Package: TSdbi (via r-universe)

November 13, 2026

Version 2017.4.1.9001

Title Time Series Database Interface

Description Provides a common interface to time series databases. The objective is to define a standard interface so users can retrieve time series data from various sources with a simple, common, set of commands, and so programs can be written to be portable with respect to the data source. The SQL implementations also provide a database table design, so users needing to set up a time series database have a reasonably complete way to do this easily. The interface provides for a variety of options with respect to the representation of time series in R. The interface, and the SQL implementations, also handle vintages of time series data (sometime called editions or real-time data). There is also a (not yet well tested) mechanism to handle multilingual data documentation. Comprehensive examples of all the 'TS*' packages is provided in the vignette Guide.pdf with the 'TSdata' package. Compatibility updates by Renova.

Depends R (>= 2.8.0)

Imports methods, DBI(>= 0.3.1), tframe (>= 2015.1-1)

Suggests zoo, tseries, tis, tfplot, tframePlus

BuildVignettes true

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URL http://tsdbi.r-forge.r-project.org/

NeedsCompilation no

Repository https://renova-r.r-universe.dev

Date/Publication 2026-11-13 15:50:44 UTC

RemoteUrl https://github.com/renova-r/TSdbi

RemoteRef renova-2017.4.1.9001

RemoteSha 4671c49acae177f4a1c9e9cf096c64e793fb19fd

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`TSdbi-package` *Time Series Data Base Interface*

Description

TSdbi provides an common interface to time series databases. Several of these are databases available over the Internet. Others are packages that use the DBI package interface to SQL databases. For these a table structure is specified. TSdbi can also be used as an interface to Fame databases through TSfame.

Details

Package:	TSdbi
Depends:	R (>= 2.5.0), methods, tframe (>= 2008.5-1)
Imports:	methods, DBI
Suggests:	zoo, tseries
License:	GPL Version 2.
URL:	http://tsdbi.r-forge.r-project.org

The main functions are:

```
TSconnect       Connect to a database.
TSget        Extract a series from a database.
TSput        Write a series to the database.
TSdates       Check the availability of a series.
TSdescription Extract the long description of a series.
TSdoc   Extract the documentation for a series.
```

Use of this package requires one of the interface packages (e. g. **TSSQLite**, **TSMySQL**, **TSPostgreSQL**) An overview of how to use the package is available in the vignettes of the package **TSdata**. Using **TSdbi** is very similar for the different database interfaces, but building vignettes requires working code so the vignettes are included in the various interface packages. For the same reason, most examples and demos must be included in the interface packages. Consult the documentation for the methods in a particular interface package for most examples.

Options can be set to simplify access to a commonly used database (see TSput).

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See Also

TSconnect, TSget, TSput, TSdates, dbConnect, TSdbiMethods in packages **TSSQLite**, **TSMySQL** and **TSPostgreSQL**

TSconnect *Connect to a Time Series Database*

Description

Return a connection to a time series database

Usage

```
    TSconnect(q, dbname, ...)
    ## S4 method for signature 'character,character'
TSconnect(q, dbname, ...)
    ## S4 method for signature 'logicalId'
show(object)
    ## S4 method for signature 'TSdb'
show(object)
    ## S4 method for signature 'TSmeta'
show(object)
    ## S4 method for signature 'TSdb'
print(x, ...)
```

Arguments

q	A character string indicating the query interface to use, or a database connection object.
dbname	The name of the database to which the connection should be established, omitted if q is a database connection object.
x	A database connection as returned by TSconnect.
object	an object to display.
...	Additional arguments passed to other methods. For TSconnect these will be passed to the database driver.

Details

This function establishes a connection using a driver from one of the driver packages (e.g. **TSMySQL** or **TSSQLite**). If q is a character string (e.g. "MySQL") then the method attempts to get a connection using the character string.

"TSconnect" uses dbConnect but checks the database has expected tables and also establishes information about additional features that may be available (vintiges and/or panels).

Options can be set to simplify access to a commonly used database (see TSput).

Value

A database connection.

See Also

TSdbi-package, dbConnect, TSget, TSput, TSdates

TSdates *Check Data Availability*

Description

Check the dates for which date is available.

Usage

```
    TSdates(serIDs, con=getOption("TSconnection"),
           vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)

    ## S4 method for signature 'character,missing'
TSdates(serIDs, con=getOption("TSconnection"),
       vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
    ## S4 method for signature 'character,ANY'
TSdates(serIDs, con=getOption("TSconnection"),
       vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)

    ## S3 method for class 'TSdates'
start(x, ...)
    ## S3 method for class 'TSdates'
tfstart(x)
    ## S3 method for class 'TSdates'
end(x, ...)
    ## S3 method for class 'TSdates'
tfend(x)
```

Arguments

con	A database connection.
serIDs	identifiers for series on the database.
x	an object returned by TSdates.
vintage	character string indicating vintage of the series on the database (if supported by the database).
panel	character string indicating panel of the series on the database (if supported by the database).
...	arguments passed to other methods.

Details

TSdates returns information about the start and end of each series in serIDs. con is a database connection as returned by dbConnect. TSdates also provides simple way to query a regularly used database. The connection can be set in options using options(TSconnection=con) and then only the series identifiers need to be specified in calls to TSdates.

start, tfstart, end, and tfend extract start and end dates from the object returned by TSdates.

Value

depends.

See Also

TSdbi-package, TSdescription, dbConnect, TSget, TSput, tfstart, tfend

---

TSdescription *Specific Methods for Documenting Data*

Description

See the generic function description.

Usage

```
    TSmeta(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,missing'
TSmeta(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,ANY'
TSmeta(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'ANY,missing'
TSmeta(x, con, ...)

    TSmeta(x) <- value
```

```
    TSdescription(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,missing'
TSdescription(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,ANY'
TSdescription(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'ANY,missing'
TSdescription(x, con, ...)
    ## S4 method for signature 'missing,ANY'
TSdescription(x, con, serIDs, ...)
    ## S4 method for signature 'missing,missing'
TSdescription(x, serIDs, ...)
    TSdescription(x) <- value

    TSdoc(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,missing'
TSdoc(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,ANY'
TSdoc(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'ANY,missing'
TSdoc(x, con, ...)
    ## S4 method for signature 'missing,ANY'
TSdoc(x, con, serIDs, ...)
    ## S4 method for signature 'missing,missing'
TSdoc(x, serIDs, ...)
    TSdoc(x) <- value

    TSlabel(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,missing'
TSlabel(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,ANY'
TSlabel(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'ANY,missing'
TSlabel(x, con, ...)
    ## S4 method for signature 'missing,ANY'
TSlabel(x, con, serIDs, ...)
    ## S4 method for signature 'missing,missing'
TSlabel(x, serIDs, ...)
    TSlabel(x) <- value

    TSsource(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,missing'
TSsource(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,ANY'
TSsource(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'ANY,missing'
TSsource(x, con, ...)
    ## S4 method for signature 'missing,ANY'
TSsource(x, con, serIDs, ...)
```

```
    ## S4 method for signature 'missing,missing'
TSsource(x, serIDs, ...)
    TSsource(x) <- value

    TSrefperiod(x)
    ## S4 method for signature 'default'
TSrefperiod(x)
    TSrefperiod(x) <- value
```

Arguments

con	A database connection.
serIDs	identifiers for series on the database.
x	a time series data object or an identifier for a series on the database.
value	a character string (or vector of character strings).
...	arguments passed to other methods.

Details

These functions return various information about the data series. Methods with con and serIDs (sometimes identifiers are passed as argument x) get data from the database. Others extract information from the object.

Assignments assign an attribute to the object x with value. If x is a multivariate time series (matrix) then value should be a vector of length equal the number of series. The reference period for a time series indicates a special refence point (e.g. "Wednesday" for weekly data collected on Wednesday).

The extraction methods extract the attribute.

Value

Depends. See details.

See Also

TSget, TSput, TSexists, TSdates

TSexists *Check if Series Exist on a Database*

Description

Return a logical value indicating if series exist on a database, including vintages.

Usage

```
    TSexists(serIDs, con=getOption("TSconnection"),
 vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
    ## S4 method for signature 'default'
TSexists(
 serIDs, con=getOption("TSconnection"),
 vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
```

Arguments

con	A database connection.
serIDs	identifiers for series on the database.
vintage	character string indicating vintage of the series on the database (if supported by the database).
panel	character string indicating panel of the series on the database (if supported by the database).
...	arguments passed to other methods.

Details

TSexists returns TRUE or FALSE, depending on whether the series exist at the connection. (All series specified must exist for TRUE.) If vintage is a vector then a corresponding vector result is returned.

Value

Depends. See details.

See Also

TSdescription, TSget, TSput, TSdates

TSfinddb *Find a Time Series Database Connection*

Description

Find a connection to a specified time series database.

Usage

```
TSfinddb(dbname=NULL, driverOrder=c("MySQL", "SQLite", "PostgreSQL"))
```

Arguments

dbname	Character string indicating the name of a database.
driverOrder	A vector of character string indicating TSdbi drivers in the order they should be tried.

Details

TSfinddb tries to establish a connection to the indicated database using the drivers in the order specified. This attempt also requires the corresponding TSdbi driver package (e.g., "TSMySQL", "TSSQLite", or "TSPostgreSQL"). If the package cannot be loaded then the driver is skipped. The first valid connection is returned. If no valid connection is found then NULL is returned.

Value

A connection

See Also

TSdbi-package, dbConnect, TSput, TSget, TSdates

TSget *Get Time Series Data Using a Database Connection*

Description

Get time series matrix structure from a database

Usage

```
    TSget(serIDs, con=getOption("TSconnection"),  ...)
    ## S4 method for signature 'character,missing'
TSget(serIDs, con=getOption("TSconnection"),  ...)
    ## S4 method for signature 'character,ANY'
TSget(serIDs, con=getOption("TSconnection"),  ...)
```

Arguments

con	A database connection.
serIDs	identifiers for series to extract.
...	Arguments passed to other methods. See details.

Details

These functions extract data from a database using a connection. This method is generic. The argument serIDs should give identifiers for the series to extract.

TSget and other functions also provide a way to query a regularly used database by setting the connection in options using options(TSconnection=con), so then only the series identifiers need to be specified in calls to TSget.

The user can specify a default time series representation with the argument TSrepresentation=something where something is "default" by default, but might be "zoo", "its", "timeSeries" or a function which is used to coerce the series to any representation. The TSrepresentation is passed in the ... argument. If TSrepresentation is a function it will be applied directly to the default

returned by the query. The default is usually ts for monthly, quarterly, annual, and semi-annual data, and zoo otherwise, but the default may be different for some TSget methods. The conversion is done with the function tframePlus::changeTSrepresentation. The user should attach any package necessary for dealing with the representation.

If TSrepresentation is not specified, or is specified as "default", then for SQL packages (**TSMySQL**, **TSPostgreSQL** , **TSSQLite**, etc) the ts representation is used for data from tables "A", "Q", "M","S" and zoo otherwise. See TSput for a list of the various tables. For other packages the default is generally the same, or zoo for all series, but this may vary.

It would be possible to specify TSrepresentation="as.zoo", but this may result in as.zoo being applied twice, in which case some information about the time representation gets lost, so the best way to get a zoo represenation is to specify TSrepresentation="zoo".

Users can set a session default with options(TSrepresentation=something) so that this is always passed as an argument to TSget.

It is also possible to pass start, end, or tframe information to truncate the returned series. This is part of the ... argument passed to tfwindow. See tfwindow for more details. By default no truncation is applied.

If the database supports vintages or panels then it is also possible to set defaults for these with, for example, options(TSvintage="current") and options(TSpanel="Canada"). The default specification has to be supported by the database for this to work.

Also, if the database supports vintages or panels it is possible to give a vector value for one of vintage or panel as long as serIDs is length 1. (That is, only one of serIDs, vintage or panel can have more than one element.) In this case, if names is not specified, vintage or panel will be used for the series names in the returned time series matrix.

names, TSdescription, TSdoc andTSlabel can also be specified as arguments. (Passed in ...).

Value

A time series matrix.

See Also

TSdbi-package, TSconnect, TSput, TSdates tfwindow tframePlus::changeTSrepresentation

---

TSput *Write Data to a Data Connection*

Description

Write data to a server.

Usage

```
    TSput(x, serIDs=seriesNames(x), con=getOption("TSconnection"), ...)

    TSdelete(serIDs, con=getOption("TSconnection"),
 vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)

    TSreplace(x, serIDs=seriesNames(x), con=getOption("TSconnection"),
 vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)

    ## S4 method for signature 'ANY,missing,missing'
TSput(
 x, serIDs=seriesNames(x), con=getOption("TSconnection"), ...)
    ## S4 method for signature 'ANY,DBIConnection,missing'
TSput(
 x, serIDs=seriesNames(x), con=getOption("TSconnection"), ...)
    ## S4 method for signature 'ANY,character,ANY'
TSput(
 x, serIDs=seriesNames(x), con=getOption("TSconnection"), ...)

    ## S4 method for signature 'character,missing'
TSdelete(
 serIDs, con=getOption("TSconnection"),
 vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
    ## S4 method for signature 'character,ANY'
TSdelete(
 serIDs, con=getOption("TSconnection"),
 vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
    ## S4 method for signature 'character,missing,ANY,ANY'
TSdelete(
 serIDs, con=getOption("TSconnection"),
 vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
    ## S4 method for signature 'character,ANY,ANY,ANY'
TSdelete(
 serIDs, con=getOption("TSconnection"),
 vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)

    ## S4 method for signature 'default'
TSreplace(
 x, serIDs=seriesNames(x), con=getOption("TSconnection"),
 vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
```

Arguments

con	A database connection.
x	time series data.
serIDs	identifiers for series on the database.
vintage	character string indicating vintage of the series on the database (if supported by the database).

panel	character string indicating panel of the series on the database (if supported by the database).
...	Arguments passed to other methods.

Details

Class logicalId is a logical indicating if the operation succeeded, and also contains meta data indicating how to retrieve the data. (Except in the case of TSdelete the data cannot be retrieved.)

These functions write data to a database connection. TSreplace removes any existing object first. TSput will fail if a series with the same identifier already exists.

TSput and TSreplace provide ways to query a regularly used single database. The connection can be set in options using options(TSconnection=con) and then only the series identifiers need to be specified in calls to TSput and TSreplace.

TSdescription and TSdoccan also be set. (Passed in ...).

If an appropriate table cannot be determined from the series it will be necessary to pass the Table argument (in ...). The DBI/SQL interface uses the following tables:

```
A     for annual data
Q     for quarterly data
M     for monthly data
S     for semiannual data
W     for weekly data
D     for daily data
B     for business data
U     for minutely data
I     for irregular data with a date
T     for irregular data with a date and time
Meta  for meta data
```

Value

An object of class logicalId.

See Also

TSdbi-package, TSdates, TSget, dbConnect

TSsourceInfo *Get source information from a data object*

Description

Get source information from an object

Usage

```
TSseriesIDs(x)
TScon(x)
TSextractionDate(x)
```

Arguments

x	An object which contains source series information (as returned by TSget).

Value

Strings indicating the information.

See Also

TSsource, TSget, TSconnect, TSdates

TSvintages *Indicate all Vintages at a Connection*

Description

Indicate all vintages on the database(s) associated with a TSconnection.

Usage

```
    TSvintages(con=getOption("TSconnection"))
    ## S4 method for signature 'missing'
TSvintages(con=getOption("TSconnection"))
    ## S4 method for signature 'ANY'
TSvintages(con=getOption("TSconnection"))
```

Arguments

con	A TSconnection object

Details

TSvintages returns the vintage identifiers if available. Otherwise NULL is returned. The result, or subsets of it, can be used as the vintage argument in calls to TSget.

Value

A vector of strings indicating vintage identifiers

See Also

TSconnect

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