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CERIF API: Access and reuse research information in CRIS

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Outline

- Specification of CERIF API v1.0
 - Identity
 - Supported Operations
 - Entities and Parameters
- Implementation of CERIF API v1.0
 - CERIF tools implemented
 - Maturity and systems using CERIF API
- Usage examples of CERIF API v1.0

CERIF API Specification

- **Who:** euroCRIS - Architecture & Development Task Group
 - 11 members (<http://eurocris.org/community/taskgroups/architecture-development>)
- **When:** November 2013 (started) - August 2015 (published stable v1.0)
 - 4 revision cycles
- **Why:**
 - To facilitate the interoperability of CRIS systems and their integration with other information systems
 - To enable the development of applications, services and components that can access and reuse information across different CRIS systems in a standard, unified way
- **Found @** <http://eurocris.org/cerif-api-v10>

CERIF API Specification

- **Addressed to:**
 - Organizations and individuals (e.g. software developers, product managers, CRIS managers) involved in the implementation of CRIS systems and related services.
 - Organizations and individuals (e.g. software developers, product managers) involved in the development of software applications, services and components that can benefit from retrieving and reusing the information stored in CRIS systems
- **Current Functionality:**
 - The present version 1.0 of the API addresses basic aspects of read-only access to information in CRIS systems.
 - Operations that alter the data in CRIS systems (for example, Create, Update and Delete) as well as sophisticated search facilities are planned for later versions of the API
- **Found @** <http://eurocris.org/cerif-api-v10>

CERIF API Specification

- **API technology: HTTP REST**
 - simplicity for developers
 - ubiquity and inherent support for CRUD operations
 - Use of HTTP as an application protocol (i.e. HTTP verbs for defining operations, HTTP message codes for addressing exceptions)
- **Response Output Format: XML**
 - content/MIME type = **application/xml**
- **CRIS Data Output Format: CERIF XML**
 - CRIS data in CERIF XML
 - Calls serving meta information about CRIS follow a simpler new non-CERIF XML scheme (currently 1 call in the API)
- **Found @ <http://eurocris.org/cerif-api-v10>**

CERIF API Supported Operations

1. Get data on all instances of a particular type of entity

GET /{entity name in plural}?identifiersOnly=[true | false]&{pagingSpec}&{returnedEntitySpec}

2. Get all information about a particular instance of a particular type of entity

GET /{entity name in plural}/{id}?{returnedEntitySpec}

3. Get information about all CERIF entities (core and link entities) supported by the CRIS system

GET /entities

CERIF API Supported operations

4. Get semantic layer contents from a CRIS

GET /semantics

5. Search by classification

GET /{entity name in plural}?class={class UUID}&classScheme={class scheme UUID}&{pagingSpec}&identifiersOnly=[true | false]&{returnedEntitySpec}

6. Search by Federated Identifier

GET /{entity name in plural}?fedIdClass={class UUID specifying the type of federated identifier}&fedId={value of federated identifier}&{returnedEntitySpec}



Entities and Parameters

Entity	URL label
cfProject	/projects
cfPerson	/persons
cfOrgUnit	/orgunits
cfResultPublication	/publications
cfResultProduct	/products
cfResultPatent	/patents
cfFunding	/fundings
cfService	/services
cfFacility	/facilities
cfEquipment	/equipments
cfMedium	/media
cfIndicator	/indicators
cfMeasurement	/measurements
cfEvent	/events
cfPAddr	/postaladdresses
cfEAddr	/electronicaddresses
cfGeoBBox	/geobboxes
cfCitation	/citations
cfCV	/cvs
cfPrize	/prizes
cfQualification	/qualifications
cfExpertiseAndSkills	/expertiseandskills

Shortcut description	Format of query fragment	Example query fragments
Paging specification Shortcut: (paging Spec) How API clients specify within a request the desired paging functionality.	Parameters: offset [integer, optional, default=0] pageSize [integer, optional, default=20, max=200]	offset=0&pageSize=100 offset=1500&pageSize =100 offset=0&pageSize=200
Returned entity content specification Shortcut: (returnedEntitySpec) How API clients specify within a request which data elements will be contained within returned CERIF Entity instances.	Parameters: fedIds [true false, default=true] classifications [true false, default=true] links [true false {cerifEntity1;cerifEntity2;...;cerifEntityN} , default=true] linkedObjects [true false {cerifEntity1;cerifEntity2;...;cerifEntityN} , default=false] linkedSemantics [true false, default=false]	http://api.examplecris.org/projects/2c9083b43ec281df013ec285e81a0000?fedIds=false http://api.examplecris.org/projects/2c9083b43ec281df013ec285e81a0000?fedIds=true&classifications=true&links=orgunits&linkedObjects=true

HTTP Response

```

▼ <CERIF-API>
  ▼ <Header>
    <api-version>1.0</api-version>
    <source>http://cc-refim.ekt.gr/cerif-rest-refim/</source>
    <offset>0</offset>
    <pageSize>1</pageSize>
    <resultsInPage>1</resultsInPage>
    <totalResults>1</totalResults>
    ▼ <query>
      http://cc-refim.ekt.gr/cerif-rest-refim/projects/96394114-73e2-4ff1-8b2f-bb375cc05649
    </query>
  </Header>
  ▼ <Payload>
    ▼ <CERIF xmlns="urn:xmlns:org:eurocris:cerif-1.6-2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="urn:xmlns:org:eurocris:cerif-1.6-2 http://www.eurocris.org/Uploads/Web%20pages/CERIF-1.6/CERIF_1.6_2.xsd" date="2015-11-04" sourceDatabase="http://cc-refim.ekt.gr/cerifcris/">
      ▼ <cfProj>
        <cfProjId>1</cfProjId>
        <cfStartDate>1970-01-01</cfStartDate>
        <cfEndDate>1970-01-01</cfEndDate>
        <cfAcro>NEUTRONSOURCESS</cfAcro>
        <cfTitle cfLangCode="en" cfTrans="o">The European Spallation Neutron Source (ESS)</cfTitle>
        ▼ <cfProj_OrgUnit>
          <cfOrgUnitId>1</cfOrgUnitId>
          <cfClassId>c77f9885-b80d-466a-9097-9768720c0fe1</cfClassId>
          <cfClassSchemeId>6b2b7d25-3491-11e1-b86c-0800200c9a66</cfClassSchemeId>
          <cfStartDate>2008-01-01T00:00:00</cfStartDate>
          <cfEndDate>2010-01-31T00:00:00</cfEndDate>
        </cfProj_OrgUnit>
        ▶ <cfProj_OrgUnit>...</cfProj_OrgUnit>
        ▶ <cfProj_OrgUnit>...</cfProj_OrgUnit>
        ▶ <cfProj_OrgUnit>...</cfProj_OrgUnit>
        ▶ <cfProj_OrgUnit>...</cfProj_OrgUnit>
        ▶ <cfProj_OrgUnit>...</cfProj_OrgUnit>
        ▶ <cfProj_OrgUnit>...</cfProj_OrgUnit>
        ▶ <cfProj_OrgUnit>...</cfProj_OrgUnit>
        ▶ <cfProj_OrgUnit>...</cfProj_OrgUnit>
        ▶ <cfProj_OrgUnit>...</cfProj_OrgUnit>
        ▶ <cfProj_OrgUnit>...</cfProj_OrgUnit>
      </cfProj>
    </CERIF>
  </Payload>
</CERIF-API>

```

- 1. Header (not the HTTP header!)**
 - Data about the source CRIS system
 - Data useful for paging results
 - The query
- 2. Payload**
 - The actual data retrieved from the CRIS system in response to the request
 - CERIF XML structure for all calls except call #3 (GET /entities) which follows a custom XML response

CERIF API Implementation

- **Who:** [National Documentation Centre, Greece](#) on behalf of euroCRIS
 - Implementation
 - Maintenance and support
- **When:**
 - 1st prototype of the CERIF API: September 2014 (based on an earlier version of the API)
 - 1st production implementation CERIF API: August 2015 (based on the CERIF API version 1.0)
- Found @ <http://cc-refim.ekt.gr/cerif-rest-refim/>

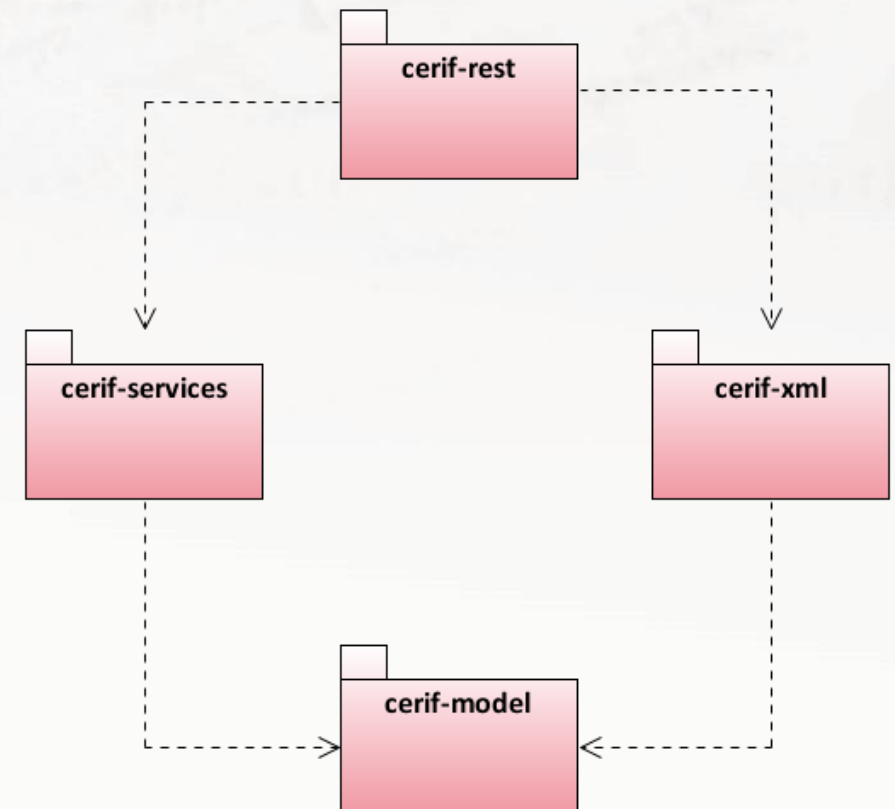
CERIF Tools (1/2)

- CERIF Model
 - All CERIF entities as POJOs
 - 100% compliant to the latest CERIF version
- CERIF Services
 - JPA data repositories for all entities
 - Common persistence and selection services
- CERIF XML
 - Full support of CERIF 1.6 XML Schema
- CERIF API
 - RESTful services
 - OAI-PMH – per entity retrieval



CERIF Tools (2/2)

- Open source
 - <http://github.com/EKT/CERIF-Tools>
- Maturity
 - 4 years of continuous development
 - Deployed on a plethora of production systems (nationally and internationally)
- Ongoing Maintenance
 - Tools aligned to CERIF versions
 - New features and bug fixing



Production Systems using CERIF API

- **National**
 - **CRIS platform and national Aggregator**
 - **DMS Metrics:** National R&D Indicators Management System (Eurostat)
 - **Scientific Indicators:** bibliometrics (Scopus and Web of Science)
 - **Greek Researcher Registry**
 - **R&D Business Registry**
- **European**
 - **Past**
 - **PAERIP Inventory of Research Infrastructures**
 - **EuroRIs-Net+ Observatory**
 - **OpenAire**
 - **RICH**
 - **Current**
 - **RICH2020**
 - **MERIL2**
 - **PT-CRIS**

South European Link for Research Information Management

FCT|FCCN (Portugal)

GIVE

PTCRISync: ORCID Synchronization Framework

TAKE

CERIF Model | CERIF Services | CERIF REST API | CERIF OAI | DSpaceCRIS

CINECA (Italy)

GIVE

DSpace-CRIS | ORCID HUB | upgrades | roadmap

TAKE

ORCID Synchronization Framework | CERIF REST API | CERIF OAI

SELRIM

A map of South Europe, including Portugal, Spain, Italy, and Greece, is shown. The countries of Portugal, Spain, Italy, and Greece are highlighted in a dark blue color. The word "SELRIM" is written in large, bold, orange letters across the center of the map.

CSUC (Catalonia)

GIVE

CERIF validator | DSpaceCRIS early adaptor

TAKE

DSpace-CRIS | CERIF OAI

EKT (Greece)

GIVE

CERIF Model | CERIF Services | CERIF XML | CERIF REST API | CERIF OAI | upgrades

TAKE

Contribution

Usage examples (1/4)

- **Goal:** Check out which and how many entities are served by EuroCRIS CERIF-CRIS Reference Implementation (CC-REFIM)
- **Query:** <http://cc-refim.ekt.gr/cerif-rest-refim/entities>

```
▼ <CERIF-API>
  ▼ <Header>
    <api-version>1.0</api-version>
  </Header>
  ▼ <Payload>
    ▼ <Entities>
      <entity count="24205">projects</entity>
      <entity count="557088">persons</entity>
      <entity count="27071">orgunits</entity>
      <entity count="222826">publications</entity>
      <entity count="456">fundings</entity>
      <entity count="1">services</entity>
      <entity count="27069">postaladdresses</entity>
      <entity count="212350">electronicaddresses</entity>
      <entity count="302">countries</entity>
      <entity count="185">languages</entity>
      <entity count="178">currencies</entity>
    </Entities>
  </Payload>
</CERIF-API>
```

Usage examples (2/4)

- **Goal:** Get list of organisations (a list of actionable urls)
- **Query:** <http://cc-refim.ekt.gr/cerif-rest-refim/orgunits>

```
▼<CERIF-API>
  ▼<Header>
    <api-version>1.0</api-version>
    <source>http://cc-refim.ekt.gr/cerif-rest-refim/</source>
    <offset>0</offset>
    <pageSize>20</pageSize>
    <resultsInPage>20</resultsInPage>
    <totalResults>27071</totalResults>
    <query>http://cc-refim.ekt.gr/cerif-rest-refim/orgunits</query>
  </Header>
  ▼<Payload>
    ▼<CERIF xmlns="urn:xmlns:org:eurocris:cerif-1.6-2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xsi:schemaLocation="urn:xmlns:org:eurocris:cerif-1.6-2 http://www.eurocris.org/Uploads/Web%20pages/CERIF-
      1.6/CERIF_1.6_2.xsd" date="2015-11-07" sourceDatabase="http://cc-refim.ekt.gr/cerifcris/">
      ▼<cfOrgUnit>
        <cfOrgUnitId/>
        ▼<cfURI>
          http://cc-refim.ekt.gr/cerif-rest-refim/orgunits/b255e4ec-b5b5-4ef3-8665-522ea7929d58
        </cfURI>
      </cfOrgUnit>
      ▼<cfOrgUnit>
        <cfOrgUnitId/>
        ▼<cfURI>
          http://cc-refim.ekt.gr/cerif-rest-refim/orgunits/e689d0b5-42f4-4ed5-9b5a-cf18bbb0178a
        </cfURI>
      </cfOrgUnit>
      ▼<cfOrgUnit>
        <cfOrgUnitId/>
        ▼<cfURI>
          http://cc-refim.ekt.gr/cerif-rest-refim/orgunits/7ceb835-56e8-46b4-9ffe-2dbf8edb22e0
        </cfURI>
      </cfOrgUnit>
      ▼<cfOrgUnit>
        <cfOrgUnitId/>
        ▼<cfURI>
          http://cc-refim.ekt.gr/cerif-rest-refim/orgunits/4af6795b-a019-4f69-a575-abc16e4f9a03
        </cfURI>
      </cfOrgUnit>
    </CERIF>
  </Payload>

```




Usage examples (3/4)

- **Goal:** Get list of organisations (just multilingual information)
- **Query:** <http://cc-refim.ekt.gr/cerif-rest-refim/orgunits?identifiersOnly=false&fedIds=false&classifications=false&links=false>

```

▼<CERIF-API>
  ▼<Header>
    <api-version>1.0</api-version>
    <source>http://cc-refim.ekt.gr/cerif-rest-refim/</source>
    <offset>0</offset>
    <pageSize>20</pageSize>
    <resultsInPage>20</resultsInPage>
    <totalResults>27071</totalResults>
  ▼<query>
    http://cc-refim.ekt.gr/cerif-rest-refim/orgunits?identifiersOnly=false&fedIds=false&classifications=false&links=false
  </query>
  </Header>
  ▼<Payload>
    ▼<CERIF xmlns="urn:xmlns:org:eurocris:cerif-1.6-2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
      xsi:schemaLocation="urn:xmlns:org:eurocris:cerif-1.6-2 http://www.eurocris.org/Uploads/Web%20pages/CERIF-1.6/CERIF_1.6_2.xsd" date="2015-11-07" sourceDatabase="http://cc-refim.ekt.gr/cerifcris/">
      ▼<cfOrgUnit>
        <cfOrgUnitId>90322</cfOrgUnitId>
        <cfAcro>WEIZMANN</cfAcro>
        <cfName cfLangCode="en" cfTrans="o">WEIZMANN INSTITUTE OF SCIENCE</cfName>
      </cfOrgUnit>
      ▼<cfOrgUnit>
        <cfOrgUnitId>90323</cfOrgUnitId>
        <cfAcro>Imperial</cfAcro>
        ▼<cfName cfLangCode="en" cfTrans="o">
          IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY AND MEDICINE
        </cfName>
      </cfOrgUnit>
      ▼<cfOrgUnit>
        <cfOrgUnitId>90324</cfOrgUnitId>
        <cfAcro>LiU</cfAcro>
        <cfName cfLangCode="en" cfTrans="o">LINKOPINGS UNIVERSITET</cfName>
      </cfOrgUnit>
    </CERIF>
  </Payload>

```



Usage examples (4/4)

- **Goal:** Get specific organisation and its projects only
- **Query:** <http://cc-refim.ekt.gr/cerif-rest-refim/orgunits/d6bb7c60-92bd-4b56-882e-bff8726ceb45?links=projects&linkedObjects=true>

```

▼<CERIF-API>
  ▼<Header>
    <api-version>1.0</api-version>
    <source>http://cc-refim.ekt.gr/cerif-rest-refim/</source>
    <offset>0</offset>
    <pageSize>1</pageSize>
    <resultsInPage>6</resultsInPage>
    <totalResults>6</totalResults>
  ▼<query>
    http://cc-refim.ekt.gr/cerif-rest-refim/orgunits/d6bb7c60-92bd-4b56-882e-bff8726ceb45?links=projects&linkedObjects=true
  </query>
</Header>
▼<Payload>
  ▼<CERIF xmlns="urn:xmlns:org:eurocris:cerif-1.6-2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="urn:xmlns:org:eurocris:cerif-1.6-2 http://www.eurocris.org/Uploads/Web%20pages/CERIF-1.6/CERIF_1.6_2.xsd" date="2015-11-07" sourceDatabase="http://cc-refim.ekt.gr/cerifcris/">
    ▼<cfProj>
      <cfProjId>535</cfProjId>
      <cfStartDate>0011-11-01</cfStartDate>
      <cfEndDate>0014-10-31</cfEndDate>
      <cfAcro>FLASH-IT</cfAcro>
      <cfURI>http://www.flash-it.eu</cfURI>
      ▼<cfTitle cfLangCode="en" cfTrans="o">
        Facilitating Access to Socio-economic Research through Information and Communications Technology
      </cfTitle>
      ▼<cfAbstr cfLangCode="en" cfTrans="o">
        'The general objective of the project is to contribute to increased dissemination and exploitation of the SSH projects research findings. The project, taking also advantage of new ICT-based technologies and tools, will Provide consolidated information arising from FP6 & FP7 SSH research projects and activities addressing major societal challenges on issues close to the main political priorities of the EU identified in the new Europe 2020 strategy: 1. Innovation Union (including economic and social innovation, social cohesion and demographic changes); 2. Youth, 3. Employment, 4. Poverty; Develop effective communication tools (such as Policy Snapshots, Policy Research Alerts, Multi-stakeholder policy dialogue workshops, interactive and innovative web platform), engaging all relevant SSH players such as European, national and local decision-makers and multipliers (policy-makers, journalists, academics, industry, civil society organisations); Improve access to research data as results of SSH projects focusing on common rules and frameworks to be applied in data management, exploring the possibilities of ex-ante and ex-post coordination with FP funded projects. Expected outputs: Evaluation of the opportunities offered by new forms of ICT for networking and clustering ongoing SSH research projects and enable exchange and knowledge transfer between projects/clusters of projects; Assessment and collection of best practices among SSH research projects in exploiting ICT technologies for knowledge transfer and dissemination of results & key messages targeting different stakeholders; Dissemination of relevant SSH projects results through effective communication tools; Analysis of the state of the art related to the usage of Open Access pilot to identify data standards to be applied by the projects.'
      </cfAbstr>
      ▶<cfFedId>...</cfFedId>
    </cfProj>
  ▶<cfProj>...</cfProj>

```



Thank you for your attention Q&A

- More info:
 - [karaiskos AT ekt.gr](http://karaiskos.at.ekt.gr)

<http://metrics.ekt.gr/en/cris>

<http://github.com/EKT/CERIF-Tools>

<http://eurocris.org/cerif-api-v10>

<http://cc-refim.ekt.gr/cerif-rest-refim/>