



Corporate Memory Control (cmemc)

v21.06

Manual



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1 Introduction

This manual describes how to install and setup and use *eccenca Corporate Memory Control* (cmemc), the command line client for eccenca Corporate Memory. cmemc is intended for system administrators and Linked Data Expert, who wants to automate / remote control activities on Corporate Memory.

To use this manual, cmemc users should have basic knowledge on command line interfaces, terminal usage and config file creation and editing.

This system manual includes the following parts:

- *Installation*
- *Configuration*

This document covers installation and basic usage pattern of cmemc and is not intended to be complete in terms of being a reference for all available options and commands. However, cmemc provides detailed documentation for users via the `--help` option.

The main documentation resource for cmemc <https://eccenca.com/go/cmemc>.

1.1 About eccenca Corporate Memory Control (cmemc)

cmemc is the eccenca Corporate Memory Command Line Interface (CLI). It is developed in python and build and delivered as a stand alone single binary for Linux and Windows.

Main features of cmemc include:

- List, edit and check configurations.
- List, create, delete, inspect datasets.
- List, import, export, delete or open graphs.
- List, import, export, create or delete projects.
- List, execute or open local and remote SPARQL queries.
- List, install, uninstall and open vocabularies.
- List, execute, open or inspect workflows.
- Import or export the workspace.

1.2 Scope of delivery

The cmemc release package consists of the following files:

- `cmemc` - the Linux ELF 64-bit LSB executable (x86-64, version 1 (SYSV), dynamically linked), tested with Ubuntu
- `cmemc-rhel` - the Linux ELF 64-bit LSB executable (x86-64, version 1 (SYSV), dynamically linked), tested with RHEL
- `cmemc.exe` - the PE32+ executable (console, x86-64), for Microsoft Windows, tested with Windows 10
- `cmemc_vXX.YY_Manual.pdf` - this document

2 Installation

cmemc can be installed using the python sources, using the release package or using the docker image.

2.1 Installation via pip

cmemc is available as an official pypi package¹ so installation can be done with pip:

```
$ pip install cmem-cmemc
```

2.2 Installation via release package

The cmemc distribution in the release package consists of stand alone binaries, so installation is not really needed.

cmemc can be started from a local path and also from a central binary path, such as `/usr/local/bin`. The only needed installation activity is to copy the binary to a path on your system which is in the `PATH` variable.

2.2.1 Linux installation

As a first step, output the content of the `PATH` variable in order to determine, the path to use:

```
user@ubuntu:/home/user/$ echo $PATH
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
```

Then unzip the distribution package and copy the binary to an acceptable path (in this example: `/usr/local/bin`)

Note: XXX depends on your actual version

```
user@ubuntu:/home/user/$ unzip cmemc-vXXX.zip
user@ubuntu:/home/user/$ cp cmemc-vXXX/cmemc /usr/local/bin
user@ubuntu:/home/user/$ chmod +x /usr/local/bin/cmemc
```

Finally, test your installation.

Note: XXX depends on your actual version

¹<https://pypi.org/project/cmem-cmemc/>

```
user@ubuntu:/home/user/$ cmemc --version
cmemc, version XXX
```

In case you are using bash or zsh as your shell, you can optionally enable tab completion for cmemc. This is documented on the [click framework homepage](#)².

In order to enable tab completion with **bash** run the following command in your shell:

```
eval "$(_CMEMC_COMPLETE=source cmemc)"
```

In order to enable tab completion with **zsh** run the following command in your shell:

```
eval "$(_CMEMC_COMPLETE=source_zsh cmemc)"
```

You may want to add the corresponding line to your `.bashrc` or `.zshrc` file for your convenience.

2.2.2 MacOS installation

There is no officially supported MacOS binary. Please use the installation with pip method.

As an alternative installation method, you can use brew:

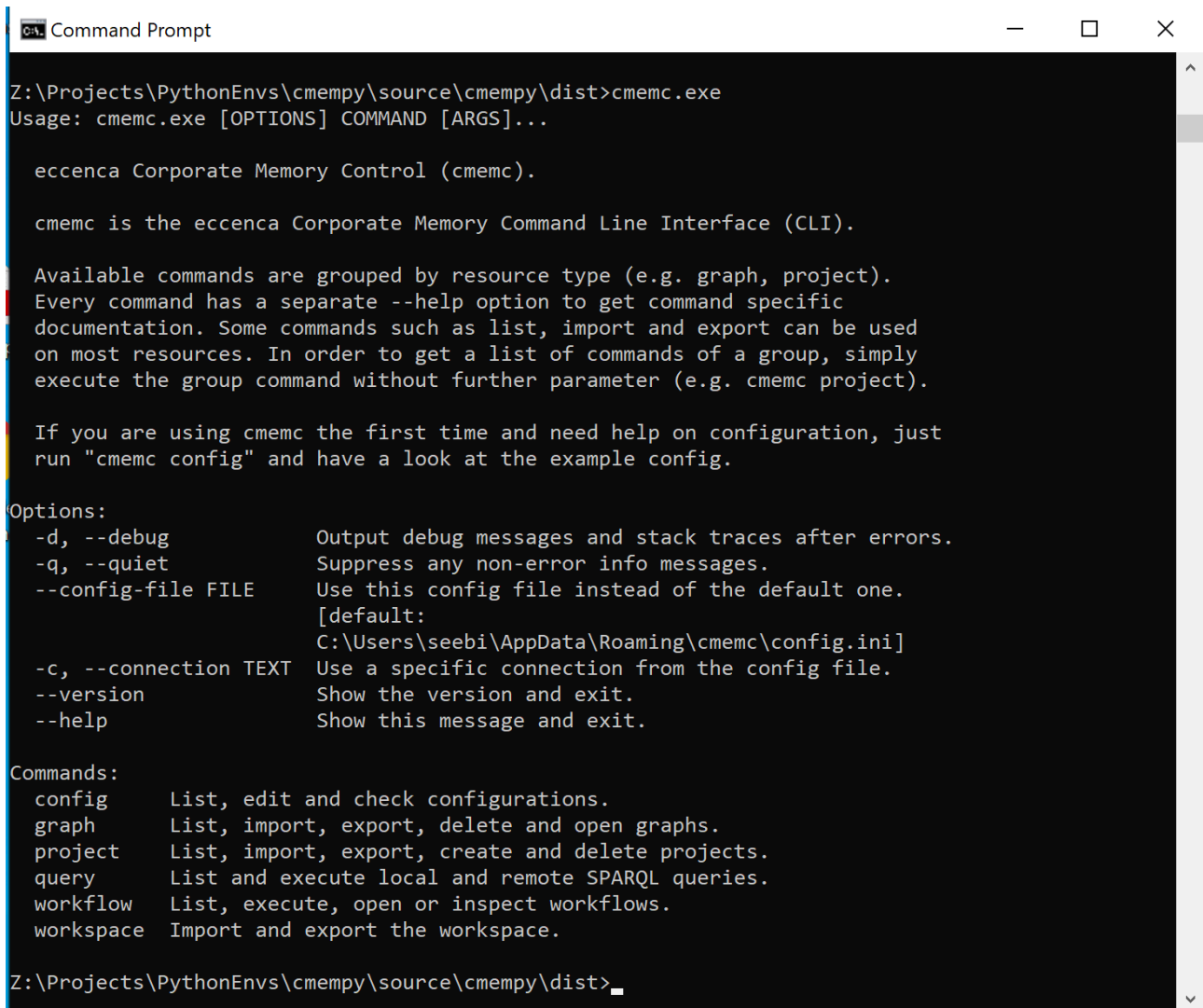
```
brew install eccenca/main/cmemc
```

2.2.3 Windows installation

The installation for Windows is similar. As a first step, unzip the distribution file (`cmemc-vXXX.zip`), then open `cmd.exe` and go to the directory where the cmemc files are extracted. Then you can start `cmemc.exe` .

Note: XXX depends on your actual version

²<https://click.palletsprojects.com/en/7.x/bashcomplete/#activation>



```
Command Prompt

Z:\Projects\PythonEnvs\cmempy\source\cmempy\dist>cmemc.exe
Usage: cmemc.exe [OPTIONS] COMMAND [ARGS]...

eccenca Corporate Memory Control (cmemc).

cmemc is the eccenca Corporate Memory Command Line Interface (CLI).

Available commands are grouped by resource type (e.g. graph, project).
Every command has a separate --help option to get command specific
documentation. Some commands such as list, import and export can be used
on most resources. In order to get a list of commands of a group, simply
execute the group command without further parameter (e.g. cmemc project).

If you are using cmemc the first time and need help on configuration, just
run "cmemc config" and have a look at the example config.

Options:
  -d, --debug           Output debug messages and stack traces after errors.
  -q, --quiet           Suppress any non-error info messages.
  --config-file FILE    Use this config file instead of the default one.
                        [default:
                        C:\Users\seebi\AppData\Roaming\cmemc\config.ini]
  -c, --connection TEXT Use a specific connection from the config file.
  --version             Show the version and exit.
  --help               Show this message and exit.

Commands:
  config    List, edit and check configurations.
  graph     List, import, export, delete and open graphs.
  project   List, import, export, create and delete projects.
  query     List and execute local and remote SPARQL queries.
  workflow  List, execute, open or inspect workflows.
  workspace Import and export the workspace.

Z:\Projects\PythonEnvs\cmempy\source\cmempy\dist>
```

Figure 2.1: Example execution of cmemc under Windows

3 Configuration

cmemc needs to know where your Corporate Memory is deployed. For this, you need to provide some key variables in a configuration file. Per default, cmemc looks for this configuration file on a reasonable place depending on your operating system.

For Linux, this is `$HOME/.config/cmemc/config.ini`.

For Windows, this is `%APPDATA%\cmemc\config.ini`

Note: `USER` is your actual user name.

Once you start cmemc the first time, it will create an empty config file at this location and will output a general introduction. In order to do so, open the terminal application of your choice.

Note: All further examples given here are based on Linux commands. For Windows, the output is the same, however, you need to start cmemc as `cmemc.exe`.

```
user@ubuntu:/home/user/$ cmemc
Empty config created: /home/user/.config/cmemc/config.ini
Usage: cmemc [OPTIONS] COMMAND [ARGS]...

eccenca Corporate Memory Control (cmemc).

cmemc is the eccenca Corporate Memory Command Line Interface (CLI).

Available commands are grouped by affecting resource type (such as graph,
project and query). Each command / group has a separate --help screen to
get command / group specific documentation.

In order to see possible commands in a command group, simply execute the
group command without further parameter (e.g. cmemc project). Some
commands such as list, import and export can be executed in most command
groups. Please have a look at the cmemc manual page for more
information:

    https://eccenca.com/go/cmemc

Options:
  -d, --debug                Output debug messages and stack traces after errors.
```

```
-q, --quiet          Suppress any non-error info messages.
--config-file FILE   Use this config file instead of the default one.
                     [default: /Users/seebi/Library/Application
                     Support/cmемc/config.ini]

-c, --connection TEXT Use a specific connection from the config file.
--version            Show the version and exit.
-h, --help           Show this message and exit.
```

Commands:

```
config      List, edit and check configurations.
dataset     List, create, delete, inspect datasets.
graph       List, import, export, delete or open graphs.
project     List, import, export, create or delete projects.
query       List, execute or open local and remote SPARQL queries.
vocabulary  List, install, uninstall and open vocabularies.
workflow    List, execute, open or inspect workflows.
workspace   Import or export the workspace.
```

You should now edit your config file and add credentials and URL parameter to your Corporate Memory deployment. You either search the config manually in your home directory or you can use the `config edit` command, which opens the config file in your default text editor.

```
user@ubuntu:/home/user/$ cmemc config edit
Open editor for config file /home/user/.config/cmемc/config.ini
```

The rules for the config file are similar to a Windows INI file and are explained in detail at [docs.python.org](https://docs.python.org/3/library/configparser.html)¹. Here is an basic example:

```
[my-local]
CMEM_BASE_URI=http://localhost/
OAUTH_GRANT_TYPE=client_credentials
OAUTH_CLIENT_ID=cmem-service-account
OAUTH_CLIENT_SECRET=c9c12831-000c-464b-9b1d-2d8b7e20df6a
```

This basically creates a named section `my-local` which is a connection to a Corporate Memory deployment on `http://localhost`. The authorization will be done with a system account `cmem-service-account` and the given client secret. Using this combination of config parameter is based on a typical installation where all components are available under the same hostname.

However, if you need to fine tune all locations, the following config file parameter can be used in addition to this example:

¹<https://docs.python.org/3/library/configparser.html>

- `DI_API_ENDPOINT` - Data Integration API endpoint, default: `CMEM_BASE_URI/dataintegration`
- `DP_API_ENDPOINT` - Data Platform API endpoint, default: `CMEM_BASE_URI/dataplatfom`
- `OAuth_TOKEN_URI` - OAuth 2.0 Token endpoint, default: `CMEM_BASE_URI/auth/realms/cmem/protocol/openid-connect/token`
- `OAuth_GRANT_TYPE` - OAuth 2.0 grant type, default: `client_credentials`
- `OAuth_USER` - Username to retrieve the token, default: `admin`, only if `OAuth_GRANT_TYPE` is `password`
- `OAuth_PASSWORD` - Password to retrieve the token, default: `admin`, only if `OAuth_GRANT_TYPE` is `password`
- `OAuth_CLIENT_ID` - OAuth 2.0 client id, default: `cmem-service-account`
- `OAuth_CLIENT_SECRET` - OAuth 2.0 client secret, default: `secret`, only if `OAuth_GRANT_TYPE` is `client_credentials`
- `SSL_VERIFY` - Use SSL verification for requests to DP/DI default: `True`
- `OAuth_AUTH_TOKEN` - a pre-fetched auth token, only if `OAuth_GRANT_TYPE` is `prefetched_token`

In order to verify your configuration, you should try to get a list of graphs via cmemc:

```
user@ubuntu:/home/user/$ cmemc -c my-local graph list
https://ns.eccenca.com/example/data/vocabs/
https://vocab.eccenca.com/shacl/
urn:elds-backend-access-conditions-graph
https://ns.eccenca.com/data/queries/
```

If you get a similar list of graphs, you successfully configured cmemc to access your deployment.

4 Reference

This section lists the help texts of all commands as a reference and to search for it.

4.1 Command group: admin

Usage: cmemc [OPTIONS] COMMAND [ARGS]...

Import bootstrap data, backup/restore workspace or get status.

This command group consists of commands for setting up and configuring eccenca Corporate Memory.

Options:

-h, --help Show this message and exit.

Commands:

bootstrap Update/Import bootstrap data.

showcase Create showcase data.

status Output health and version information.

token Fetch and output an access token.

workspace Import, export and reload the project workspace.

4.1.1 Command: admin showcase

Usage: cmemc [OPTIONS]

Create showcase data.

This command creates a showcase scenario of multiple graphs including integration graphs, shapes, statement annotations etc.

Note: There is currently no deletion mechanism for the showcase data, so you need to remove the showcase graphs manually (or just remove all graphs).

Options:

```
--scale INTEGER  The scale factor provides a way to set the target size of
                  the scenario. A value of 10 results in around 40k triples,
                  a value of 50 in around 350k triples. [default: 10]

--create          Delete old showcase data if present and create new showcase
                  databased on the given scale factor.

--delete          Delete existing showcase data if present.

-h, --help        Show this message and exit.
```

4.1.2 Command: admin bootstrap

Usage: cmemc [OPTIONS]

Update/Import bootstrap data.

This command imports the bootstrap data needed for managing shapes, access conditions, the query catalog and the vocabulary catalog.

Note: There is currently no deletion mechanism for the bootstrap data, so you need to remove the graphs manually (or just remove all graphs).

Options:

```
--import          Delete existing bootstrap data if present and import bootstrap
                  data which was delivered

-h, --help        Show this message and exit.
```

4.1.3 Command: admin status

Usage: cmemc [OPTIONS]

Output health and version information.

This command outputs version and health information of the selected deployment. In addition to that, this command warns you if the target version of your cmemc client is newer than the version of your backend.

To get status information of all configured deployments use this command in combination with xargs:

```
cmemc config list | xargs -i cmemc -c {} admin status
```

Options:

-h, --help Show this message and exit.

4.1.4 Command: admin token

Usage: cmemc [OPTIONS]

Fetch and output an access token.

This command can be used to check for correct authentication as well as to use the token with wget / curl or similar standard tools:

Example Usage: curl -H "Authorization: Bearer \$(cmemc -c my admin token)"
\$(cmemc -c my config get DP_API_ENDPOINT)/api/custom/slug

Please be aware that this command can reveal secrets, which you do not want to have in log files or on the screen.

Options:

--raw Outputs raw JSON. Note that this option will always try to fetch a new JSON token response. In case you are working with OAUTH_GRANT_TYPE=prefetched_token, this may lead to an error.

--decode Decode the access token and outputs the raw JSON. Note that the access token is only decoded and esp. not validated.

-h, --help Show this message and exit.

4.2 Command group: admin workspace

Usage: cmemc [OPTIONS] COMMAND [ARGS]...

Import, export and reload the project workspace.

Options:

-h, --help Show this message and exit.

Commands:

export Export the complete workspace (all projects) to a ZIP file.
import Import the workspace from a file.
reload Reload the workspace from the backend.

4.2.1 Command: admin workspace export

Usage: cmemc [OPTIONS] [FILE]

Export the complete workspace (all projects) to a ZIP file.

Depending on the requested type, this ZIP contains either a turtle file for each project (type `rdfTurtle`) or a substructure of resource files and XML descriptions (type `xmlZip`).

The file name is optional and will be generated with by the template if absent.

Options:

- | | |
|---|---|
| <code>-o, --overwrite</code> | Overwrite existing files. This is a dangerous option, so use it with care. |
| <code>--type TEXT</code> | Type of the exported workspace file.
[default: <code>xmlZip</code>] |
| <code>-t, --filename-template TEXT</code> | Template for the export file name. Possible placeholders are (Jinja2): <code>{{connection}}</code> (from the <code>--connection</code> option) and <code>{{date}}</code> (the current date as YYYY-MM-DD). The file suffix will be appended. Needed directories will be created. [default: <code>{{date}}-{{connection}}.workspace</code>] |
| <code>-h, --help</code> | Show this message and exit. |

4.2.2 Command: admin workspace import

Usage: cmemc [OPTIONS] FILE

Import the workspace from a file.

Options:

- | | |
|--------------------------|--|
| <code>--type TEXT</code> | Type of the exported workspace file. [default: <code>xmlZip</code>] |
| <code>-h, --help</code> | Show this message and exit. |

4.2.3 Command: admin workspace reload

Usage: cmemc [OPTIONS]

Reload the workspace from the backend.

Options:

-h, --help Show this message and exit.

4.3 Command group: config

Usage: cmemc [OPTIONS] COMMAND [ARGS]...

List and edit configs as well as get config values.

Configurations are identified by the section identifier in the config file. Each configuration represent a Corporate Memory deployment with its specific access method as well as credentials.

A minimal configuration which uses client credentials has the following entries:

[example.org]

CMEM_BASE_URI=https://cmem.example.org/

OAuth_GRANT_TYPE=client_credentials

OAuth_CLIENT_ID=cmem-service-account

OAuth_CLIENT_SECRET=my-secret-account-pass

Note that OAuth_GRANT_TYPE can be either client_credentials, password or prefetched_token.

In addition to that, the following config parameters can be used as well:

SSL_VERIFY=False - for ignoring certificate issues (not recommended)

DP_API_ENDPOINT=URL - to point to a non-standard DataPlatform location

DI_API_ENDPOINT=URL - to point to a non-standard DataIntegration location

OAuth_TOKEN_URI=URL - to point to an external IdentityProvider location

OAuth_USER=username - only if OAuth_GRANT_TYPE=password

OAuth_PASSWORD=password - only if OAuth_GRANT_TYPE=password

OAuth_ACCESS_TOKEN=token - only if OAuth_GRANT_TYPE=prefetched_token

In order to get credential information from an external process, you can use the parameter OAuth_PASSWORD_PROCESS, OAuth_CLIENT_SECRET_PROCESS and OAuth_ACCESS_TOKEN_PROCESS to setup an external executable.

```
OAUTH_CLIENT_SECRET_PROCESS=/path/to/getpass.sh
OAUTH_PASSWORD_PROCESS=["getpass.sh", "parameter1", "parameter2"]
```

The credential executable can use the cmemc environment for fetching the credential (e.g. CMEM_BASE_URI and OAUTH_USER). If the credential executable is not given with a full path, cmemc will look into your environment PATH for something which can be executed. The configured process needs to return the credential on the first line of stdout. In addition to that, the process needs to exit with exit code 0 (without failure). There are examples available in the online manual.

Options:

-h, --help Show this message and exit.

Commands:

```
edit Edit the user-scope configuration file.
get  Get the value of a known cmemc configuration key.
list List configured connections.
```

4.3.1 Command: config list

Usage: cmemc [OPTIONS]

List configured connections.

This command lists all configured connections from the currently used config file.

The connection identifier can be used with the --connection option in order to use a specific Corporate Memory instance.

In order to apply commands on more than one instance, you need to use typical unix gear such as xargs or parallel:

```
cmemc config list | xargs -I % sh -c 'cmemc -c % admin status'
```

```
cmemc config list | parallel --jobs 5 cmemc -c {} admin status
```

Options:

-h, --help Show this message and exit.

4.3.2 Command: config edit

Usage: cmemc [OPTIONS]

Edit the user-scope configuration file.

Options:

-h, --help Show this message and exit.

4.3.3 Command: config get

Usage: cmemc [OPTIONS] [CMEM_BASE_URI|SSL_VERIFY|REQUESTS_CA_BUNDLE|DP_API_ENDPOINT|DI_API_ENDPOINT|OAUTH_TOKEN_URI|OAUTH_GRANT_TYPE|OAUTH_USER|OAUTH_PASSWORD|OAUTH_CLIENT_ID|OAUTH_CLIENT_SECRET|OAUTH_ACCESS_TOKEN]

Get the value of a known cmemc configuration key.

In order to automate processes such as fetching custom API data from multiple Corporate Memory instances, this command provides a way to get the value of a cmemc configuration key for the selected deployment.

Example Usage: `curl -H "Authorization: Bearer $(cmemc -c my admin token)" $(cmemc -c my config get DP_API_ENDPOINT)/api/custom/slug`

The commands returns with exit code 1 if the config key is not used in the current configuration.

Options:

-h, --help Show this message and exit.

4.4 Command group: dataset

Usage: cmemc [OPTIONS] COMMAND [ARGS]...

List, create, delete, inspect, up-/download or open datasets.

This command group allows for managing workspace datasets as well as dataset file resources. Datasets can be created and deleted. File resources can be uploaded and downloaded. Details of dataset parameter can be listed with inspect.

Datasets are identified with a combined key of the project ID and the project internal dataset ID (e.g: my-project:my-dataset). To get a list of datasets, use the list command.

Options:

-h, --help Show this message and exit.

Commands:

create Create a dataset.
delete Delete datasets.
download Download the resource file of a dataset.
inspect Display meta data of a dataset.
list List available datasets.
open Open datasets in the browser.
upload Upload a resource file to a dataset.

4.4.1 Command: dataset list

Usage: cmemc [OPTIONS]

List available datasets.

Outputs a list of datasets IDs which can be used as reference for the dataset create and delete commands.

Options:

--project TEXT The project, from which you want to list the datasets.
Project IDs can be listed with the 'project list' command.

--raw Outputs raw JSON objects of dataset search API response.
--id-only Lists only dataset identifier and no labels or other meta data. This is useful for piping the ids into other cmemc commands.

-h, --help Show this message and exit.

4.4.2 Command: dataset delete

Usage: cmemc [OPTIONS] [DATASET_IDS]...

Delete datasets.

This deletes existing datasets in integration projects from Corporate Memory. Datasets will be deleted without prompting! Dataset resources will not be deleted.

Example: `cmemc dataset delete my_project:my_dataset`

Datasets can be listed by using the '`cmemc dataset list`' command.

Options:

- `-a, --all` Delete all datasets. This is a dangerous option, so use it with care.
- `--project TEXT` In combination with the '`--all`' flag, this option allows for deletion of all datasets of a certain project. The behaviour is similar to the '`dataset list --project`' command.
- `-h, --help` Show this message and exit.

4.4.3 Command: dataset download

Usage: `cmemc [OPTIONS] DATASET_ID OUTPUT_PATH`

Download the resource file of a dataset.

This command downloads the file resource of a dataset to your local file system or to standard out (-). Note that this is not possible for dataset types such as Knowledge Graph (`eccencaDataplatfrom`) or SQL endpoint (`sqlEndpoint`).

Without providing an output path, the output file name will be the same as the remote file resource.

Datasets can be listed by using the '`cmemc dataset list`' command.

Options:

- `--replace` Replace existing files. This is a dangerous option, so use it with care.
- `-h, --help` Show this message and exit.

4.4.4 Command: dataset upload

Usage: cmemc [OPTIONS] DATASET_ID INPUT_PATH

Upload a resource file to a dataset.

This command uploads a file to a dataset. The content of the uploaded file replaces the remote file resource. The name of the remote file resource is not changed.

Warning: If the remote file resource is used in more than one dataset, the other datasets are also affected by this command.

Warning: The content of the uploaded file is not tested, so uploading a json file to an xml dataset will result in errors.

Datasets can be listed by using the 'cmemc dataset list' command.

Example: cmemc dataset upload cmem:my-dataset new-file.csv

Options:

-h, --help Show this message and exit.

4.4.5 Command: dataset inspect

Usage: cmemc [OPTIONS] DATASET_ID

Display meta data of a dataset.

Options:

--raw Outputs raw JSON.

-h, --help Show this message and exit.

4.4.6 Command: dataset create

Usage: cmemc [OPTIONS] [DATASET_FILE]

Create a dataset.

Datasets are created in projects and can have associated file resources. Each dataset has a type (such as 'csv') and a list of parameter which can change or specify the dataset behaviour.

To get more information on possible dataset types and parameter on these types, use the '--help-types' and '--help-parameter' options.

Example: `cmemc dataset create --project my-project --type csv my-file.csv`

Options:

<code>-t, --type TEXT</code>	The dataset type of the dataset to create. Example types are 'csv', 'json' and 'eccencaDataPlatform' (-> Knowledge Graph).
<code>--project TEXT</code>	The project, where you want to create the dataset in. If there is only one project in the workspace, this option can be omitted.
<code>-p, --parameter <TEXT TEXT>...</code>	A set of key/value pairs. Each dataset type has different parameters (such as charset, arraySeparator, ignoreBadLines, ...). In order to get a list of possible parameter, use the '--help-parameter' option.
<code>--replace</code>	Replace remote file resources in case there already exists a file with the same name.
<code>--id TEXT</code>	The dataset ID of the dataset to create. The dataset ID will be automatically created in case it is not present.
<code>--help-types</code>	Lists all possible dataset types on given Corporate Memory instance. Note that this option already needs access to the instance.
<code>--help-parameter</code>	Lists all possible (optional and mandatory) parameter for a dataset type. Note that this option already needs access to the instance.
<code>-h, --help</code>	Show this message and exit.

4.4.7 Command: dataset open

Usage: `cmemc [OPTIONS] DATASET_IDS...`

Open datasets in the browser.

With this command, you can open a dataset in the workspace in your browser.

The command accepts multiple dataset IDs which results in opening multiple browser tabs.

Options:

-h, --help Show this message and exit.

4.5 Command group: graph

Usage: cmemc [OPTIONS] COMMAND [ARGS]...

List, import, export, delete, count, tree or open graphs.

Graphs are identified by an IRI. The get a list of existing graphs, execute the list command or use tab-completion.

Options:

-h, --help Show this message and exit.

Commands:

count Count triples in graph(s).
delete Delete graph(s) from the store.
export Export graph(s) as NTriples to stdout (-), file or directory.
import Import graph(s) to the store.
list List accessible graphs.
open Open / explore a graph in the browser.
tree Show graph tree(s) of the owl:imports hierarchy.

4.5.1 Command: graph count

Usage: cmemc [OPTIONS] [IRIS]...

Count triples in graph(s).

This command lists graphs with their triple count. Counts are done without following imported graphs.

Options:

-a, --all Count all graphs
-s, --summarize Display only a sum of all counted graphs together

-h, --help Show this message and exit.

4.5.2 Command: graph tree

Usage: cmemc [OPTIONS] [IRIS]...

Show graph tree(s) of the owl:imports hierarchy.

You can output one or more trees of the import hierarchy.

Imported graphs which do not exist are shown as [missing: IRI]. Imported graphs which will result in an import cycle are shown as [ignored: IRI]. Otherwise each graph is shown with label and IRI or only as IRI (in case of --id-only usage).

Options:

-a, --all Show tree of all (readable) graphs.
--raw Outputs raw JSON of the graph importTree API response.
--id-only Shows only graph IRIs in the tree and no labels.
-h, --help Show this message and exit.

4.5.3 Command: graph list

Usage: cmemc [OPTIONS]

List accessible graphs.

Options:

--raw Outputs raw JSON of the graphs list API response.
--id-only Lists only graph identifier (IRIs) and no labels or other meta data. This is useful for piping the IRIs into other commands.

--filter <CHOICE TEXT>... Filter graphs based on effective access conditions or import closure. First parameter CHOICE can be 'access' or 'imported-by'. The second parameter can be 'readonly' or 'writable' in case of 'access' or any readable graph in case of 'imported-by'.

-h, --help Show this message and exit.

4.5.4 Command: graph export

Usage: cmemc [OPTIONS] [IRIS]...

Export graph(s) as NTriples to stdout (-), file or directory.

In case of file export, data from all selected graphs will be concatenated in one file. In case of directory export, .graph and .ttl files will be created for each graph.

Options:

-a, --all	Export all readable graphs.
--include-imports	Export selected graph(s) and all graphs which are imported from these selected graph(s).
--create-catalog	In addition to the .ttl and .graph files, cmemc will create an XML catalog file (catalog-v001.xml) which can be used by applications such as Protégé.
--output-dir DIRECTORY	Export to this directory.
--output-file FILE	Export to this file. [default: -]
-t, --filename-template TEXT	Template for the export file name(s). Used together with --output-dir. Possible placeholders are (Jinja2): {{hash}} - sha256 hash of the graph IRI, {{iriname}} - graph IRI converted to filename, {{connection}} - from the --connection option and {{date}} - the current date as YYYY-MM-DD. The file suffix will be appended. Needed directories will be created. [default: {{hash}}]
--mime-type [application/n-triples text/turtle]	Define the requested mime type [default: application/n-triples]
-h, --help	Show this message and exit.

4.5.5 Command: graph delete

Usage: cmemc [OPTIONS] [IRIS]...

Delete graph(s) from the store.

Options:

- a, --all Delete all writeable graphs.
- include-imports Delete selected graph(s) and all writeable graphs which are imported from these selected graph(s).
- h, --help Show this message and exit.

4.5.6 Command: graph import

Usage: cmemc [OPTIONS] INPUT_PATH [IRI]

Import graph(s) to the store.

If input is an directory, it scans for file-pairs such as xxx.ttl and xxx.ttl.graph where xxx.ttl is the actual triples file and xxx.ttl.graph contains the graph IRI as one string: "https://mygraph.de/xxx/". If input is a file, content will be uploaded to IRI. If --replace is set, the data will be overwritten, if not, it will be added.

Options:

- replace Replace / overwrite the graph - instead of just adding new triples the graph.
- skip-existing Skip importing a file if the target graph already exists in the store. Note that the graph list is fetched once at the beginning of the process, so that you can still add multiple files to one single graph (if it does not exist).
- h, --help Show this message and exit.

4.5.7 Command: graph open

Usage: cmemc [OPTIONS] IRI

Open / explore a graph in the browser.

Options:

- h, --help Show this message and exit.

4.6 Command group: project

Usage: cmemc [OPTIONS] COMMAND [ARGS]...

List, import, export, create, delete or open projects.

Projects are identified by an PROJECTID. The get a list of existing projects, execute the list command or use tab-completion.

Options:

-h, --help Show this message and exit.

Commands:

create Create empty new project(s).
delete Delete project(s).
export Export project(s) to file(s).
import Import a project from a file or directory.
list List available projects.
open Open projects in the browser.

4.6.1 Command: project open

Usage: cmemc [OPTIONS] PROJECT_IDS...

Open projects in the browser.

With this command, you can open a project in the workspace in your browser to change them.

The command accepts multiple projects IDs which results in opening multiple browser tabs.

Options:

-h, --help Show this message and exit.

4.6.2 Command: project list

Usage: cmemc [OPTIONS]

List available projects.

Outputs a list of project IDs which can be used as reference for the

project create, delete, export and import commands.

Options:

- raw Outputs raw JSON.
- id-only Lists only project identifier and no labels or other meta data.
This is useful for piping the IDs into other commands.
- h, --help Show this message and exit.

4.6.3 Command: project export

Usage: cmemc [OPTIONS] [PROJECT_IDS]...

Export project(s) to file(s).

Projects can be exported with different export formats. The default type is a zip archive which includes meta data as well as dataset resources. If more than one project is exported, a file is created for each project. By default, these files are created in the current directory and with a descriptive name (see --template option default).

Example: cmemc project export my_project

Available projects can be listed by using the 'cmemc project list' command.

You can use the template string to create subdirectories as well: cmemc config list | parallel -I% cmemc -c % project export --all -t "dump/{{connection}}/{{date}}-{{id}}.project"

Options:

- a, --all Export all projects.
- o, --overwrite Overwrite existing files. This is a dangerous option, so use it with care.
- output-dir DIRECTORY The base directory, where the project files will be created. If this directory does not exist, it will be silently created. [default: .]
- type TEXT Type of the exported project file(s). Use the --help-types option or tab completion to see a list of possible types. [default: xmlZip]

```
-t, --filename-template TEXT  Template for the export file name(s). Possible
                               placeholders are (Jinja2): {{id}} (the project
                               ID), {{connection}} (from the --connection
                               option) and {{date}} (the current date as
                               YYYY-MM-DD). The file suffix will be appended.
                               Needed directories will be created. [default:
                               {{date}}-{{connection}}-{{id}}.project]

--extract                     Export projects to a directory structure
                               instead of a ZIP archive. Note that the
                               --filename-template option is ignored here.
                               Instead, a sub-directory per exported project
                               is created under the output directory. Also
                               note that not all export types are
                               extractable.

--help-types                  Lists all possible export types.
-h, --help                    Show this message and exit.
```

4.6.4 Command: project import

```
Usage: cmemc [OPTIONS] PATH PROJECT_ID

Import a project from a file or directory.

Example: cmemc project import my_project.zip my_project

Options:
  -o, --overwrite  Overwrite an existing project. This is a dangerous option,
                    so use it with care.

  -h, --help       Show this message and exit.
```

4.6.5 Command: project delete

```
Usage: cmemc [OPTIONS] [PROJECT_IDS]...

Delete project(s).

This deletes existing data integration projects from Corporate Memory.
Projects will be deleted without prompting!
```

Example: `cmemc project delete my_project`

Projects can be listed by using the '`cmemc project list`' command.

Options:

`-a, --all` Delete all projects. This is a dangerous option, so use it with care.

`-h, --help` Show this message and exit.

4.6.6 Command: project create

Usage: `cmemc [OPTIONS] PROJECT_IDS...`

Create empty new project(s).

This creates one or more new projects. Existing projects will not be overwritten.

Example: `cmemc project create my_project`

Projects can be listed by using the '`cmemc project list`' command.

Options:

`-h, --help` Show this message and exit.

4.7 Command group: query

Usage: `cmemc [OPTIONS] COMMAND [ARGS]...`

List, execute, get status or open SPARQL queries.

Queries are identified either by a file path, an URI from the query catalog or a shortened URI (qname, using a default namespace).

In order to get a list of queries from the query catalog, use the `list` command. One or more queries can be executed one after the other with the `execute` command. With `open` command you can jump to the query editor in your browser.

Queries can use a mustache like syntax to specify placeholder for

parameter values (e.g. {{resourceUri}}). These parameter values need to be given as well, before the query can be executed (use the -p option).

Options:

-h, --help Show this message and exit.

Commands:

execute Execute queries which are loaded from files or the query catalog.
 list List available queries from the catalog.
 open Open queries in the editor of the query catalog in your browser.
 status Get status information of executed and running queries.

4.7.1 Command: query execute

Usage: cmemc [OPTIONS] QUERIES...

Execute queries which are loaded from files or the query catalog.

Queries are identified either by a file path, an URI from the query catalog, or a shortened URI (qname, using a default namespace).

If multiple queries are executed one after the other, the first failing query stops the whole execution chain.

Limitations: All optional parameters (e.g. accept, base64, ...) are provided for ALL queries in an execution chain. If you need different parameters for each query in a chain, run cmemc multiple times and use the logical operators && and || of your shell instead.

Options:

--accept TEXT	Accept header for the HTTP request(s). Setting this to 'default' means that cmemc uses an appropriate accept header for terminal output (text/csv for tables, text/turtle for graphs, * otherwise). Please refer to the Corporate Memory system manual for a list of accepted mime types. [default: default]
--no-imports	Graphs which include other graphs (using owl:imports) will be queried as merged overall-graph. This flag disables this default behaviour. The flag has no effect on

	update queries.
<code>--base64</code>	Enables base64 encoding of the query parameter for the SPARQL requests (the response is not touched). This can be useful in case there is an aggressive firewall between cmemc and Corporate Memory.
<code>-p, --parameter <TEXT TEXT>...</code>	In case of a parameterized query (placeholders with the '{{key}}' syntax), this option fills all placeholder with a given value before the query is executed. Pairs of placeholder/value need to be given as a tuple 'KEY VALUE'. A key can be used only once.
<code>--limit INTEGER</code>	Override or set the LIMIT in the executed SELECT query. Note that this option will never give you more results than the LIMIT given in the query itself.
<code>--offset INTEGER</code>	Override or set the OFFSET in the executed SELECT query.
<code>--distinct</code>	Override the SELECT query by make the result set DISTINCT.
<code>--timeout INTEGER</code>	Set max execution time for query evaluation (in milliseconds).
<code>-h, --help</code>	Show this message and exit.

4.7.2 Command: query list

Usage: cmemc [OPTIONS]

List available queries from the catalog.

Outputs a list of query URIs which can be used as reference for the query execute command.

Options:

`--id-only` Lists only query identifier and no labels or other meta data.

This is useful for piping the ids into other cmemc commands.

-h, --help Show this message and exit.

4.7.3 Command: query open

Usage: cmemc [OPTIONS] QUERIES...

Open queries in the editor of the query catalog in your browser.

With this command, you can open (remote) queries from the query catalog in the query editor in your browser (e.g. in order to change them). You can also load local query files into the query editor, in order to import them into the query catalog.

The command accepts multiple query URIs or files which results in opening multiple browser tabs.

Options:

-h, --help Show this message and exit.

4.7.4 Command: query status

Usage: cmemc [OPTIONS] [QUERY_UUID]

Get status information of executed and running queries.

With this command, you can access the latest executed SPARQL queries on the DataPlatform. These queries are identified by UUIDs and listed ordered by starting timestamp.

You can filter queries based on status and runtime in order to investigate slow queries. In addition to that, you can get the details of a specific query by using the UUID as a parameter.

Known Issue: Timeouted queries are currently shown as running queries (means: they have no runtime and no ending timestamp). This will be fixed in a future release.

Options:

--id-only Lists only query identifier and no labels or other meta data. This is useful for piping the

```

        ids into other cmemc commands.

--raw          Outputs raw JSON response of the query status
               API.

--filter <CHOICE TEXT>... Filter queries based on execution status and
                           time. First parameter CHOICE can be 'status' or
                           'slower-than'. The second parameter has to be a
                           status in case of 'status' or a time in
                           milliseconds in case of 'slower-than' filter.

-h, --help     Show this message and exit.

```

4.8 Command group: vocabulary

```

Usage: cmemc [OPTIONS] COMMAND [ARGS]...

List, (un-)install, import or open vocabs / manage cache.

Options:
  -h, --help  Show this message and exit.

Commands:
  cache      List und update the vocabulary cache.
  import     Import a turtle file as a vocabulary.
  install    Install one or more vocabularies from the catalog.
  list       Output a list of vocabularies.
  open       Open / explore a vocabulary graph in the browser.
  uninstall  Uninstall one or more vocabularies.

```

4.8.1 Command: vocabulary open

```

Usage: cmemc [OPTIONS] IRI

Open / explore a vocabulary graph in the browser.

Vocabularies are identified by their graph IRI. Installed vocabularies can
be listed with the "vocabulary list" command.

Options:
  -h, --help  Show this message and exit.

```

4.8.2 Command: vocabulary list

Usage: cmemc [OPTIONS]

Output a list of vocabularies.

Vocabularies are graphs (see 'cmemc graph' command group) which consists of class and property descriptions.

Options:

--id-only Lists only vocabulary identifier (IRIs) and no labels or other meta data. This is useful for piping the ids into other cmemc commands.

--filter [all|installed|installable] Filter list based on status. [default: installed]

--raw Outputs raw JSON.

-h, --help Show this message and exit.

4.8.3 Command: vocabulary install

Usage: cmemc [OPTIONS] [IRIS]...

Install one or more vocabularies from the catalog.

Vocabularies are identified by their graph IRI. Installable vocabularies can be listed with the "vocabulary list --filter installable" command.

Options:

-a, --all Install all vocabularies from the catalog.

-h, --help Show this message and exit.

4.8.4 Command: vocabulary uninstall

Usage: cmemc [OPTIONS] [IRIS]...

Uninstall one or more vocabularies.

Vocabularies are identified by their graph IRI. Already installed

vocabularies can be listed with the "vocabulary list --filter installed" command.

Options:

- a, --all Uninstall all installed vocabularies.
- h, --help Show this message and exit.

4.8.5 Command: vocabulary import

Usage: cmemc [OPTIONS] FILE

Import a turtle file as a vocabulary.

With this command, you can import a local ontology file as a named graph. and create a corresponding vocabulary catalog entry.

The uploaded ontology file is analysed locally in order to discover the named graph and the prefix declaration. This requires an OWL ontology description which correctly uses the vann:preferredNamespacePrefix and vann:preferredNamespaceUri properties.

Options:

- replace Replace (overwrite) existing vocabulary, if present.
- h, --help Show this message and exit.

4.9 Command group: vocabulary cache

Usage: cmemc [OPTIONS] COMMAND [ARGS]...

List und update the vocabulary cache.

Options:

- h, --help Show this message and exit.

Commands:

- list Output the content of the global vocabulary cache.
- update Reload / updates the data integration cache for a vocabulary.

4.9.1 Command: vocabulary cache update

Usage: cmemc [OPTIONS] [IRIS]...

Reload / updates the data integration cache for a vocabulary.

Options:

- a, --all Update cache for all installed vocabularies.
- h, --help Show this message and exit.

4.9.2 Command: vocabulary cache list

Usage: cmemc [OPTIONS]

Output the content of the global vocabulary cache.

Options:

- id-only Lists only vocabulary term identifier (IRIs) and no labels or other meta data. This is useful for piping the ids into other cmemc commands.
- raw Outputs raw JSON.
- h, --help Show this message and exit.

4.10 Command group: workflow

Usage: cmemc [OPTIONS] COMMAND [ARGS]...

List, execute, status or open (io) workflows.

Workflows are identified by a WORKFLOW_ID. To get a list of existing workflows, execute the list command or use tab-completion. The WORKFLOW_ID is a concatenation of an PROJECT_ID and a TASK_ID, such as "my-project:my-workflow".

Options:

- h, --help Show this message and exit.

Commands:

- execute Execute workflow(s).
- io Execute a workflow with file input/output.
- list List available workflow ids.
- open Open a workflow in your browser.

status Get status information of workflow(s).

4.10.1 Command: workflow execute

Usage: cmemc [OPTIONS] [WORKFLOW_IDS]...

Execute workflow(s).

With this command, you can start one or more workflows at the same time or in a sequence, depending on the result of the predecessor.

Executing a workflow can be done in two ways: Without `--wait` just sends the starting signal and does not look for the workflow and its result (fire and forget). Starting workflows in this way, starts all given workflows at the same time.

The optional `--wait` option starts the workflows in the same way, but also polls the status of a workflow until it is finished. In case of an error of a workflow, the next workflow is not started.

Options:

<code>-a, --all</code>	Execute all available workflows.
<code>--wait</code>	Wait until all executed workflows are completed.
<code>--polling-interval INTEGER RANGE</code>	How many seconds to wait between status polls. Status polls are cheap, so a higher polling interval is most likely not needed. [default: 1]
<code>-h, --help</code>	Show this message and exit.

4.10.2 Command: workflow io

Usage: cmemc [OPTIONS] WORKFLOW_ID

Execute a workflow with file input/output.

With this command, you can execute a workflow that uses variable datasets as input, output or for configuration. Use the input parameter to feed data into the workflow. Likewise use output for retrieval of the workflow

result. Workflows without a variable dataset will throw an error.

Options:

`-i, --input FILE` From which file the input is taken: note that the maximum file size to upload is limited to a server configured value. If the workflow has no defined variable input dataset, this can be ignored.

`-o, --output FILE` To which file the result is written to: use '-' in order to output the result to stdout. If the workflow has no defined variable output dataset, this can be ignored. Please note that the io command will not warn you on overwriting existing output files.

`--input-mimetype [guess|application/xml|application/json|text/csv]`
Which input format should be processed: If not given, cmemc will try to guess the mime type based on the file extension or will fail

`--output-mimetype`
`[guess|application/xml|application/json|application/n-triples|application/vnd.openxmlformats-officedocument.wordprocessingml.document]`
Which output format should be requested: If not given, cmemc will try to guess the mime type based on the file extension or will fail. In case of an output to stdout, a default mime type will be used (currently xml).

`-h, --help` Show this message and exit.

4.10.3 Command: workflow list

Usage: cmemc [OPTIONS]

List available workflow ids.

Options:

`--raw` Outputs raw JSON objects of workflow task search API response.

```
--id-only           Lists only workflow identifier and no labels or
                    other meta data. This is useful for piping the
                    IDs into other commands.

--filter <CHOICE TEXT>...  Filter workflows based on project or suitability
                           for the io command .First parameter CHOICE can be
                           'project' or 'io'. The second parameter has to be
                           a project ID in case of 'project' or 'input-
                           only|output-only|input-output|any' in case of
                           'io' filter.

-h, --help           Show this message and exit.
```

4.10.4 Command: workflow status

```
Usage: cmemc [OPTIONS] [WORKFLOW_IDS]...

Get status information of workflow(s).

Options:
  --project TEXT          The project, from which you want to list the
                           workflows. Project IDs can be listed with
                           the 'project list' command.

  --raw                   Output raw JSON info.

  --filter [Idle|Not executed|Finished|Cancelled|Failed|Successful|Canceling|Running|Waiting]
                           Show only workflows of a specific status.

  -h, --help             Show this message and exit.
```

4.10.5 Command: workflow open

```
Usage: cmemc [OPTIONS] WORKFLOW_ID

Open a workflow in your browser.

Options:
  -h, --help  Show this message and exit.
```