

Package ‘callr’

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Title Call R from R

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Description It is sometimes useful to perform a computation in a separate R process, without affecting the current R process at all. This packages does exactly that.

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LazyData true

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R topics documented:

callr	2
default_repos	2
r	3
rcmd	6

remd_bg	9
remd_copycat	11
remd_process	12
remd_process_options	13
remd_safe_env	13
rscript	14
rscript_process	16
rscript_process_options	17
r_bg	17
r_copycat	19
r_process	21
r_process_options	22
r_session	22
r_session_debug	24
r_session_options	26
r_vanilla	26

Index	29
--------------	-----------

callr	<i>Call R from R</i>
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Description

It is sometimes useful to perform a computation in a separate R process, without affecting the current R process at all. This packages does exactly that.

default_repos	<i>Default value for the repos option in callr subprocesses</i>
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Description

callr sets the repos option in subprocesses, to make sure that a CRAN mirror is set up. This is because the subprocess cannot bring up the menu of CRAN mirrors for the user to choose from.

Usage

```
default_repos()
```

Value

Named character vector, the default value of the repos option in callr subprocesses.

Examples

```
default_repos()
```

Description

From `callr` version 2.0.0, `r()` is equivalent to `r_safe()`, and tries to set up a less error prone execution environment. In particular:

- It makes sure that at least one reasonable CRAN mirror is set up.
- Adds some command line arguments are added to avoid saving `.RData` files, etc.
- Ignores the system and user profiles.
- Various environment variables are set: `CYGWIN` to avoid warnings about DOS-style paths, `R_TESTS` to avoid issues when `callr` is invoked from unit tests, `R_BROWSER` and `R_PDFVIEWER` to avoid starting a browser or a PDF viewer. See `rcmd_safe_env()`.

Usage

```
r(  
  func,  
  args = list(),  
  libpath = .libPaths(),  
  repos = default_repos(),  
  stdout = NULL,  
  stderr = NULL,  
  poll_connection = TRUE,  
  error = getOption("callr.error", "error"),  
  cmdargs = c("--slave", "--no-save", "--no-restore"),  
  show = FALSE,  
  callback = NULL,  
  block_callback = NULL,  
  spinner = show && interactive(),  
  system_profile = FALSE,  
  user_profile = "project",  
  env = rcmd_safe_env(),  
  timeout = Inf,  
  ...  
)  
  
r_safe(  
  func,  
  args = list(),  
  libpath = .libPaths(),  
  repos = default_repos(),  
  stdout = NULL,  
  stderr = NULL,  
  poll_connection = TRUE,
```

```

error = getOption("callr.error", "error"),
cmdargs = c("--slave", "--no-save", "--no-restore"),
show = FALSE,
callback = NULL,
block_callback = NULL,
spinner = show && interactive(),
system_profile = FALSE,
user_profile = "project",
env = rcmd_safe_env(),
timeout = Inf,
...
)

```

Arguments

func	Function object to call in the new R process. The function should be self-contained and only refer to other functions and use variables explicitly from other packages using the <code>::</code> notation. The environment of the function is set to <code>.GlobalEnv</code> before passing it to the child process. Because of this, it is good practice to create an anonymous function and pass that to <code>callr</code> , instead of passing a function object from a (base or other) package. In particular <code>r(.libPaths)</code> does not work, because <code>.libPaths</code> is defined in a special environment, but <code>r(function() .libPaths())</code> works just fine.
args	Arguments to pass to the function. Must be a list.
libpath	The library path.
repos	The <code>repos</code> option. If <code>NULL</code> , then no <code>repos</code> option is set. This options is only used if <code>user_profile</code> or <code>system_profile</code> is set <code>FALSE</code> , as it is set using the system or the user profile.
stdout	The name of the file the standard output of the child R process will be written to. If the child process runs with the <code>--slave</code> option (the default), then the commands are not echoed and will not be shown in the standard output. Also note that you need to call <code>print()</code> explicitly to show the output of the command(s).
stderr	The name of the file the standard error of the child R process will be written to. In particular <code>message()</code> sends output to the standard error. If nothing was sent to the standard error, then this file will be empty. This argument can be the same file as <code>stdout</code> , in which case they will be correctly interleaved. If this is the string <code>"2>&1"</code> , then standard error is redirected to standard output.
poll_connection	Whether to have a control connection to the process. This is used to transmit messages from the subprocess to the main process.
error	What to do if the remote process throws an error. See details below.

<code>cmdargs</code>	Command line arguments to pass to the R process. Note that <code>c("-f", rscript)</code> is appended to this, <code>rscript</code> is the name of the script file to run. This contains a call to the supplied function and some error handling code.
<code>show</code>	Logical, whether to show the standard output on the screen while the child process is running. Note that this is independent of the <code>stdout</code> and <code>stderr</code> arguments. The standard error is not shown currently.
<code>callback</code>	A function to call for each line of the standard output and standard error from the child process. It works together with the <code>show</code> option; i.e. if <code>show = TRUE</code> , and a callback is provided, then the output is shown on the screen, and the callback is also called.
<code>block_callback</code>	A function to call for each block of the standard output and standard error. This callback is not line oriented, i.e. multiple lines or half a line can be passed to the callback.
<code>spinner</code>	Whether to show a calming spinner on the screen while the child R session is running. By default it is shown if <code>show = TRUE</code> and the R session is interactive.
<code>system_profile</code>	Whether to use the system profile file.
<code>user_profile</code>	Whether to use the user's profile file. If this is "project", then only the profile from the working directory is used, but the <code>R_PROFILE_USER</code> environment variable and the user level profile are not. See also "Security considerations" below.
<code>env</code>	Environment variables to set for the child process.
<code>timeout</code>	Timeout for the function call to finish. It can be a <code>base::difftime</code> object, or a real number, meaning seconds. If the process does not finish before the timeout period expires, then a <code>system_command_timeout_error</code> error is thrown. <code>Inf</code> means no timeout.
<code>...</code>	Extra arguments are passed to <code>processx::run()</code> .

Details

The `r()` function from before 2.0.0 is called `r_copycat()` now.

Value

Value of the evaluated expression.

Error handling

`callr` handles errors properly. If the child process throws an error, then `callr` throws an error with the same error message in the main process.

The `error_expert` argument may be used to specify a different behavior on error. The following values are possible:

- `error` is the default behavior: throw an error in the main process, with a prefix and the same error message as in the subprocess.

- `stack` also throws an error in the main process, but the error is of a special kind, class `callr_error`, and it contains both the original error object, and the call stack of the child, as written out by `utils::dump.frames()`. This is now deprecated, because the error thrown for "error" has the same information.
- `debugger` is similar to `stack`, but in addition to returning the complete call stack, it also start up a debugger in the child call stack, via `utils::debugger()`.

The default error behavior can be also set using the `callr.error` option. This is useful to debug code that uses `callr`.

`callr` uses parent errors, to keep the stacks of the main process and the subprocess(es) in the same error object.

Security considerations

`callr` makes a copy of the user's `.Renviron` file and potentially of the local or user `.Rprofile`, in the session temporary directory. Avoid storing sensitive information such as passwords, in your environment file or your profile, otherwise this information will get scattered in various files, at least temporarily, until the subprocess finishes. You can use the `keyring` package to avoid passwords in plain files.

See Also

Other `callr` functions: `r_copycat()`, `r_vanilla()`

Examples

```
# Workspace is empty
r(function() ls())

# library path is the same by default
r(function() .libPaths())
.libPaths()
```

rcmd

Run an R CMD command

Description

Run an R CMD command form within R. This will usually start another R process, from a shell script.

Usage

```
rcmd(  
  cmd,  
  cmdargs = character(),  
  libpath = .libPaths(),  
  repos = default_repos(),  
  stdout = NULL,  
  stderr = NULL,  
  poll_connection = TRUE,  
  echo = FALSE,  
  show = FALSE,  
  callback = NULL,  
  block_callback = NULL,  
  spinner = show && interactive(),  
  system_profile = FALSE,  
  user_profile = "project",  
  env = rcmd_safe_env(),  
  timeout = Inf,  
  wd = ".",  
  fail_on_status = FALSE,  
  ...  
)
```

```
rcmd_safe(  
  cmd,  
  cmdargs = character(),  
  libpath = .libPaths(),  
  repos = default_repos(),  
  stdout = NULL,  
  stderr = NULL,  
  poll_connection = TRUE,  
  echo = FALSE,  
  show = FALSE,  
  callback = NULL,  
  block_callback = NULL,  
  spinner = show && interactive(),  
  system_profile = FALSE,  
  user_profile = "project",  
  env = rcmd_safe_env(),  
  timeout = Inf,  
  wd = ".",  
  fail_on_status = FALSE,  
  ...  
)
```

Arguments

cmd	Command to run. See <code>R --help</code> from the command line for the various commands. In the current version of R (3.2.4) these are: BATCH, COMPILE, SHLIB, INSTALL, REMOVE, build, check, LINK, Rprof, Rdconv, Rd2pdf, Rd2txt, Stangle, Sweave, Rdiff, config, javareconf, rtags.
cmdargs	Command line arguments.
libpath	The library path.
repos	The repos option. If NULL, then no repos option is set. This options is only used if <code>user_profile</code> or <code>system_profile</code> is set FALSE, as it is set using the system or the user profile.
stdout	Optionally a file name to send the standard output to.
stderr	Optionally a file name to send the standard error to. It may be the same as <code>stdout</code> , in which case standard error is redirected to standard output. It can also be the special string " <code>2>&1</code> ", in which case standard error will be redirected to standard output.
poll_connection	Whether to have a control connection to the process. This is used to transmit messages from the subprocess to the parent.
echo	Whether to echo the complete command run by <code>rcmd</code> .
show	Logical, whether to show the standard output on the screen while the child process is running. Note that this is independent of the <code>stdout</code> and <code>stderr</code> arguments. The standard error is not shown currently.
callback	A function to call for each line of the standard output and standard error from the child process. It works together with the <code>show</code> option; i.e. if <code>show = TRUE</code> , and a callback is provided, then the output is shown of the screen, and the callback is also called.
block_callback	A function to call for each block of the standard output and standard error. This callback is not line oriented, i.e. multiple lines or half a line can be passed to the callback.
spinner	Whether to show a calming spinner on the screen while the child R session is running. By default it is shown if <code>show = TRUE</code> and the R session is interactive.
system_profile	Whether to use the system profile file.
user_profile	Whether to use the user's profile file. If this is "project", then only the profile from the working directory is used, but the <code>R_PROFILE_USER</code> environment variable and the user level profile are not. See also "Security considerations" below.
env	Environment variables to set for the child process.
timeout	Timeout for the function call to finish. It can be a <code>base::difftime</code> object, or a real number, meaning seconds. If the process does not finish before the timeout period expires, then a <code>system_command_timeout_error</code> error is thrown. Inf means no timeout.
wd	Working directory to use for running the command. Defaults to the current working directory.

`fail_on_status` Whether to throw an R error if the command returns with a non-zero status code. By default no error is thrown.

... Extra arguments are passed to `processx::run()`.

Details

Starting from `callr` 2.0.0, `rcmd()` has safer defaults, the same as the `rcmd_safe()` default values. Use `rcmd_copycat()` for the old defaults.

Value

A list with the command line (`$command`), standard output (`$stdout`), standard error (`$stderr`), exit status (`$status`) of the external R CMD command, and whether a timeout was reached (`$timeout`).

Security considerations

`callr` makes a copy of the user's `.Renviron` file and potentially of the local or user `.Rprofile`, in the session temporary directory. Avoid storing sensitive information such as passwords, in your environment file or your profile, otherwise this information will get scattered in various files, at least temporarily, until the subprocess finishes. You can use the `keyring` package to avoid passwords in plain files.

See Also

Other R CMD commands: `rcmd_bg()`, `rcmd_copycat()`

Examples

```
rcmd("config", "CC")
```

rcmd_bg

Run an R CMD command in the background

Description

The child process is started in the background, and the function return immediately.

Usage

```
rcmd_bg(  
  cmd,  
  cmdargs = character(),  
  libpath = .libPaths(),  
  stdout = "|",  
  stderr = "|",  
  poll_connection = TRUE,
```

```

  repos = default_repos(),
  system_profile = FALSE,
  user_profile = "project",
  env = rcmd_safe_env(),
  wd = ".",
  supervise = FALSE,
  ...
)

```

Arguments

cmd	Command to run. See <code>R --help</code> from the command line for the various commands. In the current version of R (3.2.4) these are: BATCH, COMPILE, SHLIB, INSTALL, REMOVE, build, check, LINK, Rprof, Rdconv, Rd2pdf, Rd2txt, Stangle, Sweave, Rdiff, config, javareconf, rtags.
cmdargs	Command line arguments.
libpath	The library path.
stdout	Optionally a file name to send the standard output to.
stderr	Optionally a file name to send the standard error to. It may be the same as stdout, in which case standard error is redirected to standard output. It can also be the special string " <code>2>&1</code> ", in which case standard error will be redirected to standard output.
poll_connection	Whether to have a control connection to the process. This is used to transmit messages from the subprocess to the parent.
repos	The repos option. If NULL, then no repos option is set. This options is only used if user_profile or system_profile is set FALSE, as it is set using the system or the user profile.
system_profile	Whether to use the system profile file.
user_profile	Whether to use the user's profile file. If this is "project", then only the profile from the working directory is used, but the R_PROFILE_USER environment variable and the user level profile are not. See also "Security considerations" below.
env	Environment variables to set for the child process.
wd	Working directory to use for running the command. Defaults to the current working directory.
supervise	Whether to register the process with a supervisor. If TRUE, the supervisor will ensure that the process is killed when the R process exits.
...	Extra arguments are passed to the <code>processx::process</code> constructor.

Value

It returns a `process` object.

Security considerations

callr makes a copy of the user's .Renviro file and potentially of the local or user .Rprofile, in the session temporary directory. Avoid storing sensitive information such as passwords, in your environment file or your profile, otherwise this information will get scattered in various files, at least temporarily, until the subprocess finishes. You can use the keyring package to avoid passwords in plain files.

See Also

Other R CMD commands: [rcmd_copypcat\(\)](#), [rcmd\(\)](#)

rcmd_copypcat

Call and R CMD command, while mimicking the current R session

Description

This function is similar to [rcmd\(\)](#), but it has slightly different defaults:

- The repos options is unchanged.
- No extra environment variables are defined.

Usage

```
rcmd_copypcat(
  cmd,
  cmdargs = character(),
  libpath = .libPaths(),
  repos = getOption("repos"),
  env = character(),
  ...
)
```

Arguments

cmd	Command to run. See R --help from the command line for the various commands. In the current version of R (3.2.4) these are: BATCH, COMPILE, SHLIB, INSTALL, REMOVE, build, check, LINK, Rprof, Rdconv, Rd2pdf, Rd2txt, Stangle, Sweave, Rdiff, config, javareconf, rtags.
cmdargs	Command line arguments.
libpath	The library path.
repos	The repos option. If NULL, then no repos option is set. This options is only used if user_profile or system_profile is set FALSE, as it is set using the system or the user profile.
env	Environment variables to set for the child process.
...	Additional arguments are passed to rcmd() .

Security considerations

callr makes a copy of the user's .Renviron file and potentially of the local or user .Rprofile, in the session temporary directory. Avoid storing sensitive information such as passwords, in your environment file or your profile, otherwise this information will get scattered in various files, at least temporarily, until the subprocess finishes. You can use the keyring package to avoid passwords in plain files.

See Also

Other R CMD commands: [rcmd_bg\(\)](#), [rcmd\(\)](#)

rcmd_process

External R CMD Process

Description

An R CMD * command that runs in the background. This is an R6 class that extends the [process](#) class.

Usage

```
rp <- rcmd_process$new(options)
```

Arguments

- options A list of options created via [rcmd_process_options\(\)](#).

Details

rcmd_process\$new creates a new instance. Its options argument is best created by the [rcmd_process_options\(\)](#) function.

Examples

```
options <- rcmd_process_options(cmd = "config", cmdargs = "CC")
rp <- rcmd_process$new(options)
rp$wait()
rp$read_output_lines()
```

rcmd_process_options *Create options for an [rcmd_process](#) object*

Description

Create options for an [rcmd_process](#) object

Usage

```
rcmd_process_options(...)
```

Arguments

... Options to override, named arguments.

Value

A list of options.

`rcmd_process_options()` creates a set of options to initialize a new object from the `rcmd_process` class. Its arguments must be named, the names are used as option names. The options correspond to (some of) the arguments of the `rcmd()` function. At least the `cmd` option must be specified, to select the R CMD subcommand to run. Typically `cmdargs` is specified as well, to supply more arguments to R CMD.

Examples

```
## List all options and their default values:
rcmd_process_options()
```

rcmd_safe_env	<i>rcmd_safe_env returns a set of environment variables that are more appropriate for rcmd_safe(). It is exported to allow manipulating these variables (e.g. add an extra one), before passing them to the rcmd() functions.</i>
---------------	---

Description

It currently has the following variables:

- `CYGWIN="nodosfilewarning"`: On Windows, do not warn about MS-DOS style file names.
- `R_TESTS=""`: This variable is set by R CMD check, and makes the child R process load a startup file at startup, from the current working directory, that is assumed to be the `/test` directory of the package being checked. If the current working directory is changed to something else (as it typically is by `testthat`, then R cannot start. Setting it to the empty string ensures that `callr` can be used from unit tests.
- `R_BROWSER="false"`: typically we don't want to start up a browser from the child R process.
- `R_PDFVIEWER="false"`: similarly for the PDF viewer.

Usage

```
rcmd_safe_env()
```

Details

Note that `callr` also sets the `R_ENVIRON`, `R_ENVIRON_USER`, `R_PROFILE` and `R_PROFILE_USER` environment variables appropriately, unless these are set by the user in the `env` argument of the `r`, etc. calls.

Value

A named character vector of environment variables.

rscript

Run an R script

Description

It uses the `Rscript` program corresponding to the current R version, to run the script. It streams `stdout` and `stderr` of the process.

Usage

```
rscript(  
  script,  
  cmdargs = character(),  
  libpath = .libPaths(),  
  repos = default_repos(),  
  stdout = NULL,  
  stderr = NULL,  
  poll_connection = TRUE,  
  echo = FALSE,  
  show = TRUE,  
  callback = NULL,  
  block_callback = NULL,  
  spinner = FALSE,  
  system_profile = FALSE,  
  user_profile = "project",  
  env = rcmd_safe_env(),  
  timeout = Inf,  
  wd = ".",  
  fail_on_status = TRUE,  
  color = TRUE,  
  ...  
)
```

Arguments

script	Path of the script to run.
cmdargs	Command line arguments.
libpath	The library path.
repos	The repos option. If NULL, then no repos option is set. This options is only used if user_profile or system_profile is set FALSE, as it is set using the system or the user profile.
stdout	Optionally a file name to send the standard output to.
stderr	Optionally a file name to send the standard error to. It may be the same as stdout, in which case standard error is redirected to standard output. It can also be the special string "2>&1", in which case standard error will be redirected to standard output.
poll_connection	Whether to have a control connection to the process. This is used to transmit messages from the subprocess to the parent.
echo	Whether to echo the complete command run by rcmd.
show	Logical, whether to show the standard output on the screen while the child process is running. Note that this is independent of the stdout and stderr arguments. The standard error is not shown currently.
callback	A function to call for each line of the standard output and standard error from the child process. It works together with the show option; i.e. if show = TRUE, and a callback is provided, then the output is shown of the screen, and the callback is also called.
block_callback	A function to call for each block of the standard output and standard error. This callback is not line oriented, i.e. multiple lines or half a line can be passed to the callback.
spinner	Whether to show a calming spinner on the screen while the child R session is running. By default it is shown if show = TRUE and the R session is interactive.
system_profile	Whether to use the system profile file.
user_profile	Whether to use the user's profile file. If this is "project", then only the profile from the working directory is used, but the R_PROFILE_USER environment variable and the user level profile are not. See also "Security considerations" below.
env	Environment variables to set for the child process.
timeout	Timeout for the function call to finish. It can be a base::difftime object, or a real number, meaning seconds. If the process does not finish before the timeout period expires, then a <code>system_command_timeout_error</code> error is thrown. Inf means no timeout.
wd	Working directory to use for running the command. Defaults to the current working directory.
fail_on_status	Whether to throw an R error if the command returns with a non-zero status code. By default no error is thrown.
color	Whether to use terminal colors in the child process, assuming they are active in the parent process.
...	Extra arguments are passed to processx::run() .

Security considerations

callr makes a copy of the user's .Renviro file and potentially of the local or user .Rprofile, in the session temporary directory. Avoid storing sensitive information such as passwords, in your environment file or your profile, otherwise this information will get scattered in various files, at least temporarily, until the subprocess finishes. You can use the keyring package to avoid passwords in plain files.

rscript_process	<i>External Rscript process</i>
-----------------	---------------------------------

Description

An Rscript script.R command that runs in the background. This is an R6 class that extends the [process](#) class.

Usage

```
rp <- rscript_process$new(options)
```

Arguments

- options A list of options created via [rscript_process_options\(\)](#).

Details

rscript_process\$new creates a new instance. Its options argument is best created by the [rscript_process_options\(\)](#) function.

Examples

```
options <- rscript_process_options(script = "script.R")
rp <- rscript_process$new(options)
rp$wait()
rp$read_output_lines()
```

`rscript_process_options`*Create options for an `rscript_process` object*

Description

Create options for an `rscript_process` object

Usage

```
rscript_process_options(...)
```

Arguments

... Options to override, named arguments.

Value

A list of options.

`rscript_process_options()` creates a set of options to initialize a new object from the `rscript_process` class. Its arguments must be named, the names are used as option names. The options correspond to (some of) the arguments of the `rscript()` function. At least the `script` option must be specified, the script file to run.

Examples

```
## List all options and their default values:  
rscript_process_options()
```

`r_bg`*Evaluate an expression in another R session, in the background*

Description

Starts evaluating an R function call in a background R process, and returns immediately.

Usage

```
r_bg(  
  func,  
  args = list(),  
  libpath = .libPaths(),  
  repos = default_repos(),  
  stdout = "|",  
  stderr = "|",  
  poll_connection = TRUE,
```

```

error = getOption("callr.error", "error"),
cmdargs = c("--slave", "--no-save", "--no-restore"),
system_profile = FALSE,
user_profile = "project",
env = rcmd_safe_env(),
supervise = FALSE,
...
)

```

Arguments

func	Function object to call in the new R process. The function should be self-contained and only refer to other functions and use variables explicitly from other packages using the <code>::</code> notation. The environment of the function is set to <code>.GlobalEnv</code> before passing it to the child process. Because of this, it is good practice to create an anonymous function and pass that to <code>callr</code> , instead of passing a function object from a (base or other) package. In particular <code>r(.libPaths)</code> does not work, because <code>.libPaths</code> is defined in a special environment, but <code>r(function() .libPaths())</code> works just fine.
args	Arguments to pass to the function. Must be a list.
libpath	The library path.
repos	The <code>repos</code> option. If <code>NULL</code> , then no <code>repos</code> option is set. This options is only used if <code>user_profile</code> or <code>system_profile</code> is set <code>FALSE</code> , as it is set using the system or the user profile.
stdout	The name of the file the standard output of the child R process will be written to. If the child process runs with the <code>--slave</code> option (the default), then the commands are not echoed and will not be shown in the standard output. Also note that you need to call <code>print()</code> explicitly to show the output of the command(s).
stderr	The name of the file the standard error of the child R process will be written to. In particular <code>message()</code> sends output to the standard error. If nothing was sent to the standard error, then this file will be empty. This argument can be the same file as <code>stdout</code> , in which case they will be correctly interleaved. If this is the string <code>"2>&1"</code> , then standard error is redirected to standard output.
poll_connection	Whether to have a control connection to the process. This is used to transmit messages from the subprocess to the main process.
error	What to do if the remote process throws an error. See details below.
cmdargs	Command line arguments to pass to the R process. Note that <code>c("-f", rscript)</code> is appended to this, <code>rscript</code> is the name of the script file to run. This contains a call to the supplied function and some error handling code.
system_profile	Whether to use the system profile file.

user_profile	Whether to use the user's profile file. If this is "project", then only the profile from the working directory is used, but the R_PROFILE_USER environment variable and the user level profile are not. See also "Security considerations" below.
env	Environment variables to set for the child process.
supervise	Whether to register the process with a supervisor. If TRUE, the supervisor will ensure that the process is killed when the R process exits.
...	Extra arguments are passed to the <code>processx::process</code> constructor.

Value

An `r_process` object, which inherits from `process`, so all process methods can be called on it, and in addition it also has a `get_result()` method to collect the result.

Security considerations

`callr` makes a copy of the user's `.Renviron` file and potentially of the local or user `.Rprofile`, in the session temporary directory. Avoid storing sensitive information such as passwords, in your environment file or your profile, otherwise this information will get scattered in various files, at least temporarily, until the subprocess finishes. You can use the `keyring` package to avoid passwords in plain files.

Examples

```
rx <- r_bg(function() 1 + 2)

# wait until it is done
rx$wait()
rx$is_alive()
rx$get_result()
```

r_copycat

Run an R process that mimics the current R process

Description

Differences to `r()`:

- No extra repositories are set up.
- The `--no-save`, `--no-restore` command line arguments are not used. (But `--slave` still is.)
- The system profile and the user profile are loaded.
- No extra environment variables are set up.

Usage

```
r_copycat(
  func,
  args = list(),
  libpath = .libPaths(),
  repos = getOption("repos"),
  cmdargs = "--slave",
  system_profile = TRUE,
  user_profile = TRUE,
  env = character(),
  ...
)
```

Arguments

func	Function object to call in the new R process. The function should be self-contained and only refer to other functions and use variables explicitly from other packages using the <code>::</code> notation. The environment of the function is set to <code>.GlobalEnv</code> before passing it to the child process. Because of this, it is good practice to create an anonymous function and pass that to <code>callr</code> , instead of passing a function object from a (base or other) package. In particular <code>r(.libPaths)</code> does not work, because <code>.libPaths</code> is defined in a special environment, but <code>r(function() .libPaths())</code> works just fine.
args	Arguments to pass to the function. Must be a list.
libpath	The library path.
repos	The <code>repos</code> option. If <code>NULL</code> , then no <code>repos</code> option is set. This options is only used if <code>user_profile</code> or <code>system_profile</code> is set <code>FALSE</code> , as it is set using the system or the user profile.
cmdargs	Command line arguments to pass to the R process. Note that <code>c("-f", rscript)</code> is appended to this, <code>rscript</code> is the name of the script file to run. This contains a call to the supplied function and some error handling code.
system_profile	Whether to use the system profile file.
user_profile	Whether to use the user's profile file. If this is "project", then only the profile from the working directory is used, but the <code>R_PROFILE_USER</code> environment variable and the user level profile are not. See also "Security considerations" below.
env	Environment variables to set for the child process.
...	Additional arguments are passed to <code>r()</code> .

Security considerations

callr makes a copy of the user's .Renviro file and potentially of the local or user .Rprofile, in the session temporary directory. Avoid storing sensitive information such as passwords, in your environment file or your profile, otherwise this information will get scattered in various files, at least temporarily, until the subprocess finishes. You can use the keyring package to avoid passwords in plain files.

See Also

Other callr functions: [r_vanilla\(\)](#), [r\(\)](#)

r_process

External R Process

Description

An R process that runs in the background. This is an R6 class that extends the [processx::process](#) class. The process starts in the background, evaluates an R function call, and then quits.

Usage

```
rp <- r_process$new(options)
```

```
rp$get_result()
```

See [process](#) for the inherited methods.

Arguments

- options A list of options created via [r_process_options\(\)](#).

Details

`r_process$new` creates a new instance. Its `options` argument is best created by the [r_process_options\(\)](#) function.

`rp$get_result()` returns the result, an R object, from a finished background R process. If the process has not finished yet, it throws an error. (You can use `rp$wait()` to wait for the process to finish, optionally with a timeout.)

Examples

```
## List all options and their default values:
r_process_options()

## Start an R process in the background, wait for it, get result
opts <- r_process_options(func = function() 1 + 1)
rp <- r_process$new(opts)
rp$wait()
rp$get_result()
```

r_process_options	<i>Create options for an r_process object</i>
-------------------	---

Description

Create options for an [r_process](#) object

Usage

```
r_process_options(...)
```

Arguments

... Options to override, named arguments.

Value

A list of options.

`r_process_options()` creates a set of options to initialize a new object from the `r_process` class. Its arguments must be named, the names are used as option names. The options correspond to (some of) the arguments of the `r()` function. At least the `func` option must be specified, this is the R function to run in the background.

Examples

```
## List all options and their default values:  
r_process_options()
```

r_session	<i>External R Session</i>
-----------	---------------------------

Description

A permanent R session that runs in the background. This is an R6 class that extends the `processx::process` class.

Details

The process is started at the creation of the object, and then it can be used to evaluate R function calls, one at a time.

Usage

```

rs <- r_session$new(options = r_session_options(), wait = TRUE,
                   wait_timeout = 3000)

rs$run(func, args = list())
rs$run_with_output(func, args = list())
rs$call(func, args = list())

rs$poll_process(timeout)

rs$get_state()
rs$get_running_time()

rs$read()
rs$close(grace = 1000)

rs$traceback()
rs$debug()
rs$attach()

```

Arguments

- `options`: A list of options created via `r_session_options()`.
- `wait`: Whether to wait for the R process to start and be ready for running commands.
- `wait_timeout`: Timeout for waiting for the R process to start, in milliseconds.
- `func`: Function object to call in the background R process. Please read the notes for the similar argument of `r()`
- `args`: Arguments to pass to the function. Must be a list.
- `timeout`: Timeout period in milliseconds.
- `grace`: Grace period in milliseconds, to wait for the subprocess to exit cleanly, after its standard input is closed. If the process is still running after this period, it will be killed.

Details

`r_session$new()` creates a new R background process. It can wait for the process to start up (`wait = TRUE`), or return immediately, i.e. before the process is actually ready to run. In the latter case you may call `rs$poll_process()` to make sure it is ready.

`rs$run()` is similar to `r()`, but runs the function in the `rs` R session. It throws an error if the function call generated an error in the child process.

`rs$run_with_output()` is similar to `$run()`, but returns the standard output and error of the child process as well. It does not throw on errors, but returns a non-zero error member in the result list.

`rs$call()` starts running a function in the background R session, and returns immediately. To check if the function is done, call the `poll_process()` method.

`rs$poll_process()` polls the R session with a timeout. If the session has finished the computation, it returns with "ready". If the timeout is reached, it returns with "timeout".

`rs$get_state()` return the state of the R session. Possible values:

- "starting": starting up,
- "idle": ready to compute,
- "busy": computing right now,
- "finished": the R process has finished.

`rs$get_running_time()` returns the elapsed time since the R process has started, and the elapsed time since the current computation has started. The latter is NA if there is no active computation.

`rs$read()` reads an event from the child process, if there is one available. Events might signal that the function call has finished, or they can be progress report events.

`rs$close()` terminates the current computation and the R process. The session object will be in "finished" state after this.

`rs$traceback()` can be used after an error in the R subprocess. It is equivalent to the `traceback()` call, but it is performed in the subprocess.

`rs$debug()` is an interactive debugger to inspect the dumped frames in the subprocess, after an error. See more at [r_session_debug](#).

`rs$attach()` is an experimental function that provides a REPL (Read-Eval-Print-Loop) to the subprocess.

Examples

```
rs <- r_session$new()

rs$run(function() 1 + 2)

rs$call(function() Sys.sleep(1))
rs$get_state()

rs$poll_process(-1)
rs$get_state()
rs$read()
```

Description

The `r_session$debug()` method is an interactive debugger to inspect the stack of the background process after an error.

Details

`$debug()` starts a REPL (Read-Eval-Print-Loop), that evaluates R expressions in the subprocess. It is similar to `browser()` and `debugger()` and also has some extra commands:

- `.help` prints a short help message.
- `.where` prints the complete stack trace of the error. (The same as the `$traceback()` method.
- `.inspect <n>` switches the "focus" to frame `<n>`. Frame 0 is the global environment, so `.inspect 0` will switch back to that.

To exit the debugger, press the usual interrupt key, i.e. CTRL+c or ESC in some GUIs.

Here is an example session that uses `$debug()` (some output is omitted for brevity):

```
# -----
> rs <- r_session$new()
> rs$run(function() knitr::knit("no-such-file"))
Error in rs_run(self, private, func, args) :
  callr subprocess failed: cannot open the connection

> rs$debug()
Debugging in process 87361, press CTRL+C (ESC) to quit. Commands:
  .where      -- print stack trace
  .inspect <n> -- inspect a frame, 0 resets to .GlobalEnv
  .help       -- print this message
  <cmd>       -- run <cmd> in frame or .GlobalEnv

3: file(con, "r")
2: readLines(input2, encoding = "UTF-8", warn = FALSE)
1: knitr::knit("no-such-file") at #1

RS 87361 > .inspect 1

RS 87361 (frame 1) > ls()
 [1] "encoding"  "envir"     "ext"       "in.file"   "input"     "input.dir"
 [7] "input2"    "ocode"     "oconc"     "oenvir"    "oopts"     "optc"
[13] "optk"      "otangle"   "out.purl"  "output"    "quiet"     "tangle"
[19] "text"

RS 87361 (frame 1) > input
[1] "no-such-file"

RS 87361 (frame 1) > file.exists(input)
[1] FALSE

RS 87361 (frame 1) > # <CTRL + C>
# -----
```

r_session_options *Create options for an [r_session](#) object*

Description

Create options for an [r_session](#) object

Usage

```
r_session_options(...)
```

Arguments

... Options to override, named arguments.

r_vanilla *Run an R child process, with no configuration*

Description

It tries to mimic a fresh R installation. In particular:

- No library path setting.
- No CRAN(-like) repository is set.
- The system and user profiles are not run.

Usage

```
r_vanilla(  
  func,  
  args = list(),  
  libpath = character(),  
  repos = c(CRAN = "@CRAN@"),  
  cmdargs = "--slave",  
  system_profile = FALSE,  
  user_profile = "project",  
  env = character(),  
  ...  
)
```

Arguments

func	Function object to call in the new R process. The function should be self-contained and only refer to other functions and use variables explicitly from other packages using the <code>::</code> notation. The environment of the function is set to <code>.GlobalEnv</code> before passing it to the child process. Because of this, it is good practice to create an anonymous function and pass that to <code>callr</code> , instead of passing a function object from a (base or other) package. In particular <code>r(.libPaths)</code> does not work, because <code>.libPaths</code> is defined in a special environment, but <code>r(function() .libPaths())</code> works just fine.
args	Arguments to pass to the function. Must be a list.
libpath	The library path.
repos	The <code>repos</code> option. If <code>NULL</code> , then no <code>repos</code> option is set. This options is only used if <code>user_profile</code> or <code>system_profile</code> is set <code>FALSE</code> , as it is set using the system or the user profile.
cmdargs	Command line arguments to pass to the R process. Note that <code>c("-f", rscript)</code> is appended to this, <code>rscript</code> is the name of the script file to run. This contains a call to the supplied function and some error handling code.
system_profile	Whether to use the system profile file.
user_profile	Whether to use the user's profile file. If this is "project", then only the profile from the working directory is used, but the <code>R_PROFILE_USER</code> environment variable and the user level profile are not. See also "Security considerations" below.
env	Environment variables to set for the child process.
...	Additional arguments are passed to <code>r()</code> .

Security considerations

`callr` makes a copy of the user's `.Renviro`n file and potentially of the local or user `.Rprofile`, in the session temporary directory. Avoid storing sensitive information such as passwords, in your environment file or your profile, otherwise this information will get scattered in various files, at least temporarily, until the subprocess finishes. You can use the `keyring` package to avoid passwords in plain files.

See Also

Other `callr` functions: `r_copycat()`, `r()`

Examples

```
# Compare to r()
r(function() .libPaths())
```

```
r_vanilla(function() .libPaths())  
  
r(function() getOption("repos"))  
r_vanilla(function() getOption("repos"))
```

Index

base::difftime, [5](#), [8](#), [15](#)
browser(), [25](#)

callr, [2](#)

debugger(), [25](#)
default_repos, [2](#)

process, [10](#), [12](#), [16](#), [19](#), [21](#)
processx::process, [10](#), [19](#), [21](#), [22](#)
processx::run(), [5](#), [9](#), [15](#)

r, [3](#), [21](#), [27](#)
r(), [19](#), [20](#), [22](#), [23](#), [27](#)
r_bg, [17](#)
r_copycat, [6](#), [19](#), [27](#)
r_copycat(), [5](#)
r_process, [21](#), [22](#)
r_process_options, [22](#)
r_process_options(), [21](#)
r_safe(r), [3](#)
r_session, [22](#), [26](#)
r_session_debug, [24](#), [24](#)
r_session_options, [26](#)
r_session_options(), [23](#)
r_vanilla, [6](#), [21](#), [26](#)
rcmd, [6](#), [11](#), [12](#)
rcmd(), [11](#), [13](#)
rcmd_bg, [9](#), [9](#), [12](#)
rcmd_copycat, [9](#), [11](#), [11](#)
rcmd_copycat(), [9](#)
rcmd_process, [12](#), [13](#)
rcmd_process_options, [13](#)
rcmd_process_options(), [12](#)
rcmd_safe(rcmd), [6](#)
rcmd_safe(), [13](#)
rcmd_safe_env, [13](#)
rcmd_safe_env(), [3](#)
rscript, [14](#)
rscript(), [17](#)

rscript_process, [16](#), [17](#)
rscript_process_options, [17](#)
rscript_process_options(), [16](#)

traceback(), [24](#)

utils::debugger(), [6](#)
utils::dump.frames(), [6](#)