European Network of
Transmission System Operators
for Electricity

entsoe

# CENTRAL INFORMATION PLATFORM - Web Service Integration Guide

## - DOCUMENT VERSION 1 / RELEASE 16

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## REVISION HISTORY

| Version | Release | Date | Paragraph | Comments |
|---|---|---|---|---|
| 0 | 1 | 2014-04-22 | | First draft |
| 15 | 1 | 2021-12-22 | | Included sections 2.1 and 2.2 steps to create self signed certificate |
| 16 | 1 | 2022-07-27 | | Updated new URL's sec 2.2 |



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## REFERENCED DOCUMENTS

1 Transparency Regulation 543/2013
2 Transparency Platform Manual of Procedures
3 ECP Integration Guide for transparency platform
4 Web Services Integration Guide for transparency platform

## DRAFTING TEAM MEMBERS

| Member | Company | Country | Working Group |
|---|---|---|---|
| Andy Spiceley | ENTSO-E | - | - |
| TP Team | ENTSO-E | | |



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# 1. Overview

Web Services are one of the integration channels, which can be used for communication with ENTSO-E Transparency Platform.
Web service design and message format is based on the REE document *Electronic data interchanges on the Internal Electricity Market*[1] [SPEC], which is based on the *Part 100 of the IEC 61968 standard* [STAND]. Knowledge of these documents is necessary for successful application of this guide.

## 1.1 USAGE OF WEB SERVICES

Data Providers may use Web Services for following purposes:

1. Sending data to ENTSO-E Transparency Platform
2. Receiving Acknowledgement Documents from ENTSO-E Transparency Platform
3. Receiving Notification of missing data in form of Problem statement document
4. Listing and requesting submitted messages
5. Retrieving data (also for Public Users)

[1] Document *Electronic data interchanges on the Internal Electricity Market* is to be superseded by the *Technical Specification for the utilization of web services for electronic data interchanges on the European Energy Market for Electricity* when published. These two documents contains the same information.



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# 2. Web Service Channel Configuration

## 2.1 STEPS TO CREATE SELF SIGNED CERTIFICATE USING KEYTOOL

**Generating self signed Certificate ( Caution: Keep note of password):**
keytool -genkeypair -alias "Your key name" -keyalg RSA -keysize 2048 -storetype PKCS12 -keystore "Your certificate name"_Certificate.p12 -validity "No of days of validity"

```
lpendyala@Laxmikanths-MacBook-Pro Downloads % keytool -genkeypair -alias Test  -keyalg RSA -keysize 2048 -storetype PKCS12 -keystore Test_Certificate.p12 -validity 3650
Enter keystore password:
Keystore password is too short - must be at least 6 characters
Enter keystore password:
Re-enter new password:
What is your first and last name?
  [Unknown]:  Laxmikanth Pendyala
What is the name of your organizational unit?
  [Unknown]:  ENTSOE
What is the name of your organization?
  [Unknown]:  ENTSOE
What is the name of your City or Locality?
  [Unknown]:  Brusseles
What is the name of your State or Province?
  [Unknown]:  Brissees
What is the two-letter country code for this unit?
  [Unknown]:  BE
Is CN=Laxmikanth Pendyala, OU=ENTSOE, O=ENTSOE, L=Brusseles, ST=Brissees, C=BE correct?
  [no]:  yes
```

```
-rw-r--r--  1 lpendyala  staff    2584 22 Dec 11:39 Test_Certificate.p12
```

**Importing to the Key store (Caution: Keep note of password:**
keytool -importkeystore -srckeystore "Your certificate name"_Certificate.p12 -srcstoretype pkcs12 -destkeystore "Your certificate name"_Certificate.jks -deststoretype JKS

```
lpendyala@Laxmikanths-MacBook-Pro Downloads % keytool -importkeystore -srckeystore Test_Certificate.p12 -srcstoretype pkcs12 -destkeystore Test_Certificate.jks -deststoretype JKS
Enter destination keystore password:
Re-enter new password:
Enter source keystore password:
Entry for alias test successfully imported.
Import command completed:  1 entries successfully imported, 0 entries failed or cancelled
lpendyala@Laxmikanths-MacBook-Pro Downloads %
```

```
-rw-r--r--  1 lpendyala  staff    2584 22 Dec 11:39 Test_Certificate.p12
-rw-r--r--  1 lpendyala  staff    2254 22 Dec 11:43 Test_Certificate.jks
```

**Listing the keying the Key store:**
keytool -list -v -keystore "Your keystore name".jks



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```
lpendyala@Laxmikanths-MacBook-Pro Downloads % keytool -list -v -keystore Test_Certificate.jks
Enter keystore password:

Keystore type: JKS
Keystore provider: SUN

Your keystore contains 1 entry

Alias name: test
Creation date: 22-Dec-2021
Entry type: PrivateKeyEntry
Certificate chain length: 1
Certificate[1]:
Owner: CN=Laxmikanth Pendyala, OU=ENTSOE, O=ENTSOE, L=Brusseles, ST=Brissees, C=BE
Issuer: CN=Laxmikanth Pendyala, OU=ENTSOE, O=ENTSOE, L=Brusseles, ST=Brissees, C=BE
Serial number: 66bc96a6
Valid from: Wed Dec 22 11:39:58 CET 2021 until: Sat Dec 20 11:39:58 CET 2031
Certificate fingerprints:
         MD5:  8E:73:2A:D8:7E:82:07:FB:87:C8:59:9C:96:68:B5:12
         SHA1: 27:48:F5:67:FF:AA:2A:BF:32:23:C2:7D:03:E3:82:65:09:CD:16:B2
         SHA256: 29:F6:81:3B:7C:20:E6:5E:E5:4E:28:E9:98:51:95:AB:58:73:23:7C:2F:19:FB:2E:0A:77:1F:3F:A2:1E:EE:A2
         Signature algorithm name: SHA256withRSA
         Version: 3

Extensions:

#1: ObjectId: 2.5.29.14 Criticality=false
SubjectKeyIdentifier [
KeyIdentifier [
0000: 0A C8 9B A8 8E 4D 7A BE   C2 32 A2 DE E7 45 65 48  .....Mz..2...EeH
0010: B9 A2 D5 26                                        ...&
]
]



*******************************************
*******************************************
```

**Open SSL for generating generation public and private keys pair in PEM Format:**
openssl pkcs12 -in "Your certificate name"_Certificate.p12 -out "Your certificate name"_Certificate.pem

```
lpendyala@Laxmikanths-MacBook-Pro Downloads %
lpendyala@Laxmikanths-MacBook-Pro Downloads %
lpendyala@Laxmikanths-MacBook-Pro Downloads % openssl pkcs12 -in Test_Certificate.p12 -out Test_Certificate.pem
Enter Import Password:
MAC verified OK
Enter PEM pass phrase:
Verifying - Enter PEM pass phrase:
```

```
-rw-r--r--  1 lpendyala  staff    3515 22 Dec 11:50 Test_Certificate.pem
```



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Public Part of the Key pair which should be configured against the machine user configured in Transparency platform

## 2.2 CONFIGURATION OF MACHINE USER

To enable WS support the WS information in your Machine User settings in ENTSO-E Transparency Platform must be appropriately configured as described below.



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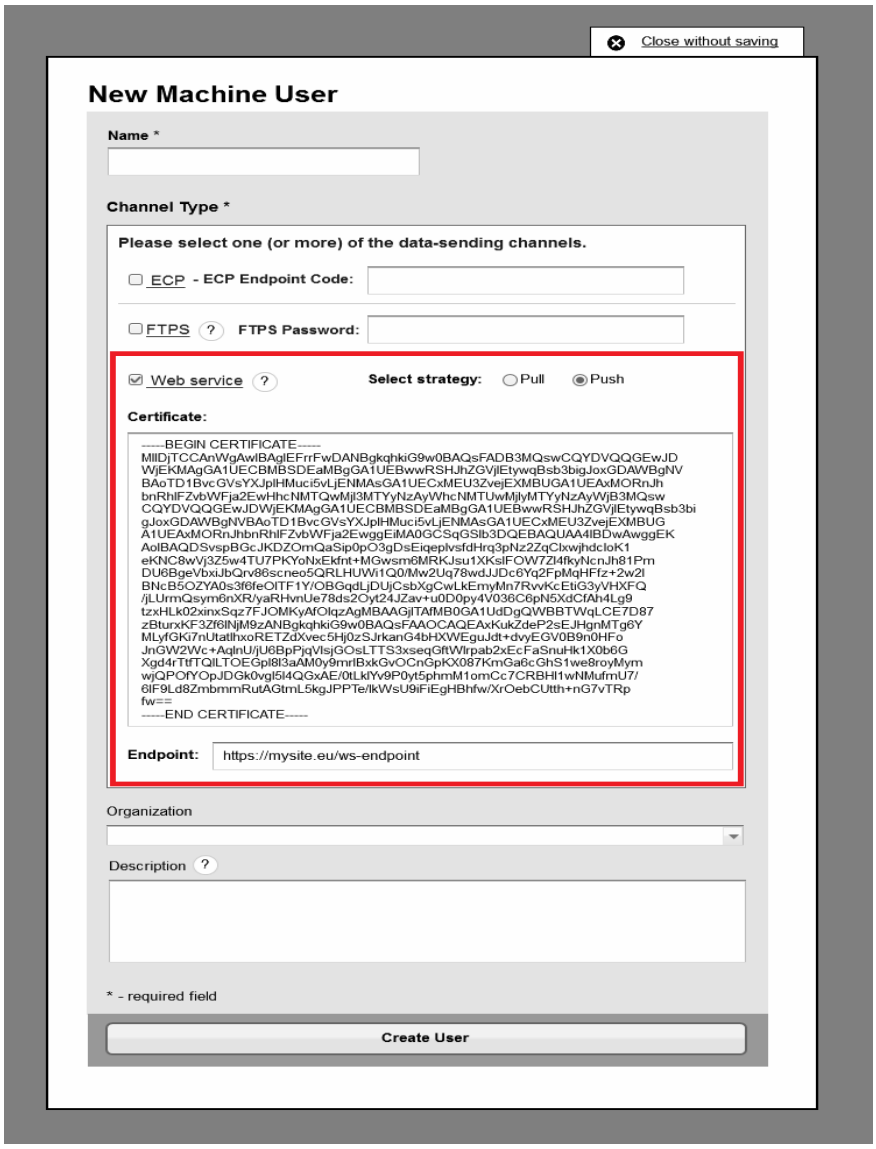


*Figure 1*

Check Web service checkbox, insert your Public part of the PEM certificate and specify the required strategy for messages from the Platform. Pull strategy means that you will request messages by GET request. Push strategy means that the Platform will push message to your WS. For Push strategy provide also your WS endpoint address. Please see informative wireframe (Figure 1).

WS URIs for all environments are provided in the table below. The version of WSDL defined by [SPEC], on which the Data Service WSDL is built on, is available at https://webstore.iec.ch/publication/22465.



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| Environment | WSDL URI | Endpoint URI |
|---|---|---|
| PROD | https://ws-submission.tp.entsoe.eu ( 20.71.78.90) | https://ws-submission.tp.entsoe.eu/data-receiver-ws/endpoints/DataService |
| IOP | https://ws-submission.tp-iop.entsoe.eu ( 20.31.194.118) | https://ws-submission.tp-iop.entsoe.eu/data-receiver-ws/endpoints/DataService |
| UAT | https://ws-submission.tp-uat.entsoe.eu (51.137.9.102) | https://ws-submission.tp-uat.entsoe.eu/data-receiver-ws/endpoints/DataService |

*Table 1: WS URIs*

WS connection requires client HTTPS authentication. Client certificate is checked against certificate provided in Machine user settings.

# 3 Data Service

Please note that this description addresses only specific aspects of the Platform's Web Service implementation. General concepts with examples can be found in [SPEC].

## 3.1 Data Submission

Data are submitted in XML Payload element. See [SPEC], Chapter *5.3 Put Messages*. Element with the message shall be the only child of the Payload element. No binary data are currently expected.
Format of submitted messages (data) is defined by ENTSO-E implementation guides and XSDs which are available from the ENTSO-E website.
As a response to submitted data, the acknowledgement document is generated and returned. In the case that submitted data are not processed before timeout configured in the Platform, problem statement document is generated instead of acknowledgement. An Acknowledgement document is then generated after data processing and depending on the selected strategy, is either pushed to data provider's web service or stored in the data provider's message queue from which it may be pulled by GET request.

## 3.2 List Messages

Data provider may list unread messages from the Platform or messages submitted by this data provider. Only messages not older than 30 days may be listed. See [SPEC], Chapter *5.1 List Messages*.

## 3.3 Get Messages

Data provider may get messages from his message queue or messages submitted by him. See [SPEC], Chapter 5.2 *Get Message*.



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## 3.4 DATA RETRIEVAL

Machine user may retrieve data from the Platform using web services. Refer to our Subscription user guide for the steps to configure data subscription.

https://transparency.entsoe.eu/content/static_content/download?path=/Static%20content/knowledge%20base/Subscription%20Configuration%20User%20Guide%20v0.1.pdf

## 3.5 DIGITAL SIGNATURES

Web service invocations that convey "business" xml messages should be signed. Please see following table for, which defines the services that should be signed. Services not mentioned in the table below are not signed.

| Service | Signed |
|---|---|
| Data Service PUT | Request and Response |
| Data Service GET | Response |
| Data Service QueryData | Response |
| Data Service LIST | Not signed |

*Table 2: Signatures*

Digital signature is described in [SPEC], Chapter *10 Security* with example in *Annex A. 6 Digital Signature*.

For data submissions (PUT) certificate in Signature element is checked against certificate provided in Machine User settings. Data responses from the Platform are signed using Platform's certificate.

# 4 Guideline for Data Provider's submissions

## 4.1 MAIN GOALS OF THE GUIDELINE

The main goal of this guideline is to raise awareness about unnecessary submissions of data performed by Data Providers. Descriptions are based on actual experience from the legacy Transparency platform and Release 1 of new Transparency platform. Expectations for Release 2 (extensions to support transparency regulation) are also taken into account.
Data Providers can help to fulfil their performance expectations of the platform by following these guidelines.
The document also provides Data Providers with information that should be used during implementation and maintenance of their systems used for data submissions into the ENTSO-E Transparency Platform.

## 4.2 HANDLING OF VERSIONS

Current issues related to versions of XML files are described in the following sub-chapters.



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### 4.2.1 REPEATING SUBMISSION FOR ALL PREVIOUS HOURS

There are cases when data for all previous hours of the day were resent every hour although nothing has changed in those previous hours. This led to a situation when the system had to receive, process, store and publish not only data for one hour (e.g. 13:00-14:00), but also for hours 00:00-01:00, 01:00-02:00, 02:00-03:00 … 12:00-13:00, etc.

Recommendation:
To send XML file with higher version only in cases that values were changed.

#### Submission of XML Files with Lower/Same Version

It appears quite often that Transparency platform receives XML file with a lower or the same version than the one which is already stored in the platform.

Recommendation:

Increase version of XML file with each change within XML file. Do not submit historical versions of XML file. These are not published anyway.

### 4.2.2 TOO FREQUENT SUBMISSIONS

There are situations when despite data are supposed to be received for each hour (for example the deadline for time interval 13:00-14:00 is at 15:00) the platform had to receive, process, store and publish many XML files (tens of files where one file is sufficient) submitted during that time interval (13:00-14:00).

Recommendation:

Meet the deadline requirement, but to submit only the latest data. It is not necessary and even not required by Regulation to submit the complete evolution of data.

Moreover evolution of such a data is not shown on the EMFIP portal – only latest version is displayed and users would need to log in and drill down to see historical values.

## 4.3 DATA GRANULARITY

Issues with amount of data in XML files were identified and described in following sub-chapters.

### 4.3.1 INCORRECT SUBMISSION RESOLUTION

Data are submitted in different resolution than the system expects. This will lead to rejection of data.

Recommendation:

To submit data in resolution that is configured in the Transparency platform. The expected resolution is defined in the Configuration Matrix via rule Submission Resolution.



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Data Provider can update the rule and it can be set differently for different time periods.

### 4.3.2 TOO DETAILED DATA IN CURVES

Release 2 of the transparency platform offers the possibility to display evolution of values during some time period. Data can be delivered as a curve. For example results of a Yearly allocation can be submitted in one hour resolution. This creates 8 760 values that need to be received, processed, stored and published. But the Implementation Guides enable submission in thirty minute (about 17 500 values) or even fifteen-minute (about 35 000 values) resolution.

This requires a lot of processing time and a lot of storage is needed. Moreover transparency platform release 2 has a limit of processing maximally 10 000 position within XML.

Recommendations:

Use the lowest possible resolution. For example, in case that Implementation Guide allows delivery in PT15M, PT30M, PT60M and P1D, please use P1D. Market Time Unit resolution should only be used when transparency regulation requires it.

Use the CurveType “A03” as much as possible. When this curve type is used, only positions with changes are delivered. This leads to a smaller size of XML file and faster processing time. For example submit CurveType “A03” and then only value for first position in case that value does not change during the time interval.

## 4.4 MASTER DATA MANAGEMENT

Potential issues related to Master data are described in following sub-chapters.

### 4.4.1 TOO FREQUENT / REGULAR UPDATES

Modification or Synchronization messages do not contain any changes.

Recommendation:

Modification or Synchronization of master data should be done in the very same way as suggested for Data Items. New documents should be submitted only when there is some real change in the data itself.

Recurring submissions without any actual changes would generate unnecessary burden for the system.

# 5 Web Service Client Troubleshooting

In general, a Web Service communication is established through the Transparency platform access point which operates with TLS 1.2 and 1.3 (TLS 1.0. and 1.1 is deprecated and no supported any more). Thus, a used client intended for messaging has to be compliant with the supported TLS standards.



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In case of a communication failure, please check following in your client:

> A client in use does not support TLS 1.2 or 1.3,

> A client in use does not use supported cypher suites,

- *TP supported SSL Cipher Suites "ECDHE-ECDSA-AES128-GCM-SHA256:ECDHE-RSA-AES128-GCM-SHA256:ECDHE-ECDSA-AES256-GCM-SHA384:ECDHE-RSA-AES256-GCM-SHA384:ECDHE-ECDSA-CHACHA20-POLY1305:ECDHE-RSA-CHACHA20-POLY1305:DHE-RSA-AES128-GCM-SHA256:DHE-RSA-AES256-GCM-SHA384",*

> A client certificate in use is not compliant with the supported SSL Cipher Suites,

> A client in use does not have imported the ENTSO-E certificate in the trust store,

- The public certificate is available and downloadable for example on https://transparency.entsoe.eu/ website, certificate export is possible in certificate details.

# 6 References

| | |
|---|---|
| SPEC | AF_284<br>Electronic data interchanges on the Internal Electricity Market (Superseded by IEC TS 62325-504) |
| STAND | IEC 61968-100<br>Application integration at electric utilities – System interfaces for distribution management –Part 100: Implementation Profiles |
| QUERY_SPEC | Parameters for query data. |



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