

ARAD-REST-API

Data interface of the CNB ARAD time series system

External version

Document history

Date	Version	Description of the version and changes compared to the previous version
2023-04-14	1.0	Initial version of the document
2023-05-26	1.1	Add the „trans“ argument
2023-05-30	1.2	Adding the „period_sort“ argument
2023-07-17	1.3	New service „data-trans“
2023-08-24	1.4	Removing the "trans" argument for the service "data".

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1. Introduction

ARAD-REST-API is the data interface of the CNB's ARAD system, which is an alternative to access via a web-based user interface. The data interface enables automation of data use on the user's side, i.e. direct connection to the CNB ARAD system database via the web services standard. The data interface provides the same set of indicators and their values as the ARAD web application. It also provides the user with access to definitions of his/her own selections (My Selections).

The data interface is implemented using the REST web services standard, which allows clients to communicate with the system via the standard HTTP protocol. Simply put, calls to each service are made via a web link (URL), which includes the parameters of the service being called. This makes the design of the call relatively user-friendly and readable.

The output of all ARAD-REST-API service calls is a structured file.

The interface call can be tried purely from a web browser, but it makes more sense to use ARAD-REST-API to automate data retrieval within procedures written in Python, R, etc. However, the interface can just as well be used to update data sources in MS Excel and other user data analysis tools that support online access to data via web services.

The content provided by the interface can be divided into 2 groups:

- Data - a service for retrieving indicator values for the requested period
- Metadata - services for retrieving attributes of indicators and other information related to them, which can be linked to the data using a reference key, usually the indicator identifier (indicator_id).

The ARAD-REST-API interface is a supported method of automated data extraction. This is in contrast to methods such as web scraping, which the ARAD web application will resist.

The use of web services is enabled for all users who have created a user account in the ARAD system. Within their account, they have the ability to generate an 'API key', which is a unique string that identifies the user calling the web service.

The use of the ARAD-REST-API can be blocked by the user in case of excessive load on the data interface by the frequency of calls or the volume of data downloaded.

The general rules for using ARAD and its data can be found [here](#).

2. Overview of ARAD-REST-API services

The base URL of the interface is: <https://www.cnb.cz/aradb/api/v1>

Method	Type	Name	Description
GET	Metadata	/indicators	List of indicators with their basic attributes
GET	Metadata	/indicators-dims	List of indicators and their dimensions
GET	Metadata	/indicators-tree	List of indicators with classification in the tree
GET	Metadata	/snapshots	List of snapshots
GET	Data	/data	Indicator data (time series)
GET	Data	/data-trans	Indicator data (time series) in the form of a contingency table
GET	Metadata	/updates	Information on time series of indicators

3. General characteristics

The following chapters describe the general properties of all interface services and call arguments.

3.1. Return values

Code	Meaning	Description
200	OK	Successful service call. Request made including the return of the output file.
400	Bad Request	Failed service call. In case one of the arguments is incorrect or the combination of parameters sent is incorrect, the server returns a structured description of the error.

Example for a bad value of the `api_key` parameter:

```
{
  "code": 400,
```

```
"message": {
  "cs": "Hodnota pro parametr api_key není registrována",
  "en": "The value for parameter api_key is not registered."
}
```

3.2. File format

The output of all services is a structured text file in the form of tabular data containing:

- Columns separated by semicolon by default, or otherwise according to the delimiter parameter (see below)
- Header on the first line
- On the next lines, the values

The files are in Central European 1250 encoding, in DOS format (line breaks CR+LF).

3.3. Date values

Date values are in the form of a string of the following form:

Mask: "YYYYMMDD"

Example: 20201231

3.4. Arguments

3.4.1. api_key

Name	API user key
Description	A key that identifies a user in a service call. Key can be obtained by any registered user as part of their user account.
Required	Yes
Default value	
Allowed values	

3.4.2. lang

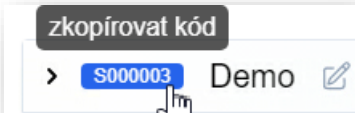
Name	Language version of output
Description	Based on the value of this parameter, the corresponding language version is output
Required	No
Default value	cs
Allowed values	cs
	en

3.4.3. delimiter

Name	Column separator
Description	In the output file, the corresponding character is used to separate the columns
Required	No
Default value	semicolon
Allowed values	semicolon
	comma
	pipe

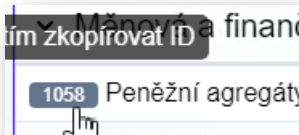
For the following services indicators, indicators-tree, indicators-dims, data, updates, **one of the following parameters** must also be filled in. If none is filled in, an error is returned.

3.4.4. selection_id

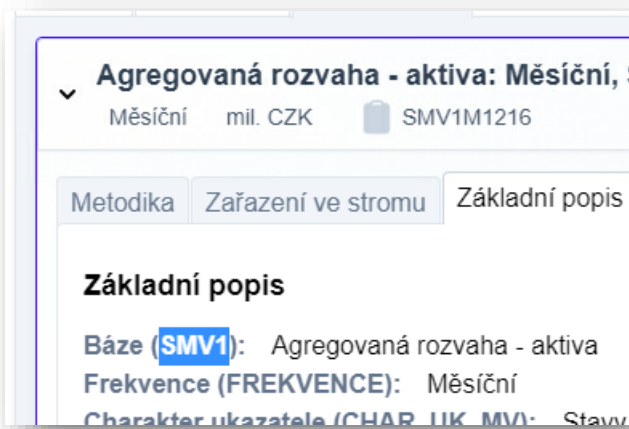
Name	Selection identifier
Description	The unique identifier of the user's selection (My Selections). The identifier is most easily obtained in the web application. Menu item "My selections", for a specific selection the option "copy code". 
Required	No. However, one of the four arguments selection_id, set_id, base_id, indicator id_list must be filled in.
Default value	
Example	S000001

3.4.5. set_id

Name	Report identifier
Description	A unique report identifier. The identifier is most easily obtained in the web application. Menu item "Sets", for a specific assembly the option "click to copy ID".

	
Required	No. However, one of the four arguments selection_id, set_id, base_id, indicator_id_list must be filled in.
Default value	
Example	1058

3.4.6. base_id

Name	Base identifier
Description	The unique identifier of the base of the pointer. The identifier is most easily obtained in the web application. On the detail of one of the indicators. 
Required	No. However, one of the four arguments selection_id, set_id, base_id, indicator_id_list must be filled in.
Default value	
Example	SGFSDEF

3.4.7. indicator_id_list

Name	List of indicator identifiers
------	-------------------------------

Description	List of unique indicator identifiers for which output can be obtained, or by selecting "ALL" to obtain output for all indicators
Required	No. However, one of the four arguments selection_id, set_id, base_id, indicator id_list must be filled in.
Default value	
Example	Multiple indicator codes separated by a comma: SMV5M101,SMV5M102,SMV5M103
	single indicator code: SMV5M101
	ALL value can be used to list all indicators

3.4.8. decimal_separator

Name	Decimal separator
Description	The decimal separator is used in the output file to separate numeric values
Required	No
Default value	comma
Allowed values	comma
	point

3.4.9. period_from

Name	Initial period
Description	Starting period of the time interval of the data to be collected in YYYYMMDD format
Required	No
Default value	If the "months_before" parameter below is not filled in, then the minimum period of the time series is taken as the default value.

3.4.10. period_to

Name	The ending period
Description	The ending period of the time interval of the collected data in the format YYYYMMDD
Required	No
Default value	If the "months_before" parameter below is not filled in, then the minimum period of the time series is taken as the default value.

3.4.11. months_before

Name	Number of months ago
Description	This parameter can be used in the response to retrieve data for the last n months since the last period of the indicator time series. This option is an alternative to calling the time interval service (period_from - period_to).
Required	No
Default value	
Allowed values	A positive integer in the range 1 to n.

3.4.12. snapshot_id_list

Name	List of unique snapshot identifiers
Description	The argument refers to indicators in the area of 'Monetary Policy Reports'. A list of all snapshot IDs can be obtained from /snapshots.
Required	No
Default value	LAST
Allowed values	Id of one snapshot: 25
	comma-separated list of snapshot ids: 4,5,6
	value ALL returns data from all snapshots
	LAST value retrieves the last snapshot (last baseline scenario)

3.4.13. period_sort

Name	Period sorting
Description	The parameter for the period ordering method for the /data service
Required	No
Default value	desc
Allowed values	descending: desc
	ascending: asc

3.4.14. decimals

Name	Number of decimal places
Description	Parameter for choosing the number of decimal places for the /data-trans service
Required	No
Default value	Default
Allowed values	By indicator definition: default
	Other possible values : 0, 1, 2, 3

3.4.15. use_mult

Name	Using of multiplier
Description	The resulting value is converted using a multiplier
Required	No
Default value	0
Allowed values	Yes, use multiplier: 1
	Without using of multiplier: 0

3.4.16. label

Name	Column names
Description	This parameter allows you to display the indicator name in the column name in addition to the code
Required	No
Default value	1
Allowed values	Indicator code: 1
	Indicator name and code: 2

3.4.17. units

Name	Display of units and possibly multiplier
Description	The parameter for possibility to display units in the column name for the /data-trans service. In the column name, the indicator identifier is followed by the units in brackets: e.g. "(thousands CZK)", "(%)", etc.
Required	No
Default value	0
Allowed values	Without units: 0
	With units: 1

4. Services

4.1. /indicators

Returns a list of indicators and their basic properties (code, name, frequency, orders and units).

4.1.1. Structure of the output

Name	Description	Lang version (CZ/EN)
indicator_id	unique identifier of the indicator	No
indicator_name	name of the indicator	Yes
frequency_code	frequency code	No
frequency_name	frequency name	Yes
unit_mult_code	orders of magnitude in exponent form (0 - units, 1 - tens, 3 - thousands ...)	No
unit_mult_name	orders in word form (units, thousands, millions ...)	Yes
unit	unit	Yes

4.1.2. Arguments

- api_key
- lang
- delimiter

Just one of the following parameters:

- selection_id
- set_id
- base_id
- indicator_id_list

4.1.3. Example of a request

https://www.cnb.cz/aradb/api/v1/indicators?set_id=1058&api_key=abcd1234

4.2. /indicators-dims

Returns indicators described by their bases and dimensions. For each indicator, returns as many rows as the indicator has dimensions.

4.2.1. Structure of the output

Name	Description	Lang version (CZ/EN)
indicator_id	unique identifier of the indicator	No
base_id	unique base identifier	No
base_name	base name	Yes
dim_code	dimension code	No
dim_name	dimension name	Yes
dim_value_code	dimension value code	No
dim_value_name	dimension value name	Yes
dim_rank	the order of the dimension within the indicator	No

4.2.2. Arguments

- api_key
- lang
- delimiter

Just one of the following parameters:

- selection_id
- set_id
- base_id
- indicator_id_list

4.2.3. Example of a request

https://www.cnb.cz/aradb/api/v1/indicators-dims?indicator_id_list=MIRFMDf12ERATPECD&api_key=abcd1234

4.3. /indicators-tree

Returns the path of the pointers in the tree.

4.3.1. Structure of the output

Name	Description	Lang version (CZ/EN)
indicator_id	unique identifier of the indicator	No
path	a path in the tree of the form "ARAD Time Series Database/Statistical Data/General Economic Statistics/GDP"	Yes

4.3.2. Arguments

- api_key
- lang
- delimiter

Just one of the following parameters:

- selection_id
- set_id
- base_id
- indicator_id_list

4.3.3. Example of a request

https://www.cnb.cz/aradb/api/v1/indicators-tree?indicator_id_list=MIRFMDF12ERATPECD&api_key=abcd1234

4.4. /snapshots

Returns a list of snapshots.

4.4.1. Structure of the output

Name	Description	Lang version (CZ/EN)
snapshot_id	unique identifier of the snaphost	No
snapshot_name	name of the snapshot	Yes

4.4.2. Arguments

- api_key
- lang
- delimiter

4.4.3. Example of a request

https://www.cnb.cz/aradb/api/v1/snapshots?api_key=abcd1234

4.5. /data

Returns indicator data in a simple structure snapshot, period and value.

Originally, the structure of the output depended on the "trans" argument. The structure for the value of the argument trans=1 was a transposed table, with the indicators in separate columns. Since this has been replaced by /data-trans, this argument will no longer be supported.

4.5.1. Structure of the output

Name	Description	Lang version (CZ/EN)
indicator_id	unique identifier of the indicator	No
snapshot_id	unique snapshot identifier for snapshotted data, for non-snapshot data the value is NULL	No
period	period in YYYYMMDD format	No
value	value in units without rounding	No

4.5.2. Arguments

- api_key
- delimiter
- decimal_separator
- period_from
- period_to
- months_before
- snapshot_id_list
- period_sort

Just one of the following parameters:

- selection_id
- set_id
- base_id
- indicator_id_list

4.5.3. Example of a request

Time series of SMV5M603 24 months ago:

https://www.cnb.cz/aradb/api/v1/data?indicator_id_list=SMV5M603&months_before=24&api_key=abcd1234

Time series of all available snapshots of the Monetary Policy Report indicator since 1 January 2018:

https://www.cnb.cz/aradb/api/v1/data?indicator_id_list=MIRFMSD1XXRATPECQ&period_from=20180101&snapshot_id_list=ALL&api_key=abcd1234

4.6. /data-trans

Returns indicator data in the form of a contingency table.

Note that care must be taken in interpreting values when the column names do not specify a unit (case of not using the "units=1" argument).

4.6.1. Structure of the output

The first column shows the period, and the other columns represent individual indicators, or a combination of indicator and snapshot (if exists).

Název	Popis	Jazyková verze (CZ/EN)
period	period in YYYYMMDD format	No
indicator_id 1..n, or indicator_id_snapshot_id 1..n	values of indicators or a combinations of indicator and snapshot Column name example: SHDPZDRQ20152B1GMIPSA MLUCLUWXXSTDQ_sn29 The values in the columns for a indicator are then in units without rounding.	Yes in case of the text labels

4.6.2. Arguments

- api_key
- delimiter
- decimal_separator
- period_from
- period_to
- months_before
- snapshot_id_list
- period_sort
- decimals
- use_mult
- label
- units

Just one of the following parameters:

- selection_id
- set_id
- base_id
- indicator_id_list

4.6.3. Example of a request

Time series of SMV5M603 with data for last 24 months with indicator's name as label and with units, unit multiplier applied:

https://www.cnb.cz/aradb/api/v1/data?indicator_id_list=SMV5M603&months_before=24&label=2&units=1&use_mult=1&api_key=abcd1234

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4.7. /updates

The service returns the last update date and the time series period range.

4.7.1. Structure of the output

Name	Description	Lang version (CZ/EN)
indicator_id	unique identifier of the indicator	No
snapshot_id	unique snapshot identifier for snapshotted data, for non-snapshot data the value is NULL	No
update_date	date and time of the last data update in YYYYMMDDHHMISS format (24 hour format)	No
data_from	the period since the data in YYYYMMDD format	No
data_to	period to data in YYYYMMDD format	No

4.7.2. Arguments

- api_key
- delimiter
- snapshot_id_list

Just one of the following parameters:

- selection_id
- set_id
- base_id
- indicator_id_list

4.7.3. Example of a request

Time series information on the indicators of the 1058 set:

https://www.cnb.cz/aradb/api/v1/updates?set_id=1058&api_key=abcd1234

Information about the time series of the indicator from snapshots 22 and 25:

https://www.cnb.cz/aradb/api/v1/updates?indicator_id_list=MIRFMSD1XXRATPECQ&snapshot_id_list=22,25&api_key=abcd1234