



SDMX CENTRAL

Web Services Guide

Last updated: August 13th 2019

[Abstract](#)

This guide provides information on the web services provided by IMF SDMX CENTRAL

- Structure Web Service
- Data Verification
- Data Conversion

Contents

1	Structure Web Service	2
2	Verify Web Service.....	6
3	Convert Web Service.....	11

1 Structure Web Service

IMF SDMX Central provides SDMX web services to query for structures (such as Dataflows, Codelists, Concepts, Data Structures), and web services to query for data. The web service conforms to the SDMX Web Service Guidelines which can be found at <http://sdmx.org>.

The web service entry point for both structures and data is:

<https://sdmxcentral.imf.org/ws/public/sdmxapi/rest>

This web service can be used to connect external software that can communicate with SDMX web services.

The Structure REST API conforms to the SDMX Web Service Guidelines which can be found at <http://sdmx.org>.

In addition to the SDMX specification, IMF SDMX Central supports some additional Accept header values and query parameters.

Both the SDMX and extended query parameters are included in this document.

1.1.1 Overview

Web Service Entry Point	https://sdmxcentral.imf.org/ws/public/sdmxapi/rest
Access	Public
HTTP Method	HTTP GET
Response Format	Multiple formats supported. Can be specified in the <i>Accept</i> HTTP Header, or the <i>format</i> parameter of the URL request.
Error Response	SDMX-ML v2.1 Error Response Document

1.1.2 HTTP Headers

The HTTP headers can be used to specify response format. This can also be defined in the request parameter.

HTTP Header	Purpose	Allowed Values
Accept	To define the response format	SDMX Formats application/vnd.sdmx.structure;version=edi application/vnd.sdmx.structure+xml;version=1.0 application/vnd.sdmx.structure+xml;version=2.0 application/vnd.sdmx.structure+xml;version=2.1 JSON Format application/vnd.sdmx.json Excel Format application/vnd.xlsx

1.1.3 Resource

The resource is used to determine which structure type is being queried. The resources identified in the following table are supported.

Resource	Purpose
datastructure	Returns all data structure definitions that match the subsequent path parameters
metadatastructure	Returns all metadata structure definitions that match the subsequent path parameters
categoryscheme	Returns all category schemes that match the subsequent path parameters
conceptscheme	Returns all concept schemes that match the subsequent path parameters
Codelist	Returns all codelists that match the subsequent path parameters
hierarchicalcodelist	Returns all hierarchical codelists that match the subsequent path parameters
organisationscheme	Returns all organisation schemes that match the subsequent path parameters
agencyscheme	Returns all agency schemes that match the subsequent path parameters
dataproviderscheme	Returns all data provider schemes that match the subsequent path parameters
dataconsumerscheme	Returns all data consumer schemes that match the subsequent path parameters
organisationunitscheme	Returns all organisation unit schemes that match the subsequent path parameters
Dataflow	Returns all dataflows that match the subsequent path parameters
metadataflow	Returns all metadata flows that match the subsequent path parameters
reportingtaxonomy	Returns all reporting taxonomies that match the subsequent path parameters
provisionagreement	Returns all provision agreements that match the subsequent path parameters
Structureset	Returns all structure sets that match the subsequent path parameters
Process	Returns all processes that match the subsequent path parameters
categorisation	Returns all categorisations that match the subsequent path parameters
contentconstraint	Returns all content constraints that match the subsequent path parameters
attachmentconstraint	Returns all attachment constraints that match the subsequent path parameters
Structure	Returns All SDMX structures that match the subsequent path parameters

1.1.4 Path Parameters

The path parameters are used to further define the attributes of the request structure(s). All the path parameters are optional. If the path parameters have a default value, it will be used in the absence of the parameter.

Parameter	Purpose	Allowed Values
agencyID	The agency which owns the structure(s)	all – default . any agency Or any string compliant with the SDMX common:NCNameIDType
structureID	The id of the structure(s) to be returned	all – default . all structure ids Or any string compliant with the SDMX common:NCNameIDType
Version	The version of the structure(s) to be returned	latest – default . latest version all – all versions Or a specific version number
itemID	If the resource is to an item scheme (Codelist, Concept Scheme, Category Scheme), the item inside the scheme can be identified by this parameter	String

1.1.5 Request Parameters

The request parameters are all optional and can be used to define the response detail, format, and any additional structures which reference, or are referenced by those identified in the query path.

Parameter	Purpose	Allowed Values
Detail	To define which structures (if any) are output as stubs	<p>full – default. Output full response</p> <p>referencestubs – Output the full query result, any structures returned as part of the</p> <p>allstubs – Output all the structures as stubs</p> <p><i>Example:</i> detail=allstubs</p>
References	<p>To define if additional structures are returned from the query.</p> <p>The structures can either be ones which reference, or are referenced by the structures in the query result.</p> <p>If the query result is for a specific item in an item scheme, then this parameter will identify the references for that item.</p>	<p>none – default. Do not output any additional structures</p> <p>parents –output structures the reference the structures matching the query</p> <p>parentsandsiblings – same as parents, but also include all the additional structures referenced by the parents</p> <p>children – the structures referenced by the structures in the query result</p> <p>descendants – children and their children (up to any level)</p> <p>In addition, a concrete type of resource may be used, for example: datastructure</p> <p><i>Example:</i> references=datastructure</p>
Partial	<p>If set to true creates partial Codelists in the response based on IMF SDMX Central Content Constraints defining allowable content.</p> <p>The pre-requisite is that the query must be for a single constrainable structure (Provision Agreements, Dataflow, or Data Structure) and include references.</p>	true/false
Format	Can be used to define the response format (as an alternative to the HTTP Accept Header).	<p>sdmx (latest version)</p> <p>sdmx-2.0</p> <p>sdmx-2.1</p> <p>sdmx-edi</p> <p>sdmx-edi-lenient</p> <p>sdmx-json</p> <p>xlsx</p> <p><i>Example:</i> format=sdmx-edi</p>



Locale	This optional parameter can be used to set the locale to return any multilingual text in (names and descriptions). If the text does not exist in the specified locale, then the default rules will be applied to find the next best appropriate locale.	Any locale <i>Example:</i> locale=fr
saveAs	If provided the HTTP Header 'Content-Disposition' will be set to attachment with the filename being set to the value provided. This will result in the response being saved to a file. The file extension is not required as IMF SDMX Central will determine the extension based on the response format.	String <i>Example:</i> saveAs=myDownload

1.1.6 Examples

1.1.6.1 All concept schemes in SDMX v2.0 format

<https://sdmxcentral.imf.org/ws/public/sdmxapi/rest/conceptscheme/all/all/latest/?format=sdmx-2.0&detail=full&references=none>

1.1.6.2 All structures saved to a file

<https://sdmxcentral.imf.org/ws/public/sdmxapi/rest/structure/all/all/latest?saveAs=fullexport>

1.1.6.3 Any concept with Id OBS_STATUS and all the data structures that reference it

https://sdmxcentral.imf.org/ws/public/sdmxapi/rest/conceptscheme/all/all/all/OBS_STATUS?references=datastructure



2 Verify Web Service

The data verification web service consumes a dataset (both SDMX and non-SDMX formats are supported) and returns a JSON response identifying details about the dataset, including if there are any validation errors.

Overview

URL Entry Point	https://sdmxcentral.imf.org/ws/public/data/validate
Access	Public
HTTP Method	POST
Accepts	Dataset in any supported format including: <ul style="list-style-type: none"> • CSV • Excel (XLSX) • SDMX
Compression	Zipped data can be submitted
Content Type	<ol style="list-style-type: none"> 1. multipart/form-data (if attaching file) – the attached file must be in field name of uploadFile 2. application/text or application/xml (if submitting data in the body of the POST)
Response Format	application/json
Error Response	{ "Error" : "Error Message" }

HTTP Headers

HTTP Header	Purpose	Allowed Values
Data-Format	Used to inform the server when the data is in CSV format.	csv;delimiter=[delimiter] Where [delimiter] is either: <ul style="list-style-type: none"> • comma • tab • semicolon • space
Sender-Id	<p>The SenderId is included in the verification report.</p> <p>If not provided, the SenderId will be taken from the header of the dataset.</p> <p>If the dataset does not contain a SenderId (for example a non-SDMX format) then the verification report will contain the SenderId of IMF SDMX Central.</p>	<p>The following charters are allowed:</p> <p>A-z, a-z 0-9 \$, _ , -, @, \</p>
Structure	<p>Provides the structure to verification the data against.</p> <p>This is optional as this information may be present in the header of the DataSet. If provided this value will override the value in the dataset (if present).</p>	Valid SDMX URN for Provision Agreement, Dataflow, or Data Structure Definition.
Inc-Metrics	Optional. Includes metrics on the verification.	Boolean (true/false)

	This will add extra detail to the verification report	
Inc-Valid	<p>Optional. Instructs the service to include a dataset with all the valid series and observations in the response.</p> <p>As the result will contain a separate file for the dataset, the response format will be set to either multipart/mixed message with a boundary per file, or if the Zip header is set to true, the output will be a single zip file.</p> <p>The file is called ValidData with the file extension based on the output format.</p>	Boolean (true/false)
Inc-Invalid	<p>Optional. Instructs the service to include a dataset with all the invalid series and observations in the response.</p> <p>As the result will contain a separate file for the dataset, the response format will be set to either multipart/mixed message with a boundary per file, or if the Zip header is set to true, the output will be a single zip file.</p> <p>The file is called InvalidData with the file extension based on the output format.</p>	Boolean (true/false)
Accept	<p>Optional. Instructs the service which data output format to output the valid or invalid datasets in.</p> <p>This Header is only used if Inc-Valid or Inc-Invalid are set to true.</p>	See Accept formats for REST Data Query
Zip	Optional. Compresses the output as a zip file. If used in conjunction with Inc-Valid or Inc-Invalid the zip will contain multiple files.	Boolean (true/false)

Verification Output

The verification output contains both human readable error descriptions, as well as machine processible locations of the errors within the dataset. The location in the dataset is described as a key or observation locator in the format; A:UK:M:2008 – where each component relates to the Dimension value, separated by a colon. If the error position is observation, the last part of the key is the observation time period.

An example output for a valid dataset is shown below:

```
{
  "Meta": {
    "RequestTime": 1564410081711,

```



```

    "Duration": 43
  },
  "FileFormat": "Structure Specific (Compact) v2.1",
  "Prepared": "2019-07-29T10:23:01",
  "SenderId": "FR_DEMO",
  "DataSetId": null,
  "Status": "Complete",
  "Errors": false,
  "Datasets": [
    {
      "DSD": "urn:sdmx.org.sdmx.infomodel.datastructure.DataStructure=OECD:HIGLINK_2011(1.0)",
      "Dataflow": "urn:sdmx.org.sdmx.infomodel.datastructure.Dataflow=OECD:AGRIC_OUTLOOK_2011_2020(1.0)",
      "DataProvider": "urn:sdmx.org.sdmx.infomodel.base.DataProvider=METATECH:DATA_PROVIDERS(1.0).METATECH",
      "ProvisionAgreement": "urn:sdmx.org.sdmx.infomodel.registry.ProvisionAgreement=OECD:OECD_AGRIC_OUTLOOK(1.0)",
      "KeysCount": 2,
      "ObsCount": 62,
      "GroupsCount": 0,
      "Errors": false,
      "ReportedPeriods": {
        "A": {
          "Name": "Annual",
          "StartPeriod": "1990",
          "EndPeriod": "2020"
        }
      }
    }
  ],
  "PreventsConversion": false,
  "PreventsPublication": false
}

```

An example output for an invalid dataset is shown below:

```

{
  "Meta": {
    "RequestTime": 1564401209760,
    "Duration": 34
  },
  "InvalidData": {
    "Datasets": [
      {
        "Structure": "urn:sdmx.org.sdmx.infomodel.registry.ProvisionAgreement=OECD:OECD_AGRIC_OUTLOOK(1.0)",
        "Series": 2,
        "Observations": 61,
        "Groups": 0
      }
    ]
  },
  "ValidData": {
    "Datasets": [
      {
        "Structure": "urn:sdmx.org.sdmx.infomodel.registry.ProvisionAgreement=OECD:OECD_AGRIC_OUTLOOK(1.0)",
        "Series": 2,
        "Observations": 32,
        "Groups": 0
      }
    ]
  },
  "FileFormat": "Structure Specific (Compact) v2.1",
  "Prepared": "2019-07-29T10:23:01",
  "SenderId": "FR_DEMO",
  "DataSetId": null,
  "Status": "Complete",
  "Errors": true,
  "Datasets": [
    {
      "DSD": "urn:sdmx.org.sdmx.infomodel.datastructure.DataStructure=OECD:HIGLINK_2011(1.0)",
      "Dataflow": "urn:sdmx.org.sdmx.infomodel.datastructure.Dataflow=OECD:AGRIC_OUTLOOK_2011_2020(1.0)",
      "DataProvider": "urn:sdmx.org.sdmx.infomodel.base.DataProvider=METATECH:DATA_PROVIDERS(1.0).METATECH",
      "ProvisionAgreement": "urn:sdmx.org.sdmx.infomodel.registry.ProvisionAgreement=OECD:OECD_AGRIC_OUTLOOK(1.0)",
      "KeysCount": 3,
      "ObsCount": 93,
      "GroupsCount": 0,
      "ReportedPeriods": {

```



```

    "A": {
      "Name": "Annual",
      "StartPeriod": "1990",
      "EndPeriod": "2020"
    }
  },
  "Errors": true,
  "ValidationReport": [
    {
      "Type": "Constraint",
      "Errors": [
        {
          "Message": "Disallowed Dimension Value: REF_AREA=AFR",
          "Dataset": 0,
          "ComponentId": " REF_AREA ",
          "ReportedValue": "AFR",
          "Position": "Series",
          "Keys": ["AFR:BT:AA"]
        }
      ]
    },
    {
      "Type": "Representation",
      "Errors": [
        {
          "Message": "Dimension 'VARIABLE' is reporting value 'AA' which is not a valid
representation in referenced Codelist 'OECD:CL_HIGH_AGLINK_2011_VARIABLE(1.0)'",
          "Dataset": 0,
          "Position": "Series",
          "ComponentId": " VARIABLE",
          "ReportedValue": "AA",
          "Keys": ["AFR:BT:AA"]
        }
      ],
      {
        "Message": "Error in Primary Measure 'OBS_VALUE': Reported value 'XXX' is not of expected
type 'Double'",
        "Dataset": 0,
        "ComponentId": " OBS_VALUE",
        "ReportedValue": "XXX",
        "Position": "Observation",
        "Keys": ["AFR:BT:IM:2010"]
      }
    ]
  },
  {
    "Type": "FormatSpecific",
    "Errors": [
      {
        "Message": "Unexpected attribute 'ASD' for element 'StructureSpecificData/DataSet/Series/Obs'",
        "Dataset": 0,
        "Position": "Dataset"
      }
    ]
  }
]
},
"PreventsConversion": false,
"PreventsPublication": true
}

```

Note the first three elements 'Meta', 'InvalidData', 'ValidData', there are present in the report if Inc-Metrics is set to true. Inc-valid and Inc-Invalid set to true enables the report to know the metrics for the invalid and valid data.

The Error Position is either set to Dataset, Series, Observation, or Group.

PreventsConversion and PreventsPublication is an indication on the severity of the error. These settings on which errors prevent conversion and publication can be set in the Fusion Registry by the administrator of the system.



An example error output from a server, which makes the request un-processible, is shown below

```
{"Error": "Unrecognised file format, contents of file are: this is a bad format"}
```

3 Convert Web Service

URL Entry Point	https://sdmxcentral.imf.org/ws/public/data/transform
Access	Public
HTTP Method	POST
Accepts	Excel (XLSX)
Content Type	<ol style="list-style-type: none"> 1. multipart/form-data (if attaching file) – the attached file must be in field name of uploadFile 2. application/text or application/xml (if submitting data in the body of the POST)
Response Format	SDMX Structure Specific v2.1
Error Response	{ "Error" : "Error Message" }

The Convert web service can be used to convert an Excel dataset into SDMX format. To use this web service POST the Excel file to the URL Entry point

Optional HTTP Headers

The following headers are all optional, and can be used to provide more details on how to perform the conversion.

HTTP Header	Purpose	Allowed Values
Structure	<p>Provides the structure used to read the data.</p> <p>This is optional as this information may be present in the header section of the Excel file. If provided this value will override the value in the dataset (if present).</p>	Valid SDMX URN for Provision Agreement, Dataflow, or Data Structure Definition.
Fail-On-Error	An optional parameter to tell the transformation process to fail if an error is detected in the dataset.	Boolean (true/false)
Zip	Compresses the output as a zip file	Boolean (true/false)