# Package: redux (via r-universe)

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**Title** R Bindings to 'hiredis'

**Version** 1.1.5

**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, https://richfitz.github.io/redux/

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

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`from_redis_hash` *Convert Redis hash*

---

## 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

```
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

```
# 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

```
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.

## Arbitrary commands with command()

##' Redis releases new commands frequently, or it's possible that the wrapper created by redux is too inflexible for your use case. In this situation you can use the command() method to send arbitrary commands to the server and either use these unsupported commands, or fundamentally change how they work.

See redis_connection() for details on how to use this.

## 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:

```
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 <- 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%, saving about 1 microsecond of a 5 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.

### 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. |

---

## redis_config *Redis configuration*

---

### Description

Create a set of valid Redis configuration options.

### Usage

```
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")
```

---

# redis_connection *Create a Redis connection*

---

## 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()` function 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. See below for the format.
- `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.

### Arbitrary commands with `command()`

Redis releases new commands frequently, or it's possible that the wrapper created by redux is too inflexible for your use case. In this situation you can use the `command()` method to send arbitrary commands to the server and either use these unsupported commands, or fundamentally change how they work.

The `command` function takes a single unnamed argument, being a list of commands. The first element of this will always be the name of a redis command (an uppercase string, such as `HMSET` or `AUTH`) and subsequent arguments will be strings, raw vectors or `NULL`. Strings and raw vectors are passed as-is, while `NULL` values are skipped over.

**Spaces within strings are not interpreted as command separators**. So you cannot pass, for example

```
r$command(list("SET", "a b"))
```

and have redis interpret this as two arguments to `SET`. You must pass each argument as an element within the list

```
r$command(list("SET", "a", "b"))
```

Raw vectors can be useful for passing in serialised R objects, you can use `object_to_bin()` and `bin_to_object()` to simplify this process.

```
r$command(list("SET", "a", object_to_bin(mtcars)))
```

### 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 aiting for a message.

### Examples

```
con <- redis_connection()
con$command(list("PING"))
```

## redis_info *Parse Redis* INFO

### 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

```
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

```
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 vignette("redux") for details and an example.

### Usage

```
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

```
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 generalises to support collecting output, SSCAN and other variants, etc.

### Usage

```
scan_apply(
  con,
  callback,
  pattern = NULL,
  ...,
  count = NULL,
  type = "SCAN",
  key = NULL
)

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

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

| | |
|---|---|
| prefix | 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., ":") will make created strings nicer to deal with. |
| con | 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. |

`hash_algorithm` Name of the hash algorithm to use. Possible values are "md5", "sha1", and others supported by `digest`. If not given, then we will default to "md5".

`default_namespace`
Default namespace (see storr::storr).

## Author(s)

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