Package ‘noctua’
August 8, 2023

<table>
<thead>
<tr>
<th>Type</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Connect to ‘AWS Athena' using R ‘AWS SDK' 'paws' ('DBI' Interface)</td>
</tr>
<tr>
<td>Version</td>
<td>2.6.2</td>
</tr>
<tr>
<td>Description</td>
<td>Designed to be compatible with the 'R' package 'DBI' (Database Interface) when connecting to Amazon Web Service ('AWS') Athena [<a href="https://aws.amazon.com/athena/">https://aws.amazon.com/athena/</a>]. To do this the 'R' 'AWS' Software Development Kit ('SDK') 'paws' [<a href="https://github.com/paws-r/paws">https://github.com/paws-r/paws</a>] is used as a driver.</td>
</tr>
<tr>
<td>Imports</td>
<td>data.table (&gt;= 1.12.4), DBI (&gt;= 0.7), methods, paws (&gt;= 0.2.0), stats, utils, uuid (&gt;= 0.1-4)</td>
</tr>
<tr>
<td>Suggests</td>
<td>arrow, bit64, dplyr (&gt;= 0.8.0), dbplyr (&gt;= 1.4.3), testthat, tibble, vroom (&gt;= 1.2.0), covr, knitr, rmarkdown, jsonify, jsonlite</td>
</tr>
<tr>
<td>VignetteBuilder</td>
<td>knitr</td>
</tr>
<tr>
<td>Depends</td>
<td>R (&gt;= 3.2.0)</td>
</tr>
<tr>
<td>License</td>
<td>MIT + file LICENSE</td>
</tr>
<tr>
<td>Encoding</td>
<td>UTF-8</td>
</tr>
<tr>
<td>RoxygenNote</td>
<td>7.2.3</td>
</tr>
<tr>
<td>URL</td>
<td><a href="https://github.com/DyfanJones/noctua">https://github.com/DyfanJones/noctua</a></td>
</tr>
<tr>
<td>BugReports</td>
<td><a href="https://github.com/DyfanJones/noctua/issues">https://github.com/DyfanJones/noctua/issues</a></td>
</tr>
<tr>
<td>NeedsCompilation</td>
<td>no</td>
</tr>
<tr>
<td>Author</td>
<td>Dyfan Jones [aut, cre]</td>
</tr>
<tr>
<td>Maintainer</td>
<td>Dyfan Jones <a href="mailto:dyfan.r.jones@gmail.com">dyfan.r.jones@gmail.com</a></td>
</tr>
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<td>CRAN</td>
</tr>
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<td>Date/Publication</td>
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</tr>
</tbody>
</table>
### R topics documented:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>noctua-package</td>
<td>3</td>
</tr>
<tr>
<td>assume_role</td>
<td>3</td>
</tr>
<tr>
<td>athena</td>
<td>5</td>
</tr>
<tr>
<td>AthenaWriteTables</td>
<td>5</td>
</tr>
<tr>
<td>backend_dbplyr_v1</td>
<td>9</td>
</tr>
<tr>
<td>backend_dbplyr_v2</td>
<td>9</td>
</tr>
<tr>
<td>dbClearResult</td>
<td>10</td>
</tr>
<tr>
<td>dbColumnInfo</td>
<td>11</td>
</tr>
<tr>
<td>dbConnect.AthenaDriver-method</td>
<td>12</td>
</tr>
<tr>
<td>dbConvertTable</td>
<td>16</td>
</tr>
<tr>
<td>dbDataType.AthenaDriver,ANY-method</td>
<td>18</td>
</tr>
<tr>
<td>dbDisconnect</td>
<td>19</td>
</tr>
<tr>
<td>dbExistsTable</td>
<td>20</td>
</tr>
<tr>
<td>dbFetch</td>
<td>21</td>
</tr>
<tr>
<td>dbGetInfo</td>
<td>22</td>
</tr>
<tr>
<td>dbGetPartition</td>
<td>23</td>
</tr>
<tr>
<td>dbGetQuery</td>
<td>25</td>
</tr>
<tr>
<td>dbGetStatement</td>
<td>26</td>
</tr>
<tr>
<td>dbGetTables</td>
<td>27</td>
</tr>
<tr>
<td>dbHasCompleted</td>
<td>28</td>
</tr>
<tr>
<td>dbIsValid</td>
<td>29</td>
</tr>
<tr>
<td>dbListFields</td>
<td>30</td>
</tr>
<tr>
<td>dbListTables</td>
<td>31</td>
</tr>
<tr>
<td>dbplyr_edition</td>
<td>32</td>
</tr>
<tr>
<td>dbQuote</td>
<td>33</td>
</tr>
<tr>
<td>dbRemoveTable</td>
<td>33</td>
</tr>
<tr>
<td>dbShow</td>
<td>35</td>
</tr>
<tr>
<td>dbStatistics</td>
<td>36</td>
</tr>
<tr>
<td>db_compute</td>
<td>37</td>
</tr>
<tr>
<td>db_connection_describe</td>
<td>39</td>
</tr>
<tr>
<td>db_copy_to</td>
<td>40</td>
</tr>
<tr>
<td>db_desc</td>
<td>42</td>
</tr>
<tr>
<td>noctua_options</td>
<td>43</td>
</tr>
<tr>
<td>Query</td>
<td>45</td>
</tr>
<tr>
<td>session_token</td>
<td>46</td>
</tr>
<tr>
<td>sqlCreateTable</td>
<td>47</td>
</tr>
<tr>
<td>sqlData</td>
<td>49</td>
</tr>
<tr>
<td>sql_translate_env</td>
<td>50</td>
</tr>
<tr>
<td>work_group</td>
<td>51</td>
</tr>
</tbody>
</table>

Index 55
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)

Maintainer: Dyfan Jones <dyfan.r.jones@gmail.com>

See Also

Useful links:

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

Description

Assume AWS ARN Role

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,
partition = NULL,
s3.location = NULL,
file.type = c("tsv", "csv", "parquet", "json"),
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", "json"),
  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", "json"),
  compress = FALSE,
  max.batch = Inf,
  ...
)

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.
<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>A data.frame to write to the database.</td>
</tr>
<tr>
<td>overwrite</td>
<td>Allows overwriting the destination table. Cannot be TRUE if append is also TRUE.</td>
</tr>
<tr>
<td>append</td>
<td>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.</td>
</tr>
<tr>
<td>row.names</td>
<td>Either TRUE, FALSE, NA or a string. If TRUE, always translate row names to a column called &quot;row_names&quot;. 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.</td>
</tr>
<tr>
<td>field.types</td>
<td>Additional field types used to override derived types.</td>
</tr>
<tr>
<td>partition</td>
<td>Partition Athena table (needs to be a named list or vector) for example: c(var1 = &quot;2019-20-13&quot;)</td>
</tr>
<tr>
<td>s3.location</td>
<td>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 &quot;s3://mybucket/data/&quot; to the following syntax &quot;s3://{mybucket/data}/{schema}/{table}/{partition}/&quot; 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.</td>
</tr>
<tr>
<td>file.type</td>
<td>What file type to store data.frame on s3, noctua currently supports [&quot;tsv&quot;, &quot;csv&quot;, &quot;parquet&quot;, &quot;json&quot;]. Default delimited file type is &quot;csv&quot;. In previous versions of noctua (&lt; 1.4.0) file type &quot;csv&quot; 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 &quot;,&quot;. This would cause issues with AWS Athena. Note: &quot;parquet&quot; format is supported by the arrow package and it will need to be installed to utilise the &quot;parquet&quot; format. &quot;json&quot; format is supported by jsonlite package and it will need to be installed to utilise the &quot;json&quot; format.</td>
</tr>
<tr>
<td>compress</td>
<td>FALSE</td>
</tr>
<tr>
<td>max.batch</td>
<td>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 &quot;csv&quot; or &quot;tsv&quot; max.batch will split data.frame into 20 batches. This is to help the performance of AWS Athena when working with files compressed in &quot;gzip&quot; format. max.batch will not split the data.frame when loading file in parquet format. For more information please go to link</td>
</tr>
</tbody>
</table>

... 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

```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())

# 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
```
**backend_dbplyr_v1**

```r
dbDisconnect(con)
## End(Not run)
```

### 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

- `db_explain.AthenaConnection(con, sql, ...)`
- `db_query_fields.AthenaConnection(con, sql, ...)`

### Arguments

- `con`  A `dbConnect` object, as returned by `dbConnect()`
- `sql`  SQL code to be sent to AWS Athena
- `...`  other parameters, currently not implemented

### Value

- `db_explain`  Returns AWS Athena explain statement
- `db_query_fields`  Returns sql query column names

---

**backend_dbplyr_v2**

### Athena S3 implementation of dbplyr backend functions (api version 2).

### 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

- `sql_query_explain.AthenaConnection(con, sql, format = "text", type = NULL, ...)`
- `sql_query_fields.AthenaConnection(con, sql, ...)`
- `sql_escape_date.AthenaConnection(con, x)`
- `sql_escape_datetime.AthenaConnection(con, x)`
Arguments

- **con**: A `dbConnect` object, as returned by `dbConnect()`
- **sql**: SQL code to be sent to AWS Athena
- **format**: returning format for explain queries, default set to "text". Other formats can be found: [https://docs.aws.amazon.com/athena/latest/ug/athena-explain-statement.html](https://docs.aws.amazon.com/athena/latest/ug/athena-explain-statement.html)
- **type**: return plan for explain queries, default set to 'NULL'. Other type can be found: [https://docs.aws.amazon.com/athena/latest/ug/athena-explain-statement.html](https://docs.aws.amazon.com/athena/latest/ug/athena-explain-statement.html)
- ... other parameters, currently not implemented
- **x**: R object to be transformed into athena equivalent

Value

- **sql_query_explain**: Returns sql query for AWS Athena explain statement
- **sql_query_fields**: Returns sql query column names
- **sql_escape_date**: Returns sql escaping from dates
- **sql_escape_datetime**: Returns sql escaping from date times

---

### dbClearResult

**Clear Results**

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.
dbColumnInfo 11

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. For example AccessDenied (HTTP 403). Access Denied. It is better use query caching or optionally prevent clear AWS S3 resource using 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)
```

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_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
**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,
    catalog_name = "AwsDataCatalog",
    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,
    endpoint_override = 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
- `catalog_name`: The catalog name to which the connection belongs
- `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: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).

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 from AWS Glue Catalogue and display it in RStudio’s Connections Tab. Default set to TRUE. For large ‘AWS Glue Catalogue’ it is recommended to set ‘rstudio_conn_tab=FALSE’ to ensure a fast connection.
endpoint_override

(character/list) The complete URL to use for the constructed client. Normally, paws will automatically construct the appropriate URL to use when communicating with a service. You can specify a complete URL (including the "http/https" scheme) to override this behaviour. If this value is provided, then disable_ssl is ignored. If endpoint_override is a character then AWS Athena endpoint is overridden. To override AWS S3 or AWS Glue endpoints a named list needs to be provided. The list can only have the following names ['athena', 's3', 'glue'] for example list(glue = "https://glue.eu-west-1.amazonaws.com")

• disable_ssl (boolean) Whether or not to use SSL. By default, SSL is used. Note that not all services support non-ssl connections.
• timeout (numeric) The time in seconds till a timeout exception is thrown when attempting to make a connection. The default is 60 seconds.
• disable_param_validation (bool) Whether parameter validation should occur when serializing requests. The default is FALSE You can disable parameter validation for performance reasons. Otherwise, it’s recommended to leave parameter validation enabled.
• s3_force_path_style Addressing style is always by path. Endpoints will be addressed as such: s3.amazonaws.com/mybucket
• s3_use_accelerate Refers to whether to use the S3 Accelerate endpoint. The value must be a boolean. If True, the client will use the S3 Accelerate endpoint. If the S3 Accelerate endpoint is being used then the addressing style will always be virtual.
• use_dual_stack Setting to TRUE enables dual stack endpoint resolution.

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(),
  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**

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

## S4 method for signature 'AthenaConnection'

```r
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]
- **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

## 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(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,
   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())
```
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
dbExistsTable

Does Athena table exist?

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

Arguments

conn A DBIConnection object, as returned by dbConnect().
name The table name, passed on to dbQuoteIdentifier(). Options are:

- a character string with the unquoted DBMS table name, e.g. "table_name";
- a call to Id() with components to the fully qualified table name, e.g. Id(schema = "my_schema", table = "table_name")
- a call to SQL() with the quoted and fully qualified table name given verbatim, e.g. SQL(""my_schema"."table_name"")

... Other parameters passed on to methods.

Value

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

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)

---

**dbGetInfo**

*Get DBMS metadata*

Description

Get DBMS metadata

Usage

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

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

Arguments

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

**Value**

a named list

**See Also**

dbGetInfo

**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())

# 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**

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

```r
## S4 method for signature 'AthenaConnection'
dbGetPartition(conn, name, ..., .format = FALSE)
```
Arguments

conn   A DBIConnection object, as returned by dbConnect().
name   The table name, passed on to dbQuoteIdentifier(). Options are:
       • a character string with the unquoted DBMS table name, e.g. "table_name",
       • a call to Id() with components to the fully qualified table name, e.g. Id(schema = "my_schema", table = "table_name")
       • a call to SQL() with the quoted and fully qualified table name given verbatim, e.g. SQL("'my_schema'."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

```r
## S4 method for signature 'AthenaConnection,character'
dbGetQuery(conn, statement, statistics = FALSE, unload = athena_unload(), ...)
```

### 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.
- **unload**: boolean input to modify `statement` to align with AWS Athena UNLOAD, default is set to FALSE.
- **...**: 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. For example AccessDenied (HTTP 403). Access Denied. It is better use query caching or optionally prevent clear AWS S3 resource using `noctua_options` so that the warning doesn’t repeatedly show.

### See Also

dbGetQuery

### 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
dbGetQuery(con, "show databases")

# Disconnect connection
dbDisconnect(con)

## End(Not run)

dbGetStatement

Get the statement associated with a result set

Description

Returns the statement that was passed to [dbSendQuery()] or [dbSendStatement()].

Usage

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

Arguments

res An object inheriting from DBIResult.
...

Value
dbGetStatement() returns a character.

See Also
dbGetStatement

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())

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

## 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
dbGetTables(conn, ...)

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

Arguments

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

...                          Other parameters passed on to methods.

catalog

Athena catalog, default set to NULL to return all tables from all Athena catalogs.

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.

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)
Description

This method returns if the query has completed.

Usage

```r
## 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

```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)
```
**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 `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
```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 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 is 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**
  - The table name, passed on to `dbQuoteIdentifier()`. Options are:
    - a character string with the unquoted DBMS table name, e.g. "table_name",
    - a call to `Id()` with components to the fully qualified table name, e.g. `Id(schema = "my_schema", table = "table_name")`
    - a call to `SQL()` with the quoted and fully qualified table name given verbatim, e.g. `SQL("my_schema"."table_name")`
  - 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)

---

**dbListTables**  
*List Athena Tables*

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

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

**Arguments**  
- **conn**: A DBIConnection object, as returned by `dbConnect()`.
- **catalog**: Athena catalog, default set to NULL to return all tables from all Athena catalogs
- **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)
```

---

`dbplyr_edition` *Declare which version of dbplyr API is being called.*

Description

Declare which version of dbplyr API is being called.

Usage

```r
dbplyr_edition.AthenaConnection(con)
```

Arguments

- `con` A `dbConnect` object, as returned by `dbConnect()`

Value

Integer for which version of `dbplyr` is going to be used.
**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,POSIXct'
dbQuoteString(conn, x, ...)

## S4 method for signature 'AthenaConnection,Date'
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**

**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, ...)

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

Arguments

- `conn`: A `DBIConnection` object, as returned by `dbConnect()`.
- `name`: The table name, passed on to `dbQuoteIdentifier()`. Options are:
  - a character string with the unquoted DBMS table name, e.g. "table_name".
  - a call to `Id()` with components to the fully qualified table name, e.g. `Id(schema = "my_schema", table = "table_name")`
  - a call to `SQL()` with the quoted and fully qualified table name given verbatim, e.g. `SQL("'my_schema'."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
```
```r
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**

```r
dbShow(conn, name, ...)
```

## S4 method for signature 'AthenaConnection'

dbShow(conn, name, ...)

**Arguments**

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

- **name**
  The table name, passed on to `dbQuoteIdentifier()`. Options are:
  
  - a character string with the unquoted DBMS table name, e.g. "table_name",
  
  - a call to `Id()` with components to the fully qualified table name, e.g. `Id(schema = "my_schema", table = "table_name")`
  
  - a call to `SQL()` with the quoted and fully qualified table name given verbatim, e.g. `SQL("'my_schema'.'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**

```r
db_compute.AthenaConnection(
  con,
  table,
  sql,
  ...,
  overwrite = FALSE,
  temporary = FALSE,
  unique_indexes = list(),
  indexes = list(),
  analyze = TRUE,
  in_transaction = FALSE,
  partition = NULL,
  s3_location = NULL,
  file_type = c("csv", "tsv", "parquet"),
  compress = FALSE
)
```

```r
sql_query_save.AthenaConnection(con, sql, name, temporary = TRUE, with, ...)
```
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]

overwrite  Allows overwriting the destination table. Cannot be TRUE if append is also TRUE.

temporary  if TRUE, will create a temporary table that is local to this connection and will be automatically deleted when the connection expires

unique_indexes  a list of character vectors. Each element of the list will create a new unique index over the specified column(s). Duplicate rows will result in failure.

indexes  a list of character vectors. Each element of the list will create a new index.

analyze  if TRUE (the default), will automatically ANALYZE the new table so that the query optimiser has useful information.

in_transaction  Should the table creation be wrapped in a transaction? This typically makes things faster, but you may want to suppress if the database doesn’t support transactions, or you’re wrapping in a transaction higher up (and your database doesn’t support nested transactions.)

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.

name  Table name, if left default noctua will use the default from dplyr’s compute function.

with  An optional WITH clause for the CREATE TABLE statement.

  • 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

AthenaWriteTables backend_dbplyr_v2 backend_dbplyr_v1

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 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_connection_describe.AthenaConnection(con)

Arguments

  con                   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_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,  
  ...,  
  partition = NULL,  
  s3_location = NULL,  
  file_type = c("csv", "tsv", "parquet"),  
  compress = FALSE,  
  max_batch = Inf,  
  overwrite = FALSE,  
  append = FALSE,  
  types = NULL,  
  temporary = TRUE,  
  unique_indexes = NULL,  
  indexes = NULL,  
  analyze = TRUE,  
  in_transaction = FALSE  
)
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.
- **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
- **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.
- **temporary**: if TRUE, will create a temporary table that is local to this connection and will be automatically deleted when the connection expires
- **unique_indexes**: a list of character vectors. Each element of the list will create a new unique index over the specified column(s). Duplicate rows will result in failure.
- **indexes**: a list of character vectors. Each element of the list will create a new index.
- **analyze**: if TRUE (the default), will automatically ANALYZE the new table so that the query optimiser has useful information.
- **in_transaction**: Should the table creation be wrapped in a transaction? This typically makes things faster, but you may want to suppress if the database doesn’t support transactions, or you’re wrapping in a transaction higher up (and your database doesn’t support nested transactions.)
Value

db_copy_to returns table name

See Also

AthenaWriteTables

Examples

## Not run:

```r
# 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 (api version 1).*
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]"

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,
    bigint,
    binary,
    json,
    cache_size,
    clear_cache,
    retry,
    retry_quiet,
    unload,
    clear_s3_resource,
    verbose
)
Arguments

file_parser  Method to read and write tables to Athena, currently default 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: "integer64"). Inbuilt bigint conversion types ["integer64", "integer", "numeric", "character"].

binary The R type that [binary/varbinary] types should be mapped to (default "raw"). Inbuilt binary conversion types ["raw", "character"].

json    Attempt to converts AWS Athena data types [arrays, json] using jsonlite::parse_json (default: "auto"). 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 (default: 0).

clear_cache Clears all previous cached query metadata

retry Maximum number of requests to attempt (default: 5).

retry_quiet This method is deprecated please use verbose instead.

unload set AWS Athena unload functionality globally (default: FALSE)

clear_s3_resource Clear down 'AWS Athena' 'AWS S3' resource (s3_staging_dir location). This is useful for users that don't have the 'AWS IAM role' permissions delete from 's3_staging_dir' (default: TRUE)

verbose print package info messages (default: TRUE)

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)
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

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

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

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

Arguments

- `conn` A `DBIConnection` object, as returned by `dbConnect()`.
- `statement` a character string containing SQL.
- `unload` boolean input to modify `statement` to align with AWS Athena UNLOAD, default is set to FALSE.
- `...` 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
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](https://aws.amazon.com/cli/) (AWS CLI) will need to be configured. To configure AWS CLI please refer to: [Configuring the AWS CLI](https://docs.aws.amazon.com/cli/latest/userguide/cli-configure-create-profile.html).
- **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.
sqlCreateTable

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

Arguments

con
   A database connection.

table
   The table name, passed on to dbQuoteIdentifier(). Options are:
   • a character string with the unquoted DBMS table name, e.g. "table_name",
   • a call to Id() with components to the fully qualified table name, e.g. Id(schema = "my_schema", table = "table_name")
   • a call to SQL() with the quoted and fully qualified table name given verbatim, e.g. SQL("my_schema"."table_name")

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.
   An 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**

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**

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

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>con</td>
<td>A database connection.</td>
</tr>
<tr>
<td>value</td>
<td>A data frame</td>
</tr>
<tr>
<td>row.names</td>
<td>Either TRUE, FALSE, NA or a string. If TRUE, always translate row names to a column called &quot;row_names&quot;. 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.</td>
</tr>
<tr>
<td>file.type</td>
<td>What file type to store data.frame on s3, noctua currently supports [&quot;csv&quot;, &quot;tsv&quot;, &quot;parquet&quot;, &quot;json&quot;]. Note: This parameter is used for format any special characters that clash with file type separator.</td>
</tr>
</tbody>
</table>

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

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_translation.AthenaConnection(con)

sql_translate_env.AthenaConnection(con)

sql_escape_string.AthenaConnection(con, x)

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>con</td>
<td>An AthenaConnection object, produced by [DBI::dbConnect()]</td>
</tr>
<tr>
<td>x</td>
<td>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.</td>
</tr>
</tbody>
</table>
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 workgroup 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,
```
work_group

```
publish_cloud_watch_metrics = FALSE,
bytes_scanned_cut_off = 1000000L,
description = NULL,
state = c("ENABLED", "DISABLED")
```

### 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 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 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.
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

```r
## 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)
Index

assume_role, 3
athena, 5
AthenaConnection, 6, 7, 16, 48, 50
AthenaWriteTables, 5, 39, 42
backend_dbplyr_v1, 9, 39
backend_dbplyr_v2, 9, 39
create_work_group (work_group), 51
db_compute, 37
db_connection_describe, 39
db_copy_to, 40
db_desc, 42
db_explain.AthenaConnection (backend_dbplyr_v1), 9
db_query_fields.AthenaConnection (backend_dbplyr_v1), 9
dbClearResult, 10
dbClearResult, AthenaResult-method (dbClearResult), 10
dbColumnInfo, 11
dbColumnInfo, AthenaResult-method (dbColumnInfo), 11
dbConnect, 4, 5, 9, 10, 15, 32, 38, 40, 41, 43, 51, 52
dbConnect (dbConnect, AthenaDriver-method), 12
dbConnect(), 19, 20, 24, 25, 27, 30, 31, 33–35, 45
dbConnect, AthenaDriver-method, 12
dConvertTable, 16
dConvertTable, AthenaConnection-method (dConvertTable), 16
dbDataType, 18
dbDataType (dbDataType, AthenaDriver, ANY-method), 18
dbDataType, AthenaConnection, ANY-method (dbDataType, AthenaDriver, ANY-method), 18
dbDataType, AthenaConnection, data.frame-method (dbDataType, AthenaDriver, ANY-method), 18
dbDataType, AthenaDriver, ANY-method, 18
dbDataType, AthenaDriver, list-method (dbDataType, AthenaDriver, ANY-method), 18
dbDisconnect, 19, 19
dbDisconnect, AthenaConnection-method (dbDisconnect), 19
dbExecute, 45
dbExecute, AthenaConnection, character-method (Query), 45
dbExistsTable, 20, 21
dbExistsTable, AthenaConnection, character-method (dbExistsTable), 20
dbExistsTable, AthenaConnection, Id-method (dbExistsTable), 20
dbFetch, 21, 22
dbFetch, AthenaResult-method (dbFetch), 21
dbGetInfo, 22, 23
dbGetInfo, AthenaConnection-method (dbGetInfo), 22
dbGetInfo, AthenaResult-method (dbGetInfo), 22
dbGetPartition, 23
dbGetPartition, AthenaConnection-method (dbGetPartition), 23
dbGetQuery, 25, 25
dbGetQuery, AthenaConnection, character-method (dbGetQuery), 25
dbGetStatement, 26, 26
dbGetStatement, AthenaResult-method (dbGetStatement), 26
dbGetTables, 27
INDEX

dbGetTables, AthenaConnection-method
  (dbGetTables), 27

dbHasCompleted, 12, 28, 28, 45
dbHasCompleted, AthenaResult-method
  (dbHasCompleted), 28

DBIConnection, 13, 18–20, 22, 24, 25, 27, 29–31, 33–35, 45

DBIDriver, 13, 18, 22, 29

DBIObject, 22, 29

DBIResult, 10, 11, 21, 22, 26, 28, 29, 36
dbIsValid, 11, 29, 29

dbIsValid, AthenaConnection-method
  (dbIsValid), 29
dbIsValid, AthenaResult-method
  (dbIsValid), 29

dbListFields, 30, 30
dbListFields, AthenaConnection, character-method
  (dbListFields), 30

dbListTables, 31, 31
dbListTables, AthenaConnection-method
  (dbListTables), 31

dbplyr_edition, 32

dbQuote, 33
dbQuoteIdentifier, 33
dbQuoteIdentifier(), 20, 24, 30, 34, 35, 48
dbQuoteIdentifier, AthenaConnection, SQL-method
  (dbQuote), 33
dbQuoteString, 33
dbQuoteString, AthenaConnection, character-method
  (dbQuote), 33
dbQuoteString, AthenaConnection, Date-method
  (dbQuote), 33
dbQuoteString, AthenaConnection, POSIXct-method
  (dbQuote), 33
dbRemoveTable, 33, 34
dbRemoveTable, AthenaConnection, character-method
  (dbRemoveTable), 33
dbRemoveTable, AthenaConnection, Id-method
  (dbRemoveTable), 33
dbSendQuery, 36, 45
dbSendQuery(), 21
dbSendQuery, AthenaConnection, character-method
  (Query), 45
dbSendStatement, 45
dbSendStatement, AthenaConnection, character-method
  (Query), 45
dbShow, 35
dbShow, AthenaConnection-method
  (dbShow), 35

dbStatistics, 36
dbStatistics, AthenaResult-method
  (dbStatistics), 36

dbWriteTable, 8
dbWriteTable, AthenaConnection, character, data.frame-method
  (AthenaWriteTables), 5
dbWriteTable, AthenaConnection, Id, data.frame-method
  (AthenaWriteTables), 5
dbWriteTable, AthenaConnection, SQL, data.frame-method
  (AthenaWriteTables), 5
delete_work_group (work_group), 51

get_session_token (session_token), 46

get_work_group (work_group), 51

Id(), 20, 24, 30, 34, 35, 48

list_work_groups (work_group), 51

noctua (noctua-package), 3

noctua-package, 3

noctua_options, 11, 25, 43

Query, 45

session_token, 46

SQL, 35, 48

SQL(), 20, 24, 30, 34, 35, 48

sql_escape_date.AthenaConnection
  (backend_dbplyr_v2), 9

sql_escape_datetime.AthenaConnection
  (backend_dbplyr_v2), 9

sql_escape_string.AthenaConnection
  (sql_translate_env), 50

sql_query_explain.AthenaConnection
  (backend_dbplyr_v2), 9

sql_query_fields.AthenaConnection
  (backend_dbplyr_v2), 9

sql_query_save.AthenaConnection
  (db_compute), 37

sql_translate_env, 50

sql_translation.AthenaConnection
  (sql_translate_env), 50

sqlCreateTable, 47, 48

sqlCreateTable, AthenaConnection-method
  (sqlCreateTable), 47

sqlData, 49, 50

sqlData, AthenaConnection-method
  (sqlData), 49
INDEX

tag_options (work_group), 51
update_work_group (work_group), 51
work_group, 51