Package ‘noctua’

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Type Package

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

Version 2.1.0

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 (>= 1.12.4), DBI (>= 0.7), methods, paws (>= 0.1.5), stats, utils, uuid (>= 0.1-4)

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VignetteBuilder knitr

Depends R (>= 3.2.0)

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URL https://github.com/DyfanJones/noctua

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

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Description

noctua provides a seamless DBI interface into Athena using the R 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 its 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](https://github.com/DyfanJones/noctua)

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.
assume_role

Usage

assume_role(
    profile_name = NULL,
    region_name = NULL,
    role_arn = NULL,
    role_session_name = sprintf("noctua-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:assumed-role/role_name/role_session_name)

role_session_name An identifier for the assumed role session. By default 'noctua' creates a session name sprintf("noctua-session-%s",as.integer(Sys.time()))

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**

*Athena Driver*

**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**

*Convenience functions for reading/writing DBMS tables*

**Description**

Convenience functions for reading/writing DBMS tables

**Usage**

```r
## S4 method for signature 'AthenaConnection,character,data.frame'
dbWriteTable(  
    conn,  
    name,  
    value,  
    overwrite = FALSE,  
    append = FALSE,  
    row.names = NA,  
    field.types = NULL,
```
Arguments

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

name 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.

value A data.frame to write to the database.
AthenaWriteTables

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 file.type 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. When appending to an Athena DDL that has been created outside of noctua. noctua can support the following SerDes and Data Formats.

- **csv/tsv**: LazySimpleSerDe
- **parquet**: Parquet SerDe
- **json**: JSON SerDe Libraries

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.

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 = "2019-10-13")

s3.location

s3 bucket to store Athena table, must be set as a s3 uri for example("s3://mybucket/data/"). By default, the s3.location is set to s3 staging directory from AthenaConnection object. **Note:** When creating a table for the first time s3.location will be formatted from "s3://mybucket/data/" to the following syntax "s3://{mybucket/data}/{schema}/{table}/{partition}/" this is to support tables with the same name but existing in different schemas. If schema isn’t specified in name parameter then the schema from dbConnect is used instead.

file.type

What file type to store data.frame on s3, noctua currently supports ["tsv", "csv", "parquet", "json"]. Default delimited file type is "tsv", in previous versions of noctua (< 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. "json" format is supported by jsonlite package and it will need to be installed to utilise the "json" 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. Currently noctua doesn’t support compression for "json" file type.

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)
### Description

These functions are used to build the different types of SQL queries. The AWS Athena implementation give extra parameters to allow access the to standard DBI Athena methods. They also utilise AWS Glue to speed up sql query execution.

### Usage

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

```r
db_explain.AthenaConnection(con, sql, ...)
```

```r
db_query_fields.AthenaConnection(con, sql, ...)
```

```r
sql_escape_date.AthenaConnection(con, x)
```

```r
sql_escape_datetime.AthenaConnection(con, x)
```

### Arguments

- **con**: A `dbConnect` object, as returned by `dbConnect()`
- **sql**: SQL code to be sent to AWS Athena
- **name**: Table name if left default nocta will use default from 'dplyr’'s compute function.
- **file_type**: What file type to store data.frame on s3, nocta currently supports ["NULL", "csv", "tsv", "parquet", "json", "orc"]. "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.
- **compress**: Compress Athena table, currently can only compress ["parquet", "orc"] AWS Athena CTAS
- **...**: other parameters, currently not implemented
- **x**: R object to be transformed into athena equivalent
Value

- **db_save_query** Returns table name
- **db_explain** Raises an error as AWS Athena does not support EXPLAIN queries. **Athena Limitations**
- **db_query_fields** Returns sql query column names

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

```r
## 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.

Note

If a user does not have permission to remove AWS S3 resource from AWS Athena output location, then an AWS warning will be returned. It is better use query caching `noctua_options` so that the warning doesn’t repeatedly show.

See Also

- `dbIsValid`

Examples

```r
## 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())

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

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

## End(Not run)

---

### dbColumnInfo

#### Information about result types

**Description**

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

**Usage**

```r
## 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**

```r
## Not run:
# Note:
# - Require AWS Account to run below example.
# - Different connection methods can be used please see `R Athena::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)

## End(Not run)

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_ATENA_S3_STAGING_DIR**: is equivalent to the dbConnect parameter - s3_staging_dir
- **AWS_ATENA_WORK_GROUP**: is equivalent to dbConnect parameter - work_group
- **AWS_REGION**: is equivalent to dbConnect parameter - region_name

**NOTE:** If you have set any environmental variables in .Renviron please restart your R in order for the changes to take affect.

Usage

```r
## 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,
bigint = c("integer64", "integer", "numeric", "character"),
binary = c("raw", "character"),
json = c("auto", "character"),
timezone = "UTC",
keyboard_interrupt = TRUE,
rstudio_conn_tab = TRUE,
...)

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:assume-
role_session_name  An identifier for the assumed role session. By default 'noctua' creates a session
name sprintf("noctua-session-%s", as.integer(Sys.time()))
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 s3://path/to/query/bucket/
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")
bigint The R type that 64-bit integer types should be mapped to, default is [bit64::integer64], which allows the full range of 64 bit integers.
binary The R type that [binary/varbinary] types should be mapped to, default is [raw]. If the mapping fails R will resort to [character] type. To ignore data type conversion set to ["character"].
json Attempt to converts AWS Athena data types [arrays, json] using jsonlite::parse_json. If the mapping fails R will resort to [character] type. Custom Json parsers can be provide by using a function with data frame parameter. To ignore data type conversion set to ["character"].
timezone Sets the timezone for the connection. The default is 'UTC'. If 'NULL' then no timezone is set, which defaults to the server’s time zone. ‘AWS Athena’ accepted time zones: https://docs.aws.amazon.com/athena/latest/ug/athena-supported-time-zones.html.
keyboard_interrupt Stops AWS Athena process when R gets a keyboard interrupt, currently defaults to TRUE
rstudio_conn_tab Optional to get AWS Athena Schema and display it in RStudio’s Connections Tab. Default set to TRUE.
... 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(noctua::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(noctua::athena(),
dbConvertTable

Profile name = "YOUR_PROFILE_NAME",
s3_staging_dir = 's3://path/to/query/bucket/

dbDisconnect(con)

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

---

**dbConvertTable**

Simple wrapper to convert Athena backend file types

**Description**

Utilises AWS Athena to convert AWS S3 backend file types. It also also to create more efficient file types i.e. "parquet" and "orc" from SQL queries.

**Usage**

```
dbConvertTable(conn, obj, name, ...)
```

## S4 method for signature 'AthenaConnection'

```
dbConvertTable(
    conn,
    obj,
    name,
    partition = NULL,
    s3.location = NULL,
    file.type = c("NULL", "csv", "tsv", "parquet", "json", "orc"),
    compress = TRUE,
    data = TRUE,
    ...
)
```

**Arguments**

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

- **obj**
  
  Athena table or SQL DML query to be converted. For SQL, the query need to be wrapped with DBI::SQL() and follow AWS Athena DML format [link](https://aws.amazon.com/about-aws/whats-new/introducing-aws-athena-dml/)

- **name**
  
  Name of destination table

- **...**
  
  Extra parameters, currently not used

- **partition**
  
  Partition Athena table
s3.location  location to store output file, must be in s3 uri format for example ("s3://mybucket/data/").

file.type  File type for name, currently support ["NULL","csv", "tsv", "parquet", "json", "orc"]. "NULL" will let Athena set the file type for you.

compress  Compress name, currently can only compress ["parquet", "orc"] (AWS Athena CTAS)

data  If name should be created with data or not.

Value  

dbConvertTable() returns TRUE but invisible.

Examples  

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

library(DBI)
library(noctua)

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

# write iris table to Athena in defualt delimited format
dbWriteTable(con, "iris", iris)

# convert delimited table to parquet
dbConvertTable(con,
  obj = "iris",
  name = "iris_parquet",
  file.type = "parquet")

# Create partitioned table from non-partitioned
# iris table using SQL DML query
dbConvertTable(con,
  obj = SQL("select
  iris.*,
  date_format(current_date, '%Y%m%d') as time_stamp
  from iris"),
  name = "iris_orc_partitioned",
  file.type = "orc",
  partition = "time_stamp")

# disconnect from Athena
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**

```r
## 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 an non-empty character string.

**See Also**

- `dbDataType`

**Examples**

```r
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)

## 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())

# Sending Queries to Athena
dbDataType(con, iris)

# Disconnect connection
dbDisconnect(con)

## End(Not run)

---

dbDisconnect

*Disconnect (close) an Athena connection*

**Description**

This closes the connection to Athena.

**Usage**

```r
## 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

```r
## 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())

# Disconnect conenction
dbDisconnect(con)

## End(Not run)
```

dbExistsTable

**Does Athena table exist?**

**Description**

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

**Usage**

```r
## 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

```r
## 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 connection
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

```r
## 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. If entire dataframe is required use `n = -1` or `n = Inf`.
- `...`: Other arguments passed on to methods.

Value

`dbFetch()` returns a data frame.
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

dbFetch

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())

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

# Disconnect from Athena
dbDisconnect(con)

## End(Not run)
See Also

dbGetInfo

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())

# 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)

## End(Not run)

---

dbGetPartition | *Athena table partitions*

Description

This method returns all partitions from Athena table.

Usage

dbGetPartition(conn, name, ..., .format = FALSE)

## S4 method for signature 'AthenaConnection'

dbGetPartition(conn, name, ..., .format = FALSE)

Arguments

- **conn**: A `DBIConnection` object, as returned by `dbConnect()`.
- **name**: A character string specifying a DBMS table name.
... Other parameters passed on to methods.
.format re-formats AWS Athena partitions format. So that each column represents a partition from the AWS Athena table. Default set to FALSE to prevent breaking previous package behaviour.

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, statistics = FALSE, ...)

Arguments

conn A DBIConnection object, as returned by dbConnect().
statement a character string containing SQL.
statistics If set to TRUE will print out AWS Athena statistics of query.
... Other parameters passed on to methods.

Value

dbGetQuery() returns a dataframe.

Note

If the user does not have permission to remove AWS S3 resource from AWS Athena output location, then an AWS warning will be returned. It is better use query caching noctua_options so that the warning doesn’t repeatedly show.

See Also
dbGetQuery

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())

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

# Disconnect connection
dbDisconnect(con)

## End(Not run)
### dbGetTables

**List Athena Schema, Tables and Table Types**

**Description**

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

**Usage**

```r
dbGetTables(conn, ...)  
```

**Example**

```r
library(DBI)

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

rs <- dbSendQuery(con, "SHOW TABLES in default")

## End(Not run)
```

**Arguments**

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

**Value**

dbGetStatement() returns a character.

**See Also**

dbGetStatement

---
Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>conn</td>
<td>A <code>DBIConnection</code> object, as returned by <code>dbConnect()</code>.</td>
</tr>
<tr>
<td>...</td>
<td>Other parameters passed on to methods.</td>
</tr>
<tr>
<td>schema</td>
<td>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.</td>
</tr>
</tbody>
</table>

Value

dbGetTables() returns a data.frame.

Examples

```r
## 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)
```

Description

This method returns if the query has completed.

Usage

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

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>res</td>
<td>An object inheriting from DBIResult.</td>
</tr>
<tr>
<td>...</td>
<td>Other arguments passed on to methods.</td>
</tr>
</tbody>
</table>
**dbIsValid**

Is this DBMS object still valid?

**Description**

This method tests whether the `dbObj` is still valid.

**Usage**

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

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

**Arguments**

- `dbObj`: An object inheriting from `DBIOobject`, i.e. `DBIDriver`, `DBIConnection`, or a `DBIResult`
- `...`: Other arguments to methods.

**Value**

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

**See Also**

`dbHasCompleted`

**Examples**

```r
## 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())

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

# Disconnect from Athena
dbDisconnect(con)

## End(Not run)
```
Value

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

See Also
dbIsValid

Examples

## Not run:
#
# 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())

# 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)

## End(Not run)

---

dbListFields List Field names of Athena table

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 connection
dbDisconnect(con)

## End(Not run)
**Arguments**

conn A `DBIConnection` object, as returned by `dbConnect()`.

schema 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.

... Other parameters passed on to methods.

**Value**

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

**See Also**

dbListTables

**Examples**

```r
## 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 connection
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**

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

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

**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**   Remove table from Athena

**Description**

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

**Usage**

```r
## 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.

**Note**

If you are having difficulty removing AWS S3 files please check if the AWS S3 location following AWS best practises: **Table Location in Amazon S3**
See Also

dbRemoveTable

Examples

```r
## 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 `dbConnect()`.
- **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

```r
## 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)
```

---

**dbStatistics**

*Show AWS Athena Statistics*

**Description**

Returns AWS Athena Statistics from execute queries `dbSendQuery`

**Usage**

```r
dbStatistics(res, ...)
```

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

**Arguments**

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

dbStatistics() returns list containing Athena Statistics return from paws.

Examples

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

library(DBI)
library(noctua)

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

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

# Clean up
dbClearResult(res)

## 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 `dbConnect()`

- **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]`

  - **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.
db_compute

- 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

backend_dbplyr

Examples

```r
## 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)
```
Description

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

Usage

```r
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 `dbConnect()`
- `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 data.frame 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 `file.type` 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: `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/")
- `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 (< 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

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)
### 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> [@region/database]"

---

### noctua_options

A method to configure noctua backend options.

#### Description

`noctua_options()` provides a method to change the backend. This includes changing the file parser, whether noctua should cache query ids locally and number of retries on a failed api call.
Usage
	noctua_options(
	  file_parser = c("data.table", "vroom"),
	  bigint = NULL,
	  binary = NULL,
	  json = NULL,
	  cache_size = 0,
	  clear_cache = FALSE,
	  retry = 5,
	  retry_quiet = FALSE
	)

Arguments

  file_parser  Method to read and write tables to Athena, currently defaults to data.table. The file_parser also determines the data format returned for example data.table will return data.table and vroom will return tibble.
  bigint       The R type that 64-bit integer types should be mapped to. Default NULL won’t make any changes that dbConnect has set. Inbuilt bigint conversion types ["integer64", "integer", "numeric", "character"].
  binary       The R type that [binary/varbinary] types should be mapped to. Default NULL won’t make any changes that dbConnect has set. Inbuilt binary conversion types ["raw", "character"].
  json         Attempt to converts AWS Athena data types [arrays, json] using jsonlite:parse_json. Default NULL won’t make any changes that dbConnect has set. Inbuilt json conversion types ["auto", "character"]. Custom json parsers can be provide by using a function with data frame parameter.
  cache_size   Number of queries to be cached. Currently only support caching up to 100 distinct queries.
  clear_cache  Clears all previous cached query metadata
  retry        Maximum number of requests to attempt.
  retry_quiet  If FALSE, will print a message from retry displaying how long until the next request.

Value

  noctua_options() returns NULL, invisibly.

Examples

  library(noctua)

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

  # cache queries locally
  noctua_options(cache_size = 5)
**Query**

**Execute a query on Athena**

---

**Description**

The `dbSendQuery()` and `dbSendStatement()` method submits a query to Athena but does not wait for query to execute. `dbHasCompleted` method will need to run 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**

```r
## 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 s4` class.

**See Also**

`dbSendQuery`, `dbSendStatement`, `dbExecute`

**Examples**

```r
## 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())

# Sending Queries to Athena
```
session_token

```r
res1 <- dbSendQuery(con, "show databases")
res2 <- dbSendStatement(con, "show databases")
res3 <- dbExecute(con, "show databases")

# Disconnect connection
dbDisconnect(con)

## End(Not run)
```

---

## session_token

Get Session Tokens for PAWS Connection

### Description

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

### Usage

```r
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

```r
## 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**

```r
## S4 method for signature 'AthenaConnection'
sqlCreateTable(
    con,
    table,
    fields,
    field.types = NULL,
    partition = NULL,
    s3.location = NULL,
```
sqlCreateTable

```r
file.type = c("tsv", "csv", "parquet", "json"),
compress = FALSE,
```

Arguments

- `con` A database connection.
- `table` Name of the table. Escaped with `dbQuoteIdentifier()`.
- `fields` Either a character vector or a data frame.
  - A named character vector: Names are column names, values are types. Names are escaped with `dbQuoteIdentifier()`. Field types are unescaped.
  - A data frame: field types are generated using `dbDataType()`.
- `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", "json"]). Default delimited file type is "tsv", in previous versions of noctua (<= 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. "json" format is supported by `jsonlite` package and it will need to be installed to utilise the "json" 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. Currently noctua doesn’t support compression for "json" file type.

Value

`sqlCreateTable` returns data.frame’s DDL in the SQL format.

See Also

`sqlCreateTable`

Examples

```r
## 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())

# 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 = "timestamp",
  s3.location = "s3://path/to/athena/table")

# Create DDL for iris data.frame with partition and file.type parquet
sqlCreateTable(con, "iris", iris,
  partition = "timestamp",
  s3.location = "s3://path/to/athena/table",
  file.type = "parquet")

# Disconnect from Athena
dbDisconnect(con)

## End(Not run)

sqlData

Converting 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 to Athena.

Usage

## S4 method for signature 'AthenaConnection'
sqlData(
  con, 
  value, 
  row.names = NA, 
  file.type = c("tsv", "csv", "parquet", "json"), 
  ...
)

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, noxtua currently supports ["csv", "tsv", "parquet", "json"]. **Note:** This parameter is used for format any special characters that clash with file type separator.

**Value**

sqlData returns a data.frame 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)

sql_escape_string.AthenaConnection(con, x)

**Arguments**

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

- **x**
  
  An object to escape. Existing sql vectors will be left as is, character vectors are escaped with single quotes, numeric vectors have trailing ‘.0’ added if they’re whole numbers, identifiers are escaped with double quotes.
work_group

Athena Work Groups

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

```r
create_work_group(
  conn,
  work_group = NULL,
  enforce_work_group_config = FALSE,
  publish_cloud_watch_metrics = FALSE,
  bytes_scanned_cut_off = 1000000L,
  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,
)```
Arguments

conn            A `dbConnect` object, as returned by `dbConnect()`
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 `tag_options()` 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 con-
  tains 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 output location in the workgroup’s result
  configuration will be updated with the new value. For more information, see
  Workgroup Settings Override Client-Side Settings.
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**

```
## Not run:
# 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)
```
## End (Not run)
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