DELIVERABLE

Project Acronym:	**EAGLE**
Grant Agreement number:	**325122**
Project Title:	**Europeana network of Ancient Greek and Latin Epigraphy**

Second Release of AIM Infrastructure

D4.2.2

Version: 1.0

Revision: Final

Authors:

Giuseppe Amato (CNR-ISTI)
Paolo Bolettieri (CNR-ISTI)
Fabrizio Falchi (CNR-ISTI)
Paolo Manghi (CNR-ISTI)
Andrea Mannocci (CNR-ISTI)
Franco Zoppi (CNR-ISTI)

Contributors:

Vittore Casarosa (CNR-ISTI)

Reviewers:

Nicola Alfarano (GOGATE)
Eydel Rivero Ruiz (UAH)

Project co-funded by the European Commission within the ICT Policy Support Programme		
Dissemination Level		
P	Public	X
C	Confidential, only for members of the consortium and the Commission Services	

Revision History

Revision	Date	Author	Organisation	Description
0.1	12/03/2015	Franco Zoppi	CNR-ISTI	Structure of the document and draft content
1.0 Draft	24/03/2015	Giuseppe Amato, Paolo Bolettieri, Fabrizio Falchi, Paolo Manghi, Andrea Mannocci, Franco Zoppi	CNR-ISTI	Full content and final internal revision
1.0 Final	31/03/2015	Nicola Alfarano Eydel Rivero Ruiz Franco Zoppi	GOGATE UAH CNR-ISTI	Final review

Statement of originality:

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

TABLE OF CONTENTS

EXECUTIVE SUMMARY 4

1 THE AIM INFRASTRUCTURE IMPLEMENTATION IN RELEASE 2 5

2 METADATA AGGREGATION SYSTEM 7

2.1 EAGLE Aggregation Workflow 7
2.2 EAGLE Aggregation Kernel 7
2.3 Store Services 8
2.4 Metadata Cleaning and Curation Services 8
2.5 Index Service 9
2.6 Export Services 9

3 IMAGE RETRIEVAL SYSTEM 10

3.1 Image Feature Extractor Component (IFE) 10
3.2 Image Indexer 10
3.3 Image RecogniZER 10
3.4 IMAGE Search ENGINE 10
3.5 Image Recognition API 11
3.6 Similarity Search API 11
3.7 TEXT Search API 11
3.8 GET METADATA API 11

4 APPENDIX A - HW AND SW REQUIREMENTS 12

5 APPENDIX B – USING THE METADATA RECORD INSPECTOR 13

6 APPENDIX C – IMAGE RECOGNITION AND SIMILARITY SEARCH SERVICE AND API 17

6.1 Image Recognition 17
6.2 Similarity Search 18
6.3 TEXT Search 19
6.4 Get METADaTA 20
6.5 Examples 21
6.5.1 Java Examples 21
6.5.2 Testing Images 21
6.5.3 XML Responses 22
6.5.3.1 Image Recognition Example 22
6.5.3.2 Image Similarity Search Example 24
6.5.3.3 Text Search Example 25
6.5.3.4 Get Metadata Example 28

EXECUTIVE SUMMARY

This document describes the final implementation (Release 2) of the EAGLE Aggregation and Image Retrieval system (AIM) Infrastructure in terms of:

- Current implementation against the specification given in "D4.1 AIM Infrastructure Specification" (Section 1).
- Details about the Metadata Aggregation System (Section 2).
- Details about the Image Retrieval System (Section 3).
- HW & SW requirements of the AIM (Appendix A).
- Sample of the Content Checker Curation Tool (Appendix B).
- Image Recognition and Similarity Search API (Appendix C).

This document being just a Release Note produced as accompanying document of the AIM infrastructure software (D4.2.2, deliverable of type "Product"), please refer to the released document "D4.1 AIM Infrastructure Specification" for details about the full featured AIM Infrastructure.

1 THE AIM INFRASTRUCTURE IMPLEMENTATION IN RELEASE 2

This section summarizes the components implemented by the Aggregation and Image Management infrastructure within the scope of the full system as defined in "D4.1 AIM Infrastructure Specification".

Figure 1-1 shows the overall architecture of the EAGLE system as defined in D4.1 and its final implementation status in Release 2. Different colors (and patterns) show respectively:

- **Green (no pattern)**: components implemented in Release 1.
- **Yellow (dotted)**: components implemented in Release 2.
- **Blue (vertical lines)**: components whose responsibility is outside the scope of the AIM Infrastructure.
- **White (dotted grid)**: component whose responsibility is outside the scope of the EAGLE project.

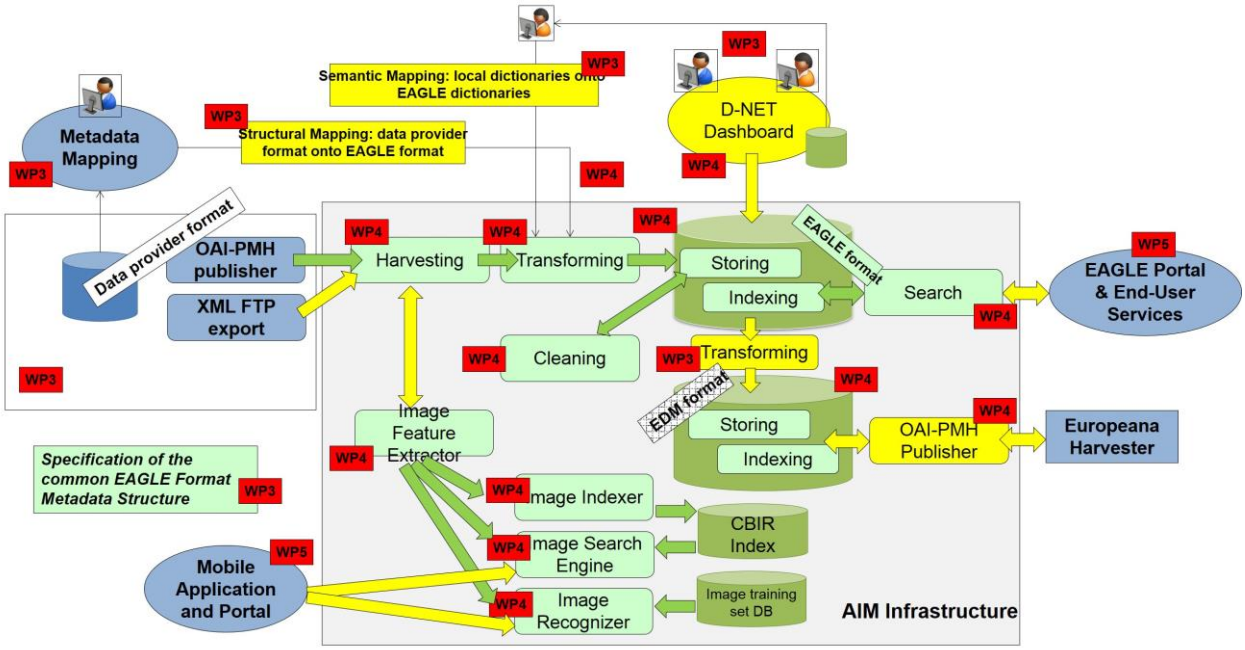

Figure 1-1 EAGLE Architecture – Global Picture – Status at Release 2

Figure 1-2 shows the global functional overview, the interaction and the flow of information between the different functional blocks and components of the AIM, i.e. the Metadata Aggregation System (MAS) and the Image Retrieval System (IRS). Here again, different colors show the different implementation status of the components.

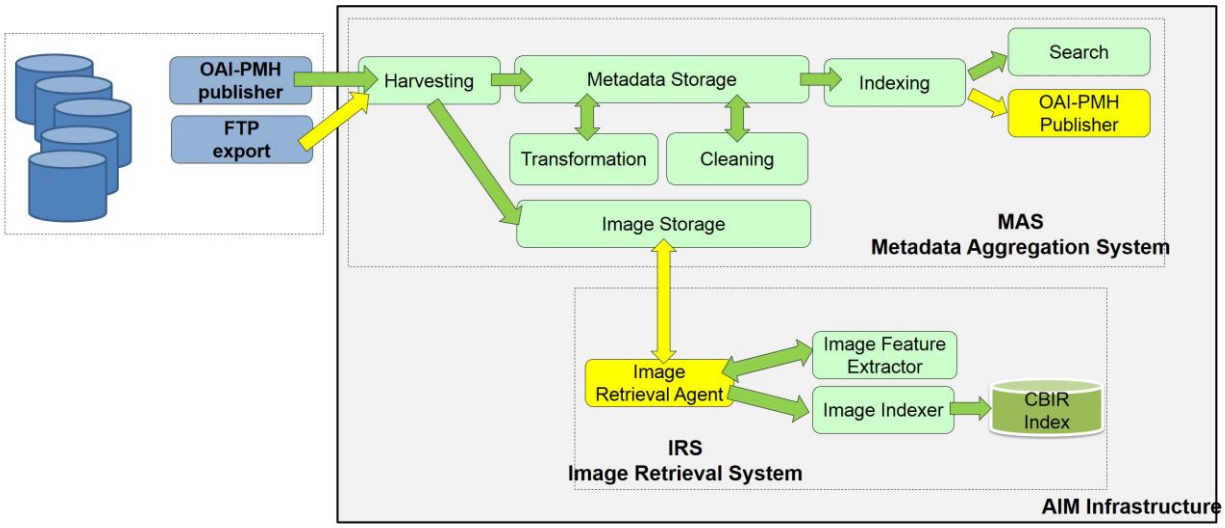

Figure 1-2 Functional AIM Infrastructure – Global Picture – Status at Release 2

The MAS will periodically harvest metadata records (Harvesting Service) made available from CPs and store them within the data infrastructure (Metadata Storage Service). Then, the MAS will start building the EAGLE Information Space step by step. Native metadata records enter a processing flow where they are structurally transformed to comply with a common metadata schema, the EAGLE Metadata Format - EMF (Transformation Service). At the same time, URLs to images pointed by metadata descriptions are visited and the relative images are persisted (Image Storage Service) in the AIM. Once metadata are transformed, metadata records are cleaned and can be further improved by curators via selective editing (Cleaning Service). Eventually they will get into their final revision and will be ready to be indexed (Indexing Service) and disseminated either to external public through the web portal and the mobile application (Search Service), or to third party software agents via OAI-PMH (OAI-PMH Publisher Service).

The IRS will periodically call the Image Storage Service via the Image Retrieval Agent to get new items to be indexed. For each new item collected, the IRS extracts its visual descriptors and encodes the visual descriptors in an efficient textual format (Image Feature Extractor Service), then puts the encoded descriptors into the CBIR[1] Index (Image Indexer Service).

[1] Content-Based Image Retrieval.

2 METADATA AGGREGATION SYSTEM

The EAGLE Metadata Aggregation System relies the D-NET software toolkit, developed within the DRIVER project efforts and extended within the OpenAIRE, OpenAIREplus[2], EFG, EFG1914[3] and HOPE[4] projects. Within the EAGLE framework, D-NET has been further extended and customized in order to meet new EAGLE-specific requirements and peculiarities.

This Section describes the customizations performed on D-NET in order to satisfy the EAGLE requirements.

2.1 EAGLE AGGREGATION WORKFLOW

The overall workflow of the EAGLE infrastructure is depicted in Figure 2-1, where all the blocks are selected D-NET components.

Figure 2-1 EAGLE Aggregation Workflow

The XML metadata records provided by the Content Providers are gathered (by harvesting, file transfer or other ad-hoc means) and stored into the Native Metadata Store. After that, metadata in native format are transformed into the EAGLE Metadata Format, making them structurally uniform, and stored in a Transformed Metadata Store. At this point the workflow forks into two: one branch deals with pure metadata enhancement, curation and indexing. The other branch is instead in charge of fetching images pointed to by collected metadata and storing them in an Object Store for later usage by the Image Retrieval System (see Section 3).

It is crucial to provide a staged metadata storage so that processing and elaborations late in the workflow can take place without repeating all the steps from the beginning. Thus, each Metadata Store can be considered as a "safe-point" in data processing.

2.2 EAGLE AGGREGATION KERNEL

Metadata Harvester Service

In Release 1 the Metadata Harvester Service has been deployed and tested against collection from OAI-PMH, and a prototypal implementation of a remote FTP collection service had been deployed. In Release 2 the FTP collection service has been completely tested and finalized.

[2] http://www.openaire.eu/

[3] http://www.europeanfilmgateway.eu/it

[4] http://www.peoplesheritage.eu/

Metadata Transformation Service

The Metadata Transformation Service is fully operational. The actual transformation step is based on an XSLT mapping which maps the properties of metadata records in input into one or more EAGLE entity in output, being them conforming to EAGLE metadata format as described in Deliverable 3.1 and its eventual amendments. In Release 1 a prototypal implementation has been deployed and tested, whilst in Release 2, a full test has been completed and a fine tuning of the whole service has been performed.

Image Harvester Service

Since Release 1 the implementation of the Image Harvester Service i) scans all the Visual Representation entities (ref. D3.1) present in the Information Space, ii) follows the URL pointing to the external file with picture extension (e.g. .jpg), and iii) collects the digital object into the Image Store Service (see below) for convenience of the IR subsystem. No updates have been implemented in Release 2.

2.3 STORE SERVICES

Metadata Stores

All the Metadata Stores and relative services were configured and integrated in the workflow in Release 1. MongoDB is the back-end on which the metadata storage service relies.

Image Store

The Image Store Service has been implemented and deployed in Release 1. It implements a REST interface for CRUD operations and tagging of collected items (pictures in this case). In Release 2 the full integration between the MAS and IRS (thank to this component) has been completed and tested. MongoDB-GridFS is the back-end on which the image storage service relies.

2.4 METADATA CLEANING AND CURATION SERVICES

Cleaner Service

The Cleaner Service component has been deployed and integrated within the workflow since Release 1. However, in its actual implementation no cleaning policy is in place. As a matter of facts, CPs made clear that they want to take care of the process of alignment of vocabularies right at the sources. Nevertheless, the component is in place in order to anticipate just in case any future need.

Curation tools

According to the DoW, the planned tools were the following: i) Metadata Editor, ii) Metadata Record Inspector (named Content Checker in Release 1) and iii) Vocabulary Editor & Vocabulary Checker.

As emerged during debates and plenary meetings, Content Providers currently chose not to edit their metadata in the aggregated information space using the Metadata Editor, as they always prefer to hold the most authoritative version of the information flowing in the infrastructure. Any modification or update of records thus will happen right at the CP repository; any change occurred is reflected in the aggregation system at the next scheduled harvesting process.

They were partially implemented in Release 1. In Release 2, since the D-NET development finalized a redesign of all backend services - including curation - all of them have been merged in a single component featuring an updated user interface: the D-NET Dashboard.

The Metadata Record Inspector is a redesign of the Content Checker released in Release 1, running and available at http://node0.d.eagle.research-infrastructures.eu:8080/is/mvc/lightui/index.do. It offers a low-level portal with basic Search& Browse features through which a CP might check its own data post-transformation and explore the XMLs of the entities generated from its initial XML records. Sample screenshots of the Metadata Record Inspector are shown in "Appendix B – Using the Metadata Record Inspector".

2.5 INDEX SERVICE

The Index Service is fully operational since Release 1. The SOLR index holds XML documents being complaint to Eagle Aggregation Metadata Schema as described in Deliverable 3.1.

2.6 EXPORT SERVICES

Search Service

The SOLR index is publicly reachable thanks to Search Service at http://node0.d.eagle.research-infrastructures.eu:8080/is/mvc/index/EMF-index-cleaned/solr.do/select?q=* and replies to queries compliant with SOLR syntax.

Its counterpart accepting CQL queries can be found at http://node0.d.eagle.research-infrastructures.eu:8080/is/mvc/index/EMF-index-cleaned/cql.do/select?q=* .

The aforementioned Content Checker is based on results returned by the Search Service.

OAI-publisher

The OAI-publisher service has been deployed in Release 1 and the configuration has been completed in Release 2. These records are used in order to troubleshoot the ingestion process to Europeana and assess the quantity and quality of the records.

3 IMAGE RETRIEVAL SYSTEM

The Image Retrieval System provides two modes of recognition of an image provided in input as a query image. In the first mode, called Similarity Search, the query result will be a list of images contained in the database, ranked in order of similarity to the query image. In the second mode, called Recognition Mode, the result of the query will be the information associated with the recognized image, or a message indicating that the image was not recognized. In this second mode, it is possible for an epigraph to appear in the query image in any position, also as part of a more general picture (e.g. the picture of an archeological site, or the scanned image of the page of a book).

In addition, the system provides an API to perform text search and an API to retrieve the metadata of an epigraph.

In the following paragraphs, we describe the component developed in the second release of the AIM Infrastructure.

3.1 IMAGE FEATURE EXTRACTOR COMPONENT (IFE)

This is the component in charge of analyze the visual content of an image (to be added to the database or being provided as a query), to generate its visual descriptors. The IFE has a multi-threaded architecture to take advantage of multicore processors. It has a plug-in architecture, so that it is easy to add or delete the mathematical libraries supporting the extraction algorithms of many different features. In the second release we leveraged SIFT features, for their effectiveness in the image recognition context.

3.2 IMAGE INDEXER

The Image indexer module leverages the functionality of Melampo CBIR System[5].

The SIFT[6] features extracted by IFE are transformed into strings of text suitable to be indexed and searched by a standard full-text search engine. The search engine used in the current implementation is Apache Lucene.

In this second release, we used the Surrogate Text Representation (STR) approach applied to the Vector of Locally Aggregated Descriptors (VLAD) technique to effective index the images into the Apache Lucene engine. This technique outperforms the Bag of Features (BoF) approach used in the first release.

3.3 IMAGE RECOGNIZER

The image recognizer, given a query image, uses the image training database to decide if the epigraph contained in the query image belongs to one of the stored training sets.

3.4 IMAGE SEARCH ENGINE

The Similarity Search components, given in input a query image, returns a list of images "similar" to the query image, ranked in decreasing order of similarity.

[5] https://github.com/claudiogennaro/Melampo

[6] Scale-Invariant Feature Transform.

3.5 IMAGE RECOGNITION API

The Image Recognition Service provides a REST API to query the index. It provides a service that gets an image and returns an XML response containing either the metadata of the recognized epigraph or a "NOT IDENTIFIED" message. The epigraph metadata are retrieved through the Metadata Aggregation System.

This API is used by the EAGLE user interface whenever it receives from a user (either through a browser or through the mobile application) an image to be recognized.

See Appendix C for details.

3.6 SIMILARITY SEARCH API

The Similarity Search REST API gets either an image or the ID of an image already in the CBIR index and returns an XML response containing a list of the most similar images to the query ranked in decreasing order of similarity.

The user can search similar images by uploading an image or by providing an URL to an image (this is known as Query by Example) or by providing the ID of an epigraph already in the index. This second case is useful to find epigraphs similar to the one already obtained as the result of a metadata search. The search result is a list of image IDs, ordered with respect to the decreasing value of the similarity.

See Appendix C for details.

3.7 TEXT SEARCH API

The Text Search API provides a REST API that gets in input a query string and returns a sorted list of the most relevant epigraphs related to that string. It calls the Metadata Aggregation System to perform the text search.

The response format is the same as the one provided in response to a simple query for artifacts done at the EAGLE portal

See Appendix C for details.

3.8 GET METADATA API

This REST Service gets an epigraph ID and returns the full metadata of that epigraph. It queries the Metadata Aggregation System to retrieve the epigraph metadata.

See Appendix C for details.

4 APPENDIX A - HW AND SW REQUIREMENTS

The hardware minimal requirements of a virtual machine to satisfy to run Release 1 of the production EAGLE Infrastructure are:

- Open Source XEN (no Citrix XEN Server) and lvm volumes (no raw files)
- CPUs: 4 (currently the production virtual machine has AMD Opteron(tm) Processor 6176, MHz 2300 CPUs)
- RAM: 8GB
- HD: 200GB (but it must be possible to extend it based on the size and number of input records)

The software requirements are instead:

- OS: 64-bit Ubuntu 12.04 LTS
- Standard Packages and Libraries:
    - MongoDB
    - Apache2
    - Apache Tomcat 6
    - Apache Lucene 3.6
    - Jetty 6.1.11 (currentlyupgrading to Tomcat 7)
    - Java 6 (currently upgrading to 7)
    - OpenCV (http://www.opencv.org/)
- Specific Libraries:
    - Melampo (https://github.com/claudiogennaro/Melampo)
    - VIR (https://github.com/ffalchi/it.cnr.isti.vir)

5 APPENDIX B – USING THE METADATA RECORD INSPECTOR

This appendix shows some screenshots captured in a sample session of the Content Checker, i.e. the curation tool that will be used to check the both the quantitative results of the aggregation process and the quality of the aggregated metadata.

First, the tool shows the initial page allowing to express a query on the content of the aggregated information space (Figure 5-1 Metadata Record Inspector - Starting page); a query on this returns a set of records which satisfy the expressed condition (Figure 5-2 Metadata Record Inspector - Retrieving a set of results). This first result is then refined to restrict the number of records of interest (Figure 5-3 Metadata Record Inspector - Refining a query) and finally a single record is accessed to check its quality (Figure 5-4 Metadata Record Inspector - Accessing a record).

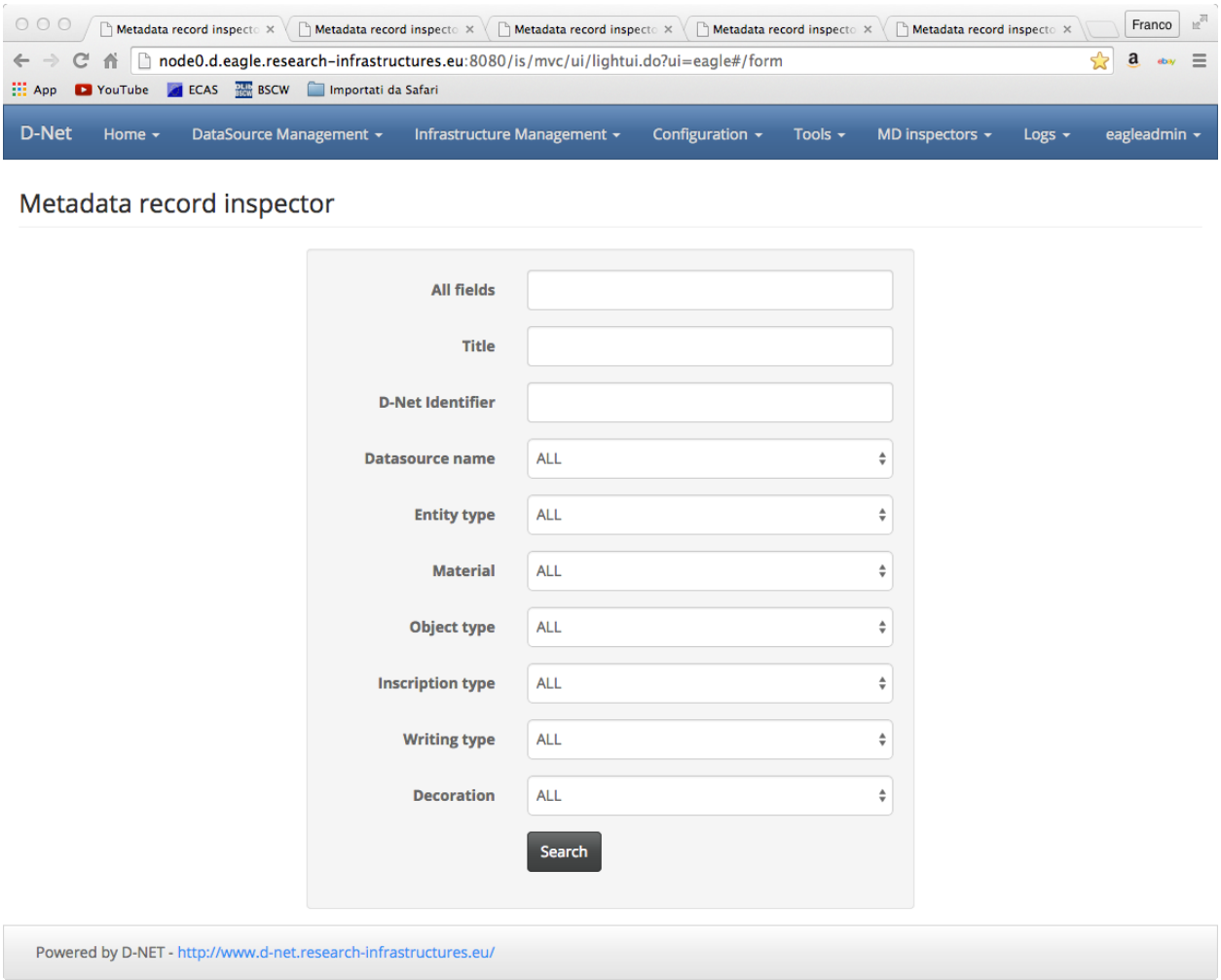

Figure 5-1 Metadata Record Inspector - Starting page

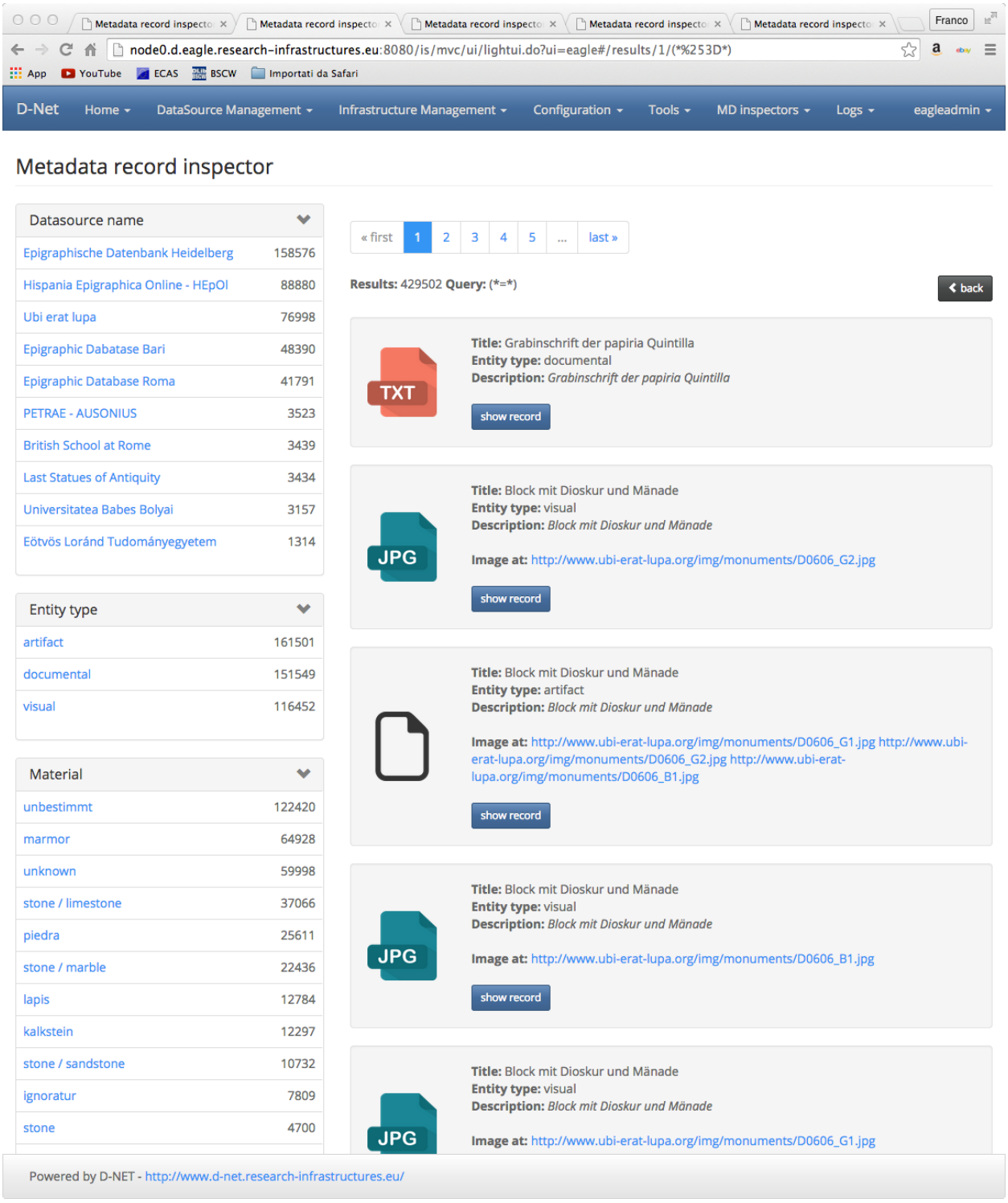

Figure 5-2 Metadata Record Inspector - Retrieving a set of results

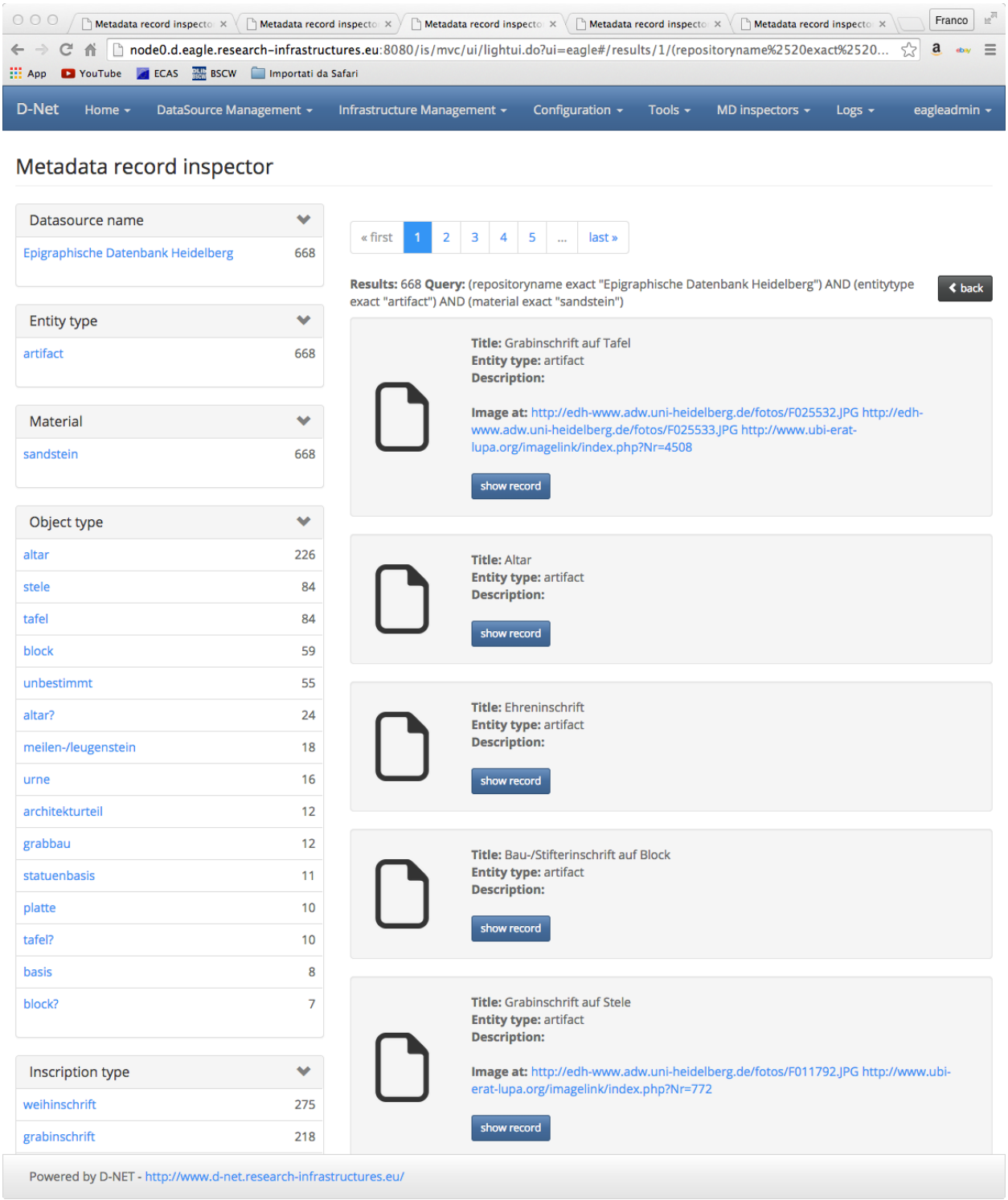

Figure 5-3 Metadata Record Inspector - Refining a query

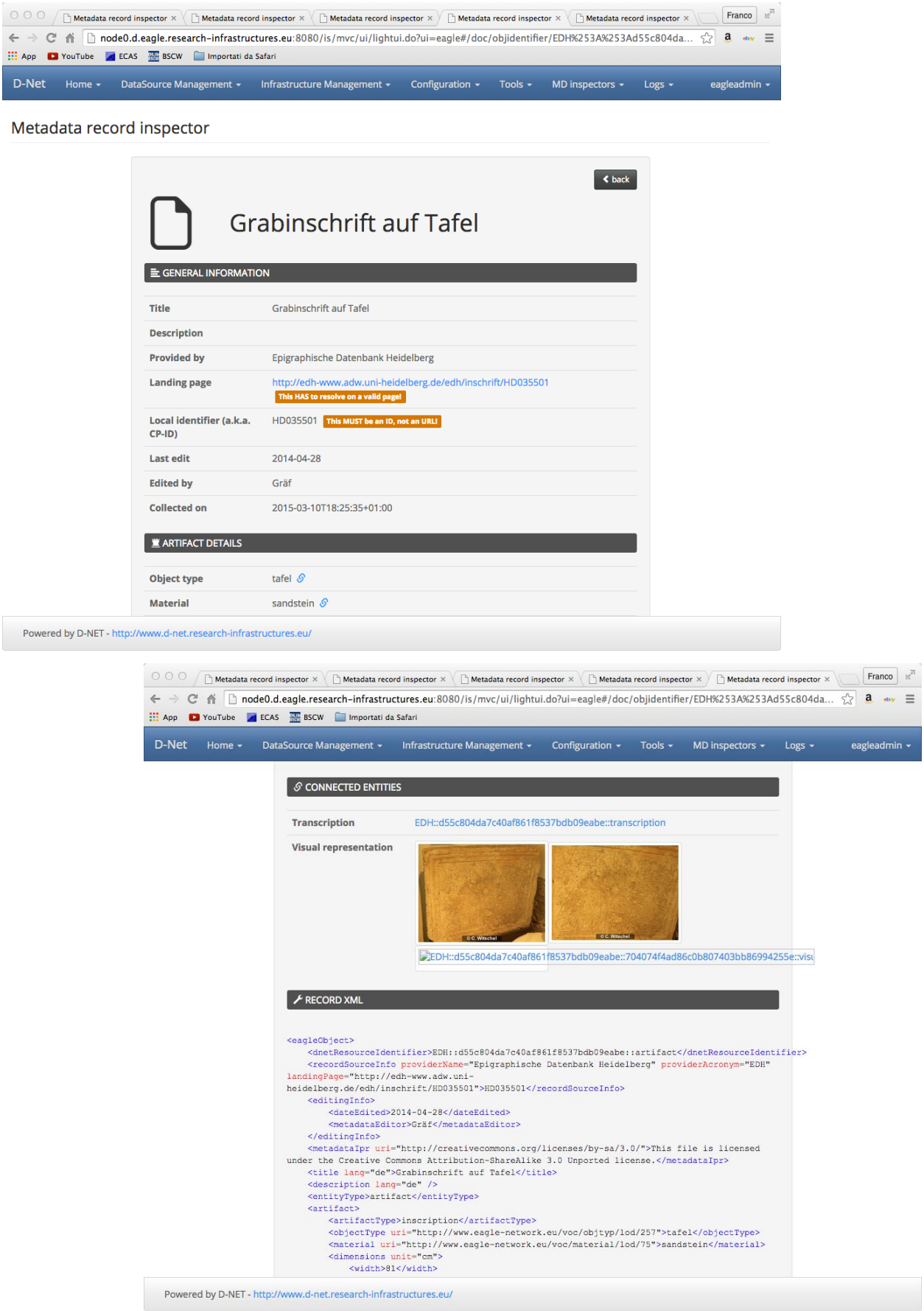

Figure 5-4 Metadata Record Inspector - Accessing a record

6 APPENDIX C – IMAGE RECOGNITION AND SIMILARITY SEARCH SERVICE AND API

6.1 IMAGE RECOGNITION

Service address**: *http://virserv101.isti.cnr.it/fma/services/IRServices/recognize***

Please note that the service address is temporary and it will change when the services are deployed on Eagle servers.

HTTP request type: **POST Multipart**

Supported images formats: ***JPG, PNG***

Image encoding: either **binary** or **Base64** encoding (by *Apache Commons Codec* library).

Parameters:

- **img** *inputstream* of an image (mandatory).
- **correlationId** optional

Returns:

- XML structure containing the metadata of the recognized epigraph.

HTML Call Example:

```
<form method="POST" enctype="multipart/form-data" name="test" action="
http://virserv101.isti.cnr.it/fma/services/IRServices/recognize">
      Query <input name="img" type="file">
      <input type="submit" value="Search" name="submit">
</form>
```

HTML Testing page:

http://virserv101.isti.cnr.it/fma/recognizeTesting.html

6.2 SIMILARITY SEARCH

Service address**: *http://virserv101.isti.cnr.it/fma/services/IRServices/searchSimilar***

Please note that the service address is temporary and it will change when the services are deployed on Eagle servers.

HTTP request type: **POST Multipart**

Supported images formats: ***JPG, PNG***

Image encoding: either **binary** or **Base64** encoding (by *Apache Commons Codec* library).

Parameters:

- **img** *inputstream* of an image (mandatory)
- **correlationId** optional
- **nResults** optional, number of results (default 30)

Returns:

XML structure containing a list of the most similar images to the query ranked in decreasing order of similarity.

HTML Call Example:

```
<form method="POST" enctype="multipart/form-data" name="test" action="
http://virserv101.isti.cnr.it/fma/services/IRServices/searchSimilar">
    Query <input name="img" type="file">
    Num of Results <input name="nResults" type="text" size="5">
      <input type="submit" value="Search" name="submit">
</form>
```

HTML Testing page:

http://virserv101.isti.cnr.it/fma/similarityTesting.html

6.3 TEXT SEARCH

Service address**:** **http://virserv101.isti.cnr.it/fma/services/IRServices/textSearch**

Please note that the service address is temporary and it will change when the services are deployed on Eagle servers.

HTTP request type: **GET**

Parameters:

- **text** query text provided by the user on the mobile device (mandatory)
- **nResults** optional, number of results (default: 30)

Returns:

- XML structure containing a sorted list of epigraph metadata. The format is exactly the same as the one provided in response to a simple query for artifacts done at the EAGLE portal (see the Developer's Guide)

HTML Call Example:

```
<form method="GET" enctype="multipart/form-data" name="test" action="
http://virserv101.isti.cnr.it/fma/services/IRServices/textSearch">
    Text Query <input name="text" type="text">
    Num of Results <input name="nResults" type="text" size="5">
      <input type="submit" value="Search" name="submit">
</form>
```

HTML Testing Page:
http://virserv101.isti.cnr.it/fma/textSearchTesting.html

6.4 GET METADATA

Service address**:** http://virserv101.isti.cnr.it/fma/services/IRServices/getMetadata

Please note that the service address is temporary and it will change when the services are deployed on Eagle servers.

HTTP request type: **GET**

Parameters:

- **id** ID of the epigraph to get

Returns:

- XML Metadata of the required epigraph.

HTML Call Example:

```
<form method="GET" name="UITestForm" action="
http://virserv101.isti.cnr.it/fma/services/IRServices/getMetadata">
      ID <input name="id" type="text" size="30">
      <input type="submit" value="Search" name="submit">
</form>
```

HTML Testing page:

http://virserv101.isti.cnr.it/fma/getMetadataTesting.html

6.5 EXAMPLES

6.5.1 Java Examples

Eclipse project: **FMAClient**

This project contains some Java code and images to test the FMA services.

The code should work also on Android platforms.

- **ResponseCodes** contains the following response codes:
  - *RESPONSE_OK* = 200
  - *RESPONSE_NO_MATCH_FOUND* = 300
  - *RESPONSE_SERVER_ERROR* = 400

- **ImageRecognitionClient** is just a simple class to show how to call the Image Recognition Service by Apache **HttpClient** library.
- **ImageSimilarityClient** is just a simple class to show how to call the Image Similarity Service by Apache **HttpClient** library.
- **TextSearchClient** is just a simple class to show how to call **TextSearch** Service by Apache **HttpClient** library
- **GetMetadataClient** is just a simple class to show how to call **GetMetadata** Service by Apache **HttpClient** library

- **RecognizerExample** is a simple image recognition example.
- **SimilaritySearchExample** is a simple image similarity search example.
- **TextSearchExample** is a simple text search esample.
- **GetMetadataExample** is a simple example to retrieve epigraph metadata.

6.5.2 Testing Images

The EDR_Images folder contains a test collection of 100 images from EDR archives.

6.5.3 XML Responses

6.5.3.1 Image Recognition Example

XML response complies with the requirements in *EAGLE_Adv_Architecture*.


```
<imageRecognition responseCode="200" correlationId="null">
  <result score="0.756">
    <id>EDR000019</id>
    <metadata>
      <response>
        <lst name="responseHeader">
          <int name="status">0</int>
          <int name="QTime">599</int>
          <lst name="params">
            <str name="q">__all:"EDR000019" AND entitytype:"artifact"</str>
          </lst>
        </lst>
        <result name="response" numFound="1" start="0">
          <doc>
            <arr name="__dsversion">
              <date>2015-03-21T11:28:38Z</date>
            </arr>
            <arr name="__result">
              <str>
                <result xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                  xmlns:dri="http://www.driver-repository.eu/namespace/dri"
                  xmlns:dc="http://purl.org/dc/elements/1.1/"
                  xmlns:dnet="eu.dnetlib.miscutils.functional.xml.DnetXsltFunctions"
                  xmlns:dr="http://www.driver-repository.eu/namespace/dr">
                  <header>
                    <dri:objIdentifier>EDR::c24ddb2331179982449bf5c37c3568f8_artifact</dri:objIdentifier>
                    <dri:repositoryId>378b3c99-21d3-47a5-ade8-
bb423e2aa39f_UmVwb3NpdG9yeVNlcnZpY2VSZXNvdXJjZXMvUmVwb3NpdG9yeVNlcnZpY2VSZXNvdXJjZVR5cGU=</dri:repositoryId>
                    <dri:dateOfCollection>2015-03-21T10:52:47+01:00</dri:dateOfCollection>
                  </header>
                  <metadata>
                    <eagleObject>

<dnetResourceIdentifier>EDR::9239d3f849857aa7459ca7ca21b7dbe7::artifact</dnetResourceIdentifier>
                      <recordSourceInfo providerName="Epigraphic Database Roma" providerAcronym="EDR"
                        landingPage="http://www.edr-
edr.it/edr_programmi/res_complex_comune.php?do=book&amp;id_nr=EDR000019">EDR000019</recordSourceInfo>
                      <editingInfo>
                        <dateEdited>2012-05-26</dateEdited>
                        <metadataEditor>LAURA CAPURSO</metadataEditor>
                      </editingInfo>
                      <metadataIpr uri="http://www.europeana.eu/rights/rr-f/">Reserved Rights - Free access
                        via Epigraphic Database Roma</metadataIpr>
                      <title lang="la">EDR000019</title>
                      <description lang="la" />
                      <entityType>artifact</entityType>
                      <artifact>
                        <artifactType>inscription</artifactType>
                        <objectType uri="http://www.eagle-network.eu/voc/objtyp/lod/29">ara,
sepulcrum</objectType>
                        <material uri="http://www.eagle-network.eu/voc/material/lod/48">marmor</material>
                        <dimensions unit="cm">
                          <width>0.00</width>
                          <height>0.00</height>
                          <depth>0.00</depth>
                        </dimensions>
                        <decoration uri="http://www.eagle-network.eu/voc/decor/lod/1000">no
decoration</decoration>
                        <stateOfPreservation uri="" />
                        <originDating notBefore="0101" notAfter="0200"
                          datingMethod="http://en.wikipedia.org/wiki/Julian_calendar"
                          evidence="" period="">101 AD - 200 AD</originDating>
                        <yearOfFinding />
                        <findingSpot>
                          <romanProvinceItalicRegion
                            uri="http://www.trismegistos.org/place/000172">Roma</romanProvinceItalicRegion>
                          <ancientFindSpot
uri="http://www.trismegistos.org/place/000172">Roma</ancientFindSpot>
                          <modernFindSpot uri="">Roma, all'incrocio tra l'acquedotto alessandrino e il fosso di
Valle Lunga circa

                            1 Km a sud della via Prenestina (km 11) Roma</modernFindSpot>
                          <modernCountry uri="">Italia</modernCountry>
                          <modernRegion uri="" />
                          <modernProvince uri="" />
                        </findingSpot>
                        <conservationPlace>
                          <conservationCountry uri="" />
                          <conservationRegion uri="" />
                          <conservationCity uri="" />
```

```
                        <museum uri="">Roma, Museo Nazionale Romano, inv. 188408</museum>
                        <position />
                        <inventoryNumber />
                      </conservationPlace>
                      <hasVisualRepresentation>

<dnetResourceIdentifier>EDR::9239d3f849857aa7459ca7ca21b7dbe7::90fec68b72336613171e9d3c2cb9ede3::visual
                        </dnetResourceIdentifier>
                        <recordSourceInfo providerName="Epigraphic Database Roma" providerAcronym="EDR"
                          landingPage="http://www.edr-
edr.it/edr_programmi/res_complex_comune.php?do=book&amp;id_nr=EDR000019">EDR000019</recordSourceInfo>
                        <url>http://www.edr-edr.it/foto_epigrafi/immagini_uso/1/000019.jpg</url>
                        <thumbnail>http://www.edr-edr.it/foto_epigrafi/immagini_uso/1/000019.jpg</thumbnail>
                      </hasVisualRepresentation>
                      <inscription>
                        <hasTmId>
                          <tmId>263109</tmId>
                        </hasTmId>
                        <inscriptionType uri="http://www.eagle-
network.eu/voc/typeins/lod/92">sepulcralis</inscriptionType>
                        <engravingTechnique uri="http://www.eagle-
network.eu/voc/writing/lod/1">scalpro</engravingTechnique>
                        <metre />
                        <paleographicCharacteristics>
                        </paleographicCharacteristics>
                        <letterSize unit="cm" min="" max="" />
                        <honorand socialStatus="unknown">unknown</honorand>
                        <hasTranscription>
                          <dnetResourceIdentifier>EDR::9239d3f849857aa7459ca7ca21b7dbe7::transcription
                          </dnetResourceIdentifier>
                          <recordSourceInfo providerName="Epigraphic Database Roma" providerAcronym="EDR"
                            landingPage="http://www.edr-
edr.it/edr_programmi/res_complex_comune.php?do=book&amp;id_nr=EDR000019">EDR000019</recordSourceInfo>
                          <text lang="la">Eucarpo/fil(io),/Eucarpus/L(uci) Cl(audi)
                            PollionÌ□is/ser(vus).</text>
                          <textHtml lang="la">
                            <div class="textpart">
                              <a id="a11"><!--0 --></a>
                              Eucarpo
                              <br id="a12" />
                              fil(io),
                              <br id="a13" />
                              Eucarpus
                              <br id="a14" />
                              L(uci) Cl(audi) Pollionì□is
                              <br id="a15" />
                              <span class="linenumber">5</span>
                              ser(vus).
                            </div>
                          </textHtml>
                          <bibliography uri="">Not. Sc., 1926, p. 297, nr. 4 (R. Paribeni) (1)</bibliography>
                          <bibliography uri="">L. Quilici, Collatia, Roma 1974, p. 494 con foto - AE 1974
(2)</bibliography>
                          <bibliography uri="">AE 1974, 0178 (3)</bibliography>
                        </hasTranscription>
                      </inscription>
                    </artifact>
                  </eagleObject>
                </metadata>
              </result>
            </str>
          </arr>
          <arr name="title">
            <str>EDR000019</str>
          </arr>
          <arr name="__dsid">
            <str>fd00d548-5f8f-4303-9f3d-becc99a62e32_SW5kZXhEU1Jlc291cmNlcy9JbmRleERTUmVzb3VyY2VUeXBl
            </str>
          </arr>
          <str name="__indexrecordidentifier">EDR::c24ddb2331179982449bf5c37c3568f8_artifact</str>
          <str name="localid">EDR000019</str>
          <str name="repositoryname">Epigraphic Database Roma</str>
          <str name="dnetresourceidentifier">EDR::9239d3f849857aa7459ca7ca21b7dbe7::artifact
          </str>
          <long name="_version_">1496250027264180224</long>
          <arr name="__fulltext">
            <str />
          </arr>
        </doc>
      </result>
    </response>
  </metadata>
 </result>
</imageRecognition>
```

6.5.3.2 Image Similarity Search Example

XML response complies with the requirements in *EAGLE_Adv_Architecture*.

```
<imageSimilarity responseCode="200" correlationId="null">
        <results>
                <result score="4.966046">
                        <id>EDR000019</id>
                        <thumbnail>http://virserv101.isti.cnr.it/eagle-images/000019.jpg
                        </thumbnail>
                        <title>EDR000019</title>
                </result>
                <result score="0.06761941">
                        <id>EDR121282</id>
                        <thumbnail>http://virserv101.isti.cnr.it/eagle-images/121282.jpg
                        </thumbnail>
                        <title>EDR121282</title>
                </result>
                <result score="0.061495587">
                        <id>edr136171</id>
                        <thumbnail>http://virserv101.isti.cnr.it/eagle-images/136171.jpg
                        </thumbnail>
                        <title>EDR136171</title>
                </result>
                <result score="0.052686572">
                        <id>EDR004924</id>
                        <thumbnail>http://virserv101.isti.cnr.it/eagle-images/004924-1.jpg
                        </thumbnail>
                        <title>EDR004924</title>
                </result>
                <result score="0.050825123">
                        <id>EDR074472</id>
                        <thumbnail>http://virserv101.isti.cnr.it/eagle-images/074472.jpg
                        </thumbnail>
                        <title>EDR074472</title>
                </result>
                <result score="0.050165024">
                        <id>EDR076089</id>
                        <thumbnail>http://virserv101.isti.cnr.it/eagle-images/076089.jpg
                        </thumbnail>
                        <title>EDR076089</title>
                </result>
                <result score="0.04998309">
                        <id>edr121619</id>
                        <thumbnail>http://virserv101.isti.cnr.it/eagle-images/121619-2.jpg
                        </thumbnail>
                        <title>EDR121619</title>
                </result>
                <result score="0.04998309">
                        <id>edr121620</id>
                        <thumbnail>http://virserv101.isti.cnr.it/eagle-images/121620.jpg
                        </thumbnail>
                        <title>EDR121620</title>
                </result>
                <result score="0.04908683">
                        <id>EDR125080</id>
                        <thumbnail>http://virserv101.isti.cnr.it/eagle-images/125080-1.jpg
                        </thumbnail>
                        <title>EDR125080</title>
                </result>
                <result score="0.049041107">
                        <id>EDR078772</id>
                        <thumbnail>http://virserv101.isti.cnr.it/eagle-images/078772.jpg
                        </thumbnail>
                        <title>EDR078772</title>
                </result>
        </results>

</imageSimilarity>
```

6.5.3.3 Text Search Example

XML response complies with the requirements in *EAGLE_Adv_Architecture*.

```
<response>
  <lst name="responseHeader">
    <int name="status">0</int>
    <int name="QTime">3463</int>
    <lst name="params">
      <str name="group.ngroups">true</str>
      <str name="start">0</str>
      <str name="q">pisaAND entitytype:"artifact"</str>
      <str name="group.limit">50</str>
      <str name="group.field">tmid</str>
      <str name="group">true</str>
      <str name="rows">1</str>
    </lst>
  </lst>
  <lst name="grouped">
    <lst name="tmid">
      <int name="matches">217535</int>
      <int name="ngroups">202020</int>
      <arr name="groups">
        <lst>
          <str name="groupValue">n/a_UOXF::81f487d529ed86827e5ec10068a7502f</str>
          <result name="doclist" numFound="1" start="0">
            <doc>
              <arr name="__dsversion">
                <date>2015-03-20T18:06:32Z</date>
              </arr>
              <arr name="__result">
                <str>
                  <result xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                    xmlns:dri="http://www.driver-repository.eu/namespace/dri"
                    xmlns:dc="http://purl.org/dc/elements/1.1/"
                    xmlns:dnet="eu.dnetlib.miscutils.functional.xml.DnetXsltFunctions"
                    xmlns:dr="http://www.driver-repository.eu/namespace/dr">
                    <header>
                      <dri:objIdentifier>UOXF::00134151da3da0376e46f7768c289166_artifact</dri:objIdentifier>
                      <dri:repositoryId>276a6ad1-41cd-4bd2-8ae8-
225fe1d50030_UmVwb3NpdG9yeVNlcnZpY2VSZXNvdXJjZXMvUmVwb3NpdG9yeVNlcnZpY2VSZXNvdXJjZVR5cGU=</dri:repositoryId>
                      <dri:dateOfCollection>2015-03-20T18:04:02+01:00</dri:dateOfCollection>
                    </header>
                    <metadata>
                      <eagleObject>
                        <dnetResourceIdentifier>UOXF::81f487d529ed86827e5ec10068a7502f::artifact
                        </dnetResourceIdentifier>
                        <recordSourceInfo providerName="Last Statues of Antiquity" providerAcronym="UOXF"
                          landingPage="http://laststatues.classics.ox.ac.uk/database/detail-
base.php?record=LSA-2187">LSofA2187</recordSourceInfo>
                        <editingInfo>
                          <dateEdited>2015-03-19</dateEdited>
                          <metadataEditor>LSA</metadataEditor>
                        </editingInfo>
                        <metadataIpr
                          uri="http://creativecommons.org/licenses/by-nc-sa/3.0/">This file is licensed under
the Creative Commons
                          Attribution-NonCommercial-ShareAlike 3.0 Unported license.
                        </metadataIpr>
                        <title lang="en">IRT 571; Tantillo &amp;amp; Bigi 2010 no. 42</title>
                        <description lang="en" />
                        <entityType>artifact</entityType>
                        <artifact>
                          <artifactType>inscription</artifactType>
                          <objectType uri="http://www.eagle-network.eu/voc/objtyp/lod/53">base</objectType>
                          <material uri="http://www.eagle-network.eu/voc/material/lod/48">marble</material>
                          <dimensions unit="cm">
                            <width>63</width>
                            <height>82.3</height>
                            <depth />
                          </dimensions>
                          <decoration uri="">clothing:</decoration>
                          <stateOfPreservation uri="" />
                          <originDating notBefore="0378" notAfter="0378"
                            datingMethod="http://en.wikipedia.org/wiki/Julian_calendar"
                            evidence="" period="">378-378</originDating>
                          <yearOfFinding />
                          <findingSpot>
                            <romanProvinceItalicRegion uri="" />
                            <ancientFindSpot uri="">Lepcis Magna</ancientFindSpot>
                            <modernFindSpot uri="" />
                            <modernCountry uri="">North Africa, Eastern (Tripolitania and
Cyrenaica)</modernCountry>
                            <modernRegion uri="">Tripolitania</modernRegion>
                            <modernProvince uri="" />
                          </findingSpot>
```

```
                        <conservationPlace>
                          <conservationCountry uri="">North Africa, Eastern (Tripolitania and
Cyrenaica)</conservationCountry>
                          <conservationRegion uri="">Tripolitania</conservationRegion>
                          <conservationCity uri="" />
                          <museum uri="" />
                          <position />
                          <inventoryNumber />
                        </conservationPlace>
                        <hasVisualRepresentation>

<dnetResourceIdentifier>UOXF::81f487d529ed86827e5ec10068a7502f::d4b0488a1fc0a2f952a970daf66de49f::visual
                          </dnetResourceIdentifier>
                          <recordSourceInfo providerName="Last Statues of Antiquity"
                            providerAcronym="UOXF"
                            landingPage="http://laststatues.classics.ox.ac.uk/database/detail-
base.php?record=LSA-2187">LSofA2187</recordSourceInfo>
                          <url>http://laststatues.classics.ox.ac.uk/database/detail-
base.php?image=Image_1_Large&amp;recid=2562
                          </url>
                          <thumbnail>http://laststatues.classics.ox.ac.uk/database/detail-
base.php?image=Image_1_Large&amp;recid=2562
                          </thumbnail>
                        </hasVisualRepresentation>
                        <hasVisualRepresentation>

<dnetResourceIdentifier>UOXF::81f487d529ed86827e5ec10068a7502f::084f2a0e5346b069d973a3d70b0609e1::visual
                          </dnetResourceIdentifier>
                          <recordSourceInfo providerName="Last Statues of Antiquity"  providerAcronym="UOXF"
                            landingPage="http://laststatues.classics.ox.ac.uk/database/detail-
base.php?record=LSA-2187">LSofA2187</recordSourceInfo>
                          <url>http://laststatues.classics.ox.ac.uk/database/detail-
base.php?image=Image_2_Large&amp;recid=2562
                          </url>
                          <thumbnail>http://laststatues.classics.ox.ac.uk/database/detail-
base.php?image=Image_2_Large&amp;recid=2562
                          </thumbnail>
                        </hasVisualRepresentation>
                        <inscription>
                          <hasTmId>
                            <tmId>n/a_UOXF::81f487d529ed86827e5ec10068a7502f</tmId>
                          </hasTmId>
                          <inscriptionType
                            uri="http://www.eagle-network.eu/voc/typeins/lod/69">honorific</inscriptionType>
                          <engravingTechnique uri="" />
                          <metre>no</metre>
                          <fieldSize unit="cm">
                            <width />
                            <height />
                          </fieldSize>
                          <paleographicCharacteristics />
                          <honorand socialStatus="unknown">unknown</honorand>
                          <hasTranscription>
                            <dnetResourceIdentifier>UOXF::81f487d529ed86827e5ec10068a7502f::transcription
                            </dnetResourceIdentifier>
                            <recordSourceInfo providerName="Last Statues of Antiquity"
                              providerAcronym="UOXF"
                              landingPage="http://laststatues.classics.ox.ac.uk/database/detail-
base.php?record=LSA-2187">LSofA2187</recordSourceInfo>
                            <text lang="la">[Be]nedictii v (iri) p (erfectissimi)
                              ,/[ded]icata die VI (?) Idum Iuniarum (vac. c.4) d
                              (ominis) n (ostris) Valente VI et/Valentiniano II Aug
                              (ustis) conss (ulibus) ./[ Fl (avio) ] Vivi[o
                              Be]nedi[cto]/(5) [ v (iro) p (erfectissimo) , p]raesidi
                              pro[ v (inciae) Trip (olitanae) ],/te[n]aci iustitia[e,
                              in-]/terpraeti (sic, for 'interpreti') iur[is,
                              i]nno-/centium [f]autori,/(9) vindici liber[t]atis,
                              no-/xiorum omniu[m] percus-/sori, (vac. c.2) ordo splen
                              (didissimus) [ci]vit (atis)/Lepcimag[nensium [. ] ]/no
                              +[ [. ] ]/[ [. ] ]POIGAV[ [. ] ]/(15) [ [. ]
                              ]DIGNETPATR++[ [. ] ].</text>
                            <textHtml lang="la">
                              <div class="textpart">
                                <a id="a11"><!--0 -->
                                </a>
                                [Be]nedictii v (iri) p (erfectissimi) ,
                                <br id="a12" />
                                [ded]icata die VI (?) Idum Iuniarum (vac. c.4) d
                                (ominis) n (ostris) Valente VI et
                                <br id="a13" />
                                Valentiniano II Aug (ustis) conss (ulibus) .
                                <br id="a14" />
                                [ Fl (avio) ] Vivi[o Be]nedi[cto]
                                <br id="a15" />
                                <span class="linenumber">5</span>
                                (5) [ v (iro) p (erfectissimo) , p]raesidi pro[ v
                                (inciae) Trip (olitanae) ],
```

```
                                <br id="al6" />
                                te[n]aci iustitia[e, in-]
                                <br id="al7" />
                                terpraeti (sic, for 'interpreti') iur[is, i]nno-
                                <br id="al8" />
                                centium [f]autori,
                                <br id="al9" />
                                (9) vindici liber[t]atis, no-
                                <br id="al10" />
                                <span class="linenumber">10</span>
                                xiorum omniu[m] percus-
                                <br id="al11" />
                                sori, (vac. c.2) ordo splen (didissimus) [ci]vit (atis)
                                <br id="al12" />
                                Lepcimag[nensium [. ] ]
                                <br id="al13" />
                                no +[ [. ] ]
                                <br id="al14" />
                                [ [. ] ]POIGAV[ [. ] ]
                                <br id="al15" />
                                <span class="linenumber">15</span>
                                (15) [ [. ] ]DIGNETPATR+++[ [. ] ].
                              </div>
                            </textHtml>
                            <bibliography uri="">IRT 571; Tantillo &amp;
                              Bigi 2010 no. 42</bibliography>
                            <bibliography uri="">Tantillo, I. and F. Bigi
                              (eds.), Leptis Magna. Una città e le sue iscrizioni in
                              epoca
                              tardoromana, Cassino 2010 395-7, no. 42, figs. 7.15, 10.49, pl. XV
                            </bibliography>
                          </hasTranscription>
                        </inscription>
                      </artifact>
                    </eagleObject>
                  </metadata>
                </result>
              </str>
            </arr>
            <arr name="title">
              <str>IRT 571; Tantillo & Bigi 2010 no. 42</str>
            </arr>
            <arr name="__dsid">
              <str>92eadf28-c4f7-47a0-bcff-3fc21b542573_SW5kZXhEU1J1c291cmNlcy9JbmRleERTUmVzb3VyY2VUeXBl
              </str>
            </arr>
            <str name="__indexrecordidentifier">UOXF::00134151da3da0376e46f7768c289166_artifact
            </str>
            <str name="localid">LSofA2187</str>
            <str name="repositoryname">Last Statues of Antiquity</str>
            <str name="dnetresourceidentifier">UOXF::81f487d529ed86827e5ec10068a7502f::artifact
            </str>
            <long name="_version_">1496182887628668928</long>
            <arr name="__fulltext">
              <str />
            </arr>
          </doc>
        </result>
      </lst>
    </arr>
  </lst>
</response>
```

6.5.3.4 Get Metadata Example

XML response complies with the requirements in *EAGLE_Adv_Architecture*.

```
<response>
  <lst name="responseHeader">
    <int name="status">0</int>
    <int name="QTime">7</int>
    <lst name="params">
      <str name="q">__all:"EDR000112" AND entitytype:"artifact"</str>
    </lst>
  </lst>
  <result name="response" numFound="1" start="0">
    <doc>
      <arr name="__dsversion">
        <date>2015-03-21T11:28:38Z</date>
      </arr>
      <arr name="__result">
        <str>
          <result xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
            xmlns:dri="http://www.driver-repository.eu/namespace/dri"
            xmlns:dc="http://purl.org/dc/elements/1.1/"
xmlns:dnet="eu.dnetlib.miscutils.functional.xml.DnetXsltFunctions"
            xmlns:dr="http://www.driver-repository.eu/namespace/dr">
            <header>
              <dri:objIdentifier>EDR::0b4b1c3b5051f3a0f4eea2be136d7b34_artifact</dri:objIdentifier>
              <dri:repositoryId>378b3c99-21d3-47a5-ade8-
bb423e2aa39f_UmVwb3NpdG9yeVNlcnZpY2VSZXNvdXJjZXMvUmVwb3NpdG9yeVNlcnZpY2VSZXNvdXJjZVR5cGU=</dri:repositoryId>
              <dri:dateOfCollection>2015-03-21T10:04:36+01:00</dri:dateOfCollection>
            </header>
            <metadata>
              <eagleObject>

<dnetResourceIdentifier>EDR::12f168eeee066f883b2bdb25cdd662a9::artifact</dnetResourceIdentifier>
                <recordSourceInfo providerName="Epigraphic Database Roma" providerAcronym="EDR"
                  landingPage="http://www.edr-
edr.it/edr_programmi/res_complex_comune.php?do=book&amp;id_nr=EDR000112">EDR000112</recordSourceInfo>
                <editingInfo>
                  <dateEdited>2015-01-15</dateEdited>
                  <metadataEditor>STEFANIA VALENTINI</metadataEditor>
                </editingInfo>
                <metadataIpr uri="http://www.europeana.eu/rights/rr-f/">Reserved Rights - Free access via
Epigraphic Database Roma
                </metadataIpr>
                <title lang="la">EDR000112</title>
                <description lang="la" />
                <entityType>artifact</entityType>
                <artifact>
                  <artifactType>inscription</artifactType>
                  <objectType uri="http://www.eagle-network.eu/voc/objtyp/lod/125">fragmentum</objectType>
                  <material uri="http://www.eagle-network.eu/voc/material/lod/48">marmor</material>
                  <dimensions unit="cm">
                    <width>0.00</width>
                    <height>0.00</height>
                    <depth>0.00</depth>
                  </dimensions>
                  <decoration uri="http://www.eagle-network.eu/voc/decor/lod/1000">no decoration</decoration>
                  <stateOfPreservation uri="" />
                  <originDating notBefore="0001" notAfter="0050"
                    datingMethod="http://en.wikipedia.org/wiki/Julian_calendar"
                    evidence="" period="">1 AD - 50 AD</originDating>
                  <yearOfFinding />
                  <findingSpot>
                    <romanProvinceItalicRegion uri="">Liguria (Regio IX)
                    </romanProvinceItalicRegion>
                    <ancientFindSpot
uri="http://www.trismegistos.org/place/031683">Albingaunum</ancientFindSpot>
                    <modernFindSpot uri="">Albenga (Savona), regione Doria Albenga (Savona)</modernFindSpot>
                    <modernCountry uri="">Italia</modernCountry>
                    <modernRegion uri="" />
                    <modernProvince uri="" />
                  </findingSpot>
                  <conservationPlace>
                    <conservationCountry uri="" />
                    <conservationRegion uri="" />
                    <conservationCity uri="" />
                    <museum uri="">ignoratur, periit</museum>
                    <position />
                    <inventoryNumber />
                  </conservationPlace>
                  <hasVisualRepresentation>

<dnetResourceIdentifier>EDR::12f168eeee066f883b2bdb25cdd662a9::0f0ca746e5bd2dc34b6c48c59068a68a::visual</dnetRe
sourceIdentifier>
                    <recordSourceInfo providerName="Epigraphic Database Roma" providerAcronym="EDR"
```

```
                    landingPage="http://www.edr-
edr.it/edr_programmi/res_complex_comune.php?do=book&amp;id_nr=EDR000112">EDR000112</recordSourceInfo>
                  <url>http://www.edr-edr.it/foto_epigrafi/immagini_uso/1/000112.jpg
                  </url>
                  <thumbnail>http://www.edr-edr.it/foto_epigrafi/immagini_uso/1/000112.jpg</thumbnail>
                </hasVisualRepresentation>
                <inscription>
                  <hasTmId>
                    <tmId>258844</tmId>
                  </hasTmId>
                  <inscriptionType uri="http://www.eagle-
network.eu/voc/typeins/lod/92">sepulcralis</inscriptionType>
                  <engravingTechnique  uri="http://www.eagle-
network.eu/voc/writing/lod/1">scalpro</engravingTechnique>
                  <metre />
                  <paleographicCharacteristics>
                  </paleographicCharacteristics>
                  <letterSize unit="cm" min="" max="" />
                  <honorand socialStatus="unknown">unknown</honorand>
                  <hasTranscription>
                    <dnetResourceIdentifier>EDR::12f168eeee066f883b2bdb25cdd662a9::transcription
                    </dnetResourceIdentifier>
                    <recordSourceInfo providerName="Epigraphic Database Roma" providerAcronym="EDR"
                      landingPage="http://www.edr-
edr.it/edr_programmi/res_complex_comune.php?do=book&amp;id_nr=EDR000112">EDR000112</recordSourceInfo>
                    <text lang="la">[T(itus) Virius [.] f(ilius)
                      Pob(lilia)]/[B]arbar[us v(ivus) f(ecit) sibi]/et Lucretiae
                      [[.] f(iliae)]/et C(aio) Virio T(iti) f(ilio)
                      Po[b(lilia)]/IIIIvir(o)aedil(icia) [t(estate)
                      ],/IIIIvir(o)iur(e) [c(undo) ]/------
                    </text>
                    <textHtml lang="la">
                      <div class="textpart">
                        <a id="a1"><!--0 -->
                        </a>
                        [T(itus) Virius [.] f(ilius) Pob(lilia)]
                        <br id="a2" />
                        [B]arbar[us v(ivus) f(ecit) sibi]
                        <br id="a3" />
                        et Lucretiae [[.] f(iliae)]
                        <br id="a4" />
                        et C(aio) Virio T(iti) f(ilio) Po[b(lilia)]
                        <br id="a5" />
                        <span class="linenumber">5</span>
                        IIIIvir(o)
                        <i>(!)</i>
                        aedil(icia) [t(estate) ],
                        <br id="a6" />
                        IIIIvir(o)
                        <i>(!)</i>
                        iur(e) [c(undo) ]
                        <br id="a0" />
                        ------
                      </div>
                    </textHtml>
                    <bibliography uri="">SupplIt, 04, 1988, p. 261, nr. 10 (con foto) (G. Mennella) - AE
1990(1)</bibliography>
                    <bibliography uri="">AE 1990, 0371 (2)</bibliography>
                  </hasTranscription>
                </inscription>
              </artifact>
            </eagleObject>
          </metadata>
        </result>
      </str>
    </arr>
    <arr name="title">
      <str>EDR000112</str>
    </arr>
    <arr name="__dsid">
      <str>fd00d548-5f8f-4303-9f3d-becc99a62e32_SW5kZXhEU1Jlc291cmNlcy9JbmRleERTUmVzb3VyY2VUeXBl</str>
    </arr>
    <str name="__indexrecordidentifier">EDR::0b4b1c3b5051f3a0f4eea2be136d7b34_artifact</str>
    <str name="localid">EDR000112</str>
    <str name="repositoryname">Epigraphic Database Roma</str>
    <str name="dnetresourceidentifier">EDR::12f168eeee066f883b2bdb25cdd662a9::artifact</str>
    <long name="_version_">1496248611932995584</long>
    <arr name="__fulltext">
      <str />
    </arr>
  </doc>
 </result>
</response>
```