

Package ‘noctua’

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Type Package

Title Connect to 'AWS Athena' using R 'AWS SDK' 'paws' ('DBI Interface')

Version 1.5.0

Description Designed to be compatible with the 'R' package 'DBI' (Database Interface) when connecting to Amazon Web Service ('AWS') Athena <<https://aws.amazon.com/athena/>>. To do this the 'R' 'AWS' Software Development Kit ('SDK') 'paws' <<https://github.com/paws-r/paws>> is used as a driver.

Imports data.table, DBI (>= 0.7), methods, paws (>= 0.1.5), stats, utils

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Depends R (>= 3.2.0)

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BugReports <https://github.com/DyfanJones/noctua/issues>

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noctua-package

noctua: a DBI interface into Athena using paws SDK

Description

noctua provides a seamless DBI interface into Athena using the python package [paws](#).

Goal of Package

The goal of the noctua package is to provide a DBI-compliant interface to [Amazon's Athena](#) using paws software development kit (SDK). This allows for an efficient, easy setup connection to Athena using the paws SDK as a driver.

AWS Command Line Interface

As noctua is using paws as it's backend, [AWS Command Line Interface \(AWS CLI\)](#) can be used to remove user credentials when interacting with Athena.

This allows AWS profile names to be set up so that noctua can connect to different accounts from the same machine, without needing hard code any credentials.

Author(s)

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See Also

Useful links:

- <https://github.com/DyfanJones/noctua>
- Report bugs at <https://github.com/DyfanJones/noctua/issues>

assume_role

Assume AWS ARN Role

Description

Returns a set of temporary security credentials that you can use to access AWS resources that you might not normally have access to ([link](#)). These temporary credentials consist of an access key ID, a secret access key, and a security token. Typically, you use AssumeRole within your account or for cross-account access.

Usage

```
assume_role(  
  profile_name = NULL,  
  region_name = NULL,  
  role_arn = NULL,  
  role_session_name = sprintf("paws-athena-session-%s", as.integer(Sys.time())),  
  duration_seconds = 3600L,  
  set_env = FALSE  
)
```

Arguments

profile_name	The name of a profile to use. If not given, then the default profile is used. To set profile name, the AWS Command Line Interface (AWS CLI) will need to be configured. To configure AWS CLI please refer to: Configuring the AWS CLI .
region_name	Default region when creating new connections. Please refer to link for AWS region codes (region code example: Region = EU (Ireland) region_name = "eu-west-1")
role_arn	The Amazon Resource Name (ARN) of the role to assume (such as arn:aws:sts::123456789012:assum
role_session_name	An identifier for the assumed role session. By default 'noctua' creates a session name <code>sprintf("noctua-session-%s", as.integer(Sys.time()))</code>
duration_seconds	The duration, in seconds, of the role session. The value can range from 900 seconds (15 minutes) up to the maximum session duration setting for the role. This setting can have a value from 1 hour to 12 hours. By default duration is set to 3600 seconds (1 hour).
set_env	If set to TRUE environmental variables AWS_ACCESS_KEY_ID, AWS_SECRET_ACCESS_KEY and AWS_SESSION_TOKEN will be set.

Value

assume_role() returns a list containing: "AccessKeyId", "SecretAccessKey", "SessionToken" and "Expiration"

See Also

[dbConnect](#)

Examples

```
## Not run:
# Note:
# - Require AWS Account to run below example.

library(noctua)
library(DBI)

# Assuming demo ARN role
assume_role(profile_name = "YOUR_PROFILE_NAME",
            role_arn = "arn:aws:sts::123456789012:assumed-role/role_name/role_session_name",
            set_env = TRUE)

# Connect to Athena using ARN Role
con <- dbConnect(noctua::athena())

## End(Not run)
```

athena	<i>Athena Driver</i>
--------	----------------------

Description

Driver for an Athena paws connection.

Usage

```
athena()
```

Value

athena() returns a s4 class. This class is used active Athena method for [dbConnect](#)

See Also

[dbConnect](#)

AthenaWriteTables	<i>Convenience functions for reading/writing DBMS tables</i>
-------------------	--

Description

Convenience functions for reading/writing DBMS tables

Usage

```
## S4 method for signature 'AthenaConnection,character,data.frame'
dbWriteTable(
  conn,
  name,
  value,
  overwrite = FALSE,
  append = FALSE,
  row.names = NA,
  field.types = NULL,
  partition = NULL,
  s3.location = NULL,
  file.type = c("tsv", "csv", "parquet"),
  compress = FALSE,
  max.batch = Inf,
  ...
)

## S4 method for signature 'AthenaConnection,Id,data.frame'
```

```

dbWriteTable(
  conn,
  name,
  value,
  overwrite = FALSE,
  append = FALSE,
  row.names = NA,
  field.types = NULL,
  partition = NULL,
  s3.location = NULL,
  file.type = c("tsv", "csv", "parquet"),
  compress = FALSE,
  max.batch = Inf,
  ...
)

## S4 method for signature 'AthenaConnection,SQL,data.frame'
dbWriteTable(
  conn,
  name,
  value,
  overwrite = FALSE,
  append = FALSE,
  row.names = NA,
  field.types = NULL,
  partition = NULL,
  s3.location = NULL,
  file.type = c("tsv", "csv", "parquet"),
  compress = FALSE,
  max.batch = Inf,
  ...
)

```

Arguments

<code>conn</code>	An AthenaConnection object, produced by <code>[DBI::dbConnect()]</code>
<code>name</code>	A character string specifying a table name. Names will be automatically quoted so you can use any sequence of characters, not just any valid bare table name.
<code>value</code>	A <code>data.frame</code> to write to the database.
<code>overwrite</code>	Allows overwriting the destination table. Cannot be <code>TRUE</code> if <code>append</code> is also <code>TRUE</code> .
<code>append</code>	Allow appending to the destination table. Cannot be <code>TRUE</code> if <code>overwrite</code> is also <code>TRUE</code> . Existing Athena DDL file type will be retained and used when uploading data to AWS Athena. If parameter <code>file.type</code> doesn't match AWS Athena DDL file type a warning message will be created notifying user and <code>noctua</code> will use the file type for the Athena DDL.
<code>row.names</code>	Either <code>TRUE</code> , <code>FALSE</code> , <code>NA</code> or a string.

	If TRUE, always translate row names to a column called "row_names". If FALSE, never translate row names. If NA, translate rownames only if they're a character vector.
	A string is equivalent to TRUE, but allows you to override the default name. For backward compatibility, NULL is equivalent to FALSE.
field.types	Additional field types used to override derived types.
partition	Partition Athena table (needs to be a named list or vector) for example: c(var1 = "2019-20-13")
s3.location	s3 bucket to store Athena table, must be set as a s3 uri for example ("s3://mybucket/data/"). By default s3.location is set s3 staging directory from AthenaConnection object.
file.type	What file type to store data.frame on s3, noctua currently supports ["tsv", "csv", "parquet"]. Default delimited file type is "tsv", in previous versions of noctua ($\leq 1.4.0$) file type "csv" was used as default. The reason for the change is that columns containing Array/JSON format cannot be written to Athena due to the separating value ",". This would cause issues with AWS Athena. Note: "parquet" format is supported by the arrow package and it will need to be installed to utilise the "parquet" format.
compress	FALSE TRUE To determine if to compress file.type. If file type is ["csv", "tsv"] then "gzip" compression is used., for file type "parquet" "snappy" compression is used.
max.batch	Split the data frame by max number of rows i.e. 100,000 so that multiple files can be uploaded into AWS S3. By default when compression is set to TRUE and file.type is "csv" or "tsv" max.batch will split data.frame into 20 batches. This is to help the performance of AWS Athena when working with files compressed in "gzip" format. max.batch will not split the data.frame when loading file in parquet format. For more information please go to link
...	Other arguments used by individual methods.

Value

dbWriteTable() returns TRUE, invisibly. If the table exists, and both append and overwrite arguments are unset, or append = TRUE and the data frame with the new data has different column names, an error is raised; the remote table remains unchanged.

See Also

[dbWriteTable](#)

Examples

```
## Not run:
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)
```

```

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# List existing tables in Athena
dbListTables(con)

# Write data.frame to Athena table
dbWriteTable(con, "mtcars", mtcars,
             partition=c("TIMESTAMP" = format(Sys.Date(), "%Y%m%d")),
             s3.location = "s3://mybucket/data/")

# Read entire table from Athena
dbReadTable(con, "mtcars")

# List all tables in Athena after uploading new table to Athena
dbListTables(con)

# Checking if uploaded table exists in Athena
dbExistsTable(con, "mtcars")

# using default s3.location
dbWriteTable(con, "iris", iris)

# Read entire table from Athena
dbReadTable(con, "iris")

# List all tables in Athena after uploading new table to Athena
dbListTables(con)

# Checking if uploaded table exists in Athena
dbExistsTable(con, "iris")

# Disconnect from Athena
dbDisconnect(con)

## End(Not run)

```

dbClearResult

Clear Results

Description

Frees all resources (local and Athena) associated with result set. It does this by removing query output in AWS S3 Bucket, stopping query execution if still running and removed the connection resource locally.

Usage

```

## S4 method for signature 'AthenaResult'
dbClearResult(res, ...)

```


Arguments

res An object inheriting from [DBIResult](#).
 ... Other arguments passed on to methods.

Value

dbClearResult() returns TRUE, invisibly.

See Also

[dbIsValid](#)

Examples

```
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

res <- dbSendQuery(con, "show databases")
dbClearResult(res)

# Check if connection if valid after closing connection
dbDisconnect(con)
```

 dbColumnInfo

Information about result types

Description

Produces a data.frame that describes the output of a query.

Usage

```
## S4 method for signature 'AthenaResult'
dbColumnInfo(res, ...)
```

Arguments

res An object inheriting from [DBIResult](#).
 ... Other arguments passed on to methods.

Value

dbColumnInfo() returns a data.frame with as many rows as there are output fields in the result. The data.frame has two columns (field_name, type).

See Also

[dbHasCompleted](#)

Examples

```
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `RAthena::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Get Column information from query
res <- dbSendQuery(con, "select * from information_schema.tables")
dbColumnInfo(res)
dbClearResult(res)

# Disconnect from Athena
dbDisconnect(con)
```

dbConnect,AthenaDriver-method

Connect to Athena using R's sdk paws

Description

It is never advised to hard-code credentials when making a connection to Athena (even though the option is there). Instead it is advised to use profile_name (set up by [AWS Command Line Interface](#)), [Amazon Resource Name roles](#) or environmental variables. Here is a list of supported environment variables:

- **AWS_ACCESS_KEY_ID:** is equivalent to the dbConnect parameter - aws_access_key_id
- **AWS_SECRET_ACCESS_KEY:** is equivalent to the dbConnect parameter - aws_secret_access_key
- **AWS_SESSION_TOKEN:** is equivalent to the dbConnect parameter - aws_session_token
- **AWS_ROLE_ARN:** is equivalent to the dbConnect parameter - role_arn
- **AWS_EXPIRATION:** is equivalent to the dbConnect parameter - duration_seconds
- **AWS_ATHENA_S3_STAGING_DIR:** is equivalent to the dbConnect parameter - s3_staging_dir
- **AWS_ATHENA_WORK_GROUP:** is equivalent to dbConnect parameter - work_group

Usage

```
## S4 method for signature 'AthenaDriver'
dbConnect(
  drv,
  aws_access_key_id = NULL,
  aws_secret_access_key = NULL,
  aws_session_token = NULL,
  schema_name = "default",
  work_group = NULL,
  poll_interval = NULL,
  encryption_option = c("NULL", "SSE_S3", "SSE_KMS", "CSE_KMS"),
  kms_key = NULL,
  profile_name = NULL,
  role_arn = NULL,
  role_session_name = sprintf("noctua-session-%s", as.integer(Sys.time())),
  duration_seconds = 3600L,
  s3_staging_dir = NULL,
  region_name = NULL,
  ...
)
```

Arguments

drv	an object that inherits from DBIDriver , or an existing DBIConnection object (in order to clone an existing connection).
aws_access_key_id	AWS access key ID
aws_secret_access_key	AWS secret access key
aws_session_token	AWS temporary session token
schema_name	The schema_name to which the connection belongs
work_group	The name of the work group to run Athena queries , Currently defaulted to NULL.
poll_interval	Amount of time took when checking query execution status. Default set to a random interval between 0.5 - 1 seconds.
encryption_option	Athena encryption at rest link . Supported Amazon S3 Encryption Options ["NULL", "SSE_S3", "SSE_KMS", "CSE_KMS"]. Connection will default to NULL, usually changing this option is not required.
kms_key	AWS Key Management Service , please refer to link for more information around the concept.
profile_name	The name of a profile to use. If not given, then the default profile is used. To set profile name, the AWS Command Line Interface (AWS CLI) will need to be configured. To configure AWS CLI please refer to: Configuring the AWS CLI .
role_arn	The Amazon Resource Name (ARN) of the role to assume (such as arn:aws:sts::123456789012:assum

role_session_name	An identifier for the assumed role session. By default 'RAthena' creates a session name <code>sprintf("RAthena-session-%s", as.integer(Sys.time()))</code>
duration_seconds	The duration, in seconds, of the role session. The value can range from 900 seconds (15 minutes) up to the maximum session duration setting for the role. This setting can have a value from 1 hour to 12 hours. By default duration is set to 3600 seconds (1 hour).
s3_staging_dir	The location in Amazon S3 where your query results are stored, such as <code>s3://path/to/query/bucket/</code>
region_name	Default region when creating new connections. Please refer to link for AWS region codes (region code example: Region = EU (Ireland) <code>region_name = "eu-west-1"</code>)
...	other parameters for paws session

Value

`dbConnect()` returns a `s4` class. This object is used to communicate with AWS Athena.

See Also

[dbConnect](#)

Examples

```
## Not run:
# Connect to Athena using your aws access keys
library(DBI)
con <- dbConnect(RAthena:athena(),
  aws_access_key_id='YOUR_ACCESS_KEY_ID', #
  aws_secret_access_key='YOUR_SECRET_ACCESS_KEY',
  s3_staging_dir='s3://path/to/query/bucket/',
  region_name='us-west-2')
dbDisconnect(con)

# Connect to Athena using your profile name
# Profile name can be created by using AWS CLI
con <- dbConnect(RAthena::athena(),
  profile_name = "YOUR_PROFILE_NAME",
  s3_staging_dir = 's3://path/to/query/bucket/')
dbDisconnect(con)

# Connect to Athena using ARN role
con <- dbConnect(athena(),
  profile_name = "YOUR_PROFILE_NAME",
  role_arn = "arn:aws:sts::123456789012:assumed-role/role_name/role_session_name",
  s3_staging_dir = 's3://path/to/query/bucket/')

dbDisconnect(con)

## End(Not run)
```

dbDataType, AthenaDriver, ANY-method
Determine SQL data type of object

Description

Returns a character string that describes the Athena SQL data type for the obj object.

Usage

```
## S4 method for signature 'AthenaDriver,ANY'  
dbDataType(dbObj, obj, ...)  
  
## S4 method for signature 'AthenaDriver,list'  
dbDataType(dbObj, obj, ...)  
  
## S4 method for signature 'AthenaConnection,ANY'  
dbDataType(dbObj, obj, ...)  
  
## S4 method for signature 'AthenaConnection,data.frame'  
dbDataType(dbObj, obj, ...)
```

Arguments

dbObj	A object inheriting from DBIDriver or DBIConnection
obj	An R object whose SQL type we want to determine.
...	Other arguments passed on to methods.

Value

dbDataType returns the Athena type that correspond to the obj argument as a non-empty character string.

See Also

[dbDataType](#)

Examples

```
library(noctua)  
dbDataType(athena(), 1:5)  
dbDataType(athena(), 1)  
dbDataType(athena(), TRUE)  
dbDataType(athena(), Sys.Date())  
dbDataType(athena(), Sys.time())  
dbDataType(athena(), c("x", "abc"))  
dbDataType(athena(), list(raw(10), raw(20)))
```

```
vapply(iris, function(x) dbDataType(noctua::athena(), x),
       FUN.VALUE = character(1), USE.NAMES = TRUE)

# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Sending Queries to Athena
dbDataType(con, iris)

# Disconnect connection
dbDisconnect(con)
```

dbDisconnect

Disconnect (close) an Athena connection

Description

This closes the connection to Athena.

Usage

```
## S4 method for signature 'AthenaConnection'
dbDisconnect(conn, ...)
```

Arguments

conn	A DBIConnection object, as returned by dbConnect() .
...	Other parameters passed on to methods.

Value

dbDisconnect() returns TRUE, invisibly.

See Also

[dbDisconnect](#)

Examples

```

# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Disconnect conenction
dbDisconnect(con)

```

dbExistsTable	<i>Does Athena table exist?</i>
---------------	---------------------------------

Description

Returns logical scalar if the table exists or not. TRUE if the table exists, FALSE otherwise.

Usage

```

## S4 method for signature 'AthenaConnection,character'
dbExistsTable(conn, name, ...)

```

Arguments

conn	A DBIConnection object, as returned by dbConnect() .
name	A character string specifying a DBMS table name.
...	Other parameters passed on to methods.

Value

dbExistsTable() returns logical scalar. TRUE if the table exists, FALSE otherwise.

See Also

[dbExistsTable](#)

Examples

```

## Not run:
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

```

```

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Write data.frame to Athena table
dbWriteTable(con, "mtcars", mtcars,
             partition=c("TIMESTAMP" = format(Sys.Date(), "%Y%m%d")),
             s3.location = "s3://mybucket/data/")

# Check if table exists from Athena
dbExistsTable(con, "mtcars")

# Disconnect conenction
dbDisconnect(con)

## End(Not run)

```

dbFetch

Fetch records from previously executed query

Description

Currently returns the top n elements (rows) from result set or returns entire table from Athena.

Usage

```

## S4 method for signature 'AthenaResult'
dbFetch(res, n = -1, ...)

```

Arguments

res	An object inheriting from DBIResult , created by dbSendQuery() .
n	maximum number of records to retrieve per fetch. Use n = -1 or n = Inf to retrieve all pending records. Some implementations may recognize other special values. Currently chunk sizes range from 0 to 999, if entire dataframe is required use n = -1 or n = Inf.
...	Other arguments passed on to methods.

Value

dbFetch() returns a data frame.

See Also

[dbFetch](#)

Examples

```
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

res <- dbSendQuery(con, "show databases")
dbFetch(res)
dbClearResult(res)

# Disconnect from Athena
dbDisconnect(con)
```

dbGetInfo

Get DBMS metadata

Description

Get DBMS metadata

Usage

```
## S4 method for signature 'AthenaConnection'
dbGetInfo(dbObj, ...)

## S4 method for signature 'AthenaResult'
dbGetInfo(dbObj, ...)
```

Arguments

dbObj An object inheriting from [DBIObject](#), i.e. [DBIDriver](#), [DBIConnection](#), or a [DBIResult](#)

... Other arguments to methods.

Value

a named list

See Also

[dbGetInfo](#)

Examples

```

# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Returns metadata from connection object
metadata <- dbGetInfo(con)

# Return metadata from Athena query object
res <- dbSendQuery(con, "show databases")
dbGetInfo(res)

# Clear result
dbClearResult(res)

# disconnect from Athena
dbDisconnect(con)

```

dbGetPartition	<i>Athena table partitions</i>
----------------	--------------------------------

Description

This method returns all partitions from Athena table.

Usage

```

dbGetPartition(conn, name, ...)

## S4 method for signature 'AthenaConnection'
dbGetPartition(conn, name, ...)

```

Arguments

conn	A DBIConnection object, as returned by dbConnect() .
name	A character string specifying a DBMS table name.
...	Other parameters passed on to methods.

Value

data.frame that returns all partitions in table, if no partitions in Athena table then function will return error from Athena.

Examples

```
## Not run:
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# write iris table to Athena
dbWriteTable(con, "iris",
             iris,
             partition = c("timestamp" = format(Sys.Date(), "%Y%m%d")),
             s3.location = "s3://path/to/store/athena/table/")

# return table partitions
noctua::dbGetPartition(con, "iris")

# disconnect from Athena
dbDisconnect(con)

## End(Not run)
```

dbGetQuery

Send query, retrieve results and then clear result set

Description

Send query, retrieve results and then clear result set

Usage

```
## S4 method for signature 'AthenaConnection,character'
dbGetQuery(conn, statement = NULL, ...)
```

Arguments

conn	A DBIConnection object, as returned by <code>dbConnect()</code> .
statement	a character string containing SQL.
...	Other parameters passed on to methods.

Value

dbGetQuery() returns a dataframe.

See Also[dbGetQuery](#)**Examples**

```
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Sending Queries to Athena
dbGetQuery(con, "show databases")

# Disconnect connection
dbDisconnect(con)
```

`dbGetTables`*List Athena Schema, Tables and TableTypes*

Description

Method to get Athena schema, tables and table types return as a data.frame

Usage

```
dbGetTables(conn, ...)

## S4 method for signature 'AthenaConnection'
dbGetTables(conn, schema = NULL, ...)
```

Arguments

<code>conn</code>	A DBIConnection object, as returned by <code>dbConnect()</code> .
<code>...</code>	Other parameters passed on to methods.
<code>schema</code>	Athena schema, default set to NULL to return all tables from all Athena schemas. Note: The use of DATABASE and SCHEMA is interchangeable within Athena.

Value

`dbGetTables()` returns a data.frame.

Examples

```
## Not run:
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)
library(noctua)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Return hierarchy of tables in Athena
dbGetTables(con)

# Disconnect connection
dbDisconnect(con)

## End(Not run)
```

dbHasCompleted	<i>Completion status</i>
----------------	--------------------------

Description

This method returns if the query has completed.

Usage

```
## S4 method for signature 'AthenaResult'
dbHasCompleted(res, ...)
```

Arguments

res	An object inheriting from DBIResult .
...	Other arguments passed on to methods.

Value

dbHasCompleted() returns a logical scalar. TRUE if the query has completed, FALSE otherwise.

See Also

[dbHasCompleted](#)

Examples

```

# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Check if query has completed
res <- dbSendQuery(con, "show databases")
dbHasCompleted(res)

dbClearResult(res)

# Disconnect from Athena
dbDisconnect(con)

```

dbIsValid	<i>Is this DBMS object still valid?</i>
-----------	---

Description

This method tests whether the dbObj is still valid.

Usage

```

## S4 method for signature 'AthenaConnection'
dbIsValid(dbObj, ...)

## S4 method for signature 'AthenaResult'
dbIsValid(dbObj, ...)

```

Arguments

dbObj	An object inheriting from DBIObject , i.e. DBIDriver , DBIConnection , or a DBIResult
...	Other arguments to methods.

Value

dbIsValid() returns logical scalar, TRUE if the object (dbObj) is valid, FALSE otherwise.

See Also

[dbIsValid](#)

Examples

```
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Check is connection is valid
dbIsValid(con)

# Check is query is valid
res <- dbSendQuery(con, "show databases")
dbIsValid(res)

# Check if query is valid after clearing result
dbClearResult(res)
dbIsValid(res)

# Check if connection if valid after closing connection
dbDisconnect(con)
dbIsValid(con)
```

dbListFields	<i>List Field names of Athena table</i>
--------------	---

Description

List Field names of Athena table

Usage

```
## S4 method for signature 'AthenaConnection,character'
dbListFields(conn, name, ...)
```

Arguments

conn	A DBIConnection object, as returned by dbConnect() .
name	a character string with the name of the remote table.
...	Other parameters passed on to methods.

Value

dbListFields() returns a character vector with all the fields from an Athena table.

See Also[dbListFields](#)**Examples**

```
## Not run:
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Write data.frame to Athena table
dbWriteTable(con, "mtcars", mtcars,
             partition=c("TIMESTAMP" = format(Sys.Date(), "%Y%m%d")),
             s3.location = "s3://mybucket/data/")

# Return list of fields in table
dbListFields(con, "mtcars")

# Disconnect conenction
dbDisconnect(con)

## End(Not run)
```

`dbListTables`*List Athena Tables*

Description

Returns the unquoted names of Athena tables accessible through this connection.

Usage

```
## S4 method for signature 'AthenaConnection'
dbListTables(conn, schema = NULL, ...)
```

Arguments

<code>conn</code>	A DBIConnection object, as returned by <code>dbConnect()</code> .
<code>schema</code>	Athena schema, default set to NULL to return all tables from all Athena schemas. Note: The use of DATABASE and SCHEMA is interchangeable within Athena.
<code>...</code>	Other parameters passed on to methods.

Value

dbListTables() returns a character vector with all the tables from Athena.

See Also

[dbListTables](#)

Examples

```
## Not run:
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Return list of tables in Athena
dbListTables(con)

# Disconnect conenction
dbDisconnect(con)

## End(Not run)
```

dbQuote

Quote Identifiers

Description

Call this method to generate string that is suitable for use in a query as a column or table name.

Usage

```
## S4 method for signature 'AthenaConnection,character'
dbQuoteString(conn, x, ...)

## S4 method for signature 'AthenaConnection,SQL'
dbQuoteIdentifier(conn, x, ...)
```

Arguments

conn	A DBIConnection object, as returned by dbConnect() .
x	A character vector to quote as string.
...	Other arguments passed on to methods.

Value

Returns a character object, for more information please check out: [dbQuoteString](#), [dbQuoteIdentifier](#)

See Also

[dbQuoteString](#), [dbQuoteIdentifier](#)

dbRemoveTable	<i>Remove table from Athena</i>
---------------	---------------------------------

Description

Removes Athena table but does not remove the data from Amazon S3 bucket.

Usage

```
## S4 method for signature 'AthenaConnection,character'
dbRemoveTable(conn, name, delete_data = TRUE, confirm = FALSE, ...)
```

Arguments

conn	A DBIConnection object, as returned by dbConnect() .
name	A character string specifying a DBMS table name.
delete_data	Deletes S3 files linking to AWS Athena table
confirm	Allows for S3 files to be deleted without the prompt check. It is recommend to leave this set to FALSE to avoid deleting other S3 files when the table's definition points to the root of S3 bucket.
...	Other parameters passed on to methods.

Value

dbRemoveTable() returns TRUE, invisibly.

See Also

[dbRemoveTable](#)

Examples

```
## Not run:
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
```

```

con <- dbConnect(noctua::athena())

# Write data.frame to Athena table
dbWriteTable(con, "mtcars", mtcars,
             partition=c("TIMESTAMP" = format(Sys.Date(), "%Y%m%d")),
             s3.location = "s3://mybucket/data/")

# Remove Table from Athena
dbRemoveTable(con, "mtcars")

# Disconnect connection
dbDisconnect(con)

## End(Not run)

```

dbShow

Show Athena table's DDL

Description

Executes a statement to return the data description language (DDL) of the Athena table.

Usage

```

dbShow(conn, name, ...)

## S4 method for signature 'AthenaConnection'
dbShow(conn, name, ...)

```

Arguments

conn	A DBIConnection object, as returned by <code>dbConnect()</code> .
name	A character string specifying a DBMS table name.
...	Other parameters passed on to methods.

Value

dbShow() returns [SQL](#) characters of the Athena table DDL.

Examples

```

## Not run:
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name

```

```

con <- dbConnect(noctua::athena())

# write iris table to Athena
dbWriteTable(con, "iris",
             iris,
             partition = c("timestamp" = format(Sys.Date(), "%Y%m%d")),
             s3.location = "s3://path/to/store/athena/table/")

# return table ddl
noctua::dbShow(con, "iris")

# disconnect from Athena
dbDisconnect(con)

## End(Not run)

```

db_compute

S3 implementation of db_compute for Athena

Description

This is a backend function for dplyr's compute function. Users won't be required to access and run this function.

Usage

```
db_compute.AthenaConnection(con, table, sql, ...)
```

Arguments

con	A dbConnect object, as returned by <code>dbConnect()</code>
table	Table name, if left default noctua will use the default from dplyr's compute function.
sql	SQL code to be sent to the data
...	passes noctua table creation parameters: [file_type,s3_location,partition] <ul style="list-style-type: none"> file_type: What file type to store data.frame on s3, noctua currently supports ["NULL","csv", "parquet", "json"]. "NULL" will let athena set the file_type for you. s3_location: s3 bucket to store Athena table, must be set as a s3 uri for example ("s3://mybucket/data/") partition: Partition Athena table, requires to be a partitioned variable from previous table.

Value

db_compute returns table name

See Also[db_save_query](#)**Examples**

```
## Not run:
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)
library(dplyr)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Write data.frame to Athena table
copy_to(con, mtcars,
        s3_location = "s3://mybucket/data/")

# Write Athena table from tbl_sql
athena_mtcars <- tbl(con, "mtcars")
mtcars_filter <- athena_mtcars %>% filter(gear >=4)

# create athena with unique table name
mtcars_filer %>%
  compute()

# create athena with specified name and s3 location
mtcars_filer %>%
  compute("mtcars_filer",
        s3_location = "s3://mybucket/mtcars_filer/")

# Disconnect from Athena
dbDisconnect(con)

## End(Not run)
```

db_copy_to

S3 implementation of db_copy_to for Athena

Description

This is an Athena method for dbplyr function `db_copy_to` to create an Athena table from a `data.frame`.

Usage

```
db_copy_to.AthenaConnection(
  con,
```

```

    table,
    values,
    overwrite = FALSE,
    append = FALSE,
    types = NULL,
    partition = NULL,
    s3_location = NULL,
    file_type = c("csv", "tsv", "parquet"),
    compress = FALSE,
    max_batch = Inf,
    ...
  )

```

Arguments

con	A dbConnect object, as returned by <code>dbConnect()</code>
table	A character string specifying a table name. Names will be automatically quoted so you can use any sequence of characters, not just any valid bare table name.
values	A <code>data.frame</code> to write to the database.
overwrite	Allows overwriting the destination table. Cannot be TRUE if append is also TRUE.
append	Allow appending to the destination table. Cannot be TRUE if overwrite is also TRUE. Existing Athena DDL file type will be retained and used when uploading data to AWS Athena. If parameter <code>file.type</code> doesn't match AWS Athena DDL file type a warning message will be created notifying user and noctua will use the file type for the Athena DDL.
types	Additional field types used to override derived types.
partition	Partition Athena table (needs to be a named list or vector) for example: <code>c(var1 = "2019-20-13")</code>
s3_location	s3 bucket to store Athena table, must be set as a s3 uri for example (" <code>s3://mybucket/data/</code> ")
file_type	What file type to store <code>data.frame</code> on s3, noctua currently supports ["tsv", "csv", "parquet"]. Default delimited file type is "tsv", in previous versions of noctua (<code>=< 1.4.0</code>) file type "csv" was used as default. The reason for the change is that columns containing Array/JSON format cannot be written to Athena due to the separating value ",". This would cause issues with AWS Athena. Note: "parquet" format is supported by the arrow package and it will need to be installed to utilise the "parquet" format.
compress	FALSE TRUE To determine if to compress file.type. If file type is ["csv", "tsv"] then "gzip" compression is used, for file type "parquet" "snappy" compression is used.
max_batch	Split the data frame by max number of rows i.e. 100,000 so that multiple files can be uploaded into AWS S3. By default when compression is set to TRUE and file.type is "csv" or "tsv" max.batch will split data.frame into 20 batches. This is to help the performance of AWS Athena when working with files compressed in "gzip" format. max.batch will not split the data.frame when loading file in parquet format. For more information please go to link
...	other parameters currently not supported in noctua

Value

db_copy_to returns table name

See Also

[AthenaWriteTables](#)

Examples

```
## Not run:
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)
library(dplyr)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# List existing tables in Athena
dbListTables(con)

# Write data.frame to Athena table
copy_to(con, mtcars,
        s3_location = "s3://mybucket/data/")

# Checking if uploaded table exists in Athena
dbExistsTable(con, "mtcars")

# Write Athena table from tbl_sql
athena_mtcars <- tbl(con, "mtcars")
mtcars_filter <- athena_mtcars %>% filter(gear >=4)

copy_to(con, mtcars_filter)

# Checking if uploaded table exists in Athena
dbExistsTable(con, "mtcars_filter")

# Disconnect from Athena
dbDisconnect(con)

## End(Not run)
```

db_desc

S3 implementation of db_desc for Athena

Description

This is a backend function for dplyr to retrieve meta data about Athena queries. Users won't be required to access and run this function.

Usage

```
db_desc.AthenaConnection(x)
```

Arguments

x A [dbConnect](#) object, as returned by `dbConnect()`

Value

Character variable containing Meta Data about query sent to Athena. The Meta Data is returned in the following format:

```
"Athena <paws version> [<profile_name>@region/database]"
```

db_save_query

S3 implementation of db_save_query for Athena

Description

This is a backend method for dplyr function `db_save_query` to creating tables from `tbl` using compute function. Users won't be required to access and run this function. However users may find it useful to know the extra parameters `db_save_query` provided for compute function.

Usage

```
db_save_query.AthenaConnection(
  con,
  sql,
  name,
  file_type = c("NULL", "csv", "parquet", "json"),
  s3_location = NULL,
  partition = NULL,
  ...
)
```

Arguments

con	A dbConnect object, as returned by <code>dbConnect()</code>
sql	SQL code to be sent to the data
name	Table name if left default noctua will use default from 'dplyr's compute function.
file_type	What file type to store data.frame on s3, noctua currently supports ["NULL","csv", "parquet", "json"]. "NULL" will let athena set the file_type for you.
s3_location	s3 bucket to store Athena table, must be set as a s3 uri for example ("s3://mybucket/data/")
partition	Partition Athena table, requires to be a partitioned variable from previous table.
...	other parameters, currently not implemented

Value

db_save_query returns table name

noctua_options	<i>A method to change noctua backend file parser.</i>
----------------	---

Description

A method to change noctua backend file parser.

Usage

```
noctua_options(file_parser = c("data.table", "vroom"))
```

Arguments

file_parser Method to read and write tables to Athena, currently defaults to data.table

Value

noctua_options() returns NULL, invisibly.

Examples

```
library(noctua)

# change file parser from default data.table to vroom
noctua_options("vroom")
```

Query	<i>Execute a query on Athena</i>
-------	----------------------------------

Description

The dbSendQuery() and dbSendStatement() method submits a query to Athena but does not wait for query to execute. [dbHasCompleted](#) method will need to ran to check if query has been completed or not. The dbExecute() method submits a query to Athena and waits for the query to be executed.

Usage

```
## S4 method for signature 'AthenaConnection,character'
dbSendQuery(conn, statement = NULL, ...)

## S4 method for signature 'AthenaConnection,character'
dbSendStatement(conn, statement = NULL, ...)

## S4 method for signature 'AthenaConnection,character'
dbExecute(conn, statement = NULL, ...)
```

Arguments

conn A [DBIConnection](#) object, as returned by `dbConnect()`.
statement a character string containing SQL.
... Other parameters passed on to methods.

Value

Returns `AthenaResult` class.

See Also

[dbSendQuery](#), [dbSendStatement](#), [dbExecute](#)

Examples

```
# Note:  
# - Require AWS Account to run below example.  
# - Different connection methods can be used please see `noctua::dbConnect` documentation  
  
library(DBI)  
  
# Demo connection to Athena using profile name  
con <- dbConnect(noctua::athena())  
  
# Sending Queries to Athena  
res1 <- dbSendQuery(con, "show databases")  
res2 <- dbSendStatement(con, "show databases")  
res3 <- dbExecute(con, "show databases")  
  
# Disconnect connection  
dbDisconnect(con)
```

session_token

Get Session Tokens for PAWS Connection

Description

Returns a set of temporary credentials for an AWS account or IAM user ([link](#)).

Usage

```
get_session_token(  
  profile_name = NULL,  
  region_name = NULL,  
  serial_number = NULL,  
  token_code = NULL,
```

```

    duration_seconds = 3600L,
    set_env = FALSE
)

```

Arguments

profile_name	The name of a profile to use. If not given, then the default profile is used. To set profile name, the AWS Command Line Interface (AWS CLI) will need to be configured. To configure AWS CLI please refer to: Configuring the AWS CLI .
region_name	Default region when creating new connections. Please refer to link for AWS region codes (region code example: Region = EU (Ireland) region_name = "eu-west-1")
serial_number	The identification number of the MFA device that is associated with the IAM user who is making the GetSessionToken call. Specify this value if the IAM user has a policy that requires MFA authentication. The value is either the serial number for a hardware device (such as 'GAHT12345678') or an Amazon Resource Name (ARN) for a virtual device (such as arn:aws:iam::123456789012:mfa/user).
token_code	The value provided by the MFA device, if MFA is required. If any policy requires the IAM user to submit an MFA code, specify this value. If MFA authentication is required, the user must provide a code when requesting a set of temporary security credentials. A user who fails to provide the code receives an "access denied" response when requesting resources that require MFA authentication.
duration_seconds	The duration, in seconds, that the credentials should remain valid. Acceptable duration for IAM user sessions range from 900 seconds (15 minutes) to 129,600 seconds (36 hours), with 3,600 seconds (1 hour) as the default.
set_env	If set to TRUE environmental variables AWS_ACCESS_KEY_ID, AWS_SECRET_ACCESS_KEY and AWS_SESSION_TOKEN will be set.

Value

get_session_token() returns a list containing: "AccessKeyId", "SecretAccessKey", "SessionToken" and "Expiration"

Examples

```

## Not run:
# Note:
# - Require AWS Account to run below example.

library(noctua)
library(DBI)

# Create Temporary Credentials duration 1 hour
get_session_token("YOUR_PROFILE_NAME",
  serial_number='arn:aws:iam::123456789012:mfa/user',
  token_code = "531602",
  set_env = TRUE)

```

```
# Connect to Athena using temporary credentials
con <- dbConnect(athena())

## End(Not run)
```

```
sqlCreateTable      Creates query to create a simple Athena table
```

Description

Creates an interface to compose CREATE EXTERNAL TABLE.

Usage

```
## S4 method for signature 'AthenaConnection'
sqlCreateTable(
  con,
  table,
  fields,
  field.types = NULL,
  partition = NULL,
  s3.location = NULL,
  file.type = c("tsv", "csv", "parquet"),
  compress = FALSE,
  ...
)
```

Arguments

con	A database connection.
table	Name of the table. Escaped with <code>dbQuoteIdentifier()</code> .
fields	Either a character vector or a data frame. A named character vector: Names are column names, values are types. Names are escaped with <code>dbQuoteIdentifier()</code> . Field types are unescaped. A data frame: field types are generated using <code>dbDataType()</code> .
field.types	Additional field types used to override derived types.
partition	Partition Athena table (needs to be a named list or vector) for example: <code>c(var1 = "2019-20-13")</code>
s3.location	s3 bucket to store Athena table, must be set as a s3 uri for example (<code>"s3://mybucket/data/"</code>). By default s3.location is set s3 staging directory from <code>AthenaConnection</code> object.
file.type	What file type to store data.frame on s3, noctua currently supports <code>["csv", "tsv", "parquet"]</code>
compress	FALSE TRUE To determine if to compress file.type. If file type is <code>["csv", "tsv"]</code> then "gzip" compression is used. Currently parquet compression isn't supported.
...	Other arguments used by individual methods.

Value

sqlCreateTable returns data.frame's DDL in the [SQL](#) format.

See Also

[sqlCreateTable](#)

Examples

```
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(DBI)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# Create DDL for iris data.frame
sqlCreateTable(con, "iris", iris, s3.location = "s3://path/to/athena/table")

# Create DDL for iris data.frame with partition
sqlCreateTable(con, "iris", iris,
               partition = c("timestamp" = format(Sys.Date(), "%Y%m%d")),
               s3.location = "s3://path/to/athena/table")

# Create DDL for iris data.frame with partition and file.type parquet
sqlCreateTable(con, "iris", iris,
               partition = c("timestamp" = format(Sys.Date(), "%Y%m%d")),
               s3.location = "s3://path/to/athena/table",
               file.type = "parquet")

# Disconnect from Athena
dbDisconnect(con)
```

sqlData

Converts data frame into suitable format to be uploaded to Athena

Description

This method converts data.frame columns into the correct format so that it can be uploaded Athena.

Usage

```
## S4 method for signature 'AthenaConnection'
sqlData(
  con,
```

```

    value,
    row.names = NA,
    file.type = c("tsv", "csv", "parquet"),
    ...
  )

```

Arguments

con	A database connection.
value	A data frame
row.names	Either TRUE, FALSE, NA or a string. If TRUE, always translate row names to a column called "row_names". If FALSE, never translate row names. If NA, translate rownames only if they're a character vector. A string is equivalent to TRUE, but allows you to override the default name. For backward compatibility, NULL is equivalent to FALSE.
file.type	What file type to store data.frame on s3, noctua currently supports ["csv", "tsv", "parquet"]. Note: This parameter is used for format any special characters that clash with file type separator.
...	Other arguments used by individual methods.

Value

sqlData returns a dataframe formatted for Athena. Currently converts list variable types into character split by ' | ', similar to how data.table writes out to files.

See Also

[sqlData](#)

sql_translate_env *AWS Athena backend dbplyr*

Description

Create s3 implementation of sql_translate_env for AWS Athena sql translate environment based off [Athena Data Types](#) and [DML Queries, Functions, and Operators](#)

Usage

```
sql_translate_env.AthenaConnection(con)
```

Arguments

con	An AthenaConnection object, produced by [DBI::dbConnect()]
-----	--

work_group	<i>Athena Work Groups</i>
------------	---------------------------

Description

Lower level API access, allows user to create and delete Athena Work Groups.

create_work_group Creates a workgroup with the specified name ([link](#)). The work group utilises parameters from the dbConnect object, to determine the encryption and output location of the work group. The s3_staging_dir, encryption_option and kms_key parameters are gotten from [dbConnect](#)

tag_options Helper function to create tag options for function create_work_group()

delete_work_group Deletes the workgroup with the specified name ([link](#)). The primary work-group cannot be deleted.

list_work_groups Lists available workgroups for the account ([link](#)).

get_work_group Returns information about the workgroup with the specified name ([link](#)).

update_work_group Updates the workgroup with the specified name ([link](#)). The workgroup's name cannot be changed. The work group utilises parameters from the dbConnect object, to determine the encryption and output location of the work group. The s3_staging_dir, encryption_option and kms_key parameters are gotten from [dbConnect](#)

Usage

```
create_work_group(
  conn,
  work_group = NULL,
  enforce_work_group_config = FALSE,
  publish_cloud_watch_metrics = FALSE,
  bytes_scanned_cut_off = 10000000L,
  description = NULL,
  tags = tag_options(key = NULL, value = NULL)
)

tag_options(key = NULL, value = NULL)

delete_work_group(conn, work_group = NULL, recursive_delete_option = FALSE)

list_work_groups(conn)

get_work_group(conn, work_group = NULL)

update_work_group(
  conn,
  work_group = NULL,
  remove_output_location = FALSE,
  enforce_work_group_config = FALSE,
```

```

publish_cloud_watch_metrics = FALSE,
bytes_scanned_cut_off = 10000000L,
description = NULL,
state = c("ENABLED", "DISABLED")
)

```

Arguments

conn	A dbConnect object, as returned by <code>dbConnect()</code>
work_group	The Athena workgroup name.
enforce_work_group_config	If set to TRUE, the settings for the workgroup override client-side settings. If set to FALSE, client-side settings are used. For more information, see Workgroup Settings Override Client-Side Settings .
publish_cloud_watch_metrics	Indicates that the Amazon CloudWatch metrics are enabled for the workgroup.
bytes_scanned_cut_off	The upper data usage limit (cutoff) for the amount of bytes a single query in a workgroup is allowed to scan.
description	The workgroup description.
tags	A tag that you can add to a resource. A tag is a label that you assign to an AWS Athena resource (a workgroup). Each tag consists of a key and an optional value, both of which you define. Tags enable you to categorize workgroups in Athena, for example, by purpose, owner, or environment. Use a consistent set of tag keys to make it easier to search and filter workgroups in your account. The maximum tag key length is 128 Unicode characters in UTF-8. The maximum tag value length is 256 Unicode characters in UTF-8. You can use letters and numbers representable in UTF-8, and the following characters: "+ -= . _ : / @". Tag keys and values are case-sensitive. Tag keys must be unique per resource. Please use the helper function <code>tag_options()</code> to create tags for work group, if no tags are required please put NULL for this parameter.
key	A tag key. The tag key length is from 1 to 128 Unicode characters in UTF-8. You can use letters and numbers representable in UTF-8, and the following characters: "+ -= . _ : / @". Tag keys are case-sensitive and must be unique per resource.
value	A tag value. The tag value length is from 0 to 256 Unicode characters in UTF-8. You can use letters and numbers representable in UTF-8, and the following characters: "+ -= . _ : / @". Tag values are case-sensitive.
recursive_delete_option	The option to delete the workgroup and its contents even if the workgroup contains any named queries
remove_output_location	If set to TRUE, indicates that the previously-specified query results location (also known as a client-side setting) for queries in this workgroup should be ignored and set to null. If set to FALSE the out put location in the workgroup's result configuration will be updated with the new value. For more information, see Workgroup Settings Override Client-Side Settings .

state The workgroup state that will be updated for the given workgroup.

Value

create_work_group Returns NULL but invisible
tag_options Returns list but invisible
delete_work_group Returns NULL but invisible
list_work_groups Returns list of available work groups
get_work_group Returns list of work group meta data
update_work_group Returns NULL but invisible

Examples

```
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `noctua::dbConnect` documentation

library(noctua)

# Demo connection to Athena using profile name
con <- dbConnect(noctua::athena())

# List current work group available
list_work_groups(con)

# Create a new work group
wg <- create_work_group(con,
                        "demo_work_group",
                        description = "This is a demo work group",
                        tags = tag_options(key = "demo_work_group", value = "demo_01"))

# List work groups to see new work group
list_work_groups(con)

# get meta data from work group
wg <- get_work_group(con, "demo_work_group")

# Update work group
wg <- update_work_group(con, "demo_work_group",
                        description = "This is a demo work group update")

# get updated meta data from work group
wg <- get_work_group(con, "demo_work_group")

# Delete work group
delete_work_group(con, "demo_work_group")

# Disconnect from Athena
dbDisconnect(con)
```


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