

Notification Reports and HTTP-Callback

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1. Introduction

This document describes the notification methods made available to DOI Registrants in case they use the asynchronous registration method.

Chapter 2 describes the report with the outcome of the submissions that is generated by the DOI Registration system. Submissions can be for DOI registrations and updates, for Citations deposits and for metadata and cited by queries. Chapter 3 describes the 2 notification methods currently supported for sending this report to the user. Finally, chapter 4 shows the specifications of the service that the user must make available in case the user wants to use the HTTP-Callback notification method.

2. Report

The report with the description of the outcome of the submission is an XML document conforming to the schema: https://www.medra.org/schema/callback/doiWSResponse_2.0.xsd

Elements of the report

The XML report includes a combination of the following elements:

- **<submission-id>**: contains the identifier assigned by the DOI registration system to the request;
- **<operation >**: contains the identifier of the operation that is the subject of the report:
 - *DOIUpload* if the report refers to the creation / updating of DOI;
 - *crossrefDOIUpload* if the report refers to the DOI deposit / update in Crossref;
 - *DOICitationsUpload* if the report refers to the deposit / update of citations;
 - *crossrefDOICitationsUpload* if the report refers to the deposit / update of citations in Crossref.
 - *crossrefQueryUpload* if the report refers to the queries sent in an XML file for querying Crossref (metadata, DOI and cited by queries)
- **<submitted-tot>**: the total number of records contained in the submission;
- **<success-record>**: indicates that the record associated with the DOI specified in the <DOI> field has been successfully processed. Child elements are:
 - **<DOI>**: the DOI object of the record;
 - **<notification-type>**: indicates the type of operation requested on that DOI. It can take the values: *06* (DOI registration / citations deposit) or *07* (DOI update / citations update). The element is optional because in case of errors in the processing of the request it may not have been possible to determine this value;
 - **<message>**: text commenting on the outcome of the request (eg some warning messages sent by Crossref).
- **<failure-record>**: it indicates there have been problems during the processing of the records associated with the DOI specified in the <DOI>. Child elements are:
 - **<rec_idx>**: specifies the position (initial index 0) of the record within the original submission. It is present only for the *DOIUpload* and *DOICitationsUpload* operations;
 - **<DOI>**: the DOI object of the record;
 - **<notification-type>**: indicates the type of operation requested on that DOI. It can take the values: *06* (DOI registration / citations deposit) or *07* (DOI update / citations update). The element is optional because in case of errors in the processing of the request it may not have been possible to determine this value;
 - **<error>**: textual description of the cause of failure in processing the record;
 - **<status>**: textual description of the outcome of the submission;
 - **<status-code>**: reports the registration status code of that DOI. The possible values are shown in Appendix A.
- **<success-tot>**: the total number of failed records that have been successfully processed;
- **<failure-tot>**: the total number of submitted records that were not successfully processed;
- **<crossref-request>**: optional element that, in the case of reports with <operation> *DOIUpload* or *DOICitationsUpload*, indicates that the request for DOI creation / update or citation deposit / update was also sent to Crossref.
- **<message-reference-number>**: contains the identifier assigned by the user to the request
- **<failure-description>**: textual description of the cause of failure in processing the callback;
- **<query-response-message-url>**: optional element that reports the url endpoint for the response upon query upload in Crossref. It is present only in case of *crossrefQueryUpload*.

Examples of reports

Following some examples of reports for the different operations.

Creation or update of a DOI in mEDRA (DOIUpload)

```
<? xml version = "1.0" encoding = "UTF-8"?>
<report xmlns = "https://www.medra.org/doiWSResponse/2.0">
  <submission-id> DEMO_20230112239131_it </submission-id>
  <operation> DOIUpload </operation>
  <submitted-tot> 2 </submitted-tot>
  <success-record>
    <DOI>10.5236/test</DOI>
    <notification-type> 07 </notification-type>
  </success-record>
  <failure-record>
    <rec_idx>1</rec_idx>
    <DOI>10.5236/test2</DOI>
    <error> DOI_DOES_NOT_EXIST</error>
    <status> doi was not updated</status>
    <status-code>10</status-code>
  </failure-record>
  <success-tot>1</success-tot>
  <failure-tot>1</failure-tot>
</report>
```

Creation or update of a DOI in mEDRA that will also be deposited in Crossref (DOIUpload)

```
<? xml version = "1.0" encoding = "UTF-8"?>
<report xmlns = "https://www.medra.org/doiWSResponse/2.0">
  <submission-id> DEMO_20230112239131_it </submission-id>
  <operation> DOIUpload </operation>
  <submitted-tot> 2 </submitted-tot>
  <success-record>
    <DOI>10.5236/test3</DOI>
    <notification-type> 07 </notification-type>
  </success-record>
  <success-tot>1</success-tot>
  <failure-tot>0</failure-tot>
  <crossref-request/>
</report>
```

Deposit or update of a DOI in Crossref (crossrefDOIUpload)

```
<?xml version="1.0" encoding="UTF-8"?>
<report xmlns=http://www.medra.org/doiWSResponse/2.0>
  <submission-id> DEMO_20230112239131_it </submission-id>
  <operation>crossrefDOIUpload</operation>
  <submitted-tot>1</submitted-tot>
  <success-record>
    <DOI>10.5236/test3</DOI>
    <notification-type>07</notification-type>
    <message>Updated with conflict</message>
  </success-record>
  <success-tot>1</success-tot>
  <failure-tot>0</failure-tot>
</report>
```

Deposit or update of Citations in mEDRA (DOICitationsUpload)

```
<?xml version="1.0" encoding="UTF-8"?>
<report xmlns=http://www.medra.org/doiWSResponse/2.0>
  <submission-id>cl_DEMO_20230828122440_en</submission-id>
  <operation>DOICitationsUpload</operation>
  <submitted-tot>1</submitted-tot>
```

```

    <success-record>
      <DOI>10.5236/test</DOI>
      <notification-type>07</notification-type>
    </success-record>
    <success-tot>1</success-tot>
    <failure-tot>0</failure-tot>
  </report>

```

Deposit or update of Citations in mEDRA that will also be deposited in Crossref (DOICitationsUpload)

```

<?xml version="1.0" encoding="UTF-8"?>
<report xmlns=http://www.medra.org/doiWSResponse/2.0>
  <submission-id>c1_DEMO_20230828122666_en</submission-id>
  <operation>DOICitationsUpload</operation>
  <submitted-tot>1</submitted-tot>
  <success-record>
    <DOI>10.5236/test2</DOI>
    <notification-type>07</notification-type>
  </success-record>
  <success-tot>1</success-tot>
  <failure-tot>0</failure-tot>
  <crossref-request/>
</report>

```

Deposit or update of Citations in Crossref (crossrefDOICitationsUpload):

```

<?xml version="1.0" encoding="UTF-8"?>
<report xmlns=http://www.medra.org/doiWSResponse/2.0>
  <submission-id>c1_PMAZZUCCHI_20230828122666_en</submission-id>
  <operation>crossrefDOICitationsUpload</operation>
  <submitted-tot>1</submitted-tot>
  <success-record>
    <DOI>10.5236/test2</DOI>
    <notification-type>07</notification-type>
    <message>References processed successfully</message>
  </success-record>
  <success-tot>1</success-tot>
  <failure-tot>0</failure-tot>
</report>

```

Query for Citation metadata or Cited by query in Crossref with success (crossrefQueryUpload)

```

<?xml version="1.0" encoding="UTF-8"?>
<report xmlns=http://www.medra.org/doiWSResponse/2.0>
  <submission-id>DEMO_20230828123447_it</submission-id>
  <message-reference-number>Querytest2023message5</message-reference-number>
  <operation>crossrefQueryUpload</operation>
  <query-response-message-url> https://www.medra.org/servlet/query-
response-message/eb3f5e7a-de8b-412d-a874-aef387c96f1f</query-response-message-
url>
</report>

```

Query for Citation metadata or Cited by query in Crossref with failure (crossrefQueryUpload)

```

<?xml version="1.0" encoding="UTF-8"?>
<report xmlns=http://www.medra.org/doiWSResponse/2.0>
  <submission-id> DEMO_20230828123449_de </submission-id>
  <message-reference-number> Querytest2023message6</message-reference-
number>
  <operation>crossrefQueryUpload</operation>
  <failure-description>Description of the error</failure-description>
</report>

```

3. Notification methods

The report described in the previous paragraph can be sent to the user in 2 different ways:

1. e-mail;
2. HTTP-callback.

The notification method can be specified for each single submission by appropriately adding a value to the (optional) **<NotificationResponse>** element of the **<Header>** of the xml message:

- **01** notification by e-mail;
- **02** notification via HTTP-callback.

If not specified, the default will be 01 notification by e-mail.

However, the e-mail address (**<FromEmail>** element of the **<Header>**) remains mandatory, even if the notification method chosen is HTTP-callback, as fallback mechanism in case of problems using the HTTP-callback method.

Email notification

It is the default notification service: the report with the outcome of the recording is converted into human-readable text and inserted into the body of an e-mail sent to the address specified in the **<FromEmail>** of **<Header>** request.

Notification via HTTP-Callback

With this notification method, the report, in XML format, is sent to a specific HTTP service made available to the user. This allows the user to automate the verification of their submissions.

There are 2 notification Callback calls:

- one call for the report on the submissions in mEDRA DOI RA, these happen are usually within seconds from submission.
- the second call provides notifications received from Crossref service. The timespan for notifications on deposits or queries in Crossref depends on the queue on Crossref system, usually 3 minutes, in some cases hours.

4. HTTP-Callback service requirements

The service exposed by the user for the HTTP-Callback must have the following characteristics:

- be able to receive an HTTP request, sent in POST mode, with *xml* parameter valued with the submission report, in XML format, as described in paragraph 2;
- must validate the report received according to the schema:

https://www.medra.org/schema/callback/doiWSResponse_2.0.xsd

- must send an XML document in the HTTP response (HTTP Response with Content-type: text / xml and charset = UTF-8) with the result of receiving the report, conforming to the schema:

<https://www.medra.org/schema/callback/doiHttpCallbackResponse.xsd>

For example, if the report is not valid against the *doiWSResponse_2.0.xsd* schema, the service must return an XML document of the type:

```
<? xml version = "1.0" encoding = "UTF-8"?>
<HttpCallbackResponse xmlns = "http://www.medra.org/httpCallbackResponse" >
  <operation>DOIUpload</operation>
  <failureDescription>invalid record</failureDescription>
  <status>failure</status>
</HttpCallbackResponse>
```

In general, in case the report is incorrect, an XML document with `<status>` equal to 'failure' must be created. In the `<failureDescription>` element it is then possible to insert a text description of the error found.

If no errors have been found, the XML document returned by the service must be of the type:

```
<? xml version = "1.0" encoding = "UTF-8"?>
<HttpCallbackResponse xmlns = "http://www.medra.org/httpCallbackResponse" >
  <operation>DOIUpload</operation>
  <status>success</status>
</HttpCallbackResponse>
```

In the case no response is received, or the response have a negative outcome, the DOI Registration system will send the report via e-mail, as specified in the section Email notification.

To use this notification method, the user must first communicate the details of his HTTP service to the DOI Registration service support team: URL and any access credentials.

Please contact mEDRA support staff via e-mail support@medra.org.

A. Status Code List

Below are the possible values of the <status-code> element and a description of the corresponding state, which varies according to the operation indicated in the <operation> element.

Note:

- hereinafter, *processing* means the creation / updating of DOIs or the deposit / updating of citations, depending on the context;
- hereinafter *nd* means that that status code is not allowed for that operation, for example only codes 10|11|12 in DOIUpload will be received for DOI registration in OP DOI RA, while codes 0|1|2|3|10|20|21|22|23|30 (CrossrefDOIUpload) will be received when the DOIs and metadata are deposited in Crossref.

A.1. DOIUpload

CODE	STATUS
0	nd
1	nd
2	nd
3	nd
10	metadata, citations and resolution data not processed
11	processed metadata - citations and resolution data not processed
12	processed metadata and resolution data - citations not processed
20	nd
21	nd
22	nd
23	nd
24	nd
25	nd
26	nd
30	nd
31	nd

A. 2. DOICitations Upload

CODE	STATUS
0	nd
1	nd
2	nd
3	nd
10	Citations not processed
11	nd
12	nd
20	nd
21	nd
22	nd
23	nd
24	nd
25	nd
26	nd

30	nd
31	nd

A. 3. crossrefDOI Upload

CODE	STATUS
0	processing of the DOI record is pending
1	processing of DOI was successful
2	DOI record sent to Crossref
3	processing of the DOI in Crossref was successful
10	processing of the DOI record failed
11	nd
12	nd
20	user not enabled for Crossref services
21	the user has no permissions on that DOI prefix
22	error in creating the DOI record to submit to Crossref
23	error in sending the DOI record to Crossref
24	nd
25	nd
26	nd
30	processing of the DOI record in Crossref failed
31	nd

A. 4. crossrefDOICitations Upload

CODE	STATUS
0	processing of citations is pending
1	processing of citations was successful
2	citations sent to Crossref
3	processing of citations in Crossref was successful
10	processing of citations failed
11	nd
12	nd
20	user not enabled for Crossref services
21	the user has no permissions on that DOI prefix
22	error in creating the record to submit to Crossref
23	error in sending citations to Crossref
24	DOI metadata do not exist
25	the DOI metadata namespace is incorrect
26	the root element of the DOI metadata is incorrect
30	Processing of citations in Crossref failed
31	DOI metadata do not exist in Crossref