



Outbound Automated Document

Application Programming Interface

Issue 8.0

This document presents and describes the application programming interface (API) for automating retrieval of XML reports published by the IESO

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3.0	Revised to reflect new URL	September 14, 2005
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Related Documents

Document ID	Document Title

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Reference (Section and Paragraph)	Description of Change

1. Introduction

1.1 Purpose

- 1 This document presents and describes the application programming interface (API) for automating retrieval of automated documents, mostly XML reports, published by the IESO to the IESO Reports web site.

1.2 Scope

- 2 The document provides a secure download mechanism for outbound automated documents located on the IESO Report Site. It provides guidelines on when and how frequently to download these documents with consideration to minimize the load on IESO servers and to make reports available in timely manner to *market participants*. In addition it describes an algorithm for automated download mechanism by *market participants*. It is highly recommended that the *market participants* use and adhere to the guidelines specified in this document.
- 3 The automated retrieval of reports not yet migrated to the IESO Report Site is described in the "IESO Developers Kit (IDK) Implementation Manual" (IMO_MAN_0023) for the Market Information Management Application Programmatic Interface (MIM API) and "Public Report Retrieval, Anonymous FTP Site" (IESO_SPEC_0110).

1.3 Who Should Use This Document

- 4 This document is for the use of *market participants* in designing programmatic access mechanism to the outbound automated documents.

1.4 Conventions

- 5 The standard conventions followed for this document are as follows:
 - The word 'shall' denotes a mandatory requirement;
 - Terms and acronyms used in this document that are *italicized* have the meanings ascribed thereto in Chapter 11 of the "Market Rules";
 - Double quotation marks are used to indicate titles of legislation, publications, forms and other documents.

- The terms document, report, and XML report are used interchangeably and mean the same thing as "automated document", as defined in "[Automated Documents - Information Technology Standard](#)".

– End of Section –

2. Definitions

2.1 Automated Document

6 The definition of and standards applicable to IESO automated documents are defined in the "[Automated Documents - Information Technology Standard](#)" document.

7 Automated documents comply with the external file naming convention defined in the "[External Document Naming Convention – Information Technology Standard](#)" document.

8 Each automated document name consists of 5 mandatory elements separated with an underscore (_). The 5 elements are:

<Document Security>

<Document Identifier>

<Document Date/Time>

<Document Version>

<File Type>

9 All future automated documents published by *IESO* will be based on XML technology. Each automated document will be comprised of 3 or more files:

- a. XML file – contains the document data. This file can either be of security class public or confidential; and it is required.
- b. XSD file – describes the document schema definition. This file is public and required.
- c. PDF file – provides the document help file. This file is public and required.

XSL file – provides the document style sheet. This file is public and optional. The business use of the document determines if this file is required. An automated document may contain 0, 1, or many XSL files for rendering the document in 0, 1, or many output formats (e.g. HTML, CSV, PDF, XLS, etc.).

2.2 Global Link

10 The term “Global Link” is used to denote a symbolic link to the latest version of a document issued for the most recent reporting period (i.e. last occurrence of the document). The name of the global link shall be the name of the original document with the date/time and version components removed.

11 Hence the name of global link is comprised of:

<Document Security>

<Document Identifier>

<File Type>

2.3 Local Link

12 The term “Local Link” is used to denote a symbolic link to the latest version of a document within the same reporting period, and it exists for every unique reporting period of the document. The name of the local link shall be the name of the original document (including the data/time component) but with the version component removed.

13 Hence the name of local link is comprised of:

<Document Security>

<Document Identifier>

<Document Date/Time>

<File Type>

2.4 Report Purging

14 Report Purging is the process of removing reports from the IESO Report Site when the Report Retention Period has been exceeded. The version of the report is ignored in the Report Purging process.

15 Report Retention Period is set per report. Once the retention period is reached (based on the document date and the current date) the report is removed.

16 If there is a Local and/or Global Links associated with the report being purged, the links are removed.

– End of Section –

3. Public Report Repository

- 17 The production URL for the public report repository HTTP site is:
<http://reports.ieso.ca/public/>
- 18 Second production URL for the public report repository HTTPS site is:
<https://reports.ieso.ca/public/>
- 19 The sandbox URL for the public report repository HTTP site is: <http://reports-sandbox.ieso.ca/public/>
- 20 Second sandbox URL for the public report repository HTTPS site is: <https://reports-sandbox.ieso.ca/public/>
- 21 The report specific URL for the public reports HTTP site is:
<http://reports.ieso.ca/public/<Document Identifier>> where the document identifier is the same as the document identifier specified in the report file name.
- 22 The report specific URL for the public reports HTTPS site is:
<https://reports.ieso.ca/public/<Document Identifier>> where the document identifier is the same as the document identifier specified in the report file name.
- 23 All *market participants*, and in general, the public have access to public report repository. All public reports are located under the root directory indicated in the public report repository specific URL above. Each report has its own file directory, named identically to the document identifier of the report. The report files reside within the subdirectories.

– End of Section –

4. Confidential Report Repository

- 24 The production URL for the confidential report repository HTTPS site is:
<https://reports.ieso.ca/private/>
- 25 The sandbox URL for the confidential report repository HTTPS site is: <https://reports-sandbox.ieso.ca/private/>
- 26 The URL for the confidential report repository is a password-protected URL. The *market participant* must provide valid user name and password in order to access the confidential report repository. Upon successful authentication, the *market participant* shall have access to its confidential report repository.
- 27 The *market participant* specific URL for the confidential reports HTTPS site is:
<https://reports.ieso.ca/private/<MP Short Name>/>.
- 28 All *market participant* reports are located under the root directory indicated in the *market participant* specific URL above. Each report has its own file directory, named identically to the document identifier of the report. The report files reside within the subdirectories.
- 29 The confidential reports secure server uses the Thawte Server CA certificate to assure users that the server is run by the *IESO* it claims to be affiliated with and that the content provided is legitimate. This certificate is pre-installed on most browsers (Internet Explorer) and likely needs to be installed or configured on *market participant* API clients.

– End of Section –

5. Automated Documents

5.1 Attributes

30 Each outbound automated document has its own attributes such as:

- Title
- Confidentiality
- Purpose
- Publishing Frequency
- Reporting Granularity
- Global Link
- Local Link
- Report Purging Retention Period

31 Where applicable, these attributes are included in the help file that accompanies each of these documents.

5.2 Report Types

32 For the purposes of determining default settings for purging, reports can be categorized into Report Types.

33 Report Types are based on the type of data contained within the report, the publishing frequency, and the document frequency.

34 Each Report Type could be created automatically or manually.

5.2.1 Appending Multi-Version Reports

35 The characteristics of these reports are as follows:

- a. They have multiple versions for each reporting period, each version containing additional interval data only. That is, all information from the previous report is also included in the current report.
- b. The publishing frequency will be greater than the report granularity thereby creating multiple versions for each report period (e.g. a report that is generated every 5 minutes with the document date/time of YYYYMMDDHH).

5.2.2 Non-Appending Multi-Version Reports

36 The characteristics of these reports are as follows:

- a. They have multiple versions for each reporting period, each version could have unique data that is not included in subsequent reports.
- b. The publishing frequency will be greater than the report granularity thereby creating multiple versions for each report period (e.g. a report that is generated every hour with the document date/time of YYYYMMDD).

5.2.3 Single Version Reports

37 The characteristics of these reports are as follows:

- a. They usually have 1 version for each reporting period. Subsequent versions are required only if data within the report needs to be corrected and the report republished.
- b. The publishing frequency will be less than or equal to the report granularity thereby creating only 1 version for each report period (e.g. a report that is generated every month with the document date/time of YYYYMMDD).

5.2.4 Report of Record Reports

38 The characteristics of these reports are as follows:

- a. They have multiple versions for each reporting period with one version being the report of record. That is, there is one version that contains the data that is considered the final official version.
- b. The publishing frequency will be greater than the report granularity thereby creating multiple versions for each report period.

Table 5-1: Local Link and Global Link for each Report Type

Report Type	Local Link Enabled	Global Link Enabled
Appending Multi-Version	Yes	Yes
Non-Appending Multi-Version	Yes	Yes
Single Version	Yes	Yes
Report of Record	Yes (The Local Link will not point to the Report of Record if this report is not the last version)	Yes (The Global Link will not point to the Report of Record if this report is not the last version)

Local and Global Links for Concurrent Reports

39 If there is more than one report produced at the same time, the link will point to the report with the latest Document Date/Time. For example, if the report PUB_Adequacy_20081107_v28.xml is created at the same time as PUB_Adequacy_20081108_v4.xml, then the Global Link will point to PUB_Adequacy_20081108_v4.xml. Two Local Links, PUB_Adequacy_20081107.xml and PUB_Adequacy_20081108.xml will also be created.

5.3 Recommended Polling Frequency

40 The recommended polling frequency is based upon the reporting period for the specific document as stated below.

Table 5-2: Recommended Polling Frequency

Reporting Period	Recommended Polling Frequency
5 minutes	15 to 30 seconds
Hourly	4 to 10 minutes
Daily	30 to 60 minutes

41 It is strongly recommended that heavy users of the IESO Report Site provide their IP addresses to customer.relations@ieso.ca. The IP addresses will aid the IESO technical staff in troubleshooting any problems.

5.4 Programmatic Access

42 To build a programmatic access, the basic concepts of the HTTP/HTTPS/SFTP access protocol will need to be understood by the programmer.

43 The section below specifies the algorithm to retrieve confidential reports. The recommended programmatic access applies to confidential reports.

44 Version numbers must not be relied upon as representing anything other than the next version for a specific report (e.g. v23 for a report produced each hour would normally represent hour 23 but because of a problem with issuing a previous report (i.e. a report is missed), v23 is for hour 24).

45 It is possible for API programs to take advantage of the last modified date/time on report parent Folders. The parent folders of all reports are listed together. The API program could scan the last modified date in the list of parent folders to determine if there is a need to further traverse the contents of each folder.

46 Market participants should be aware that the last modified date/time will change for parent folders, not only if a report within the folder is added but also when a report is moved or removed. Reports will be removed during the Report and Version Purging processes which normally run once per day for applicable reports.

5.5 Access Interface – Representational State Transfer (REST) API

- 47 The IESO Reports Site application programming interface (API) is based on RESTful API queries to support automated retrieval of public and private reports.
- 48 The REST API for the IESO Reports Site takes both JSON and XML as input, and can output either JSON or XML.
- 49 The production API URL for the confidential report repository HTTPS site is: <https://reports.ieso.ca/api/v1.1/files>
- 50 The sandbox API URL for the confidential report repository HTTPS site is: <https://reports-sandbox.ieso.ca/api/v1.1/files>

5.5.1 Examples

- 51 The examples outlined will be executed using cURL. You can use any HTTP(s) client - .NET HTTP, Perl's HTTP::Tiny or LWP::Simple, cURL, or Java HttpClient. A valid user name and password is required for each request to the API resource.
- 52 The examples below will assume the machine account executing the API requests has the username of "username" and password of "password". These examples also assume the account is programmatically obtaining reports through the sandbox confidential report repository (<https://reports-sandbox.ieso.ca/api/v1.1/files>).

List all directories and files in user's home folder

The HTTPS request below will provide a listing of all files and folders in the account's root folder.

Command:

curl -k -u username:password <https://reports-sandbox.ieso.ca/api/v1.1/files>

Output:

The root folder has two sub folders: “subfolder1” and “subfolder2”, both having the “isDirectory” attribute set to “true”, which our single file “sample_file.xml” has it set to false.

Timestamps are stored as “epoch-time-milliseconds”.

```
{
  "files": [ {
    "fileName": "sample_file.xml",
    "lastModifiedTime": 1428677940000,
    "size": 5,
    "isDirectory": false,
    "isRegularFile": true,
    "isSymbolicLink": false,
    "isOther": false,
    "group": "root",
    "owner": "root",
    "permissions": "644"
  }, {
    "fileName": "subfolder1",
    "lastModifiedTime": 1428678000000,
    "isDirectory": true,
    "isRegularFile": false,
    "isSymbolicLink": false,
    "isOther": false,
    "group": "root",
    "owner": "root",
    "permissions": "755"
  }, {
    "fileName": "subfolder2",
    "lastModifiedTime": 1428678000000,
    "isDirectory": true,
    "isRegularFile": false,
    "isSymbolicLink": false,
    "isOther": false,
    "group": "root",
    "owner": "root",
    "permissions": "755"
  } ]
}
```

List all directories and files in user`s subfolder with sort, limit and order

Appending the subfolder name to URL after the “files” resource will provide a listing of all files and folders in the specified subfolder.

Adding the ‘limit’ parameter allows you to limit the number of results returned.

Adding the ‘sortBy’ and ‘order’ parameter allows you to specify which column to order and the type of order.

Command:

```
curl -k -u username:password "https://reports-  
sandbox.ieso.ca/api/v1.1/files/subfolder1/?limit=3&sortBy=lastModifiedTime&order=ASC"
```

Output:

Our relative directory '/subfolder' displays 3 files and 0 subfolders. The results are also ordered based on the 'lastModified' attribute.

```
{
  "files": [ {
    "fileName": "sample_file3.xml",
    "lastModifiedTime": 1428678000005,
    "size": 17,
    "isDirectory": false,
    "isRegularFile": true,
    "isSymbolicLink": false,
    "isOther": false,
    "group": "root",
    "owner": "root",
    "permissions": "644"
  }, {
    "fileName": "sample_file2.xml",
    "lastModifiedTime": 1428678000003,
    "size": 17,
    "isDirectory": false,
    "isRegularFile": true,
    "isSymbolicLink": false,
    "isOther": false,
    "group": "root",
    "owner": "root",
    "permissions": "644"
  }, {
    "fileName": "sample_file1.xml",
    "lastModifiedTime": 1428678000001,
    "size": 17,
    "isDirectory": false,
    "isRegularFile": true,
    "isSymbolicLink": false,
    "isOther": false,
    "group": "root",
    "owner": "root",
    "permissions": "644"
  } ]
}
```

Get Properties of a file

Obtain additional properties of a file.

Command

```
curl -k -u username:password https://reports-sandbox.ieso.ca/api/v1.1/files/subfolder1/sample\_file1.xml?status
```

Output

```
{
  "lastModifiedTime": "1428678000000",
  "lastAccessTime": "1428678000000",
  "isSymbolicLink": "false",
  "size": "17",
  "fileKey": "(dev=fd01,ino=4134547)",
  "isDirectory": "false",
  "isOther": "false",
  "owner": "root",
  "fileName": "sample_file1.xml",
  "isRegularFile": "true",
  "permissions": "644",
  "creationTime": "1428678000000",
  "group": "root"
}
```

Download a file

Command

```
curl -k -u username:password -o localfile_download.xml https://reports-sandbox.ieso.ca/api/v1.1/files/subfolder1/sample\_file1.xml
```

Output

The command above downloads a file **sample_file1.xml** from the remote `"/subfolder1"` directory to the current local directory, as the filename **localfile_download.xml**.

5.5.2 Additional Resource Materials

53 For more detailed information regarding the Web API provided, please refer to the documentation linked below. This gives details of all the parameters (options) that can be configured as part of the API request when requesting folders/files. Please note that this version of the API documentation only lists functions for market participants to query and download reports.

54 Check API documentation at : http://www.ieso.ca/reports_api/api/v1.1/docs/index.html

5.6 Access Interface – SFTP

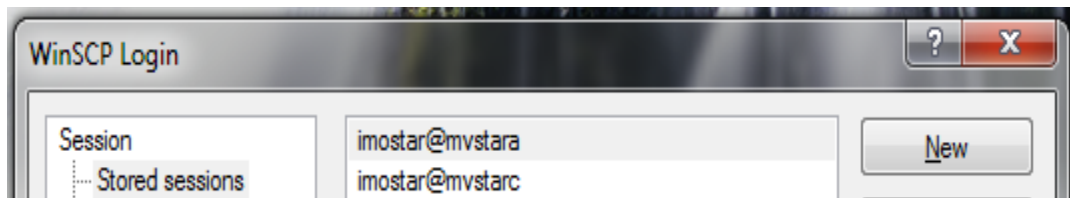
55 SFTP, which stands for SSH File Transfer Protocol, or Secure File Transfer Protocol, is a network protocol that provides file transfer functionalities over Internet. To download reports using SFTP and a machine account, a participant must satisfy the following:

- a. Have a machine account to access the IESO Report Site
- b. Supply client software which uses the SFTP protocol to transfer files securely from the IESO Report Site
- c. Configure local firewalls to enable access to the IESO Report Site
- d. Test connectivity to the IESO Reports Site

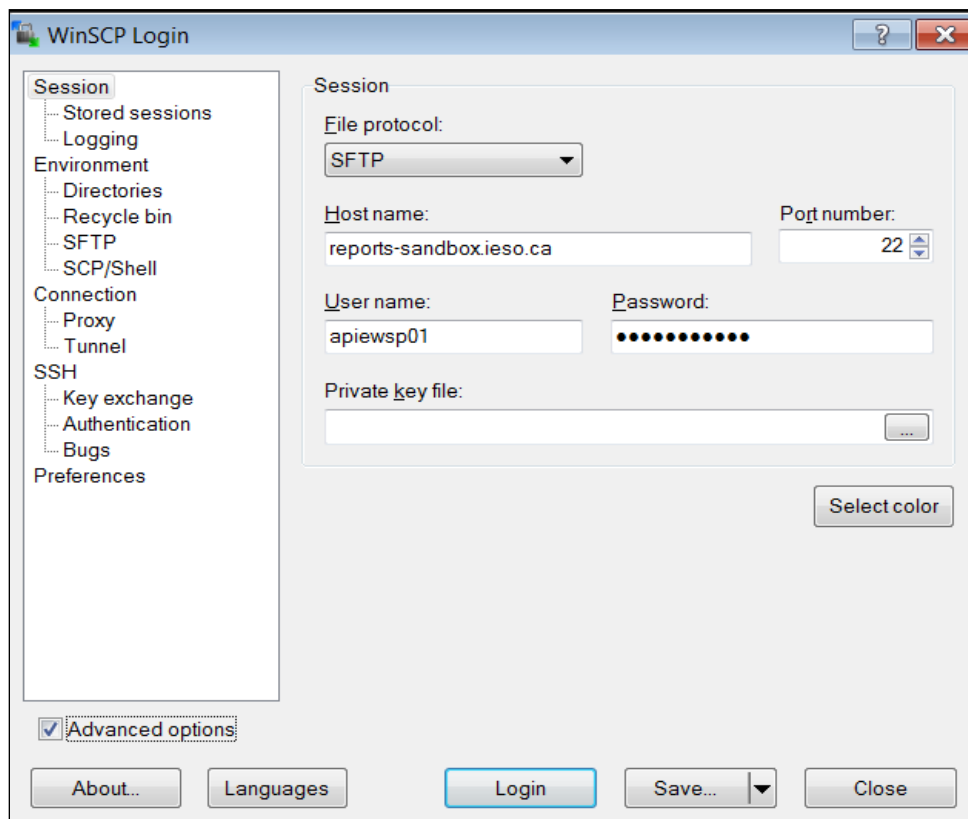
56 If required, please contact your organization`s IT support group when trying to establish the SFTP connection.

57 In the following example we configure WinSCP on Windows as the SFTP client software to access the IESO Report Site in the Sandbox environment.

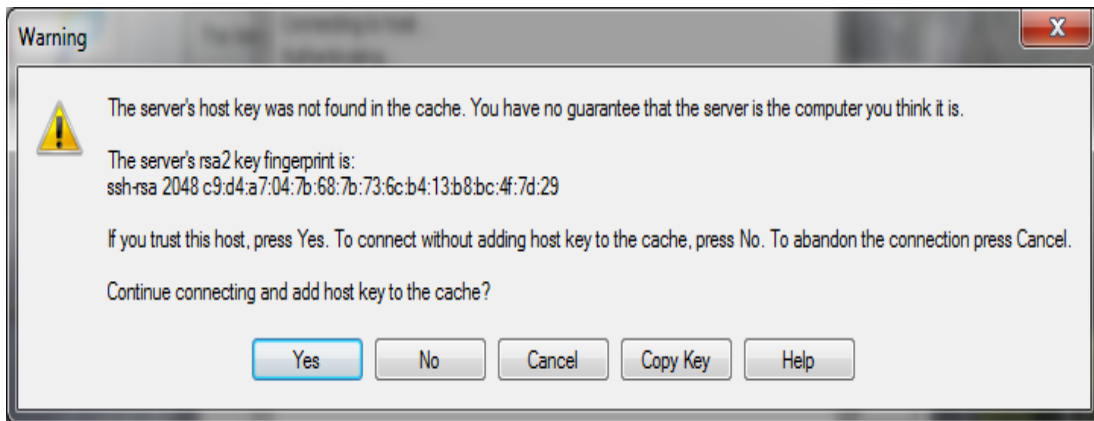
58 Start WinSCP, Login Dialog appears, click New to setup server connection



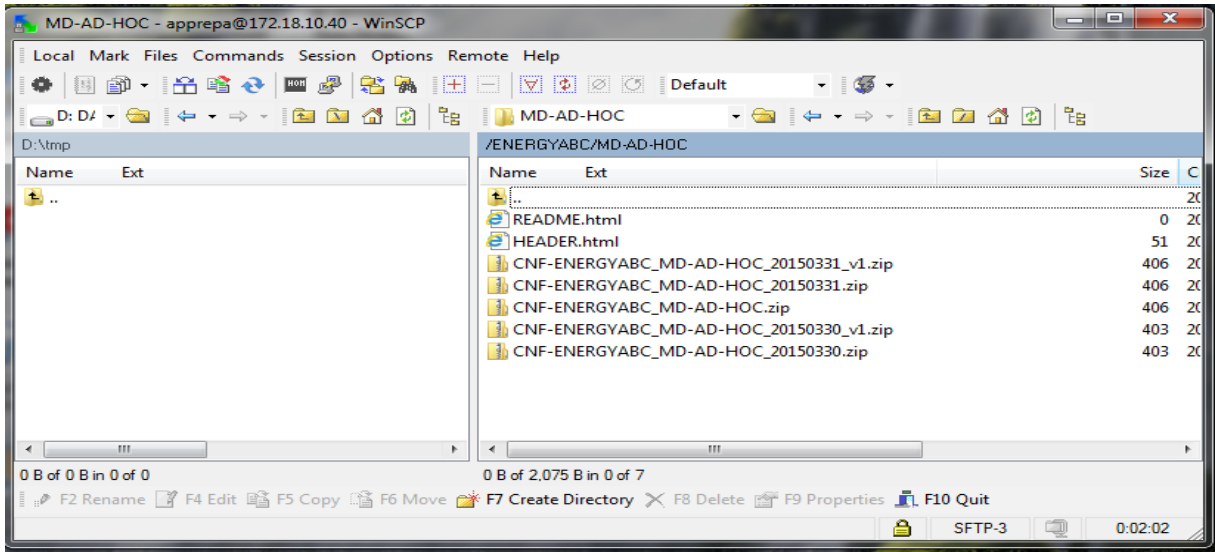
59 Enter reports-sandbox.ieso.ca as Host Name, 22 as Port Number, select SFTP as File Protocol, your machine API account as user name and password for your machine API account. Click Save to save your settings or Login to connect to SFTP sandbox server



60 A confirmation box appears, click Yes to add server's host key to your computer. The server's host key must be added to the client for a SFTP connection to be successful.



61 The list of reports available within the company and report folder appears



62 Click on the report(s) you want to download, click on F5 Copy to download the report(s) your selected local folder

References

Document Name	Document ID
External Document Naming Convention – Information Technology Standard	IESO_ISTD_0001
Automated Documents - Information Technology Standard	IESO_STD_0002

– End of Document –