Package 'withr'

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Title Run Code 'With' Temporarily Modified Global State

Version 2.1.2

Description A set of functions to run code 'with' safely and temporarily modified global state. Many of these functions were originally a part of the 'devtools' package, this provides a simple package with limited dependencies to provide access to these functions.

URL http://withr.r-lib.org, http://github.com/r-lib/withr#readme

BugReports http://github.com/r-lib/withr/issues

Depends R (>= 3.0.2)

License GPL (>= 2)

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R topics documented:

`defer` *Defer Evaluation of an Expression*

Description

Similar to `on.exit()`, but allows one to attach an expression to be evaluated when exiting any frame currently on the stack. This provides a nice mechanism for scoping side effects for the duration of a function's execution.

Usage

```
defer(expr, envir = parent.frame(), priority = c("first", "last"))

defer_parent(expr, priority = c("first", "last"))
```

Arguments

expr	[expression] An expression to be evaluated.
envir	[environment] Attach exit handlers to this environment. Typically, this should be either the current environment or a parent frame (accessed through parent.frame()).
priority	[character(1)] Specify whether this handler should be executed "first" or "last", relative to any other registered handlers on this environment.

Details

defer works by attaching handlers to the requested environment (as an attribute called "handlers"), and registering an exit handler that executes the registered handler when the function associated with the requested environment finishes execution.

Author(s)

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Examples

```
# define a 'local' function that creates a file, and
# removes it when the parent function has finished executing
local_file <- function(path) {
  file.create(path)
  defer_parent(unlink(path))
}

# create tempfile path
path <- tempfile()

# use 'local_file' in a function
local({
  local_file(path)
  stopifnot(file.exists(path))
})

# file is deleted as we leave 'local' local
stopifnot(!file.exists(path))

# investigate how 'defer' modifies the
# executing function's environment
local({
  local_file(path)
  print(attributes(environment()))
})
```

devices *Graphics devices*

Description

Temporarily use a graphics device.

Usage

```
with_bmp(new, code, ...)

local_bmp(new, ..., .local_envir = parent.frame())

with_cairo_pdf(new, code, ...)

local_cairo_pdf(new, ..., .local_envir = parent.frame())

with_cairo_ps(new, code, ...)

local_cairo_ps(new, ..., .local_envir = parent.frame())

with_pdf(new, code, width, height, onefile, family, title, fonts, version,
  paper, encoding, bg, fg, pointsize, pagecentre, colormodel, useDingbats,
  useKerning, fillOddEven, compress)

local_pdf(new, width, height, onefile, family, title, fonts, version, paper,
  encoding, bg, fg, pointsize, pagecentre, colormodel, useDingbats, useKerning,
  fillOddEven, compress, .local_envir = parent.frame())

with_postscript(new, code, onefile, family, title, fonts, encoding, bg, fg,
  width, height, horizontal, pointsize, paper, pagecentre, print.it, command,
  colormodel, useKerning, fillOddEven)

local_postscript(new, onefile, family, title, fonts, encoding, bg, fg, width,
  height, horizontal, pointsize, paper, pagecentre, print.it, command,
  colormodel, useKerning, fillOddEven, .local_envir = parent.frame())

with_svg(new, code, width = 7, height = 7, pointsize = 12,
  onefile = FALSE, family = "sans", bg = "white",
  antialias = c("default", "none", "gray", "subpixel"))

local_svg(new, width = 7, height = 7, pointsize = 12, onefile = FALSE,
  family = "sans", bg = "white", antialias = c("default", "none", "gray",
  "subpixel"), .local_envir = parent.frame())

with_tiff(new, code, ...)
```

```
local_tiff(new, ..., .local_envir = parent.frame())

with_xfig(new, code, onefile = FALSE, encoding = "none",
  paper = "default", horizontal = TRUE, width = 0, height = 0,
  family = "Helvetica", pointsize = 12, bg = "transparent",
  fg = "black", pagecentre = TRUE, defaultfont = FALSE,
  textspecial = FALSE)

local_xfig(new, onefile = FALSE, encoding = "none", paper = "default",
  horizontal = TRUE, width = 0, height = 0, family = "Helvetica",
  pointsize = 12, bg = "transparent", fg = "black", pagecentre = TRUE,
  defaultfont = FALSE, textspecial = FALSE, .local_envir = parent.frame())

with_png(new, code, ...)

local_png(new, ..., .local_envir = parent.frame())

with_jpeg(new, code, ...)

local_jpeg(new, ..., .local_envir = parent.frame())
```

Arguments

new	[named character] New graphics device
code	[any] Code to execute in the temporary environment
...	Additional arguments passed to the graphics device.
.local_envir	[environment] The environment to use for scoping.
width	the width of the device in inches.
height	the height of the device in inches.
onefile	should all plots appear in one file or in separate files?
family	one of the device-independent font families, "sans", "serif" and "mono", or a character string specify a font family to be searched for in a system-dependent way. See, the 'Cairo fonts' section in the help for X11.
title	title string to embed as the '/Title' field in the file. Defaults to "R Graphics Output".
fonts	a character vector specifying R graphics font family names for additional fonts which will be included in the PDF file. Defaults to NULL.
version	a string describing the PDF version that will be required to view the output. This is a minimum, and will be increased (with a warning) if necessary. Defaults to "1.4", but see 'Details'.
paper	the target paper size. The choices are "a4", "letter", "legal" (or "us") and "executive" (and these can be capitalized), or "a4r" and "USr" for rotated ('landscape'). The default is "special", which means that the width and

	height specify the paper size. A further choice is "default"; if this is selected, the papersize is taken from the option "papersize" if that is set and as "a4" if it is unset or empty. Defaults to "special".
encoding	the name of an encoding file. See postscript for details. Defaults to "default".
bg	the initial background colour: can be overridden by setting par("bg").
fg	the initial foreground color to be used. Defaults to "black".
pointsize	the default pointsize of plotted text (in big points).
pagecentre	logical: should the device region be centred on the page? – is only relevant for paper != "special". Defaults to TRUE.
colormodel	a character string describing the color model: currently allowed values are "srgb", "gray" (or "grey") and "cmyk". Defaults to "srgb". See section 'Color models'.
useDingbats	logical. Should small circles be rendered *via* the Dingbats font? Defaults to TRUE, which produces smaller and better output. Setting this to FALSE can work around font display problems in broken PDF viewers: although this font is one of the 14 guaranteed to be available in all PDF viewers, that guarantee is not always honoured. See the 'Note' for a possible fix for some viewers.
useKerning	logical. Should kerning corrections be included in setting text and calculating string widths? Defaults to TRUE.
fillOddEven	logical controlling the polygon fill mode: see polygon for details. Defaults to FALSE.
compress	logical. Should PDF streams be generated with Flate compression? Defaults to TRUE.
horizontal	the orientation of the printed image, a logical. Defaults to true, that is landscape orientation on paper sizes with width less than height.
print.it	logical: should the file be printed when the device is closed? (This only applies if file is a real file name.) Defaults to false.
command	the command to be used for 'printing'. Defaults to "default", the value of option "printcmd". The length limit is 2*PATH_MAX, typically 8096 bytes on unix systems and 520 bytes on windows.
antialias	string, the type of anti-aliasing (if any) to be used; defaults to "default".
defaultfont	logical: should the device use xfig's default font?
textspecial	logical: should the device set the textspecial flag for all text elements. This is useful when generating pstex from xfig figures.

Value

[any]
The results of the evaluation of the code argument.

Functions

- with_bmp: BMP device
- with_cairo_pdf: CAIRO_PDF device

- `with_cairo_ps`: CAIRO_PS device
- `with_pdf`: PDF device
- `with_postscript`: POSTSCRIPT device
- `with_svg`: SVG device
- `with_tiff`: TIFF device
- `with_xfig`: XFIG device
- `with_png`: PNG device
- `with_jpeg`: JPEG device

See Also

`withr` for examples

`Devices`

Examples

```
# dimensions are in inches
with_pdf(file.path(tempdir(), "test.pdf"), width = 7, height = 5,
  plot(runif(5))
)

# dimensions are in pixels
with_png(file.path(tempdir(), "test.png"), width = 800, height = 600,
  plot(runif(5))
)
```

`withr` *Execute code in temporarily altered environment*

Description

All functions prefixed by `with_` work as follows. First, a particular aspect of the global environment is modified (see below for a list). Then, custom code (passed via the `code` argument) is executed. Upon completion or error, the global environment is restored to the previous state. Each `with_` function has a `local_` variant, which instead resets the state when the current evaluation context ends (such as the end of a function).

Arguments pattern

`new`	`[various]`	Values for setting
`code`	`[any]`	Code to execute in the temporary environment
`...`		Further arguments

Usage pattern

```
with_...(new, code, ...)
```

withr functions

- `with_collate()`: collation order
- `with_dir()`: working directory
- `with_envvar()`: environment variables
- `with_libpaths()`: library paths, replacing current libpaths
- `with_locale()`: any locale setting
- `with_makevars()`: Makevars variables
- `with_options()`: options
- `with_par()`: graphics parameters
- `with_path()`: PATH environment variable
- `with_sink()`: output redirection

Creating new "with" functions

All `with_` functions are created by a helper function, `with_()`. This functions accepts two arguments: a setter function and an optional resetter function. The setter function is expected to change the global state and return an "undo instruction". This undo instruction is then passed to the resetter function, which changes back the global state. In many cases, the setter function can be used naturally as resetter.

Examples

```
getwd()
with_dir(tempdir(), getwd())
getwd()

Sys.getenv("WITHR")
with_envvar(c("WITHR" = 2), Sys.getenv("WITHR"))
Sys.getenv("WITHR")

with_envvar(c("A" = 1),
  with_envvar(c("A" = 2), action = "suffix", Sys.getenv("A"))
)

# local variants are best used within other functions
f <- function(x) {
  local_envvar(c("WITHR" = 2))
  Sys.getenv("WITHR")
}
Sys.getenv("WITHR")
```

with_collate *Collation Order*

Description

Temporarily change collation order by changing the value of the LC_COLLATE locale.

Usage

```
with_collate(new, code)

local_collate(new, .local_envir = parent.frame())
```

Arguments

new	[character(1)] New collation order
code	[any] Code to execute in the temporary environment
.local_envir	[environment] The environment to use for scoping.

Value

[any]
The results of the evaluation of the code argument.

See Also

withr for examples

with_connection *Connections which close themselves*

Description

R file connections which are automatically closed.

Usage

```
with_connection(con, code)

local_connection(con, .local_envir = parent.frame())
```

Arguments

con	For `with_connection()` a named list with the connection(s) to create. For `local_connection()` the code to create a single connection, which is then returned.
code	`[any]` Code to execute in the temporary environment
.local_envir	`[environment]` The environment to use for scoping.

Value

`[any]`
The results of the evaluation of the code argument.

See Also

`withr` for examples

Examples

```
with_connection(list(con = file("foo", "w")), {
  writeLines(c("foo", "bar"), con)
})

read_foo <- function() {
  readLines(local_connection(file("foo", "r")))
}
read_foo()
```

---

with_db_connection *DBMS Connections which disconnect themselves.*

Description

Connections to Database Management Systems which automatically disconnect. In particular connections which are created with `DBI::dbConnect()` and closed with `DBI::dbDisconnect()`.

Usage

```
with_db_connection(con, code)

local_db_connection(con, .local_envir = parent.frame())
```

Arguments

con	For `with_db_connection()` a named list with the connection(s) to create. For `local_db_connection()` the code to create a single connection, which is then returned.
code	`[any]` Code to execute in the temporary environment
.local_envir	`[environment]` The environment to use for scoping.

Value

`[any]`
The results of the evaluation of the code argument.

See Also

withr for examples

Examples

```
db <- tempfile()
with_db_connection(
  list(con = DBI::dbConnect(RSQLite::SQLite(), db)), {
    DBI::dbWriteTable(con, "mtcars", mtcars)
})

head_db_table <- function(...) {
  con <- local_db_connection(DBI::dbConnect(RSQLite::SQLite(), db))
  head(DBI::dbReadTable(con, "mtcars"), ...)
}
head_db_table()
unlink(db)
```

---

with_dir *Working directory*

Description

Temporarily change the current working directory.

Usage

```
with_dir(new, code)

local_dir(new, .local_envir = parent.frame())
```

Arguments

new	[character(1)] New working directory
code	[any] Code to execute in the temporary environment
.local_envir	[environment] The environment to use for scoping.

Value

[any]
The results of the evaluation of the code argument.

See Also

withr for examples

setwd()

---

with_envvar *Environment variables*

Description

Temporarily change system environment variables.

Usage

```
with_envvar(new, code, action = "replace")

local_envvar(new, action = "replace", .local_envir = parent.frame())
```

Arguments

new	[named character] New environment variables
code	[any] Code to execute in the temporary environment
action	should new values "replace", "prefix" or "suffix" existing variables with the same name.
.local_envir	[environment] The environment to use for scoping.

Details

if NA is used those environment variables will be unset. If there are any duplicated variable names only the last one is used.

Value

[any]
The results of the evaluation of the code argument.

See Also

withr for examples

Sys.setenv()

---

with_file *Files which delete themselves*

Description

Create files, which are then automatically removed afterwards.

Usage

```
with_file(file, code)

local_file(file, .local_envir = parent.frame())
```

Arguments

file	[named list] Files to create.
code	[any] Code to execute in the temporary environment
.local_envir	[environment] The environment to use for scoping.

Value

[any]
The results of the evaluation of the code argument.

See Also

withr for examples

Examples

```
with_file("file1", {
  writeLines("foo", "file1")
  readLines("file1")
})

with_file(list("file1" = writeLines("foo", "file1")), {
  readLines("file1")
})
```

`with_gctorture2` *Torture Garbage Collector*

Description

Temporarily turn gctorture2 on.

Usage

```
with_gctorture2(new, code, wait = new, inhibit_release = FALSE)
```

Arguments

`new`	`[integer]` run GC every 'step' allocations.
`code`	`[any]` Code to execute in the temporary environment
`wait`	integer; number of allocations to wait before starting GC torture.
`inhibit_release`	logical; do not release free objects for re-use: use with caution.

Value

`[any]`
The results of the evaluation of the `code` argument.

See Also

`withr` for examples

`with_libpaths` *Library paths*

Description

Temporarily change library paths.

Usage

```
with_libpaths(new, code, action = "replace")

local_libpaths(new, action = "replace", .local_envir = parent.frame())
```

Arguments

`new`	`[character]` New library paths
`code`	`[any]` Code to execute in the temporary environment
`action`	`[character(1)]` should new values `"replace"`, `"prefix"` or `"suffix"` existing paths.
`.local_envir`	`[environment]` The environment to use for scoping.

Value

`[any]`
The results of the evaluation of the code argument.

See Also

`withr` for examples

`.libPaths()`

Other libpaths: `with_temp_libpaths`

`with_locale` *Locale settings*

Description

Temporarily change locale settings.

Usage

```
with_locale(new, code)

local_locale(new, .local_envir = parent.frame())
```

Arguments

`new`	`[named character]` New locale settings
`code`	`[any]` Code to execute in the temporary environment
`.local_envir`	`[environment]` The environment to use for scoping.

Details

Setting the `LC_ALL` category is currently not implemented.

Value

`[any]`
The results of the evaluation of the `code` argument.

See Also

`withr` for examples

`Sys.setlocale()`

`with_makevars` *Makevars variables*

Description

Temporarily change contents of an existing `Makevars` file.

Usage

```
with_makevars(new, code, path = file.path("~", ".R", "Makevars"),
  assignment = c("=", ":=", "?=", "+="))
```

Arguments

`new`	`[named character]` New variables and their values
`code`	`[any]` Code to execute in the temporary environment
`path`	`[character(1)]` location of existing `Makevars` file to modify.
`assignment`	`[character(1)]` assignment type to use.

Details

If no `Makevars` file exists or the fields in `new` do not exist in the existing `Makevars` file then the fields are added to the new file. Existing fields which are not included in `new` are appended unchanged. Fields which exist in `Makevars` and in `new` are modified to use the value in `new`.

Value

`[any]`
The results of the evaluation of the `code` argument.

See Also

`withr` for examples

with_options *Options*

Description

Temporarily change global options.

Usage

```
with_options(new, code)

local_options(new, .local_envir = parent.frame())
```

Arguments

new	[named list] New options and their values
code	[any] Code to execute in the temporary environment
.local_envir	[environment] The environment to use for scoping.

Value

[any]
The results of the evaluation of the code argument.

See Also

withr for examples

options()

with_package *Execute code with a modified search path*

Description

with_package() attaches a package to the search path, executes the code, then removes the package from the search path. The package namespace is *not* unloaded however. with_namespace() does the same thing, but attaches the package namespace to the search path, so all objects (even unexported ones) are also available on the search path.

Usage

```
with_package(package, code, help, pos = 2, lib.loc = NULL,
  character.only = TRUE, logical.return = FALSE, warn.conflicts = FALSE,
  quietly = TRUE, verbose = getOption("verbose"))

local_package(package, help, pos = 2, lib.loc = NULL,
  character.only = TRUE, logical.return = FALSE, warn.conflicts = FALSE,
  quietly = TRUE, verbose = getOption("verbose"),
  .local_envir = parent.frame())

with_namespace(package, code, warn.conflicts = FALSE)

local_namespace(package, .local_envir = parent.frame(),
  warn.conflicts = FALSE)

with_environment(env, code, pos = 2L, name = format(env),
  warn.conflicts = FALSE)

local_environment(env, pos = 2L, name = format(env),
  warn.conflicts = FALSE, .local_envir = parent.frame())
```

Arguments

package	[character(1)] package name to load.
code	[any] Code to execute in the temporary environment
help	the name of a package, given as a name or literal character string, or a character string, depending on whether character.only is FALSE (default) or TRUE).
pos	the position on the search list at which to attach the loaded namespace. Can also be the name of a position on the current search list as given by search().
lib.loc	a character vector describing the location of R library trees to search through, or NULL. The default value of NULL corresponds to all libraries currently known to .libPaths(). Non-existent library trees are silently ignored.
character.only	a logical indicating whether package or help can be assumed to be character strings.
logical.return	logical. If it is TRUE, FALSE or TRUE is returned to indicate success.
warn.conflicts	logical. If TRUE, warnings are printed about conflicts from attaching the new package. A conflict is a function masking a function, or a non-function masking a non-function.
quietly	a logical. If TRUE, no message confirming package attaching is printed, and most often, no errors/warnings are printed if package attaching fails.
verbose	a logical. If TRUE, additional diagnostics are printed.
.local_envir	[environment] The environment to use for scoping.

env	[environment()] Environment to attach.
name	name to use for the attached database. Names starting with package: are reserved for library.

Value

[any]
The results of the evaluation of the code argument.

See Also

withr for examples

Examples

```
## Not run:
with_package("ggplot2", {
  ggplot(mtcars) + geom_point(aes(wt, hp))
})

## End(Not run)
```

---

with_par *Graphics parameters*

Description

Temporarily change graphics parameters.

Usage

```
with_par(new, code, no.readonly = FALSE)

local_par(new, no.readonly = FALSE, .local_envir = parent.frame())
```

Arguments

new	[named list] New graphics parameters and their values
code	[any] Code to execute in the temporary environment
no.readonly	[logical(1)] see par() documentation.
.local_envir	[environment] The environment to use for scoping.

Value

[any]
The results of the evaluation of the code argument.

See Also

withr for examples

par()

---

with_path *PATH environment variable*

Description

Temporarily change the system search path.

Usage

```
with_path(new, code, action = "prefix")

local_path(new, action = "prefix", .local_envir = parent.frame())
```

Arguments

new	[character] New PATH entries
code	[any] Code to execute in the temporary environment
action	[character(1)] Should new values "replace", "prefix" or "suffix" existing paths
.local_envir	[environment] The environment to use for scoping.

Value

[any]
The results of the evaluation of the code argument.

See Also

withr for examples

Sys.setenv()

`with_seed` *Random seed*

Description

`with_seed()` runs code with a specific random seed and resets it afterwards.

`with_preserve_seed()` runs code with the current random seed and resets it afterwards.

Usage

```
with_seed(seed, code)

with_preserve_seed(code)
```

Arguments

`seed`	`[integer(1)]` The random seed to use to evaluate the code.
`code`	`[any]` Code to execute in the temporary environment

Value

`[any]`
The results of the evaluation of the `code` argument.

See Also

`withr` for examples

Examples

```
# Same random values:
with_preserve_seed(runif(5))
with_preserve_seed(runif(5))

# Use a pseudorandom value as seed to advance the RNG and pick a different
# value for the next call:
with_seed(seed <- sample.int(.Machine$integer.max, 1L), runif(5))
with_seed(seed, runif(5))
with_seed(seed <- sample.int(.Machine$integer.max, 1L), runif(5))
```

`with_sink` *Output redirection*

Description

Temporarily divert output to a file via `sink()`. For sinks of type `message`, an error is raised if such a sink is already active.

Usage

```
with_output_sink(new, code, append = FALSE, split = FALSE)

local_output_sink(new, append = FALSE, split = FALSE,
  .local_envir = parent.frame())

with_message_sink(new, code, append = FALSE)

local_message_sink(new, append = FALSE, .local_envir = parent.frame())
```

Arguments

`new`	`[character(1)|connection]` A writable connection or a character string naming the file to write to. Passing `NULL` will throw an error.
`code`	`[any]` Code to execute in the temporary environment
`append`	logical. If `TRUE`, output will be appended to `file`; otherwise, it will overwrite the contents of `file`.
`split`	logical: if `TRUE`, output will be sent to the new sink and to the current output stream, like the Unix program `tee`.
`.local_envir`	`[environment]` The environment to use for scoping.

Value

`[any]`
The results of the evaluation of the code argument.

See Also

`withr` for examples

`sink()`

`with_tempfile` *Temporary files*

Description

Temporarily create a tempfile, which is automatically removed afterwards.

Usage

```
with_tempfile(new, code, envir = parent.frame(), pattern = "file",
  tmpdir = tempdir(), fileext = "")

local_tempfile(new, envir = parent.frame(), pattern = "file",
  tmpdir = tempdir(), fileext = "")
```

Arguments

`new`	`[character vector]` Names of temporary file handles to create.
`code`	`[any]` Code to execute in the temporary environment
`envir`	`[environment]` Environment in which to define the temporary files.
`pattern`	a non-empty character vector giving the initial part of the name.
`tmpdir`	a non-empty character vector giving the directory name
`fileext`	a non-empty character vector giving the file extension

Value

`[any]`
The results of the evaluation of the `code` argument.

See Also

`withr` for examples

`with_temp_libpaths` *Library paths*

Description

Temporarily prepend a new temporary directory to the library paths.

Usage

```
with_temp_libpaths(code, action = "prefix")

local_temp_libpaths(action = "prefix", .local_envir = parent.frame())
```

Arguments

`code`	`[any]` Code to execute in the temporary environment
`action`	`[character(1)]` should new values `"replace"`, `"prefix"` or `"suffix"` existing paths.
`.local_envir`	`[environment]` The environment to use for scoping.

Value

`[any]`
The results of the evaluation of the `code` argument.

See Also

`withr` for examples

`.libPaths()`

Other libpaths: `with_libpaths`

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