



D3.6: Wikimedia Application

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Contents

<i>Executive summary</i>	4
1. Introduction	5
Overview of the microservice	5
Overview of the development methodology	7
2. Getting started	8
Operating system	8
Server	8
Terms of use (API key)	8
Authentication	8
Base URL	8
3. API Reference	9
Harvest	9
ListItems	10
GetItem	11
HTML Status Codes	13
4. How to install the microservice	14
5. How the microservice is installed in LoCloud	14
6. Conclusions	14
7. References	15

Executive summary

This deliverable presents the Wikimedia application which will be used within the LoCloud infrastructure. The application allows the harvesting of content provided by small cultural institutions or independent experts and uploaded to Wikimedia installations, and the provision of enriched content to Europeana.

The application (or microservice) has been built as a web service (REST based) and uses the Wikimedia API in order to communicate with Wikimedia. The application's main functionalities are to harvest content from Wikimedia, parse the harvested content, and identify useful entities that can be mapped to the ESE or EDM metadata schemas.

The application is connected to the LoCloud infrastructure through its REST services. The LoCloud aggregator (MoRe) uses the services in order to allow users to initiate a harvest and get content into the aggregator. The mapped ESE / EDM records are delivered to MoRe, where they can be enriched using the various enrichment services available on the aggregator and then provided to Europeana.

The base URL of the application can be found at:

<http://more.locloud.eu/wikimedia/>

The API console is accessible from:

<http://more.locloud.eu/wikimedia/console.php>

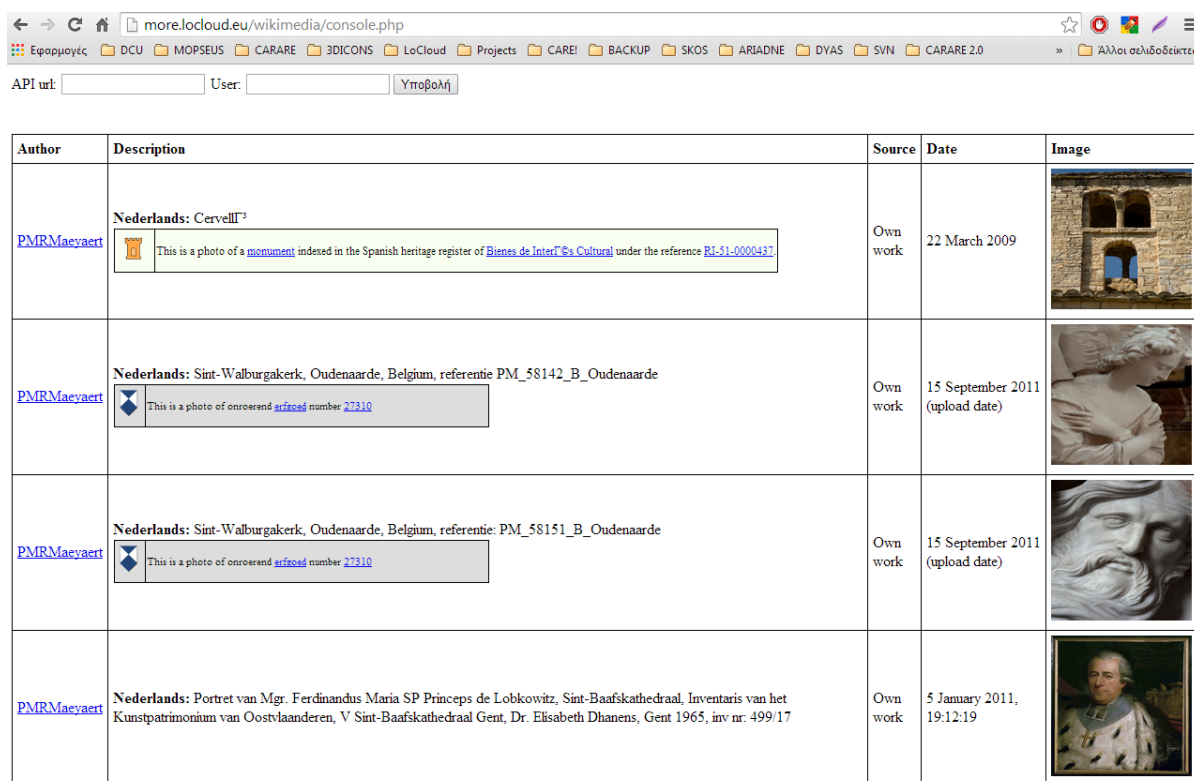
1. Introduction





Overview of the microservice

The Wikimedia application has been built as a web service and uses a REST interface in order to communicate with Wikimedia commons and facilitate the exchange of information. On top of the REST services, an API console has been built that demonstrates its functionality. The user is required to provide the URL to the Wikimedia API installation endpoint (e.g. <http://commons.wikimedia.org/w/api.php>), plus the user identifier that has provided the content to be harvested (e.g. PMRMaeyaert). The application will then use the API in order to retrieve the records associated with this user, parse and extract useful information that is then displayed to the user. This information includes the following elements so far:

- author
- description
- source
- date
- image (url)

The harvested information can then be mapped to ESE or EDM (Europeana Semantic Elements , Europeana Data Model , see references for further information) in order to be ingested into the LoCloud Metadata Aggregator (MoRe).



Author	Description	Source	Date	Image
PMRMaeyaert	Nederlands: Cervell ³ This is a photo of a monument indexed in the Spanish heritage register of Bienes de Interés Cultural under the reference RI-51-0000437	Own work	22 March 2009	
PMRMaeyaert	Nederlands: Sint-Walburgakerk, Oudenaarde, Belgium, referentie PM_58142_B_Oudenaarde This is a photo of onroerend erfgoed number 27310	Own work	15 September 2011 (upload date)	
PMRMaeyaert	Nederlands: Sint-Walburgakerk, Oudenaarde, Belgium, referentie: PM_58151_B_Oudenaarde This is a photo of onroerend erfgoed number 27310	Own work	15 September 2011 (upload date)	
PMRMaeyaert	Nederlands: Portret van Mgr. Ferdinandus Maria SP Princps de Lobkowitz, Sint-Baafskathedraal, Inventaris van het Kunstpatrimonium van Oostvlaanderen, V Sint-Baafskathedraal Gent, Dr. Elisabeth Dhanens, Gent 1965, inv nr: 499/17	Own work	5 January 2011, 19:12:19	

API url for the next items: <http://commons.wikimedia.org/w/api.php?action=query&list=usercontribs&uclimit=5&format=xml&ucuser=PMRMaeyaert&uccontinue=20140621122314|27166447>

Figure 1: Wikimedia application console. List of harvested records





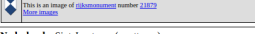

Author	Description	Source	Date
Jan van Eyck (circa 1390†c1441)  Alternative names: Jean van Eyck, Johannes van Eyck Description: Southern Netherlandish painter and draughtsman Date of birth/death: circa 1390 before 9 June 1441 Location of birth/death: Maaseik Bruges Work location: The Hague (1422), Bruges (1425), Lille (1425†c1428), Bruges (1431†c1441) Authority control: <ul style="list-style-type: none"> VIAF: 54156267 LCCN: n50948855 GND: 118531527 BnF: cb119389315 ISNI: 000000036000140362101433e4186 WorldCat WP:Person 			
PMRMaeyaert	English: Onze-Lieve-Vrouwehospitaal, Oudenaarde, Belgium, 59325_B_Oudenaarde Français: Onze-Lieve-Vrouwehospitaal, d'Audenaarde, Belgique Nederlands: Onze-Lieve-Vrouwehospitaal, Oudenaarde, België 	Own work	15 September 2011 (upload date)
PMRMaeyaert	Nederlands: Sint-Walburgakerk, Oudenaarde, Belgium, PM_08315_B_Oudenaarde 	Own work	15 September 2011 (upload date)
PMRMaeyaert	Nederlands: Sint-Walburgakerk, Oudenaarde, Belgium, PM_08315_B_Oudenaarde 	Own work	15 September 2011 (upload date)
PMRMaeyaert	Nederlands: Kooromgang, vanuit zuid-oost 	Own work	2 April 2011
PMRMaeyaert	Nederlands: Sint-Jansoren (westoren) 	Own work	2 April 2011

Figure 2: Wikimedia application console. List of harvested records

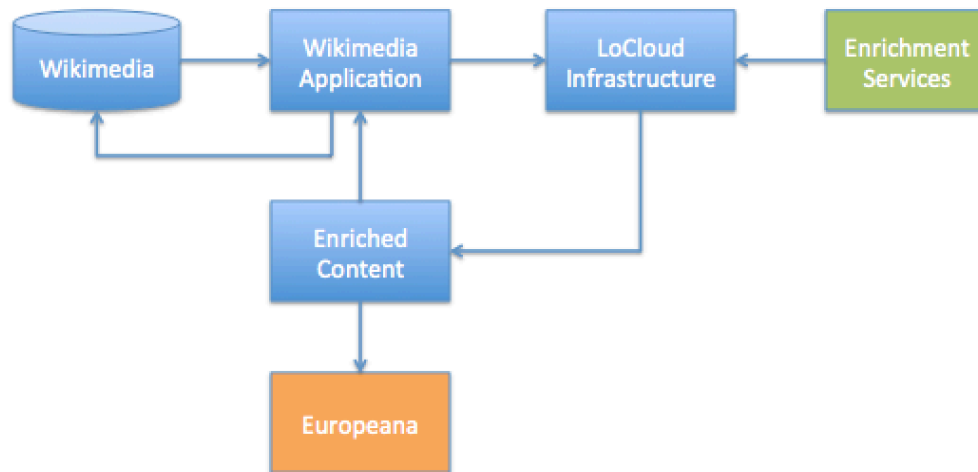
Author	Description	Source	Date
PMRMaeyaert	English: Monument memorial de la guerre 1914-18, Place Jean Absil	Own work	22 September 2011 (upload date)
PMRMaeyaert	English: Monument memorial de la guerre 1914-18, Place Jean Absil	Own work	22 September 2011 (upload date)
PMRMaeyaert	Français: Conservatoire, le beffroi et la cathédrale, Place Reine Astrid	Own work	26 September 2012, 15:22:36
PMRMaeyaert	Español: procesion dd 30 julio 2013	Own work	30 June 2013, 12:39:22
PMRMaeyaert	Nederlands: Plaza Mayor	Own work	26 June 2013, 16:21:53
PMRMaeyaert	Català: Església de Sant Pere	Own work	13 August 2013, 11:48:56
PMRMaeyaert	Español: Ermita de San Baudelio de Berlanga	Own work	3 August 2013, 10:29:40
PMRMaeyaert	Nederlands: Plaza Mayor	Own work	25 June 2013, 12:16:42
PMRMaeyaert	Español: Palacio Real	Own work	16 July 2013, 08:01:10
PMRMaeyaert	Español: Palacio Real	Own work	15 July 2013, 08:03:47

API url for the next items: <https://commons.wikimedia.org/w/api.php?action=query&list=usercontribs&uclimit=108&format=xml&ucuser=PMRMaeyaert&uccontinue=201310071635091065508155&ucuser=PMRMaeyaert&uccontinue=20131003092959106166082&ucuser=PMRMaeyaert&uccontinue=20130929101217105721844>

Figure 3: Wikimedia application console. List of harvested records

The harvested and transformed records will be enriched within the LoCloud MoRe aggregator and through the various enriched micro-services. Enrichment through MoRe allows the streamlining of all available enrichment micro-services into robust workflows. Typical enrichment scenarios include:

- Annotation of text using Wikipedia lemmas
- Discovery of associations of records in close proximity
- Annotation with subject terms from various thesauri



The overall workflow is depicted in the above schema where the Wikimedia application harvests content from Wikimedia and ingests it into the LoCloud infrastructure (MoRe). There, the content is enriched through the various enrichment micro-services and the enriched version is delivered to Europeana and back to the Wikimedia application for possible re-ingestion into Wikimedia as a new version.

Overview of the development methodology

The Wikimedia application has been built as a web service and the PHP language was used to develop it. Although it makes extensive use of REST services, the Wikimedia Commons API library has been used. The main challenge in developing the Wikimedia application focuses on extracting and correctly parsing content from Wikimedia, because Wiki content is not always semantically correct and little information can be extracted with a good degree of confidence. The semantic disambiguities have to do mainly with the fact that Wikis are inherently difficult in: a) capturing metadata and b) annotating parts of the wiki text. This means that few metadata per page are available and textual descriptions within the pages of the wiki are not annotated with metadata (they appear as plain text). The testing of the application involves two parts:

Testing of the application

Various API calls were tested using Chrome REST clients. The tests involved using combinations of various parameters.

Testing of the content

Testing using real content was carried out using a dummy Wikimedia installation and using the real Wikimedia Commons. The harvested content was parsed so that the appropriate entities could be extracted.

2. Getting started

Operating system

The Wikimedia application can be installed in any web server that has Apache HTTP and PHP installed. This includes the following operating systems:

- Windows server
- Linux server
- MacOS server

Server

The minimum server requirements of the Wikimedia application match those of the Apache HTTP server. Wikimedia is an extremely lightweight microservice providing it harvests no more than five simultaneous Wikimedia installations.

Terms of use (API key)

There are two access levels in place in order to ensure the proper use of the application, and safeguard the server's resources.

Access to the REST API calls

These require an API key that is provided on request. Each API call must be accompanied by this API key in order to provide proper audit and resource limitation (when needed).

Access to the API console

The access to the API console is free and does not require any keys. It was meant as a demo of the application's capabilities.

Authentication

There is no authentication required (except the use of an API key when using the REST API calls).

Base URL

The base URL of the application can be found under:

<http://more.locloud.eu/wikimedia/>

The API console is accessible from:

<http://more.locloud.eu/wikimedia/console.php>

3. API Reference

Harvest

The id of the batch is received or is created.

Request

Method	URL
[POST or GET]	http://more.locloud.eu/wikimedia/Harvest.php?api_key=AAAAA&harvest_id=1

Parameter	Datatype	Description
api_key	String	The API Key
url	String	The base URL of the Wikimedia installation
contributor	String	The contributor name
harvest_id	Integer	The harvest_id of the batch. If empty, a new harvest is created and returned.

Response

Status	Response
200	<p>An XML document with the id of the batch to harvest is received (harvest_id).</p> <p>Example response:</p> <pre><harvest id="1"> <url> http://commons.wikimedia.org/w/api.php?action=query&list=usercontribs&uclimit=5&format=xml </url> <contributor>PMRMaeyaert</contributor> </harvest></pre>

ListItems

A list with all the harvested items is received.

Request

Method	URL
[GET]	http://more.locloud.eu/wikimedia/ListItems.php?api_key=AAAAA&harvest_id=1

Parameter	Datatype	Description
api_key	String	The API Key
harvest_id	String	The id of the harvest
c_token	String	A token containing the id of the page to harvest. If c_token is empty, the first page is received

Response

Status	Response
200	<p>An XML document with the harvested items is received. Each item contains a record identifier.</p> <p>Example response:</p> <pre><items> <item userid="1661583" user="PMRMaeyaert" pageid="28077239" revid="131600008" parentid="103515855" ns="2" title="User: PMRMaeyaert" timestamp="2014-08- 14T20:54:06Z" top="" comment="" size="150"/> <item userid="1661583" user="PMRMaeyaert" pageid="16731736" revid="131338987" parentid="62183871" ns="6" title="File:S ant Ponç de Corbera PM 25909.jpg"timestamp="2014-08- 12T09:50:25Z" top="" comment="PMRMaeyaert uploaded a new version of File:Sant Ponç de Corbera PM 25909.jpg" size="371"/> <item userid="1661583" user="PMRMaeyaert" pageid="16497745" revid="131281535" parentid="115967226" ns="6" title="File: 27310 Oudenaarde Sint-Walburgakerk 76.jpg" timestamp="2014- 08-11T13:30:11Z" top="" comment="/* {{int:filedesc}} */" size="638"/> <item userid="1661583" user="PMRMaeyaert" pageid="16497751" revid="131281244" parentid="115967231" ns="6" title="File: 27310 Oudenaarde Sint-Walburgakerk 77.jpg" timestamp="2014- 08-11T13:24:43Z" top="" comment="/* {{int:filedesc}} */" size="639"/> <item userid="1661583" user="PMRMaeyaert" pageid="33507675" revid="127166448" parentid="0" ns="6" title="File:Gent Sint-Baafskathedraal portret bisschop Lobkowitz B STB 578.jpg" timestamp="2014-06-</pre>

	<pre>21T12:23:15Z" new="" comment="User created page with UploadWizard" size="528"/> </items></pre>
--	--

GetItem

The harvested item is received.

Request

Method	URL
[GET]	http://more.locloud.eu/wikimedia/GetItem.php?api_key=AAAA&harvest_id=1&item_id=Gent Sint-Baafskathedraal portret bisschop Lindanus B STB 602.jpg

Parameter	Datatype	Description
api_key	String	The API Key
harvest_id	String	The id of the harvest
Item_id	String	The id of the item to harvest

Response

Status	Response
200	<p>An XML document with the harvested item is received.</p> <p>Example response:</p> <pre><response version="0.92"> <file> <name> Gent Sint-Baafskathedraal portret bisschop Lindanus B STB 602.jpg </name> <title> File:Gent_Sint- Baafskathedraal_portret_bisschop_Lindanus_B_STB_602.jpg </title> <urls> <file> http://upload.wikimedia.org/wikipedia/commons/3/30/Gent_Sin t-Baafskathedraal_portret_bisschop_Lindanus_B_STB_602.jpg </file> <description> http://commons.wikimedia.org/wiki/File:Gent_Sint- Baafskathedraal_portret_bisschop_Lindanus_B_STB_602.jpg</pre>

```

</description>
</urls>
<size>117595</size>
<width>463</width>
<height>600</height>
<uploader>PMRMaeyaert</uploader>
<upload_date>2014-06-21T12:23:14Z</upload_date>
<sha1>3e862647cad40628a0027bd828611cf1ca5f897f</sha1>
<date>
<span style="white-space:nowrap"><time class="dtstart"
datetime="2011-01-05">5 January 2011</time></span>,
19:12:21
</date>
<author>
<a
href="http://commons.wikimedia.org/wiki/User:PMRMaeyaert"
title="User:PMRMaeyaert">PMRMaeyaert</a>
</author>
<source><span class="int-own-work">Own work</span></source>
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</file>
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title=""><b>Nederlands:</b></span> Portret van Mgr. Willem
Lindanus, Sint-Baafskathedraal Inventaris van het
Kunstpatrimonium van Oostvlaanderen, V Sint-Baafskathedraal
Gent, Dr. Elisabeth Dhanens, Gent 1965 inv nr: 499/2</div>
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2014</category>
<category>Media needing categories as of 21 June
2014</category>
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V3.0</full_name>
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_some_rights_reserved.svg/90px-
CC_some_rights_reserved.svg.png
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sa/3.0/</license_info_url>
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http://creativecommons.org/licenses/by-sa/3.0/legalcode
</license_text_url>
</license>
</licenses>
</response>

```

HTML Status Codes

All status codes are standard HTTP status codes. The ones below are used in this API.

2XX - Success of some kind

4XX - Error occurred in client's part

5XX - Error occurred in server's part

Status Code	Description
200	OK
201	Created
202	Accepted (Request accepted, and queued for execution)
400	Bad request
401	Authentication failure
403	Forbidden
404	Resource not found
405	Method Not Allowed
409	Conflict
412	Precondition Failed
413	Request Entity Too Large
500	Internal Server Error
501	Not Implemented
503	Service Unavailable

4. How to install the microservice

The application is a web service and does not require any installation, it can be used directly through its REST interface. However, it is possible to install on a new server. The requirements for that installation are:

- Apache HTTP Server (version 2.0 and above)
- PHP Support (version 5.0 and above)
- MySQL (version 5.0 and above)

5. How the microservice is installed in LoCloud

The Wikimedia application can be connected to the LoCloud infrastructure through its REST services. The LoCloud aggregator (MoRe) can use the services in order to allow users to initiate a new harvest and get content into the aggregator, using one of the intermediate formats supported by LoCloud. Once the Wikimedia records have been delivered to MoRe, they can be enriched using the various enrichment services available. These services include the addition of vocabulary terms, the annotation with Wikipedia lemmas etc.

6. Conclusions

In conclusion, the micro-service's general approach includes harvesting of metadata on top of a RESTful architecture. The web based application and REST endpoints have been tested using real-data.

The main challenges in developing and operating such a service have to do mostly with the ambiguities of the harvested metadata. This is because of Wikimedia's lack of formalization (and enforcing of that normalization) of metadata.

Once the Wikimedia records have been harvested using the application and they are on the MoRe aggregator they can take advantage of the full range of enrichment micro-services before being published on Europeana.

7. References

ESE – Europeana Semantic Elements - http://www.europeana.eu/portal/ese_index.html

EDM – Europeana Data Model - <http://pro.europeana.eu/edm-documentation>

LoCloud, 2013: [D2.3 Modified MoRe Prototype](#)

Wikimedia Commons - http://commons.wikimedia.org/wiki/Main_Page

Wikimedia Commons API - <http://tools.wmflabs.org/magnus-toolserver/commonsapi.php>