

Package ‘riods’

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Title R Client for 'iRODS'

Version 0.1.2

Description The open sourced data management software 'Integrated Rule-Oriented Data System' ('iRODS') offers solutions for the whole data life cycle (<<https://irods.org/>>). The loosely constructed and highly configurable architecture of 'iRODS' frees the user from strict formatting constraints and single-vendor solutions. This package provides an interface to the 'iRODS' REST API, allowing you to manage your data and metadata in 'iRODS' with R. Storage of annotated files and R objects in 'iRODS' ensures findability, accessibility, interoperability, and reusability of data.

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URL https://github.com/irods/irods_client_library_riods,
<https://riods.irods4r.org>

BugReports https://github.com/irods/irods_client_library_riods/issues

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as.data.frame.irods_df
Coerce to a Data Frame

Description

Coerce iRODS Zone information class to `data.frame()`.

Usage

```
## S3 method for class 'irods_df'
as.data.frame(x, ...)
```

Arguments

x	irods_df class object.
...	Currently not implemented

Value

Returns a data.frame. Note, that the columns of metadata consists of a list of data frames, and status_information and permission_information consist of data frames.

Examples

```
is_irods_demo_running()

# demonstration server (requires Bash, Docker and Docker-compose)
# use_irods_demo()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home")

# authenticate
iauth("rods", "rods")

# some data
foo <- data.frame(x = c(1, 8, 9), y = c("x", "y", "z"))

# store data in iRODS
isaveRDS(foo, "foo.rds")

# add some metadata
imeta(
  "foo.rds",
  "data_object",
  operations =
    data.frame(operation = "add", attribute = "foo", value = "bar",
              units = "baz")
)

# iRODS Zone with metadata
irods_zone <- ils(metadata = TRUE)

# check class
class(irods_zone)

# coerce into `data.frame` and extract metadata of "foo.rds"
irods_zone <- as.data.frame(irods_zone)
irods_zone[basename(irods_zone$logical_path) == "foo.rds", "metadata"]

# delete object
irm("foo.rds", force = TRUE)
```

Description

This will create an iRODS configuration file containing information about the iRODS server. Once the file has been created, future sessions connect again with the same iRODS server without further intervention.

Usage

```
create_irods(host, zone_path, overwrite = FALSE)
```

Arguments

host	URL of host.
zone_path	Path to the zone of the iRODS server (e.g., "/tempZone/home").
overwrite	Overwrite existing iRODS configuration file. Defaults to FALSE.

Details

The configuration file is located in the user-specific configuration directory. This destination is set with `R_USER_CONFIG_DIR` if set. Otherwise, it follows platform conventions (see also `rappdirs::user_config_dir()`).

Value

Invisibly, the path to the iRODS configuration file.

iadmin

The Administration Interface to iRODS

Description

Note that this function can only be used with admin rights.

Usage

```
iadmin(
  action,
  target,
  arg2 = character(1),
  arg3 = character(1),
  arg4 = character(1),
  arg5 = character(1),
  arg6 = character(1),
  arg7 = character(1),
  verbose = FALSE
)
```

Arguments

action	The action: add, modify, or remove.
target	The subject of the action: user, zone, resource, childtoresc,
arg2	arg2
arg3	arg3
arg4	arg4
arg5	arg5
arg6	arg6
arg7	arg7
verbose	Show information about the http request and response. Defaults to FALSE.

Value

Invisible http status.

Examples

```
is_irods_demo_running()

# demonstration server (requires Bash, Docker and Docker-compose)
# use_irods_demo()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home")

# authentication
iauth("rods", "rods")

# add user
iadmin(action = "add", target = "user", arg2 = "Bob", arg3 = "rodsuser")

# add user password
iadmin(action = "modify", target = "user", arg2 = "Bob", arg3 = "password",
  arg4 = "pass")

# delete user
iadmin(action = "remove", target = "user", arg2 = "Bob")
```

iauth

Authentication Service for an iRODS Zone

Description

Provides an authentication service for an iRODS zone. Using the function without arguments results in a prompt asking for the user name and password thereby preventing hard-coding of sensitive information in scripts.

Usage

```
iauth(user = NULL, password = NULL, role = "rodsuser")
```

Arguments

user	iRODS user name (prompts user for user name if not supplied).
password	iRODS password (prompts user for password if not supplied).
role	iRODS role of user (defaults to "rodsuser").

Value

Invisibly NULL.

Examples

```
is_irods_demo_running()

# demonstration server (requires Bash, Docker and Docker-compose)
# use_irods_demo()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home")

# authenticate
iauth("rods", "rods")
```

icd

Get or Set Current Working Directory in iRODS

Description

ipwd() and icd() are the iRODS equivalents of [getwd\(\)](#) and [setwd\(\)](#) respectively. For example, whereas getwd() returns the current working directory in the local system, ipwd() returns the current working directory in iRODS.

Usage

```
icd(dir)
```

```
ipwd()
```

Arguments

dir	Collection to set as working directory.
-----	---

Value

Invisibly the current directory before the change (same convention as `setwd()`).

See Also

[setwd\(\)](#) and [getwd\(\)](#) for R equivalents, [ils\(\)](#) for listing collections and objects in iRODS.

Examples

```
is_irods_demo_running()

# demonstration server (requires Bash, Docker and Docker-compose)
# use_irods_demo()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home")

# authenticate
iauth("rods", "rods")

# default dir
icd(".")
ipwd()

# relative paths work as well
icd("/tempZone/home")
ipwd()

# go back on level lower
icd("../")
ipwd()

# absolute paths work as well
icd("/tempZone/home/rods")
ipwd()

# back home
icd("/tempZone/home")
```

iget

Retrieve File or Object from iRODS

Description

Transfer a file from iRODS to the local storage with [iget\(\)](#) or read an R object from an RDS file in iRODS with [ireadRDS\(\)](#) (see [readRDS\(\)](#)).

Usage

```
iget(
  logical_path,
  local_path,
  offset = 0,
  count = 2000L,
  verbose = FALSE,
  overwrite = FALSE
)
```

```
ireadRDS(
  logical_path,
  offset = 0,
  count = 2000L,
  verbose = FALSE,
  overwrite = FALSE
)
```

Arguments

<code>logical_path</code>	Source path in iRODS.
<code>local_path</code>	Destination path in local storage. By default, the basename of the logical path; the file will be stored in the current directory (see <code>getwd()</code>).
<code>offset</code>	Offset in bytes into the data object. Defaults to 0.
<code>count</code>	Maximum number of bytes to write. Defaults to 2000.
<code>verbose</code>	Whether information should be printed about the HTTP request and response.
<code>overwrite</code>	Whether the local file should be overwritten if it exists. Defaults to FALSE.

Value

The R object in case of `ireadRDS()`, invisibly NULL in case of `iget()`.

The R object in case of `ireadRDS()`, invisibly NULL in case of `iget()`.

See Also

[iput\(\)](#) for sending files, [isaveRDS\(\)](#) for sending R objects to iRODS, [saveRDS\(\)](#) for an R equivalent.

Transfer a file from iRODS to the local storage with `iget()` or read an R object from an RDS file in iRODS with `ireadRDS()` (see `readRDS()`).

Examples

```
is_irods_demo_running()
```

```
# demonstration server (requires Bash, Docker and Docker-compose)
```



```
# use_irods_demo()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home")

# authenticate
iauth("rods", "rods")

# save the iris dataset as csv and send the file to iRODS
write.csv(iris, "iris.csv")
input("iris.csv", "iris.csv")

# bring the file back with a different name
iget("iris.csv", "newer_iris.csv")
file.exists("newer_iris.csv") # check that it has been transferred

# send an R object to iRODS in RDS format
isaveRDS(iris, "irids_in_rds.rds")

# read it back
iris_again <- ireadRDS("irids_in_rds.rds")
iris_again

# delete objects in iRODS
irm("irids_in_rds.rds", force = TRUE)
irm("iris.csv", force = TRUE)
```

ils

List iRODS Data Objects and Collections

Description

List the contents of a collection, optionally with stat, metadata, and/or access control information for each element in the collection.

Usage

```
ils(  
  logical_path = ".",  
  stat = FALSE,  
  permissions = FALSE,  
  metadata = FALSE,  
  offset = 0,  
  limit = 100,  
  message = TRUE,  
  verbose = FALSE  
)
```

Arguments

<code>logical_path</code>	Path to the collection whose contents are to be listed. By default this is the current working collection (see <code>ipwd()</code>).
<code>stat</code>	Whether stat information should be included. Defaults to FALSE.
<code>permissions</code>	Whether access control information should be included. Defaults to FALSE.
<code>metadata</code>	Whether metadata information should be included. Defaults to FALSE.
<code>offset</code>	Number of records to skip for pagination. Defaults to 0.
<code>limit</code>	Number of records to show per page. Defaults to 100.
<code>message</code>	Whether a message should be printed when the collection is empty. Defaults to TRUE.
<code>verbose</code>	Whether information should be printed about the HTTP request and response. Defaults to FALSE.

Value

Dataframe with logical paths and, if requested, additional information.

See Also

`ipwd()` for finding the working collection, `ipwd()` for setting the working collection, and `list.files()` for an R equivalent.

Examples

```
is_irods_demo_running()

# demonstration server (requires Bash, Docker and Docker-compose)
# use_irods_demo()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home")

# authenticate
iauth("rods", "rods")

# list home directory
ils()

# make collection
imkdir("some_collection")

# list a different directory
ils("/tempZone/home/rods/some_collection")

# show metadata
ils(metadata = TRUE)

# delete `some_collection`
```

```
irm("some_collection", force = TRUE, recursive = TRUE)
```

imeta

Add or Remove Metadata

Description

In iRODS, metadata is stored as attribute-value-units triples (AVUs), consisting of an attribute name, an attribute value and an optional unit. This function allows to chain several operations ('add' or 'remove') linked to specific AVUs. Read more about metadata by looking at the iCommands equivalent imeta in the [iRODS Docs](#).

Usage

```
imeta(
  logical_path,
  entity_type = c("data_object", "collection", "user"),
  operations = list(),
  verbose = FALSE
)
```

Arguments

logical_path	Path to the data object or collection (or name of the user).
entity_type	Type of item to add metadata to or remove it from. Options are 'data_object', 'collection' and 'user'.
operations	List of named lists or data.frame representing operations. The valid components of each of these lists or vectors are: <ul style="list-style-type: none"> • operation, with values 'add' or 'remove', depending on whether the AVU should be added to or removed from the metadata of the item (required). • attribute, with the name of the AVU (required). • value, with the value of the AVU (required). • units, with the unit of the AVU (optional).
verbose	Whether information should be printed about the HTTP request and response. Defaults to FALSE.

Value

Invisibly, the HTTP response.

References

<https://docs.irods.org/master/icommands/metadata/>

See Also[iquery\(\)](#)**Examples**

```
is_irods_demo_running()

# demonstration server (requires Bash, Docker and Docker-compose)
# use_irods_demo()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home")

# authentication
iauth("rods", "rods")

# some data
foo <- data.frame(x = c(1, 8, 9), y = c("x", "y", "z"))

# store
isaveRDS(foo, "foo.rds")

# check if file is stored
ils()

# add some metadata
imeta(
  "foo.rds",
  "data_object",
  operations =
    list(
      list(operation = "add", attribute = "foo", value = "bar", units = "baz")
    )
)

# `operations` can contain multiple tags supplied as a `data.frame`
imeta(
  "foo.rds",
  "data_object",
  operations = data.frame(
    operation = c("add", "add"),
    attribute = c("foo2", "foo3"),
    value = c("bar2", "bar3"),
    units = c("baz2", "baz3")
  )
)

# or again as a list of lists
imeta(
  "foo.rds",
  "data_object",
```

```

operations = list(
  list(operation = "add", attribute = "foo4", value = "bar4", units = "baz4"),
  list(operation = "add", attribute = "foo5", value = "bar5", units = "baz5")
)

# list of lists are useful as AVUs don't have to contain units
imeta(
  "foo.rds",
  "data_object",
  operations = list(
    list(operation = "add", attribute = "foo6", value = "bar6"),
    list(operation = "add", attribute = "foo7", value = "bar7", units = "baz7")
  )
)

# check if file is stored with associated metadata
ils(metadata = TRUE)

# delete object
irm("foo.rds", force = TRUE)

```

imkdir

Create a New Collection in iRODS

Description

This is the equivalent to `dir.create()`, but creating a collection in iRODS instead of a local directory.

Usage

```
imkdir(logical_path, create_parent_collections = FALSE, verbose = FALSE)
```

Arguments

logical_path	Path to the collection to create, relative to the current working directory (see <code>ipwd()</code>).
create_parent_collections	Whether parent collections should be created when necessary. Defaults to FALSE.
verbose	Whether information about the HTTP request and response should be printed. Defaults to FALSE.

Value

Invisibly the HTTP request.

See Also

[irm\(\)](#) for removing collections, [dir.create\(\)](#) for an R equivalent.

Examples

```
is_irods_demo_running()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home")

# authentication
iauth("rods", "rods")

# list all object and collection in the current collection of iRODS
ils()

# create a new collection
mkdir("new_collection")

# check if it is there
ils()

# and move to the new directory
icd("new_collection")

# remove collection
icd("../")
irm("new_collection", force = TRUE, recursive = TRUE)
```

iput

Save Files and Objects in iRODS

Description

Store an object or file into iRODS. [iput\(\)](#) should be used to transfer a file from the local storage to iRODS; [isaveRDS\(\)](#) saves an R object from the current environment in iRODS in RDS format (see [saveRDS\(\)](#)).

Usage

```
iput(
  local_path,
  logical_path,
  offset = 0,
  count = 2000L,
  truncate = TRUE,
  verbose = FALSE,
```

```

    overwrite = FALSE
  )

  isaveRDS(
    x,
    logical_path,
    offset = 0,
    count = 2000L,
    truncate = TRUE,
    verbose = FALSE,
    overwrite = FALSE
  )

```

Arguments

<code>local_path</code>	Local path of file to be sent to iRODS.
<code>logical_path</code>	Destination path in iRODS.
<code>offset</code>	Offset in bytes into the data object. Defaults to 0.
<code>count</code>	Maximum number of bytes to write. Defaults to 2000.
<code>truncate</code>	Whether to truncate the object when opening it. Defaults to TRUE.
<code>verbose</code>	Whether to print information about the HTTP request and response. Defaults to FALSE.
<code>overwrite</code>	Whether the file in iRODS should be overwritten if it exists. Defaults to FALSE.
<code>x</code>	R object to save in iRODS.

Value

(Invisibly) the HTTP response.

See Also

[iget\(\)](#) for obtaining files, [ireadRDS\(\)](#) for obtaining R objects from iRODS, [readRDS\(\)](#) for an R equivalent.

Examples

```

is_irods_demo_running()

# demonstration server (requires Bash, Docker and Docker-compose)
# use_irods_demo()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home", TRUE)

# authenticate
iauth("rods", "rods")

```

```

# save the iris dataset as csv and send the file to iRODS
write.csv(iris, "iris.csv")
iput("iris.csv", "iris.csv")

# save with a different name
iput("iris.csv", "iris_in_irods.csv")
ils()

# send an R object to iRODS in RDS format
isaveRDS(iris, "iris_in_rds.rds")

# delete objects in iRODS
irm("iris_in_irods.csv", force = TRUE)
irm("iris_in_rds.rds", force = TRUE)
irm("iris.csv", force = TRUE)

```

iquery

Query Data Objects and Collections in iRODS

Description

Use SQL-like expressions to query data objects and collections based on different properties. Read more about queries by looking at the iCommands equivalent `iquery` in the [iRODS Docs](#).

Usage

```

iquery(
  query,
  limit = 100,
  offset = 0,
  type = c("general", "specific"),
  case_sensitive = TRUE,
  distinct = TRUE,
  verbose = FALSE
)

```

Arguments

<code>query</code>	GeneralQuery for searching the iCAT database.
<code>limit</code>	Maximum number of rows to return. Defaults to 100.
<code>offset</code>	Number of rows to skip for paging. Defaults to 0.
<code>type</code>	Type of query: 'general' (the default) or 'specific'.
<code>case_sensitive</code>	Whether the string matching in the query is case sensitive. Defaults to TRUE.
<code>distinct</code>	Whether only distinct rows should be listed. Defaults to TRUE.
<code>verbose</code>	Whether information should be printed about the HTTP request and response.

Value

A dataframe with one row per result and one column per requested attribute, with "size" and "time" columns parsed to the right type.

Invisibly, the HTTP response.

References

<https://docs.irods.org/master/icommands/user/#iquest>

Use SQL-like expressions to query data objects and collections based on different properties.

See Also

[imeta\(\)](#)

Examples

```
is_irods_demo_running()

# demonstration server (requires Bash, Docker and Docker-compose)
# use_irods_demo()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home")

# authentication
iauth("rods", "rods")

# some data
foo <- data.frame(x = c(1, 8, 9), y = c("x", "y", "z"))

# store
isaveRDS(foo, "foo.rds")

# add metadata
imeta(
  "foo.rds",
  "data_object",
  operations =
    list(
      list(operation = "add", attribute = "bar", value = "baz")
    )
)

# search for objects by metadata
iquery("SELECT COLL_NAME, DATA_NAME WHERE META_DATA_ATTR_NAME LIKE 'bar%'")

# delete object
irm("foo.rds", force = TRUE)
```

irm*Remove Data Objects or Collections in iRODS*

Description

This is the equivalent of `file.remove()`, but applied to an item inside iRODS.

Usage

```
irm(logical_path, force = TRUE, recursive = FALSE, verbose = FALSE)
```

Arguments

<code>logical_path</code>	Path to the data object or collection to remove.
<code>force</code>	Whether the data object or collection should be deleted permanently. If FALSE, it is sent to the trash collection. Defaults to TRUE.
<code>recursive</code>	If a collection is provided, whether its contents should also be removed. If a collection is not empty and recursive is FALSE, it cannot be deleted. Defaults to FALSE.
<code>verbose</code>	Whether information should be printed about the HTTP request and response. Defaults to FALSE.

Value

Invisibly the HTTP call.

See Also

`imkdir()` for creating collections, `file.remove()` for an R equivalent.

Examples

```
# demonstration server (requires Bash, Docker and Docker-compose)
# use_irods_demo()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home")

# authenticate
iauth("rods", "rods")

# some data
foo <- data.frame(x = c(1, 8, 9), y = c("x", "y", "z"))

# store
isaveRDS(foo, "foo.rds")
```

```
# check if file is stored
ils()

# delete object
irm("foo.rds", force = TRUE)

# check if file is deleted
ils()
```

is_connected_irods *Predicate for iRODS Connectivity*

Description

A predicate to check whether you are currently connected to an iRODS server.

Usage

```
is_connected_irods(...)
```

Arguments

... Currently not implemented.

Value

Boolean whether or not a connection to iRODS exists.

Examples

```
is_connected_irods()
```

is_irods_demo_running *Predicate for iRODS Demonstration Service State*

Description

A predicate to check whether you are running iRODS docker demo containers.

Usage

```
is_irods_demo_running(...)
```

Arguments

... Currently not implemented.

Value

Boolean whether or not connected to iRODS

Examples

```
is_irods_demo_running()
```

print.irods_df	<i>Print Method for iRODS Data Frame Class.</i>
----------------	---

Description

Print Method for iRODS Data Frame Class.

Usage

```
## S3 method for class 'irods_df'
print(
  x,
  ...,
  digits = NULL,
  quote = FALSE,
  right = TRUE,
  row.names = FALSE,
  max = NULL
)
```

Arguments

x	An object of class irods_df.
...	optional arguments to print methods.
digits	the minimum number of significant digits to be used: see print.default .
quote	logical, indicating whether or not entries should be printed with surrounding quotes.
right	logical, indicating whether or not strings should be right-aligned. The default is right-alignment.
row.names	logical (or character vector), indicating whether (or what) row names should be printed.
max	numeric or NULL, specifying the maximal number of entries to be printed. By default, when NULL, getOption("max.print") used.

Value

Invisibly return the class irods_df object.

See Also

[print.data.frame\(\)](#)

Examples

```
is_irods_demo_running()

# demonstration server (requires Bash, Docker and Docker-compose)
# use_irods_demo()

# connect project to server
create_irods("http://localhost/irods-rest/0.9.3", "/tempZone/home")

# authenticate
iauth("rods", "rods")

# some data
foo <- data.frame(x = c(1, 8, 9), y = c("x", "y", "z"))

# store data in iRODS
isaveRDS(foo, "foo.rds")

# add some metadata
imeta(
  "foo.rds",
  "data_object",
  operations =
    data.frame(operation = "add", attribute = "foo", value = "bar",
              units = "baz")
)

# iRODS Zone with metadata
irods_zone <- ils(metadata = TRUE)

# print (default no row.names)
print(irods_zone)

# with row.names
print(irods_zone, row.names = TRUE)

# delete object
irm("foo.rds", force = TRUE)
```

Description

Run an iRODS demonstration server with `use_irods_demo()` as a Docker container instance. The function `stop_irods_demo()` stops the containers.

Usage

```
use_irods_demo(  
  user = character(),  
  pass = character(),  
  recreate = FALSE,  
  verbose = TRUE  
)
```

```
stop_irods_demo()
```

Arguments

<code>user</code>	Character vector for user name (defaults to "rods" admin)
<code>pass</code>	Character vector for password (defaults to "rods" admin password)
<code>recreate</code>	Boolean to indicate whether to recreate (reboot) the iRODS demo server (defaults to FALSE). Recreating will destroy all content on the current instance.
<code>verbose</code>	Verbosity (defaults to TRUE).

Details

These functions are untested on Windows and macOS and require:

- bash
- docker
- docker-compose

Value

Invisible

References

https://github.com/irods/irods_demo

Examples

```
if (interactive()) {  
  
  # launch docker irods_demo containers (and possibly download images) with  
  # default credentials  
  use_irods_demo()  
  
  # same but then with "alice" as user and "PASSWORD" as password
```

```
    use_irods_demo("alice", "PASSword")  
  
    # stop containers  
    stop_irods_demo()  
}
```

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