Package 'RMySQL'

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Title Database Interface and 'MySQL' Driver for R

Description Implements 'DBI' Interface to 'MySQL' and 'MariaDB' Databases.

Depends R (>= 2.8.0), DBI (>= 0.4)

Imports methods

License GPL-2

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https://downloads.mariadb.org/connector-c/

BugReports https://github.com/rstats-db/rmysql/issues

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R topics documented:

`constants` *Constants*

Description

Constants

Constants

`.MySQLPkgName` (currently `"RMySQL"`), `.MySQLPkgVersion` (the R package version), `.MySQLPkgRCS` (the RCS revision), `.MySQLSQLKeywords` (a lot!)

`db-meta` *Database interface meta-data*

Description

Database interface meta-data

Usage

```
## S4 method for signature 'MySQLConnection'
dbGetInfo(dbObj, what = "", ...)

## S4 method for signature 'MySQLConnection'
dbListResults(conn, ...)

## S4 method for signature 'MySQLConnection'
summary(object, verbose = FALSE, ...)

## S4 method for signature 'MySQLConnection'
dbGetException(conn, ...)

## S4 method for signature 'MySQLConnection'
show(object)
```

Arguments

what	optional
...	Other arguments for compatibility with generic.
conn,dbObj,object	MySQLConnection object.
verbose	If TRUE, add extra info.

Examples

```
if (mysqlHasDefault()) {
  con <- dbConnect(RMySQL::MySQL(), dbname = "test")

  summary(con)

  dbGetInfo(con)
  dbListResults(con)
  dbListTables(con)

  dbDisconnect(con)
}
```

---

dbApply *Apply R/S-Plus functions to remote groups of DBMS rows (experimental)*

Description

Applies R/S-Plus functions to groups of remote DBMS rows without bringing an entire result set all at once. The result set is expected to be sorted by the grouping field.

The MySQL implementation allows us to register R functions that get invoked when certain fetching events occur. These include the "begin" event (no records have been yet fetched), "begin.group" (the record just fetched belongs to a new group), "new record" (every fetched record generates this event), "group.end" (the record just fetched was the last row of the current group), "end" (the very last record from the result set). Awk and perl programmers will find this paradigm very familiar (although SAP's ABAP language is closer to what we're doing).

Usage

```
dbApply(res, ...)

## S4 method for signature 'MySQLResult'
dbApply(res, INDEX, FUN = stop("must specify FUN"),
  begin = NULL, group.begin = NULL, new.record = NULL, end = NULL,
  batchSize = 100, maxBatch = 1e+06, ..., simplify = TRUE)
```

Arguments

res	a result set (see dbSendQuery).
...	any additional arguments to be passed to FUN.
INDEX	a character or integer specifying the field name or field number that defines the various groups.
FUN	a function to be invoked upon identifying the last row from every group. This function will be passed a data frame holding the records of the current group, a character string with the group label, plus any other arguments passed to dbApply as "...".
begin	a function of no arguments to be invoked just prior to retrieve the first row from the result set.
group.begin	a function of one argument (the group label) to be invoked upon identifying a row from a new group
new.record	a function to be invoked as each individual record is fetched. The first argument to this function is a one-row data.frame holding the new record.
end	a function of no arguments to be invoked just after retrieving the last row from the result set.
batchSize	the default number of rows to bring from the remote result set. If needed, this is automatically extended to hold groups bigger than batchSize.
maxBatch	the absolute maximum of rows per group that may be extracted from the result set.
simplify	Not yet implemented

Details

This function is meant to handle somewhat gracefully(?) large amounts of data from the DBMS by bringing into R manageable chunks (about `batchSize` records at a time, but not more than `maxBatch`); the idea is that the data from individual groups can be handled by R, but not all the groups at the same time.

Value

A list with as many elements as there were groups in the result set.

Examples

```
if (mysqlHasDefault()) {
con <- dbConnect(RMySQL::MySQL(), dbname = "test")

dbWriteTable(con, "mtcars", mtcars, overwrite = TRUE)
res <- dbSendQuery(con, "SELECT * FROM mtcars ORDER BY cyl")
dbApply(res, "cyl", function(x, grp) quantile(x$mpg, names=FALSE))

dbClearResult(res)
dbRemoveTable(con, "mtcars")
dbDisconnect(con)
}
```

---

dbConnect,MySQLDriver-method

Connect/disconnect to a MySQL DBMS

Description

These methods are straight-forward implementations of the corresponding generic functions.

Usage

```
## S4 method for signature 'MySQLDriver'
dbConnect(drv, dbname = NULL, username = NULL,
  password = NULL, host = NULL, unix.socket = NULL, port = 0,
  client.flag = 0, groups = "rs-dbi", default.file = NULL, ...)

## S4 method for signature 'MySQLConnection'
dbConnect(drv, ...)

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

Arguments

drv	an object of class MySQLDriver, or the character string "MySQL" or an MySQLConnection.
dbname	string with the database name or NULL. If not NULL, the connection sets the default daabase to this value.
username,password	Username and password. If username omitted, defaults to the current user. If password is ommitted, only users without a password can log in.
host	string identifying the host machine running the MySQL server or NULL. If NULL or the string "localhost", a connection to the local host is assumed.
unix.socket	(optional) string of the unix socket or named pipe.
port	(optional) integer of the TCP/IP default port.
client.flag	(optional) integer setting various MySQL client flags. See the MySQL manual for details.
groups	string identifying a section in the default.file to use for setting authentication parameters (see MySQL).
default.file	string of the filename with MySQL client options. Defaults to $HOME/.my.cnf
...	Unused, needed for compatibility with generic.
conn	an MySQLConnection object as produced by dbConnect.

Examples

```
## Not run:
# Connect to a MySQL database running locally
con <- dbConnect(RMySQL::MySQL(), dbname = "mydb")
# Connect to a remote database with username and password
con <- dbConnect(RMySQL::MySQL(), host = "mydb.mycompany.com",
  user = "abc", password = "def")
# But instead of supplying the username and password in code, it's usually
# better to set up a group in your .my.cnf (usually located in your home
directory). Then it's less likely you'll inadvertently share them.
con <- dbConnect(RMySQL::MySQL(), group = "test")

# Always cleanup by disconnecting the database
dbDisconnect(con)

## End(Not run)

# All examples use the rs-dbi group by default.
if (mysqlHasDefault()) {
  con <- dbConnect(RMySQL::MySQL(), dbname = "test")
  summary(con)
  dbDisconnect(con)
}
```

dbDataType,MySQLDriver-method

Determine the SQL Data Type of an S object

Description

This method is a straight-forward implementation of the corresponding generic function.

Usage

```
## S4 method for signature 'MySQLDriver'
dbDataType(dbObj, obj)

## S4 method for signature 'MySQLConnection'
dbDataType(dbObj, obj)
```

Arguments

dbObj	A MySQLDriver or MySQLConnection.
obj	R/S-Plus object whose SQL type we want to determine.
...	any other parameters that individual methods may need.

Examples

```
dbDataType(RMySQL::MySQL(), "a")
dbDataType(RMySQL::MySQL(), 1:3)
dbDataType(RMySQL::MySQL(), 2.5)
```

dbEscapeStrings *Escape SQL-special characters in strings.*

Description

Escape SQL-special characters in strings.

Usage

```
dbEscapeStrings(con, strings, ...)

## S4 method for signature 'MySQLConnection,character'
dbEscapeStrings(con, strings)

## S4 method for signature 'MySQLResult,character'
dbEscapeStrings(con, strings, ...)
```

Arguments

con	a connection object (see dbConnect).
strings	a character vector.
...	any additional arguments to be passed to the dispatched method.

Value

A character vector with SQL special characters properly escaped.

Examples

```
if (mysqlHasDefault()) {
con <- dbConnect(RMySQL::MySQL(), dbname = "test")

tmp <- sprintf("SELECT * FROM emp WHERE lname = %s", "O'Reilly")
dbEscapeStrings(con, tmp)

dbDisconnect(con)
}
```

---

dbFetch,MySQLResult,numeric-method

Execute a SQL statement on a database connection.

Description

To retrieve results a chunk at a time, use dbSendQuery, dbFetch, then dbClearResult. Alternatively, if you want all the results (and they'll fit in memory) use dbGetQuery which sends, fetches and clears for you.

Usage

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

## S4 method for signature 'MySQLResult,numeric'
fetch(res, n = -1, ...)

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

## S4 method for signature 'MySQLResult,missing'
fetch(res, n = -1, ...)

## S4 method for signature 'MySQLConnection,character'
dbSendQuery(conn, statement)
```

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

## S4 method for signature 'MySQLResult'
dbGetInfo(dbObj, what = "", ...)

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

## S4 method for signature 'MySQLResult,missing'
dbListFields(conn, name, ...)
```

Arguments

res,dbObj	A MySQLResult object.
n	maximum number of records to retrieve per fetch. Use -1 to retrieve all pending records; use 0 for to fetch the default number of rows as defined in MySQL
...	Unused. Needed for compatibility with generic.
conn	an MySQLConnection object.
statement	a character vector of length one specifying the SQL statement that should be executed. Only a single SQL statment should be provided.
what	optional
name	Table name.

Details

fetch() will be deprecated in the near future; please use dbFetch() instead.

Examples

```
if (mysqlHasDefault()) {
con <- dbConnect(RMySQL::MySQL(), dbname = "test")
dbWriteTable(con, "arrests", datasets::USArrests, overwrite = TRUE)

# Run query to get results as dataframe
dbGetQuery(con, "SELECT * FROM arrests limit 3")

# Send query to pull requests in batches
res <- dbSendQuery(con, "SELECT * FROM arrests")
data <- dbFetch(res, n = 2)
data
dbHasCompleted(res)

dbListResults(con)
dbClearResult(res)
dbRemoveTable(con, "arrests")
dbDisconnect(con)
}
```

dbGetInfo,MySQLDriver-method
Get information about a MySQL driver.

Description

Get information about a MySQL driver.

Usage

```
## S4 method for signature 'MySQLDriver'
dbGetInfo(dbObj, what = "", ...)

## S4 method for signature 'MySQLDriver'
dbListConnections(drv, ...)

## S4 method for signature 'MySQLDriver'
summary(object, verbose = FALSE, ...)

## S4 method for signature 'MySQLDriver'
show(object)
```

Arguments

dbObj,object,drv	Object created by MySQL.
what	Optional
...	Ignored. Needed for compatibility with generic.
verbose	If TRUE, print extra info.

Examples

```
db <- RMySQL::MySQL()

db
dbGetInfo(db)
dbListConnections(db)
summary(db)
```

dbNextResult *Fetch next result set from an SQL script or stored procedure (experimental)*

Description

SQL scripts (i.e., multiple SQL statements separated by ';') and stored procedures oftentimes generate multiple result sets. These generic functions provide a means to process them sequentially. dbNextResult fetches the next result from the sequence of pending results sets; dbMoreResults returns a logical to indicate whether there are additional results to process.

Usage

```
dbNextResult(con, ...)

## S4 method for signature 'MySQLConnection'
dbNextResult(con, ...)

dbMoreResults(con, ...)

## S4 method for signature 'MySQLConnection'
dbMoreResults(con, ...)
```

Arguments

con	a connection object (see dbConnect).
...	any additional arguments to be passed to the dispatched method

Value

dbNextResult returns a result set or NULL.

dbMoreResults returns a logical specifying whether or not there are additional result sets to process in the connection.

Examples

```
if (mysqlHasDefault()) {
con <- dbConnect(RMySQL::MySQL(), dbname = "test", client.flag = CLIENT_MULTI_STATEMENTS)
dbWriteTable(con, "mtcars", datasets::mtcars, overwrite = TRUE)

sql <- "SELECT cyl FROM mtcars LIMIT 5; SELECT vs FROM mtcars LIMIT 5"
rs1 <- dbSendQuery(con, sql)
dbFetch(rs1, n = -1)

if (dbMoreResults(con)) {
   rs2 <- dbNextResult(con)
   dbFetch(rs2, n = -1)
}
```

```
dbClearResult(rs1)
dbClearResult(rs2)
dbRemoveTable(con, "mtcars")
dbDisconnect(con)
}
```

---

dbReadTable,MySQLConnection,character-method
Convenience functions for importing/exporting DBMS tables

Description

These functions mimic their R/S-Plus counterpart `get`, `assign`, `exists`, `remove`, and `objects`, except that they generate code that gets remotely executed in a database engine.

Usage

```
## S4 method for signature 'MySQLConnection,character'
dbReadTable(conn, name, row.names,
  check.names = TRUE, ...)

## S4 method for signature 'MySQLConnection'
dbListTables(conn, ...)

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

## S4 method for signature 'MySQLConnection,character'
dbRemoveTable(conn, name, ...)

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

Arguments

`conn`	a `MySQLConnection` object, produced by `dbConnect`
`name`	a character string specifying a table name.
`row.names`	A string or an index specifying the column in the DBMS table to use as `row.names` in the output data.frame. Defaults to using the `row_names` column if present. Set to `NULL` to never use row names.
`check.names`	If `TRUE`, the default, column names will be converted to valid R identifiers.
`...`	Unused, needed for compatiblity with generic.

Value

A data.frame in the case of `dbReadTable`; otherwise a logical indicating whether the operation was successful.

Note

Note that the data.frame returned by dbReadTable only has primitive data, e.g., it does not coerce character data to factors.

Examples

```
if (mysqlHasDefault()) {
con <- dbConnect(RMySQL::MySQL(), dbname = "test")

# By default, row names are written in a column to row_names, and
# automatically read back into the row.names()
dbWriteTable(con, "mtcars", mtcars[1:5, ], overwrite = TRUE)
dbReadTable(con, "mtcars")
dbReadTable(con, "mtcars", row.names = NULL)
}
```

---

dbUnloadDriver,MySQLDriver-method

Unload MySQL driver.

Description

Unload MySQL driver.

Usage

```
## S4 method for signature 'MySQLDriver'
dbUnloadDriver(drv, ...)
```

Arguments

drv	Object created by MySQL.
...	Ignored. Needed for compatibility with generic.

Value

A logical indicating whether the operation succeeded or not.

dbWriteTable,MySQLConnection,character,data.frame-method
Write a local data frame or file to the database.

Description

Write a local data frame or file to the database.

Usage

```
## S4 method for signature 'MySQLConnection,character,data.frame'
dbWriteTable(conn, name, value,
  field.types = NULL, row.names = TRUE, overwrite = FALSE,
  append = FALSE, ..., allow.keywords = FALSE)

## S4 method for signature 'MySQLConnection,character,character'
dbWriteTable(conn, name, value,
  field.types = NULL, overwrite = FALSE, append = FALSE, header = TRUE,
  row.names = FALSE, nrows = 50, sep = ",", eol = "\n", skip = 0,
  quote = "\"", ...)
```

Arguments

conn	a MySQLConnection object, produced by dbConnect
name	a character string specifying a table name.
value	a data.frame (or coercible to data.frame) object or a file name (character). In the first case, the data.frame is written to a temporary file and then imported to SQLite; when value is a character, it is interpreted as a file name and its contents imported to SQLite.
field.types	character vector of named SQL field types where the names are the names of new table's columns. If missing, types inferred with dbDataType).
row.names	A logical specifying whether the row.names should be output to the output DBMS table; if TRUE, an extra field whose name will be whatever the R identifier "row.names" maps to the DBMS (see make.db.names). If NA will add rows names if they are characters, otherwise will ignore.
overwrite	a logical specifying whether to overwrite an existing table or not. Its default is FALSE. (See the BUGS section below)
append	a logical specifying whether to append to an existing table in the DBMS. Its default is FALSE.
...	Unused, needs for compatibility with generic.
allow.keywords	logical indicating whether column names that happen to be MySQL keywords be used as column names in the resulting relation (table) being written. Defaults to FALSE, forcing mysqlWriteTable to modify column names to make them legal MySQL identifiers.

header	logical, does the input file have a header line? Default is the same heuristic used by read.table, i.e., TRUE if the first line has one fewer column that the second line.
nrows	number of lines to rows to import using read.table from the input file to create the proper table definition. Default is 50.
sep	field separator character
eol	End-of-line separator
skip	number of lines to skip before reading data in the input file.
quote	the quote character used in the input file (defaults to \".)

---

isIdCurrent *Check if a database object is valid.*

Description

Support function that verifies that an object holding a reference to a foreign object is still valid for communicating with the RDBMS. isIdCurrent will be deprecated in the near future; please use the dbIsValid() generic instead.

Usage

```
isIdCurrent(obj)

## S4 method for signature 'MySQLDriver'
dbIsValid(dbObj)

## S4 method for signature 'MySQLConnection'
dbIsValid(dbObj)

## S4 method for signature 'MySQLResult'
dbIsValid(dbObj)
```

Arguments

dbObj,obj	A MysqlDriver, MysqlConnection, MysqlResult.

Details

dbObjects are R/S-Plus remote references to foreign objects. This introduces differences to the object's semantics such as persistence (e.g., connections may be closed unexpectedly), thus this function provides a minimal verification to ensure that the foreign object being referenced can be contacted.

Value

a logical scalar.

Examples

```
dbIsValid(MySQL())
```

`make.db.names,MySQLConnection,character-method`
Make R/S-Plus identifiers into legal SQL identifiers

Description

These methods are straight-forward implementations of the corresponding generic functions.

Usage

```
## S4 method for signature 'MySQLConnection,character'
make.db.names(dbObj, snames,
  keywords = .SQL92Keywords, unique = TRUE, allow.keywords = TRUE, ...)

## S4 method for signature 'MySQLConnection'
SQLKeywords(dbObj, ...)

## S4 method for signature 'MySQLConnection,character'
isSQLKeyword(dbObj, name,
  keywords = .MySQLKeywords, case = c("lower", "upper", "any")[3], ...)
```

Arguments

`dbObj`	any MySQL object (e.g., `MySQLDriver`).
`snames`	a character vector of R/S-Plus identifiers (symbols) from which we need to make SQL identifiers.
`keywords`	a character vector with SQL keywords, by default it is `.MySQLKeywords` define in `RMySQL`. This may be overriden by users.
`unique`	logical describing whether the resulting set of SQL names should be unique. Its default is `TRUE`. Following the SQL 92 standard, uniqueness of SQL identifiers is determined regardless of whether letters are upper or lower case.
`allow.keywords`	logical describing whether SQL keywords should be allowed in the resulting set of SQL names. Its default is `TRUE`
`...`	Unused, needed for compatibility with generic.
`name`	a character vector of SQL identifiers we want to check against keywords from the DBMS.
`case`	a character string specifying whether to make the comparison as lower case, upper case, or any of the two. it defaults to `any`.

mysqlClientLibraryVersions *MySQL Check for Compiled Versus Loaded Client Library Versions*

Description

This function prints out the compiled and loaded client library versions.

Usage

```
mysqlClientLibraryVersions()
```

Value

A named integer vector of length two, the first element representing the compiled library version and the second element representint the loaded client library version.

Examples

```
mysqlClientLibraryVersions()
```

MySQLDriver-class *Class MySQLDriver with constructor MySQL.*

Description

An MySQL driver implementing the R database (DBI) API. This class should always be initialized with the `MySQL()` function. It returns a singleton that allows you to connect to MySQL.

Usage

```
MySQL(max.con = 16, fetch.default.rec = 500)
```

Arguments

`max.con`	maximum number of connections that can be open at one time. There's no intrinic limit, since strictly speaking this limit applies to MySQL *servers*, but clients can have (at least in theory) more than this. Typically there are at most a handful of open connections, thus the internal `RMySQL` code uses a very simple linear search algorithm to manage its connection table.
`fetch.default.rec`	number of records to fetch at one time from the database. (The `fetch` method uses this number as a default.)

Examples

```
if (mysqlHasDefault()) {
# connect to a database and load some data
con <- dbConnect(RMySQL::MySQL(), dbname = "test")
dbWriteTable(con, "USArrests", datasets::USArrests, overwrite = TRUE)

# query
rs <- dbSendQuery(con, "SELECT * FROM USArrests")
d1 <- dbFetch(rs, n = 10)      # extract data in chunks of 10 rows
dbHasCompleted(rs)
d2 <- dbFetch(rs, n = -1)      # extract all remaining data
dbHasCompleted(rs)
dbClearResult(rs)
dbListTables(con)

# clean up
dbRemoveTable(con, "USArrests")
dbDisconnect(con)
}
```

---

mysqlHasDefault *Check if default database is available.*

Description

RMySQL examples and tests connect to a database defined by the `rs-dbi` group in `~/.my.cnf`. This function checks if that database is available, and if not, displays an informative message.

Usage

```
mysqlHasDefault()
```

Examples

```
if (mysqlHasDefault()) {
  db <- dbConnect(RMySQL::MySQL(), dbname = "test")
  dbListTables(db)
  dbDisconnect(db)
}
```

result-meta *Database interface meta-data.*

Description

See documentation of generics for more details.

Usage

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

## S4 method for signature 'MySQLResult'
dbGetRowsAffected(res, ...)

## S4 method for signature 'MySQLResult'
dbGetRowCount(res, ...)

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

## S4 method for signature 'MySQLResult'
dbGetException(conn, ...)

## S4 method for signature 'MySQLResult'
summary(object, verbose = FALSE, ...)

## S4 method for signature 'MySQLResult'
show(object)
```

Arguments

res,conn,object	An object of class MySQLResult
...	Ignored. Needed for compatibility with generic
verbose	If TRUE, print extra information.

Examples

```
if (mysqlHasDefault()) {
con <- dbConnect(RMySQL::MySQL(), dbname = "test")
dbWriteTable(con, "t1", datasets::USArrests, overwrite = TRUE)

rs <- dbSendQuery(con, "SELECT * FROM t1 WHERE UrbanPop >= 80")
dbGetStatement(rs)
dbHasCompleted(rs)
```

```
dbGetInfo(rs)
dbColumnInfo(rs)

dbClearResult(rs)
dbRemoveTable(con, "t1")
dbDisconnect(con)
}
```

`transactions` *DBMS Transaction Management*

Description

Commits or roll backs the current transaction in an MySQL connection. Note that in MySQL DDL statements (e.g. `CREATE TABLE`) can not be rolled back.

Usage

```
## S4 method for signature 'MySQLConnection'
dbCommit(conn, ...)

## S4 method for signature 'MySQLConnection'
dbBegin(conn, ...)

## S4 method for signature 'MySQLConnection'
dbRollback(conn, ...)
```

Arguments

`conn`	a `MySQLConnection` object, as produced by `dbConnect`.
`...`	Unused.

Examples

```
if (mysqlHasDefault()) {
con <- dbConnect(RMySQL::MySQL(), dbname = "test")
df <- data.frame(id = 1:5)

dbWriteTable(con, "df", df)
dbBegin(con)
dbGetQuery(con, "UPDATE df SET id = id * 10")
dbGetQuery(con, "SELECT id FROM df")
dbRollback(con)

dbGetQuery(con, "SELECT id FROM df")

dbRemoveTable(con, "df")
dbDisconnect(con)
}
```

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