts via the property *dct:publisher* (see the DCAT model).

The maintainer or publisher of a Specification is a *foaf:Agent*, which allows great flexibility to the CSSV model as *foaf:Agent* is the base class in many ontologies. The CSSV puts forward the reuse of the Core Person Vocabulary (ISA² CPV) and the Organization Ontology (W3C Org) for this purpose. Also, the *foaf:Agent* also provides the contact point of the specification.

Concerning the Intellectual Property Rights, they are covered by the fact that a specification which is a *dcat:Resource* and it allows to define the *dct:license* and *dct:rights*.

Finally, note that all the descendants of the *cssv:Specification* are disjoint. This entails that an individual of an application profile or family cannot be a standard, but does not preclude that, in time, the application profile or the family can become standards. If that were the case then individuals of

⁸ EU Vocabularies: <https://publications.europa.eu/en/web/eu-vocabularies/controlled-vocabularies>

cassv:Standard would be created to represent the standardisation of those specifications that are application profiles and families.

3.3. The Core Assessment Vocabulary (CAV)

The Core Assessment Vocabulary represents and defines what an “Assessment” of an “Asset” is and how to perform the Assessment using scenario-based “Criteria”. It is a domain-agnostic vocabulary, meaning that it can be used to assess any type of asset. Hence, the CAV is at the very core of the CAMSS Ontology. Or, in other words, the CAMSS Ontology reuses 100% of the CAV.

The following figure shows the classes and properties that are used or defined in the vocabulary:

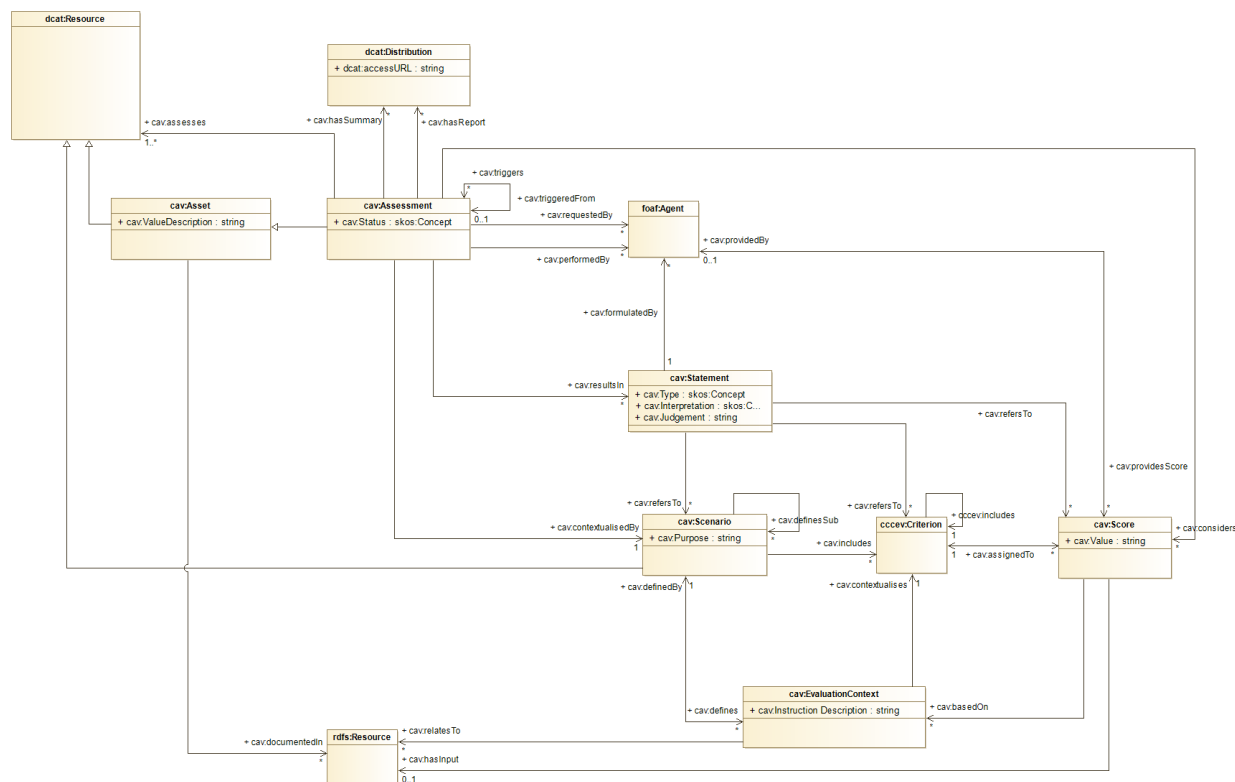


Figure 3 The Core Assessment Vocabulary

A CAV **Assessment** is a specialisation of an Asset, which is itself also a specialisation of the *dcat:Resource*. As any asset, it can be identified and described, and has individual distributions, publishers, etc. Additionally to these properties, the CAV class Assessment needs to specify who are the requestors and evaluators of the Assessments. These can be anything represented by a FOAF⁹ Agent, such as a natural person or an organisation. Notice that the objects assessed are also Resources meaning that the CAV may

⁹ FOAF Vocabulary Specification <http://xmlns.com/foaf/spec/>

be used to assess anything that is considered a valuable resource. Examples of such resources could be products, services, or, in the case of CAMSS, standards, and specifications.

An Assessment results in **Statements** capturing the produced knowledge and providing value judgments. These can refer to the Assessment as a whole or a specific section, even being as detailed as to refer to individual evaluated criteria. A **Criterion** is typically derived from a Reference Framework, which is to be understood as a series of “agreed and descriptive reference requirements” coming from one or more sources (e.g., legislation, specifications and standards, ICT policy-related works like the EIF within the EIS, etc.). Throughout the Assessment each Criterion is assigned a **Score** (in principle by humans, but potentially also by systems) as the value output that is considered when formulating the resulting Statement(s). The **Score** can take into consideration any resource input (e.g., when the score is calculated based on different input parameters, algorithms, and formulae).

Any Assessment is performed in the context of a **Scenario**. The Scenario defines the purpose of the Assessment and the set of Criteria to be scored by one or more Agents. Scenarios can be defined with a flexible structure including nested sections (represented as sub-Scenarios) that serve to provide additional context, group thematically Criteria and be referred to by the assessment’s resulting Statement(s). Criteria can themselves be simple or complex and originate from various reference sources. The overall context for the evaluation of the Criteria is provided by the Scenario, however, in case certain Criteria require additional contextualisation or evaluation instructions these can exceptionally be provided by means of **EvaluationContext** which is related to a resource.

Finally, an Assessment might trigger another related Assessment of different content which has its own Scenario and Criteria. Note that it is also possible to model work in progress, expressed by having the Assessment defining optional links to Scores, Statements, reports, and summaries.

3.4. ELIS Overview

This section explains how ELIS is connected with DCAT, the CSSV, and the CAV. The figure below shows a conceptual overview of how the ELIS is connected:

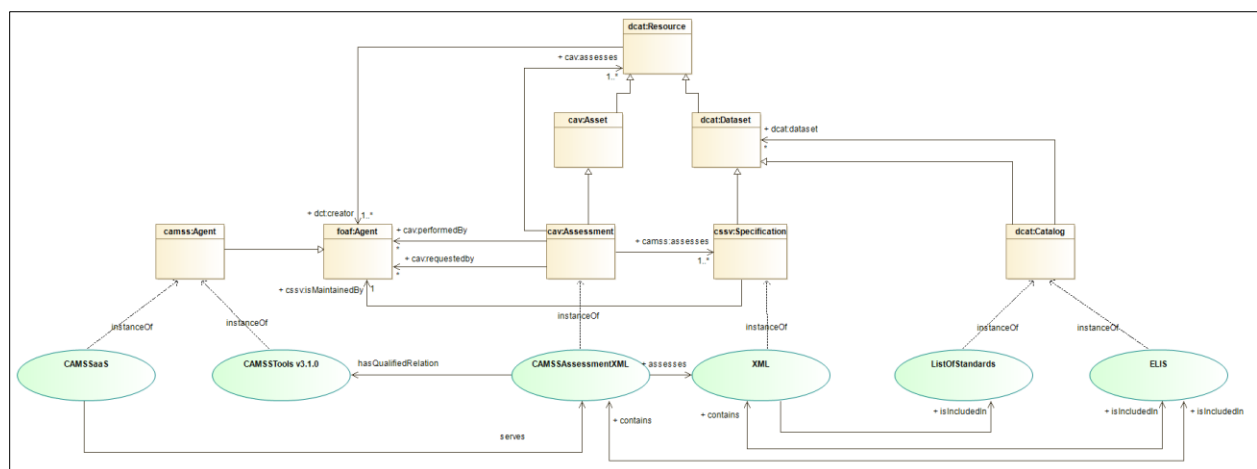


Figure 4 ELIS conceptual overview

Beware of the following:

- The ELIS Catalogue is instantiated using the DCAT class Catalog;
- The ELIS Catalogue has as many entries as instances of DCAT CatalogRecord(s). One CatalogRecord is composed of metadata about each entry in the ELIS Catalogue representing one CSSV Specification;
- The Primary Topic of an ELIS Catalogue Record is always a Specification, a Standard, an Application Profile, or a Family, which are implemented as a DCAT DataSet.
- The Primary Topic always has a Distribution that points to the web page where the specification is available.
- Some Specifications have associated Assessments that also have Distributions that point to the Joinup page where can be downloaded.
- Notice that some entities are associated with a domain expressed as dcat:theme and the ELIS_T-box, which defines de structure.
 - o The **Interoperability Specification Domain** helps to contextualise the area/domain that the specifications included in ELIS are addressing. It is worth noting that one specification can have multiple domains depending on the association with ABBs and its context. In those cases, specs can be considered as multi-domain or cross-domain, but since the ELIS is referring also to EIRA views, it needs to be specified.
 - o The **ELIS T-Box** provides the structure of the library according to CSSV and CAV.
- Additionally, each EIRA Interoperability Specification can express its interoperability aspects via the association to one or other EIRA ABB as defined in EIRA¹⁰ (expressed as SKOS Concepts).

The language chosen to represent the ELIS is the Terse RDF Triple Language (Turtle)¹¹. Turtle is a textual syntax for Resource Description Framework (RDF) that allows an RDF graph to be completely written in a compact and natural text form, with abbreviations for common usage patterns and data types. Turtle provides levels of compatibility with the N-Triples [N-TRIPLES] format as well as the triple pattern syntax of the SPARQL W3C Recommendation.

4. ELIS v5.0.0 AND RELEASE COMPONENTS

The ELIS v2.0.0 release consists of the following release components:

- [ELIS v5.0.0.ttl](#); the EIRA Library of Interoperability Specifications in TTL format.
- [ELIS v5.0.0.xlsx](#); the EIRA Library of Interoperability Specifications in Microsoft Excel format.
- [ELIS T-box v5.0.0.ttl](#); the constituent entities of the ELIS.

¹⁰ EIRA v4.0.0 SKOS: <https://joinup.ec.europa.eu/collection/european-interoperability-reference-architecture-eira/solution/eira/distribution/eira-v400-skos>

¹¹ RDF 1.1. Turtle: <https://www.w3.org/TR/turtle/>

- [EIRA v5.0.0 SKOS](#); The EIRA as controlled vocabulary in SKOS format.
- [ELIS Overview v5.0.0](#); Document for the introduction to the ELIS catalogue.
- [CAMSS Info Package v7.0.0](#); Set of informative documents about CAMSS.
- [ELIS v5.0.0 Release Notes](#); The release notes of this ELIS release.
- [ELIS Factsheets v5.0.0](#); an overview of the ELIS population process.
- [EUPL License v1.2](#); the license under which ELIS will be released.
- [ELIS v5.0.0 Release](#); an archive containing each of the above-mentioned files.

5. ELIS FACTSHEETS ONLINE DASHBOARD

This section contains the ELIS Dashboard which shows the overview of the ELIS metrics and characteristics regarding its population.

[ELIS Dashboard](#)

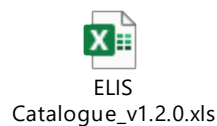
6. ACRONYMS

Acronym	Description
ABB	Architecture Building Block
CSSV	Core Standards and Specifications Vocabulary
DCAT	Data Catalog Vocabulary
EIA	European Interoperability Action
EIF	European Interoperability Framework
EIRA	European Interoperability Reference Architecture
ELIS	EIRA Library of Interoperability Specifications
RDF	Resource Description Framework
SKOS	Simple Knowledge Organisation System
SPARQL	SPARQL Protocol and RDF Query Language

ANNEX I – ELIS SPARQL QUERIES



ANNEX II – ELIS CATALOGUE XLSX



ANNEX III – ELIS CATALOGUE TTL



ELIS v1.2.0.ttl