Package ‘redux’

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Title R Bindings to 'hiredis'

Version 1.1.3

Description A 'hiredis' wrapper that includes support for transactions, pipelining, blocking subscription, serialisation of all keys and values, 'Redis' error handling with R errors. Includes an automatically generated 'R6' interface to the full 'hiredis' API. Generated functions are faithful to the 'hiredis' documentation while attempting to match R's argument semantics. Serialisation must be explicitly done by the user, but both binary and text-mode serialisation is supported.

SystemRequirements hiredis

License GPL-2

URL https://github.com/richfitz/redux

BugReports https://github.com/richfitz/redux/issues

Depends R (>= 3.2.0)

Imports R6, storrr (>= 1.1.1)

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from_redis_hash

**R topics documented:**

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**Description**

Convert a Redis hash to a character vector or list. This tries to bridge the gap between the way Redis returns hashes and the way that they are nice to work with in R, but keeping all conversions very explicit.

**Usage**

```r
from_redis_hash(
  con,
  key,
  fields = NULL,
  f = as.character,
  missing = NA_character_
)
```

**Arguments**

- **con** A Redis connection object
- **key** key of the hash
- **fields** Optional vector of fields (if absent, all fields are retrieved via HGETALL).
- **f** Function to apply to the list of values retrieved as a single set. To apply element-wise, this will need to be run via something like Vectorize.
- **missing** What to substitute into the returned vector for missing elements. By default an NA will be added. A stop expression is OK and will only be evaluated if values are missing.
Examples

```r
if (redux::redis_available()) {
  # Using a random key so we don't overwrite anything in your database:
  key <- paste0("redux::", paste(sample(letters, 15), collapse = ""))
  r <- redux::hiredis()
  r$HSET(key, "a", "apple")
  r$HSET(key, "b", "banana")
  r$HSET(key, "c", "carrot")

  # Now we have a hash with three elements:
  r$HGETALL(key)

  # Ew, that's not very nice. This is nicer:
  redux::from_redis_hash(r, key)

  # If one of the elements was not a string, then that would not
  # have worked, but you can always leave as a list:
  redux::from_redis_hash(r, key, f = identity)

  # To get just some elements:
  redux::from_redis_hash(r, key, c("a", "c"))

  # And if some are not present:
  redux::from_redis_hash(r, key, c("a", "x"))
  redux::from_redis_hash(r, key, c("a", "z"), missing = "zebra")

  r$DEL(key)
}
```

---

**hiredis**

*Interface to Redis*

**Description**

Create an interface to Redis, with a generated interface to all Redis commands.

**Usage**

```r
hiredis(..., version = NULL)

redis_available(...)```

**Arguments**

... Named configuration options passed to `redis_config`, used to create the environment (notable keys include `host`, `port`, and the environment variable `REDIS_URL`). For `redis_available`, arguments are passed through to `hiredis`. 

version

Version of the interface to generate. If given as a string to numeric version, then only commands that exist up to that version will be included. If given as TRUE, then we will query the Redis server (with INFO) and extract the version number that way.

Details

There is no need to explicitly close the redis connection. It will be closed automatically when the connection goes out of scope and is garbage collected.

Warning

Some commands will block. This includes BRPOP (and other list commands beginning with B). Once these commands have been started, they cannot be interrupted by Ctrl-C from an R session. This is because the redux package hands over control to a blocking function in the hiredis (C) library, and this cannot use R’s normal interrupt machinery. If you want to block but retain the ability to interrupt then you will need to wrap this in another call that blocks for a shorter period of time:

```r
found <- NULL
con <- redux::hiredis()
found <- NULL
while (is.null(found)) {
  found <- con$BLPOP("key", 1)
  Sys.sleep(0.01) # needed for R to notice that interrupt has happened
}
```

Examples

```r
# Only run if a Redis server is running
if (redux::redis_available()) {
  r <- redux::hiredis()
  r$PING()
  r$SET("foo", "bar")
  r$GET("foo")

  # There are lots of methods here:
  r
}
```

---

**object_to_string**  
*Convert R objects to/from strings*

**Description**

Serialise/deserialise an R object into a string. This is a very thin wrapper around the existing R functions `serialize` and `rawToChar`. This is useful to encode arbitrary R objects as string to then save in Redis (which expects a string).
Usage

object_to_string(obj)

string_to_object(str)

object_to_bin(obj, xdr = FALSE)

bin_to_object(bin)

Arguments

obj   An R object to convert into a string
str   A string to convert into an R object
xdr   Use the big-endian representation? Unlike, serialize this is disabled here by
default as it is a bit faster (~ 20 microsecond roundtrip for a serialization of 100
doubles)
bin   A binary vector to convert back to an R object

Examples

s <- object_to_string(1:10)
s
string_to_object(s)
identical(string_to_object(s), 1:10)

parse_redis_url Parse Redis URL

Description

Parse a Redis URL.

Usage

parse_redis_url(url)

Arguments

url   A URL to parse
redis

Redis commands object

Description

Primarily used for pipelining, the redis object produces commands the same way that the main redis_api objects do. If passed in as arguments to the pipeline method (where supported) these commands will then be pipelined. See the redux package for an example.

Usage

redis

Format

An object of class redis_commands of length 199.

Examples

# This object creates commands in the format expected by the
# lower-level redis connection object:
redis$PING()

# For example to send two PING commands in a single transmission:
if (redux::redis_available()) {
  r <- redux::hiredis()
  r$pipeline(
    redux::redis$PING(),
    redux::redis$PING())
}

redis_api

Create a Redis API object

Description

Create a Redis API object. This function is designed to be used from other packages, and not designed to be used directly by users.

Usage

redis_api(x, version = NULL)
Arguments

- **x**
  - An object that defines at least the function command capable of processing commands in the appropriate form.

- **version**
  - Version of the Redis API to generate. If given as a numeric version (or something that can be coerced into one). If given as `TRUE`, then we query the Redis server for its version and generate only commands supported by the server.

Description

Create a set of valid Redis configuration options.

Usage

```r
redis_config(..., config = list(...))
```

Arguments

- **...**
  - See Details

- **config**
  - A list of options, to use in place of ...

Details

Valid arguments here are:

- **url**
  - The URL for the Redis server. See examples. (default: Look up environment variable `REDIS_URL` or `NULL`).

- **host**
  - The hostname of the Redis server. (default: `127.0.0.1`).

- **port**
  - The port of the Redis server. (default: `6379`).

- **path**
  - The path for a Unix socket if connecting that way.

- **password**
  - The Redis password (for use with `AUTH`). This will be stored in `plain text` as part of the Redis object. (default: `NULL`).

- **db**
  - The Redis database number to use (for use with `SELECT`). Do not use in a redis clustering context. (default: `NULL`; i.e., don’t switch).

- **timeout**
  - The maximum number of milliseconds to wait for the connection to be established. (default: `NULL`; i.e. wait forever).

The way that configuration options are resolved follows the design for redis-rb very closely.

1. First, look up (and parse if found) the `REDIS_URL` environment variable and override defaults with that.
2. Any arguments given (`host`, `port`, `password`, `db`) override values inferred from the `url` or `defaults`.
3. If `path` is given, that overrides the `host/port` settings and a socket connection will be used.
Examples

# default config:
redis_config()

# set values
redis_config(host = "myhost")

# url settings:
redis_config(url = "redis://:p4ssw0rd@myhost:32000/2")

# override url settings:
redis_config(url = "redis://myhost:32000", port = 31000)
redis_config(url = "redis://myhost:32000", path = "/tmp/redis.conf")

Description

Create a Redis connection. This function is designed to be used in other packages, and not directly by end-users. However, it is possible and safe to use. See the hiredis package for the user friendly interface.

Usage

redis_connection(config = redis_config())

Arguments

config Configuration parameters as generated by redis_config

Details

This function creates a list of functions, appropriately bound to a pointer to a Redis connection. This is designed for package authors to use so without having to ever deal with the actual pointer itself (which cannot be directly manipulated from R anyway).

The returned list has elements, all of which are functions:

config() The configuration information
reconnect() Attempt reconnection of a connection that has been closed, through serialisation/deserialisation or through loss of internet connection.
command(cmd) Run a Redis command. The format of this command will be documented elsewhere.
pipeline(cmds) Run a pipeline of Redis commands.
subscribe(channel, pattern, callback, envir) Subscribe to a channel or pattern specifying channels. Here, channel must be a character vector, pattern a logical indicating if channel should be interpreted as a pattern, callback is a function to apply to each received message, returning TRUE when subscription should stop, and envir is the environment in which to evaluate callback. See below.
Subscriptions

The callback function must take a single argument; this will be the received message with named elements type (which will be message), channel (the name of the channel) and value (the message contents). If pattern was TRUE, then an additional element pattern will be present (see the Redis docs). The callback must return TRUE or FALSE; this indicates if the client should continue quit (i.e., TRUE means return control to R, FALSE means keep going).

Because the subscribe function is blocking and returns nothing, so all data collection needs to happen as a side-effect of the callback function.

There is currently no way of interrupting the client while it is waiting for a message.

Description

Parse and return Redis INFO data.

Usage

redis_info(con)

parse_info(x)

redis_version(con)

Arguments

con A Redis connection

x character string

Examples

if (redux::redis_available()) {
  r <- redux::hiredis()

  # Redis server version:
  redux::redis_version(r)

  # This is a 'numeric_version' object so you can compute with it
  # if you need to check for minimum versions
  redux::redis_version(r) >= numeric_version("2.1.1")

  # Extensive information is given back by the server:
  redux::redis_info(r)

  # Which is just:
  redux::parse_info(r$INFO())
}
**redis_multi** *Helper for Redis MULTI*

**Description**

Helper to evaluate a Redis `MULTI` statement. If an error occurs then, `DISCARD` is called and the transaction is cancelled. Otherwise `EXEC` is called and the transaction is processed.

**Usage**

```r
redis_multi(con, expr)
```

**Arguments**

- `con` A Redis connection object
- `expr` An expression to evaluate

**redis_scripts** *Load Lua scripts into Redis*

**Description**

Load Lua scripts into Redis, providing a convenience function to call them with. Using this function means that scripts will be available to use via `EVALSHA`, and will be preloaded on the Redis server. Scripts are then accessed by `name` rather than by content or SHA. See the vignette for details and an example.

**Usage**

```r
redis_scripts(con, ..., scripts = list(...))
```

**Arguments**

- `con` A Redis connection
- `...` A number of scripts
- `scripts` Alternatively, a list of scripts
redis_time

Get time from Redis

Description

Get time from Redis and format as a string.

Usage

redis_time(con)

format_redis_time(x)

redis_time_to_r(x)

Arguments

con A Redis connection object

x a list as returned by TIME

Examples

if (redux::redis_available()) {
  r <- redux::hiredis()

  # The output of Redis' TIME command is not the *most* useful
  # thing in the world:
  r$TIME()

  # We can get a slightly nicer representation like so:
  redux::redis_time(r)

  # And from that convert to an actual R time:
  redux::redis_time_to_r(redux::redis_time(r))
}

scan_apply

Iterate over keys using SCAN

Description

Support for iterating with SCAN. Note that this will generalise soon to support collecting output, SSCAN and other variants, etc.
Usage

```r
scan_apply(
  con,
  callback,
  pattern = NULL,
  ...,  # additional arguments passed through to callback
  count = NULL,
  type = "SCAN",
  key = NULL
)
```

```r
scan_del(con, pattern, count = NULL, type = "SCAN", key = NULL)
```

```r
scan_find(con, pattern, count = NULL, type = "SCAN", key = NULL)
```

Arguments

- `con`: A `redis_api` object
- `callback`: Function that takes a character vector of keys and does something useful to it. `con$DEL` is one option here to delete keys that match a pattern. Unlike R’s `*apply` functions, `callback` is called for its side effects and its return values will be ignored.
- `pattern`: Optional pattern to use.
- `...`: additional arguments passed through to `callback`. Note that if used, `pattern` must be provided (at least as `NULL`).
- `count`: Optional step size (default is Redis’ default which is 10)
- `type`: Type of SCAN to run. Options are "SCAN" (the default), "HSCAN" (scan through keys of a hash), "SSCAN" (scan through elements of a set) and "ZSCAN" (scan though elements of a sorted set). If `type` is not "SCAN", then `key` must be provided. HSCAN and ZSCAN currently do not work usefully.
- `key`: Key to use when running a hash, set or sorted set scan.

Details

The functions `scan_del` and `scan_find` are example functions that delete and find all keys corresponding to a given pattern.

---

**storr_redis_api**

*Redis object cache driver*

**Description**

Redis object cache driver
Usage

```
storr_redis_api(
    prefix,
    con,
    hash_algorithm = NULL,
    default_namespace = "objects"
)
```

driver_redis_api(prefix, con, hash_algorithm = NULL)

Arguments

<table>
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<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>prefix</td>
<td>Prefix for keys. We'll generate a number of keys that start with this string. Probably terminating the string with a punctuation character (e.g., &quot;:&quot;) will make created strings nicer to deal with.</td>
</tr>
<tr>
<td>con</td>
<td>A redis_api connection object, as created by redux. Alternatively if passing in a redis_config object, a list, or NULL this will be passed through to hiredis to create a new connection.</td>
</tr>
<tr>
<td>hash_algorithm</td>
<td>Name of the hash algorithm to use. Possible values are &quot;md5&quot;, &quot;sha1&quot;, and others supported by digest. If not given, then we will default to &quot;md5&quot;.</td>
</tr>
<tr>
<td>default_namespace</td>
<td>Default namespace (see storrr).</td>
</tr>
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Author(s)

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