Mundi Download service

Mundi Copernicus DIAS (Data and Information Access Services)

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Identification

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Revision	Date	Description of the release	Author
1.0	14/06/2019	First release of the document	Mundi Team
1.1	19/06/2019	New Website layout for Web Token	Mundi Team

Content

1   Introduction

1.1   Scope of the document

Provide users with guidelines about product download from Mundi storage.

Target audience is registered users and 3PU users, with programming skills.

1.2   Reference Documents

Abbreviation	Document
[SOW]	**Copernicus Data and Information Access Services Operations – Statement of Work**
	Reference: ESA-EOPG-CSCOP-SOW-0015- V1.0 – 17/01/2016

1.3   Acronyms and Abbreviations

Acronym or Abbreviation	Meaning
3PU	Third-Party Users / Mundi users having a cloud infrastructure
CSW	Catalogue Service for the Web
OBS	Object Storage
OGC	Open Geospatial Consortium
XML	Extensible Markup Language

2   Mundi Download feature

Mundi offers to users the Discovery, View and Download features for earth observation data and products.

2.1   Discovery

Any user, registered or not, can discover and explore graphically the Earth Observation products available on Mundi through our Geodata Access UI. Discovery feature for each collection can be found on Mundi website dedicated page:
https://mundiwebservices.com/data
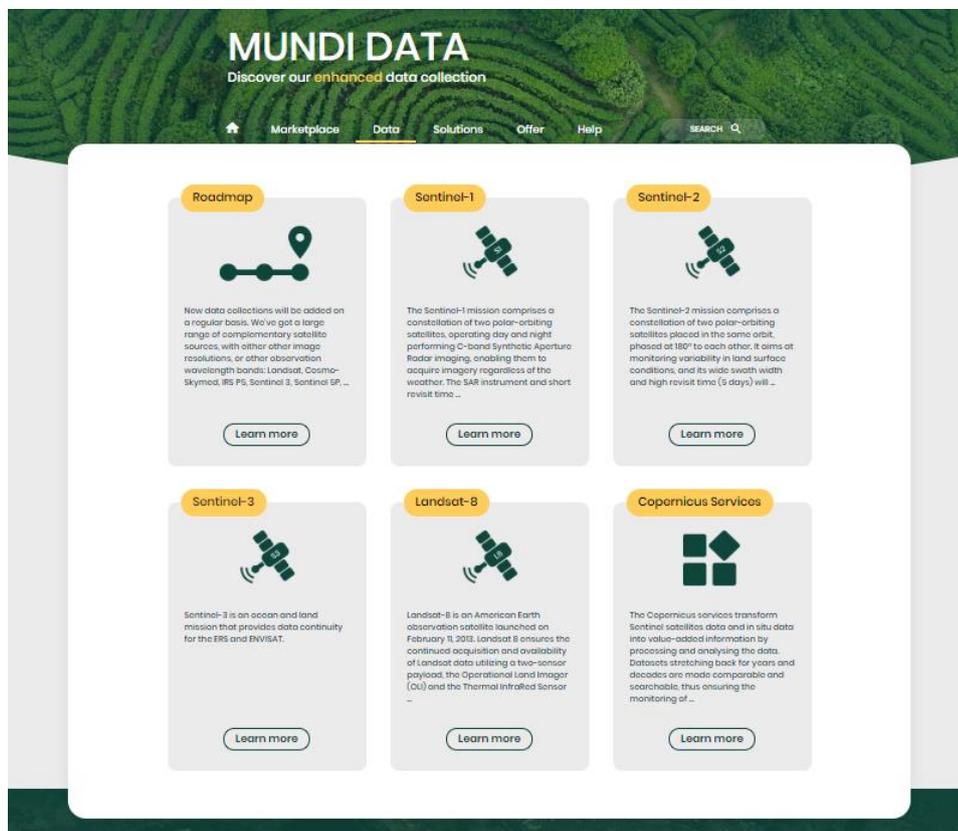
All the available products are described in Mundi catalogue. This catalogue adheres to common standards. It is a unique feature of Mundi that provides users with a standardised catalogue for products that are otherwise accessible through several heterogeneous interfaces.

Mundi catalogue can be searched using an API access that complies with both OpenSearch interface specifications, and OGC CSW standard catalogue service. The specifications of each data collection give the corresponding access point and can be found in Mundi online documentation:
https://mundiwebservices.com/help/documentation

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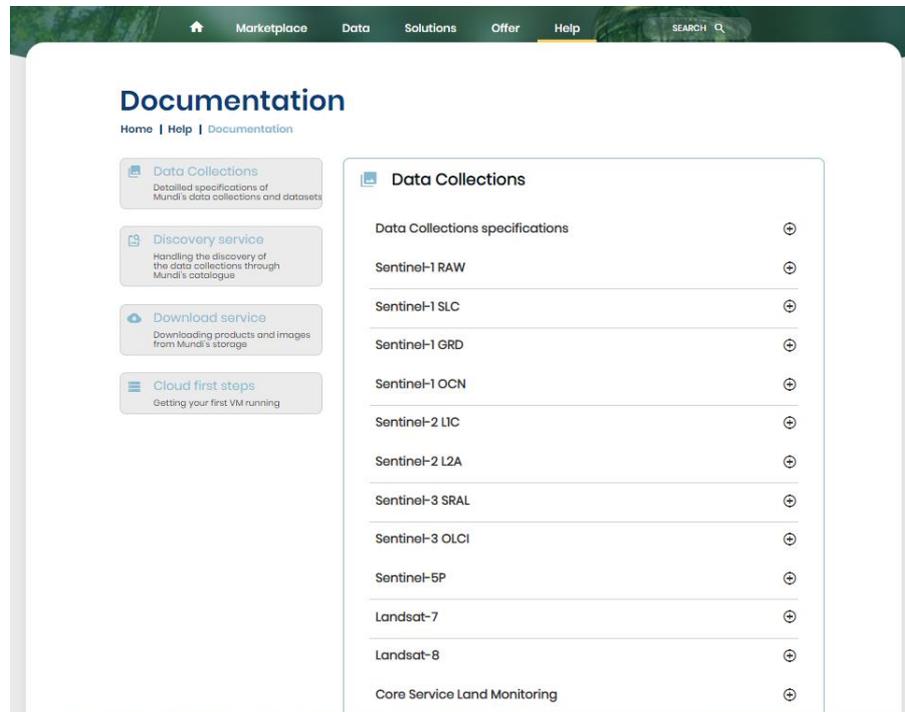
The Geodata Access UI also provides users with sample OpenSearch queries to the selected products.

2.2   Download

Once a user is registered and logged-in, Mundi website offers the download of selected products. The easiest way to download products is to use the Geodata Access UI.

Another way is to use the Mundi Catalogue API, OpenSearch or OGC CSW.

2.2.1   Products available for download

When a product is available for download in Mundi's storage, the **DIAS:onlineStatus** metadata in the catalogue has a specific value. Here below the meaning of the different values of this metadata:

- **DIAS:onlineStatus** is empty, the product is not available online. If needed, users have to ask for a reload query (if possible for the collection). The product will be set online few hours after the reload query has been accepted. The reload feature is accessible when logged-in through "My Account" > "My request Data" (https://mundiwebservices.com/account/requested .)
- **DIAS:onlineStatus=STAGING** the product is available online, but some post-processing, unziping or metadata enrichment are not finished yet. The product is usable in its current format but has not been checked by Mundi.
- **DIAS:onlineStatus=ONLINE** the product is available online, and all checks and post-processing are finished. The product is usable in its target format.

- **DIAS:onlineStatus=FAILED** the product has been checked, and the check has shown a problem. The product is not usable and should not be downloaded. Mundi's Data Management System will automatically reload it from its source within a few hours.
- **DIAS:onlineStatus=OFFLINE** the product was available online on Mundi, but has been evicted by the retention policy. If needed, users have to ask for a reload query (if possible for the collection). The product will be set online few hours after the reload query has been accepted.

When a product is provided as one file of archive (zip file for example), the product URL gives the direct access to the file. The **DIAS:productDeliveryFormat** gives the archive format, **zip** for zipped files or **netcdf** for netcdf files..

When the product is provided unzipped as a full directory structure, the URL gives the root folder of the structure, without trailing "/". The **DIAS:productDeliveryFormat** is in this case set to **folder**.

2.2.2   Products download URL with OpenSearch

Search result for OpenSearch is embedded in a **feed** XML element.

Each individual result is returned in an **entry** XML element.

Beyond obvious and standardized metadata, a few of them gives relevant information for the View and Download services:

- The URL of the product's quick-look image can be found in the **media:group/media:content[media:category=QUICKLOOK]@url** XML element.
- The URL to the product's thumbnail image can be found in the **media:group/media:content[media:category=THUMBNAIL]@url** XML element.
- The URL to the product itself (if available) is given by the **link[@rel='enclosure']@href** XML element.

2.2.3   Products download url with OGC CSW

The following explanations about results consider that the results are provided with the default **outputSchema** schema in an XML presentation.

Search result for CSW is embedded in a **csw:GetRecordsResponse** XML element.

Each individual result is returned in a **‹csw:Record›** XML element.

Beyond obvious and standardized metadata, a few of them gives relevant information for the View and Download services:

- The URL of the product's quick-look image can be found in the **DIAS:quicklookURI** XML element.
- The URL to the product's thumbnail image can be found in the **DIAS:thumbnailURI** XML element.

- The URL to the product itself (if available) is given by the **DIAS:archiveProductURI** XML element.

2.3   Downloading products through the Geodata GUI

This chapter details the way products can be downloaded through the Geodata GUI.

2.3.1.1   Search results

Once the Geodata page dedicated to a collection has been reached, the GUI shows a few results corresponding to a recent period for time filter, and the geographic area displayed for spatial filter.

The time filter can be changed with help of the slider at the bottom of the screen, or with the Time Filter area in the Filters tab of the left panel.

The spatial filter can be changed with help of the zoom-in / zoom-out of the displayed map, or with the Spatial Filter tools in the Filters tab.
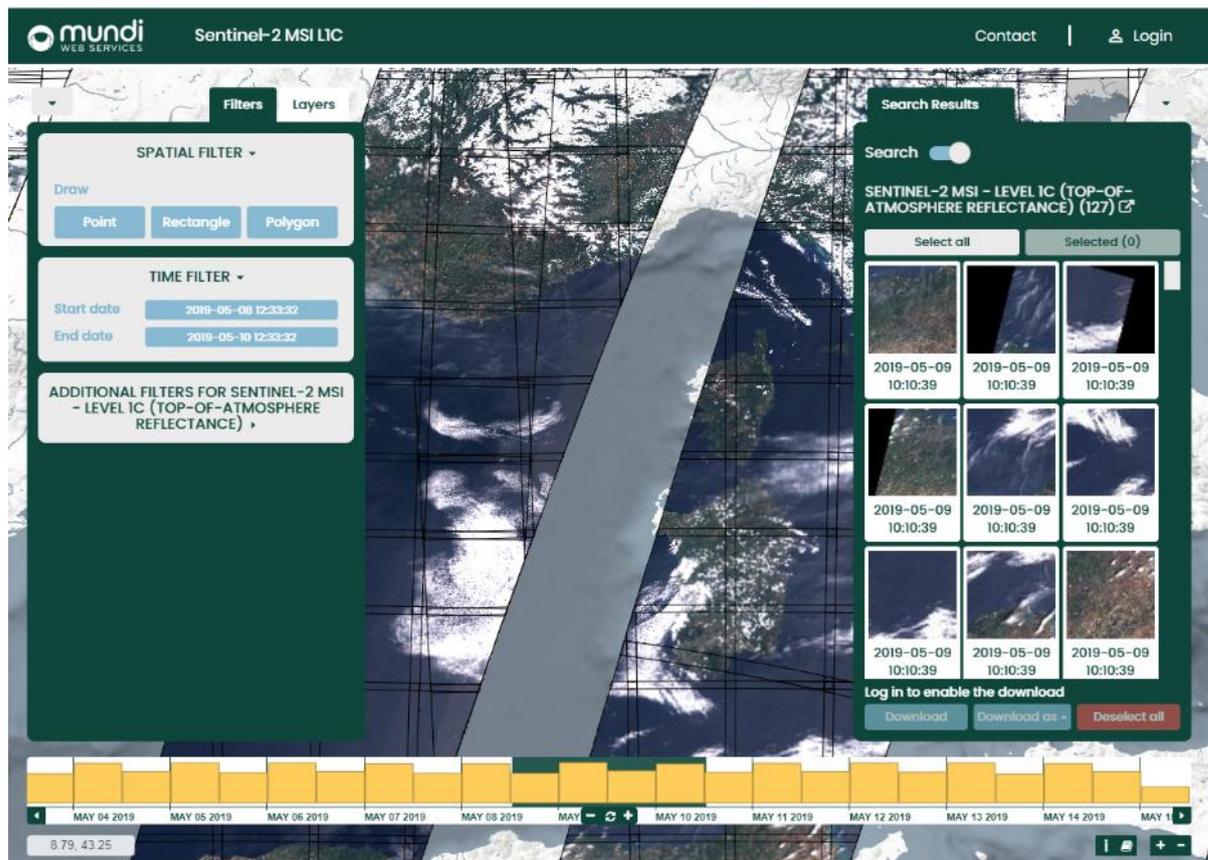
The "Search results" thumbnail are displayed in the right panel. Relevant products can be selected by clicking on them. The selected products are displayed by clicking the "Selected" button of the right panel.

Mundi Download service
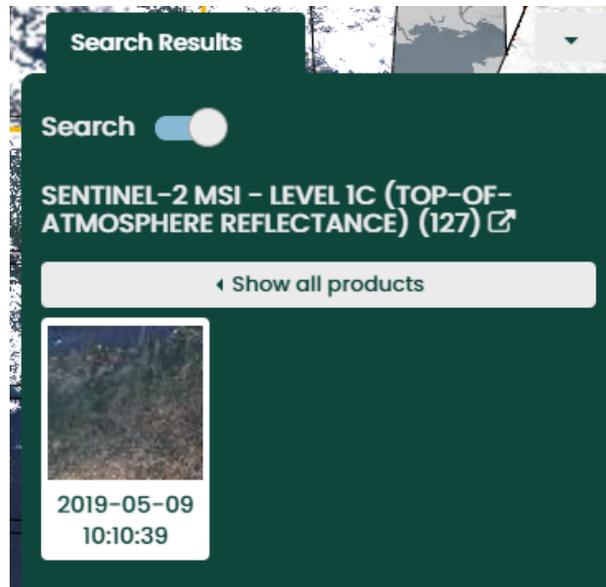
At this stage, not registered / not logged-in users are not allowed to download the products.

If the selected products are provided as zipped archive, both the "Download" button is active and "Download as" is active.

The "Download" button launches directly the download of all selected products.
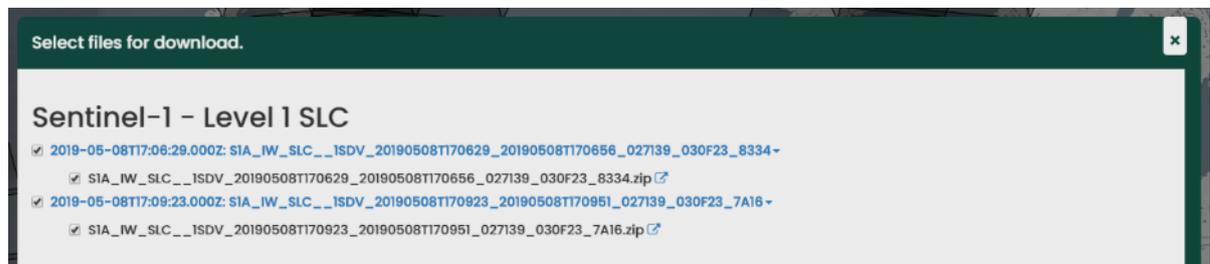
If the selected products are provided as folder structures, only the "Download as" button is active.

19/06/2019
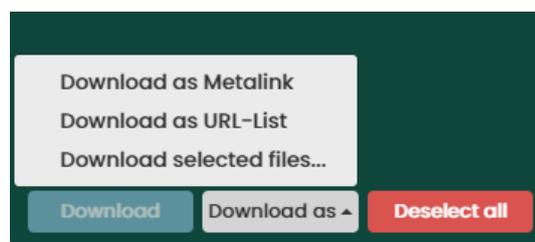
2.3.1.2   Download as Metalink

Download as Metalink downloads an XML encoded file containing a description of all the products and files selected with their name and URL.

2.3.1.3   Download as URL-list

Download as URL-list downloads a TXT file containing the list of the URL to the products and files selected to download.

2.3.1.4   Download selected files…

Download selected files displays the details of sub-files in the folder structure. Each file can be downloaded as a single file with the ⬀ button or provide the Metalink or URL-list of the selected files.
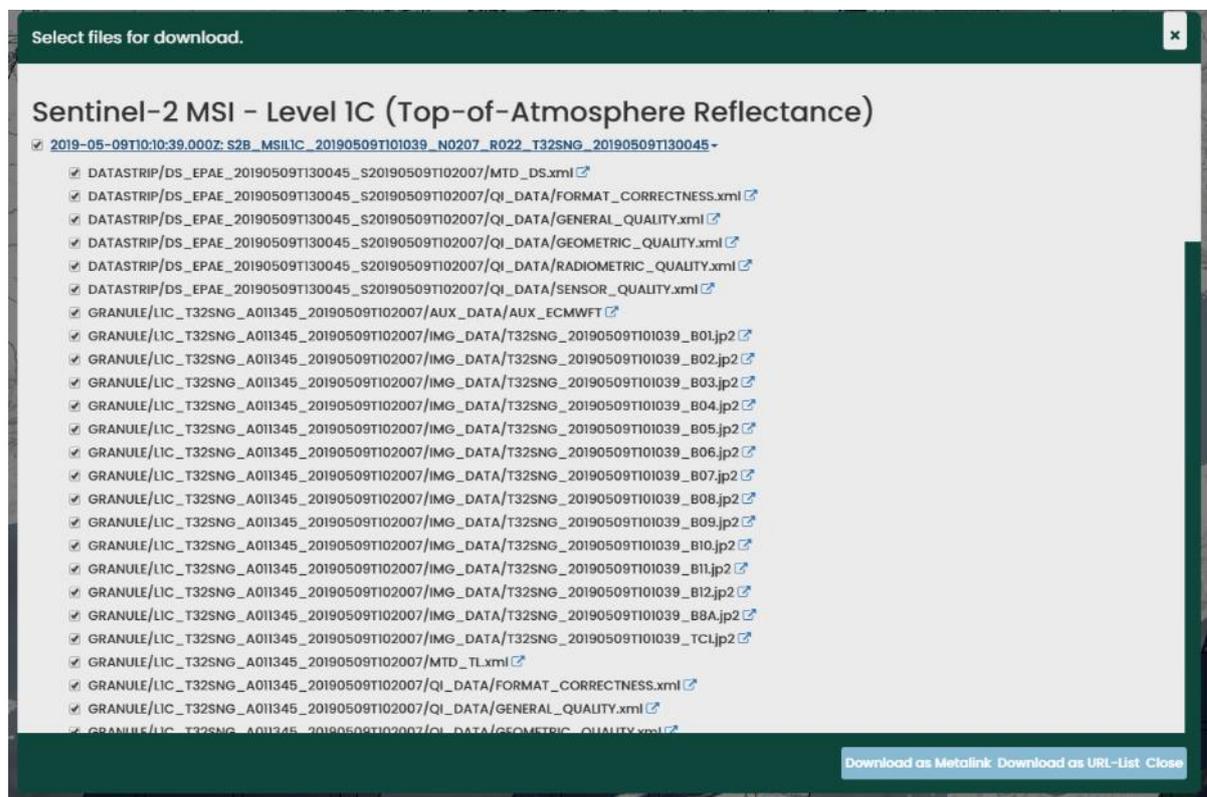
This feature provides an easy way to download sub-files of products: for example, the manifest file, or just one specific band of a product containing many of them.

2.4   Downloading products through API

The URL of products provided by Mundi Catalogue can be used for downloading either through a simple HTTP/REST API or through an Amazon S3 compatible API.
The Amazon S3 API is dedicated to Object Storage (OBS) and usage is described in chapter §4.

2.4.1   Amazon S3 API

The Amazon S3 compatible API is reserved to users having a cloud infrastructure on Mundi. It provides a dedicated download bandwidth, all the S3 features and a direct use of url provided by Mundi catalogue without any change.
The corresponding download endpoint is called the "Private" endpoint, or the OBS direct access.

Regarding Amazon S3 specific features, URL are provided by Mundi Catalogue in a "path" format:

https://obs.eu-de.otc.t-systems.com/<bucket>/<path>

Those URL can also be used directly, or used with S3 compatible library and tools, in a "virtual host" format:

https://<bucket>.obs.eu-de.otc.t-systems.com/<path>

The identification of the so called "bucket" name (the S3 object where the products are stored) is important for some S3 compatible tools. Please see OTC documentation for further details:
https://docs.otc.t-systems.com/en-us/api_obs/obs/en-us_topic_0031665955.html

Amazon S3 API always require authentication, with a couple of Access Key and Secret Key (AK/SK). Please see OTC documentation for further details:
https://docs.otc.t-systems.com/en-us/ugs3cmd/obs/en-us_topic_0076545672.html

2.4.2   HTTP/REST API

The HTTP/REST API can be used by any user, either for free download or for users having a cloud infrastructure on Mundi. It provides a free download feature, with a download bandwidth shared among users, and the URL provided by Mundi catalogue has to be changed for authentication through Mundi Download Proxy.
The corresponding download endpoint is called the "Public" endpoint, or the Download Proxy.
The <host> part of the URL provided by Mundi catalogue has to be altered in the following way:

https://obs.eu-de.otc.t-systems.com/<bucket>/<path>

replaced by

https://mundiwebservices.com/dp/<bucket>/<path>

The HTTP/REST queries have to be authenticated using the same JWT Token as Mundi website (see chapter §3) for free users, or by signing the URL through the S3 mechanisms (see chapter §4) for users having a cloud infrastructure.

Object Storage paths can also be listed through REST API through a specific change in the URL:

https://obs.eu-de.otc.t-systems.com/<bucket>/<path>

can be listed with the private endpoint:

https://obs.eu-de.otc.t-systems.com/<bucket>?prefix=<path>

or with the public endpoint:

https://mundiwebservices.com/dp/<bucket>?prefix=<path>

3   Authentication through REST API

3.1   Authentication scheme with JWT Token

The authentication of download through the public endpoint is made with a JWT Token called "seeedtoken", which is the same used for Mundi website authentication. Downloads are automatically authenticated as soon as a logged-in session is active in the same browser.

3.2   Retrieving the Token in the browser

The JWT token is a cookie that authenticated the website user session.
Each time a user logs in the website, the JWT token is generated and is valid within the next few days or until the user logs out.

Google Chrome is the browser preferred by Mundi Website.
The token can be retrieved in the cookie named "seeedtoken" in the "storage" section of the navigator DevTools (F12 or right click > inspect) after logging in.

Below the steps to retrieve the token:

- **Step 1:** Ensure that you are logged in on Mundi's website https://mundiwebservices.com.
- **Step 2:** On Mundi Website, Right click + inspect anywhere on the page (or press F12) to display the DevTools of the navigator.
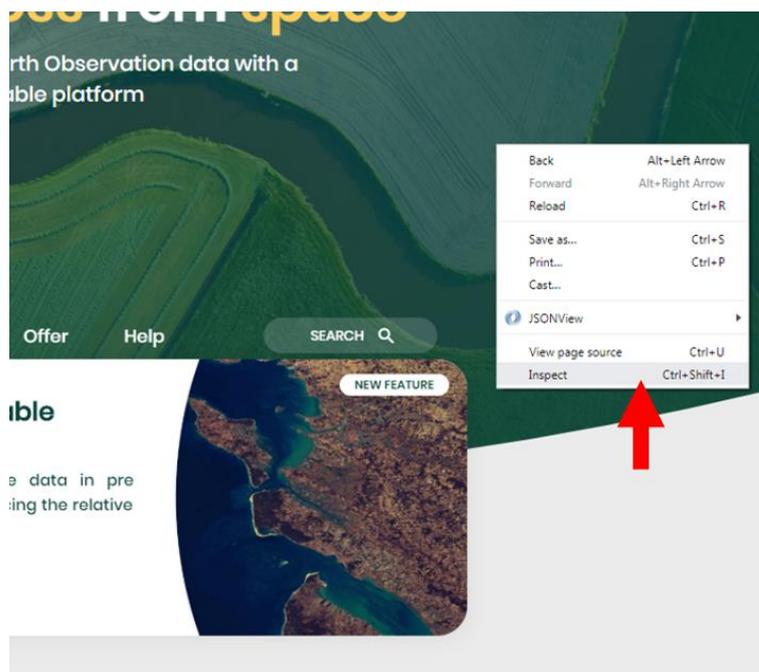
- **Step 3:** Find the Storage section in the DevTool (in Google Chrome: Application tab › expand "Cookies" and click on https://mundiwebservices.com). From here find a cookie named "seeedtoken", the value of this cookie is actually the token. You can copy this token from here.
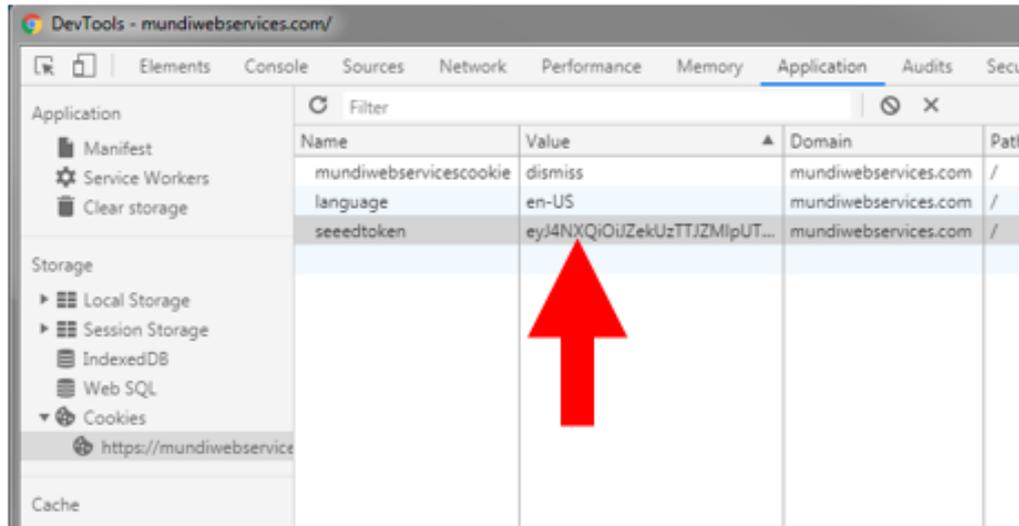
3.3   Retrieving the Token in the profile

The token can be easily retrieved in Mundi website user profile.
Below the steps to retrieve the token:

- **Step 1:** Ensure that you are logged in on Mundi's website https://mundiwebservices.com.
- **Step 2:** Click on your name on the top right corner of the screen and select "My Account"
- **Step 3:** On the My Account page, select "My Profile" section, or reach it directly with the link https://mundiwebservices.com/account/profile
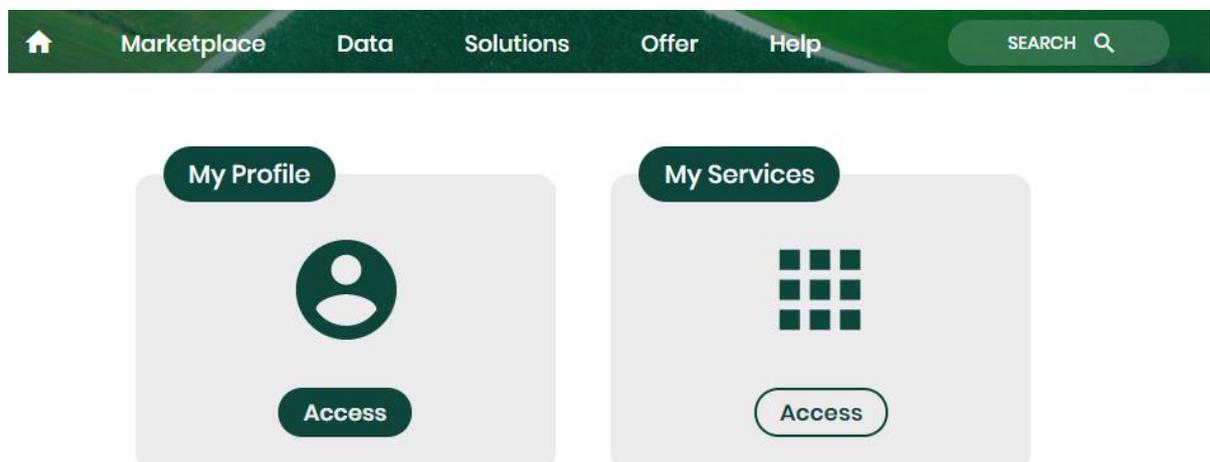
- **Step 4:** At the bottom of the page, in the "API and Token" section, you can copy the Web Token with the dedicated "COPY" button. The expiration date of the token is also displayed.

API and Token

Web token: eyJ4NXQiOiJZekUzTTJZMlpUmhNbVV6TVRObVltTXhNV...   COPY

Expiration date: 29/06/2019 at 4:02PM

3.4   Usage

Users can download products using the public endpoint being authenticated with Mundi website.

First, generate the token as explained above. Add your token in the value of a HTTP header named "seedtoken" to the requests to authenticate them.

If the authentication information is correct the Download Proxy redirects the URL to the Private endpoint with a signed URL granting access to the requested file.

Here below some examples using well-known tools or languages.

3.4.1   POSTMAN

Sample way of requesting a download with token with POSTMAN.

Import the text below in a JSON for POSTMAN:

```
{
    "info": {
        "_postman_id": "53505bfb-9bea-489e-8e4e-ae0f48b16eba",
        "name": "Postman example",
        "schema": "https://schema.getpostman.com/json/collection/v2.1.0/collection.json"
    },
    "item": [
        {
            "name": "Download MTD_DS.xml",
            "request": {
                "method": "GET",
                "header": [
                    {
                        "key": "Cache-Control",
                        "type": "text",
                        "value": "no-cache"
                    },
                    {
```

```
                    "key": "Cookie",
                    "type": "text",
                    "value": "seeedtoken={insert Token here}"
                }
            ],
            "url": {
                "raw": "https://mundiwebservices.com/dp/s2-l1c-2019-
q2/31/U/DU/2019/04/19/S2A_MSIL1C_20190419T105621_N0207_R094_T31UDU_20190419T130656/DATASTR
IP/DS_SGS__20190419T130656_S20190419T110407/MTD_DS.xml",
                "protocol": "https",
                "host": [
                    "mundiwebservices",
                    "com"
                ],
                "path": [
                    "dp",
                    "s2-l1c-2019-q2",
                    "31",
                    "U",
                    "DU",
                    "2019",
                    "04",
                    "19",
                    "S2A_MSIL1C_20190419T105621_N0207_R094_T31UDU_20190419T130656",
                    "DATASTRIP",
                    "DS_SGS__20190419T130656_S20190419T110407",
                    "MTD_DS.xml"
                ]
            }
        },
        "response": []
    }
  ]
}
```

3.4.2   cURL

Sample way of a building a cURL with token:

```
curl -L GET \
  https://mundiwebservices.com/dp/s2-l1c-2019-
q2/31/U/DU/2019/04/19/S2A_MSIL1C_20190419T105621_N0207_R094_T31UDU_20190419T130656/DATASTR
IP/DS_SGS__20190419T130656_S20190419T110407/MTD_DS.xml \
  -H 'cache-control: no-cache' \
  -H 'Cookie: seeedtoken={insert Token here}' \
```

3.4.3   wget

Sample way of a building a wget with token:

```
wget --quiet \
  --header 'Cache-Control: no-cache' \
  --header 'Cookie: seeedtoken={insert Token here}' \
  - https://mundiwebservices.com/dp/s2-l1c-2019-
q2/31/U/DU/2019/04/19/S2A_MSIL1C_20190419T105621_N0207_R094_T31UDU_20190419T130656/DATASTR
IP/DS_SGS__20190419T130656_S20190419T110407/MTD_DS.xml
```

3.4.4   Python Requests

Sample way of a building a Python Requests with token:

```python
import requests

url = "https://mundiwebservices.com/dp/s2-l1c-2019-
q2/31/U/DU/2019/04/19/S2A_MSIL1C_20190419T105621_N0207_R094_T31UDU_20190419T130656/DATASTR
IP/DS_SGS__20190419T130656_S20190419T110407/MTD_DS.xml"

headers = {
    'Cache-Control': "no-cache",
    'Cookie': "seeedtoken={insert Token here}}",
    }

response = requests.request("GET", url, headers=headers)

print(response.text)
```

4 Authentication through Amazon S3 API

For users who have an OTC tenant, they can generate their own AK/SK keys on OTC and then access the Mundi storage using S3 libraries or REST API. All this process is described below.

4.1 Authentication scheme AK/SK

When accessing your tenant through the multitenant login page (https://console.otc.t-systems.com), you will be able to generate your AK/SK keys with the steps described in the following link:

https://docs.otc.t-systems.com/en-us/api_obs/obs/en-us_topic_0102082279.html

4.2 Usage with s3 cmd

With the AK/SK keys, you can now access the Mundi buckets. Different tools exist in order to do so.

We advise the usage of s3cmd to manage your access and manipulate items in object storage. Information can be found at https://docs.otc.t-systems.com/en-us/ugs3cmd/obs/en-us_topic_0076546563.html and https://s3tools.org/s3cmd.

4.3 Usage with OBS REST API

REST API are also available in order to access the Mundi buckets. The different kind of request are described on the link presented below.

4.3.1 V2 Temporarily Authorized Request

https://docs.otc.t-systems.com/en-us/api_obs/obs/en-us_topic_0031666016.html

4.3.2 V4 Temporarily Authorized Request

https://docs.otc.t-systems.com/en-us/api_obs/obs/en-us_topic_0031666105.html

4.3.3 V4 Browser-based Authorized POST Request

https://docs.otc.t-systems.com/en-us/api_obs/obs/en-us_topic_0031665935.html