Package: RedisParam (via r-universe)

November 1, 2026

Title Provide a 'redis' back-end for BiocParallel

Version 1.14.0

Description This package provides a Redis-based back-end for BiocParallel, enabling an alternative mechanism for distributed computation. The The 'manager' distributes tasks to a 'worker' pool through a central Redis server, rather than directly to workers as with other BiocParallel implementations. This means that the worker pool can change dynamically during job evaluation. All features of BiocParallel are supported, including reproducible random number streams, logging to the manager, and alternative 'load balancing' task distributions.

Depends R (>= 4.2.0), BiocParallel (>= 1.29.12)

SystemRequirements hiredis

Imports methods, redux, withr, logger

License Artistic-2.0

Encoding UTF-8

Roxygen list(markdown = TRUE)

RoxygenNote 7.3.3

Suggests rmarkdown, knitr, testthat, BiocStyle

Collate 'Redis.R' 'RedisBackend-class.R' 'RedisParam-class.R' 'RedisParam-accessors.R' 'RedisParam-logger.R' 'RedisParam-methods.R' 'RedisTaskManager.R' 'zzz.R'

biocViews Infrastructure

VignetteBuilder knitr

Config/pak/sysreqs libhiredis-dev

Repository Bioconductor 3.23

Date/Publication 2026-04-28 12:58:42 UTC

RemoteUrl https://github.com/bioc/RedisParam

RemoteRef RELEASE_3_23

RemoteSha 01804a70b8603bc061bbbe5be88709d0e1638381

Contents

bpstopall 2
RedisParam 2

Index **7**

`bpstopall` *Deprecated functions in the RedisParam package*

Description

`bpstopall()` is provided for compatibility with previous versions of RedisParam, and will be defunct after the next release. Use `rpstopall()` instead.

Usage

```
bpstopall(x)
```

Arguments

`x`	a `RedisParam` object.

Value

See `?rpstopall` for return value.

Examples

```
if (FALSE) {
    ## bpstopall()
    ## deprecated -- use rpstopall() instead
}
```

`RedisParam` *Enable redis-based parallel evaluation in BiocParallel*

Description

`RedisParam()` creates an object describing manager and worker configurations for parallel computation using a Redis server back-end.

`rpalive()` tests whether it is possible to connect to a redis server using the host, port, and password in the `RedisParam` object.

`rpstopall()` is used from the manager to stop redis workers launched independently, with `is.worker=TRUE`.

`rpworkers()` determines the number of workers using `snowWorkers()` if workers are created dynamically, or a fixed maximum (currently 1000) if workers are listening on a queue.

`rphost()` reads the host name of the Redis server from the system environment variable `REDISPARAM_HOST`, if the variable is not defined, fallback to `REDIS_HOST`. Otherwise default to `"127.0.0.1"`. `rphost(x)` gives the host name used by `x`.

`rpport()` reads the port of the Redis server from a system environment variable `REDISPARAM_PORT`, if the variable is not defined, fallback to `REDIS_PORT`. Otherwise default to `6379`. `rpport(x)` gives the port used by `x`.

`rppassword()` reads an (optional) password from the system environment variable `REDISPARAM_PASSWORD`, if the variable is not defined, fallback to `REDIS_PASSWORD`. Otherwise default to `NA_character_` (no password). `rppassword(x)` gives the password used by `x`.

Usage

```
RedisParam(
  workers = rpworkers(is.worker),
  tasks = 0L,
  jobname = ipcid(),
  log = FALSE,
  logdir = NA,
  threshold = "INFO",
  resultdir = NA_character_,
  stop.on.error = TRUE,
  timeout = NA_integer_,
  exportglobals = TRUE,
  progressbar = FALSE,
  RNGseed = NULL,
  queue.multiplier = 2L,
  redis.hostname = rphost(),
  redis.port = rpport(),
  redis.password = rppassword(),
  is.worker = NA
)

rpalive(x)

rpstopall(x)

rpworkers(is.worker)

rphost(x)

rpport(x)

rppassword(x)

rpisworker(x)

## S4 method for signature 'RedisParam'
bpisup(x)
```

```
## S4 method for signature 'RedisParam'
bpbackend(x)

## S4 method for signature 'RedisParam'
bpstart(x, ...)

## S4 method for signature 'RedisParam'
bpstop(x)

## S4 method for signature 'RedisParam'
bpworkers(x)

## S4 replacement method for signature 'RedisParam,logical'
bplog(x) <- value
```

Arguments

workers	integer(1) number of redis workers. For `is.worker=FALSE`, this parameter is the maximum number of workers expected to be available. For `is.worker=NA`, this is the number of workers opened by `bpstart()`.
tasks	See ?"BiocParallelParam-class".
jobname	character(1) name (unique) used to associate manager & workers on a queue.
log	See ?"BiocParallelParam-class".
logdir	See ?"BiocParallelParam-class".
threshold	See ?"BiocParallelParam-class".
resultdir	See ?"BiocParallelParam-class".
stop.on.error	See ?"BiocParallelParam-class".
timeout	See ?"BiocParallelParam-class".
exportglobals	See ?"BiocParallelParam-class".
progressbar	See ?"BiocParallelParam-class".
RNGseed	See ?"BiocParallelParam-class".
queue.multiplier	numeric(1), The multiplier of the queue depth. The depth of the queue is calculated by `queue.multiplier * bpnworkers(p)`. A proper queue depth can provide more performance benefit in task dispatching, but the improvement is likely to be marginal for an excessively large `queue.multiplier`.
redis.hostname	character(1) host name of redis server, from system environment variable `REDISPARAM_HOST` or `REDIS_HOST`, if both are not defined, the default `"127.0.0.1"` is used.
redis.port	integer(1) port of redis server, from system environment variable `REDISPARAM_PORT` or `REDIS_PORT`, if both are not defined, the default `6379` is used.
redis.password	character(1) or NULL, host password of redis server from system environment variable `REDISPARAM_PASSWORD` or `REDIS_PASSWORD`, if both are not defined, the default `NA_character_` (no password) is used.

is.worker	logical(1) bpstart() creates worker-only (TRUE), manager-only (FALSE), or manager and worker (NA, default) connections.
x	A RedisParam object.
...	ignored.
value	The value you want to replace with

Details

Use an instance of RedisParam() for interactive parallel evaluation using bplapply() or bpiterate(). RedisParam() requires access to a redis server, running on manager.hostname (e.g., 127.0.0.1) at manager.port (e.g., 6379). The manager and workers communicate via the redis server, rather than the socket connections used by other BiocParallel back-ends.

When invoked with is.worker = NA (the default) bpstart(), bplapply() and bpiterate() start and stop redis workers on the local computer. It may be convenient to use bpstart() and bpstop() independently, to amortize the cost of worker start-up across multiple calls to bplapply() / bpiterate().

Alternatively, a manager and one or more workers can each be started in different processes across a network. The manager is started, e.g., in an interactive session, by specifying is.worker=FALSE. Workers are started, typically as background processes, with is.worker = TRUE. Both manager and workers must specify the same value for jobname =, the redis key used for communication. In this scenario, workers can be added at any time, including during e.g., bplapply() evaluation on the manager. See the vignette for possible scenarios.

Value

RedisParam() returns an object of class RedisParam, for use in controlling parallel evaluation with BiocParallel::bplapply() or BiocParallel::bpiterate().

Examples

```
param <- RedisParam()
if (rpalive(param)) {
    res <- bplapply(1:20, function(i) Sys.getpid(), BPPARAM = param)
    table(unlist(res))
}

## Not run:
## start workers in background proocess(es)
rscript <- R.home("bin/Rscript")
worker_script <- tempfile()
writeLines(c(
    'worker <- RedisParam::RedisParam(jobname = "demo", is.worker = TRUE)',
    'RedisParam::bpstart(worker)'
), worker_script)

for (i in seq_len(2))
    system2(rscript, worker_script, wait = FALSE)

## start manager
p <- RedisParam(jobname = "demo", is.worker = FALSE)
```

```
result <- bplapply(1:5, function(i) Sys.getpid(), BPPARAM = p)
table(unlist(result))

## stop all workers
rpstopall(p)

## End(Not run)
```

Index

bpbackend,RedisParam-method
        *(*RedisParam*)*, 2
bpisup,RedisParam-method *(*RedisParam*)*, 2
bplog<-,RedisParam,logical-method
        *(*RedisParam*)*, 2
bpstart,RedisParam-method *(*RedisParam*)*,
        2
bpstop,RedisParam-method *(*RedisParam*)*, 2
bpstopall, 2
bpworkers,RedisParam-method
        *(*RedisParam*)*, 2

RedisParam, 2
rpalive *(*RedisParam*)*, 2
rphost *(*RedisParam*)*, 2
rpisworker *(*RedisParam*)*, 2
rppassword *(*RedisParam*)*, 2
rpport *(*RedisParam*)*, 2
rpstopall *(*RedisParam*)*, 2
rpworkers *(*RedisParam*)*, 2