Package 'targets'

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Title Dynamic Function-Oriented 'Make'-Like Declarative Workflows

Description As a pipeline toolkit for Statistics and data science in R, the 'targets' package brings together function-oriented programming and 'Make'-like declarative workflows. It analyzes the dependency relationships among the tasks of a workflow, skips steps that are already up to date, runs the necessary computation with optional parallel workers, abstracts files as R objects, and provides tangible evidence that the results match the underlying code and data. The methodology in this package borrows from GNU 'Make' (2015, ISBN:978-9881443519) and 'drake' (2018, <doi:10.21105/joss.00550>).

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`targets-package` *targets: Dynamic Function-Oriented Make-Like Declarative Pipelines for R*

Description

As a pipeline toolkit for Statistics and data science in R, the `targets` package brings together function-oriented programming and Make-like declarative pipelines. It analyzes the dependency relationships among the tasks of a workflow, skips steps that are already up to date, runs the necessary computations with optional parallel workers, abstracts files as R objects, and provides tangible

evidence that the results match the underlying code and data. The methodology in this package borrows from GNU Make (2015, ISBN:978-9881443519) and drake (2018, doi:10.21105/joss.00550).

See Also

Other help: tar_reprex(), use_targets_rmd(), use_targets()

`tar_active` *Show if the pipeline is running.*

Description

Return TRUE if called in a target or _targets.R and the pipeline is running.

Usage

```
tar_active()
```

Value

Logical of length 1, TRUE if called in a target or _targets.R and the pipeline is running (FALSE otherwise).

See Also

Other utilities: tar_call(), tar_cancel(), tar_definition(), tar_envir(), tar_group(), tar_name(), tar_path(), tar_seed(), tar_source(), tar_store()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_active() # FALSE
tar_script({
  message("Pipeline running? ", tar_active())
  tar_target(x, tar_active())
})
tar_manifest() # prints "Pipeline running? FALSE"
tar_make() # prints "pipeline running? TRUE"
tar_read(x) # TRUE
})
}
```

tar_assert *Assertions*

Description

These functions assert the correctness of user inputs and generate custom error conditions as needed. Useful for writing packages built on top of `targets`.

Usage

```
tar_assert_chr(x, msg = NULL)

tar_assert_dbl(x, msg = NULL)

tar_assert_df(x, msg = NULL)

tar_assert_equal_lengths(x, msg = NULL)

tar_assert_envir(x, msg = NULL)

tar_assert_expr(x, msg = NULL)

tar_assert_flag(x, choices, msg = NULL)

tar_assert_file(x)

tar_assert_finite(x, msg = NULL)

tar_assert_function(x, msg = NULL)

tar_assert_function_arguments(x, args, msg = NULL)

tar_assert_ge(x, threshold, msg = NULL)

tar_assert_identical(x, y, msg = NULL)

tar_assert_in(x, choices, msg = NULL)

tar_assert_not_dirs(x, msg = NULL)

tar_assert_not_dir(x, msg = NULL)

tar_assert_not_in(x, choices, msg = NULL)

tar_assert_inherits(x, class, msg = NULL)

tar_assert_int(x, msg = NULL)
```

```
tar_assert_internet(msg = NULL)

tar_assert_lang(x, msg = NULL)

tar_assert_le(x, threshold, msg = NULL)

tar_assert_list(x, msg = NULL)

tar_assert_lgl(x, msg = NULL)

tar_assert_name(x)

tar_assert_named(x, msg = NULL)

tar_assert_names(x, msg = NULL)

tar_assert_nonempty(x, msg = NULL)

tar_assert_not_expr(x, msg = NULL)

tar_assert_nzchar(x, msg = NULL)

tar_assert_package(package)

tar_assert_path(path, msg = NULL)

tar_assert_match(x, pattern, msg = NULL)

tar_assert_nonmissing(x, msg = NULL)

tar_assert_positive(x, msg = NULL)

tar_assert_scalar(x, msg = NULL)

tar_assert_target(x, msg = NULL)

tar_assert_target_list(x)

tar_assert_true(x, msg = NULL)

tar_assert_unique(x, msg = NULL)

tar_assert_unique_targets(x)
```

Arguments

x	R object, input to be validated. The kind of object depends on the specific assertion function called.

msg	Character of length 1, a message to be printed to the console if x is invalid.
choices	Character vector of choices of x for certain assertions.
args	Character vector of expected function argument names. Order matters.
threshold	Numeric of length 1, lower/upper bound for assertions like tar_assert_le()/tar_assert_ge().
y	R object, value to compare against x.
class	Character vector of expected class names.
package	Character of length 1, name of an R package.
path	Character, file path.
pattern	Character of length 1, a grep pattern for certain assertions.

See Also

Other utilities to extend targets: tar_condition, tar_dir(), tar_language, tar_test()

Examples

```
tar_assert_chr("123")
try(tar_assert_chr(123))
```

---

tar_branches *Reconstruct the branch names and the names of their dependencies.*

Description

Given a branching pattern, use available metadata to reconstruct branch names and the names of each branch's dependencies. The metadata of each target must already exist and be consistent with the metadata of the other targets involved.

Usage

```
tar_branches(name, pattern, store = targets::tar_config_get("store"))
```

Arguments

name	Symbol, name of the target.
pattern	Language to define branching for a target. For example, in a pipeline with numeric vector targets x and y, tar_target(z, x + y, pattern = map(x, y)) implicitly defines branches of z that each compute x[1] + y[1], x[2] + y[2], and so on. See the user manual for details.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

The results from this function can help you retroactively figure out correspondences between upstream branches and downstream branches. However, it does not always correctly predict what the names of the branches will be after the next run of the pipeline. Dynamic branching happens while the pipeline is running, so we cannot always know what the names of the branches will be in advance (or even how many there will be).

Value

A `tibble` with one row per branch and one column for each target (including the branched-over targets and the target with the pattern.)

See Also

Other branching: `tar_branch_index()`, `tar_branch_names_raw()`, `tar_branch_names()`, `tar_pattern()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, head(letters, 2)),
    tar_target(z, head(LETTERS, 2)),
    tar_target(dynamic, c(x, y, z), pattern = cross(z, map(x, y)))
  )
}, ask = FALSE)
tar_make()
tar_branches(dynamic, pattern = cross(z, map(x, y)))
})
}
```

---

tar_branch_index *Integer branch indexes*

Description

Get the integer indexes of individual branch names within their corresponding dynamic branching targets.

Usage

```
tar_branch_index(names, store = targets::tar_config_get("store"))
```

Arguments

names	Character vector of branch names
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

A named integer vector of branch indexes.

See Also

Other branching: tar_branch_names_raw(), tar_branch_names(), tar_branches(), tar_pattern()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(4)),
    tar_target(y, 2 * x, pattern = map(x)),
    tar_target(z, y, pattern = map(y))
  )
}, ask = FALSE)
tar_make()
names <- c(
  tar_meta(y, children)$children[[1]][c(2, 3)],
  tar_meta(z, children)$children[[1]][2]
)
names
tar_branch_index(names) # c(2, 3, 2)
})
}
```

---

tar_branch_names *Branch names*

Description

Get the branch names of a dynamic branching target using numeric indexes.

Usage

```
tar_branch_names(name, index, store = targets::tar_config_get("store"))
```

Arguments

name	Symbol, name of the dynamic branching target (pattern).
index	Integer vector of branch indexes.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

A character vector of branch names.

See Also

Other branching: tar_branch_index(), tar_branch_names_raw(), tar_branches(), tar_pattern()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(4)),
    tar_target(y, 2 * x, pattern = map(x)),
    tar_target(z, y, pattern = map(y))
  )
}, ask = FALSE)
tar_make()
tar_branch_names(z, c(2, 3))
})
}
```

---

tar_branch_names_raw *Branch names (raw version)*

Description

Get the branch names of a dynamic branching target using numeric indexes. Same as tar_branch_names() except name is a character of length 1.

Usage

```
tar_branch_names_raw(name, index, store = targets::tar_config_get("store"))
```

Arguments

name	Character of length 1, name of the dynamic branching target (pattern).
index	Integer vector of branch indexes.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

A character vector of branch names.

See Also

Other branching: tar_branch_index(), tar_branch_names(), tar_branches(), tar_pattern()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(w, 1),
    tar_target(x, seq_len(4)),
    tar_target(y, 2 * x, pattern = map(x)),
    tar_target(z, y, pattern = map(y))
  )
}, ask = FALSE)
tar_make()
tar_branch_names_raw("z", c(2, 3))
})
}
```

---

tar_built *List built targets.*

Description

List targets whose progress is "built".

Usage

```
tar_built(names = NULL, store = targets::tar_config_get("store"))
```

Arguments

names	Optional, names of the targets. If supplied, the function restricts its output to these targets. You can supply symbols or tidyselect helpers like all_of() and starts_with().
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

A character vector of built targets.

See Also

Other progress: tar_canceled(), tar_errored(), tar_poll(), tar_progress_branches(), tar_progress_summary(), tar_progress(), tar_skipped(), tar_started(), tar_watch_server(), tar_watch_ui(), tar_watch()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, 2 * x, pattern = map(x))
  )
}, ask = FALSE)
tar_make()
tar_built()
tar_built(starts_with("y_")) # see also all_of()
})
}
```

---

tar_call *Identify the called* targets *function.*

Description

Get the name of the currently running targets interface function. Returns NULL if not invoked inside a target or _targets.R (i.e. if not directly invoked by tar_make(), tar_visnetwork(), etc.).

Usage

```
tar_call()
```

Value

Character of length 1, name of the currently running `targets` interface function. For example, suppose you have a call to `tar_call()` inside a target or `_targets.R`. Then if you run `tar_make()`, `tar_call()` will return `"tar_make"`.

See Also

Other utilities: `tar_active()`, `tar_cancel()`, `tar_definition()`, `tar_envir()`, `tar_group()`, `tar_name()`, `tar_path()`, `tar_seed()`, `tar_source()`, `tar_store()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_call() # NULL
tar_script({
  message("called function: ", tar_call())
  tar_target(x, tar_call())
})
tar_manifest() # prints "called function: tar_manifest"
tar_make() # prints "called function: tar_make"
tar_read(x) # "tar_make"
})
}
```

`tar_cancel` *Cancel a target mid-build under a custom condition.*

Description

Cancel a target while its command is running if a condition is met.

Usage

```
tar_cancel(condition = TRUE)
```

Arguments

`condition`	Logical of length 1, whether to cancel the target.

Details

Must be invoked by the target itself. `tar_cancel()` cannot interrupt a target from another process.

See Also

Other utilities: `tar_active()`, `tar_call()`, `tar_definition()`, `tar_envir()`, `tar_group()`, `tar_name()`, `tar_path()`, `tar_seed()`, `tar_source()`, `tar_store()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(tar_target(x, tar_cancel(1 > 0)))
tar_make() # Should cancel target x.
})
}
```

`tar_canceled` *List canceled targets.*

Description

List targets whose progress is "canceled".

Usage

```
tar_canceled(names = NULL, store = targets::tar_config_get("store"))
```

Arguments

names	Optional, names of the targets. If supplied, the function restricts its output to these targets. You can supply symbols or tidyselect helpers like all_of() and starts_with().
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

A character vector of canceled targets.

See Also

Other progress: tar_built(), tar_errored(), tar_poll(), tar_progress_branches(), tar_progress_summary(), tar_progress(), tar_skipped(), tar_started(), tar_watch_server(), tar_watch_ui(), tar_watch()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, 2 * x, pattern = map(x))
  )
```

```
}, ask = FALSE)
tar_make()
tar_canceled()
tar_canceled(starts_with("y_")) # see also all_of()
})
}
```

`tar_condition` *Conditions*

Description

These functions throw custom `targets`-specific error conditions. Useful for error handling in packages built on top of `targets`.

Usage

```
tar_message_run(...)

tar_throw_file(...)

tar_throw_run(...)

tar_throw_validate(...)

tar_warn_deprecate(...)

tar_warn_run(...)

tar_warn_validate(...)

tar_error(message, class)

tar_warning(message, class)

tar_message(message, class)
```

Arguments

`...`	zero or more objects which can be coerced to character (and which are pasted together with no separator) or a single condition object.
`message`	Character of length 1, text of the message.
`class`	Character vector of S3 classes of the message.

See Also

Other utilities to extend targets: `tar_assert`, `tar_dir()`, `tar_language`, `tar_test()`

Examples

```
try(tar_throw_validate("something is not valid"))
```

`tar_config_get` *Get configuration settings.*

Description

Read the custom settings for the current project in the optional YAML configuration file.

Usage

```
tar_config_get(
  name,
  config = Sys.getenv("TAR_CONFIG", "_targets.yaml"),
  project = Sys.getenv("TAR_PROJECT", "main")
)
```

Arguments

`name`	Character of length 1, name of the specific configuration setting to retrieve.
`config`	Character of length 1, file path of the YAML configuration file with `targets` project settings. The `config` argument specifies which YAML configuration file that `tar_config_get()` reads from or `tar_config_set()` writes to in a single function call. It does not globally change which configuration file is used in subsequent function calls. The default file path of the YAML file is always `_targets.yaml` unless you set another default path using the `TAR_CONFIG` environment variable, e.g. `Sys.setenv(TAR_CONFIG = "custom.yaml")`. This also has the effect of temporarily modifying the default arguments to other functions such as `tar_make()` because the default arguments to those functions are controlled by `tar_config_get()`.
`project`	Character of length 1, name of the current `targets` project. Thanks to the `config` R package, `targets` YAML configuration files can store multiple sets of configuration settings, with each set corresponding to its own project. The `project` argument allows you to set or get a configuration setting for a specific project for a given call to `tar_config_set()` or `tar_config_get()`. The default project is always called `"main"` unless you set another default project using the `TAR_PROJECT` environment variable, e.g. `Sys.setenv(tar_project = "custom")`. This also has the effect of temporarily modifying the default arguments to other functions such as `tar_make()` because the default arguments to those functions are controlled by `tar_config_get()`.

Value

The value of the configuration setting from the YAML configuration file (default: `_targets.yaml`) or the default value if the setting is not available. The data type of the return value depends on your choice of `name`.

Configuration

For several key functions like tar_make(), the default values of arguments are controlled though tar_config_get(). tar_config_get() retrieves data from an optional YAML configuration file. You can control the settings in the YAML file programmatically with tar_config_set(). The default file path of this YAML file is _targets.yaml, and you can set another path globally using the TAR_CONFIG environment variable. The YAML file can store configuration settings for multiple projects, and you can globally set the default project with the TAR_PROJECT environment variable. The structure of the YAML file follows rules similar to the config R package, e.g. projects can inherit settings from one another using the inherits field. Exceptions include:

1. There is no requirement to have a configuration named "default".
2. Other projects do not inherit from the default project‘ automatically.
3. Not all fields need values because targets already has defaults.

targets does not actually invoke the config package. The implementation in targets was written from scratch without viewing or copying any part of the source code of config.

See Also

Other configuration: tar_config_set(), tar_config_unset(), tar_envvars(), tar_option_get(), tar_option_reset(), tar_option_set()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(list(tar_target(x, 1 + 1)))
tar_config_get("store") # "_targets"
store_path <- tempfile()
tar_config_set(store = store_path)
tar_config_get("store") # Shows a temp file.
tar_make() # Writes to the custom data store identified in _targets.yaml.
tar_read(x) # tar_read() knows about _targets.yaml too.
file.exists("_targets") # FALSE
file.exists(store_path) # TRUE
})
}
```

---

tar_config_set *Set configuration settings.*

Description

tar_config_set() writes special custom settings for the current project to an optional YAML configuration file.

Usage

```
tar_config_set(
  inherits = NULL,
  reporter_make = NULL,
  reporter_outdated = NULL,
  store = NULL,
  shortcut = NULL,
  script = NULL,
  workers = NULL,
  config = Sys.getenv("TAR_CONFIG", "_targets.yaml"),
  project = Sys.getenv("TAR_PROJECT", "main")
)
```

Arguments

inherits	Character of length 1, name of the project from which the current project should inherit configuration settings. The current project is the `project` argument, which defaults to `Sys.getenv("TAR_PROJECT", "main")`. If the `inherits` argument `NULL`, the `inherits` setting is not modified. Use `tar_config_unset()` to delete a setting.
reporter_make	Character of length 1, `reporter` argument to `tar_make()` and related functions that run the pipeline. If the argument `NULL`, the setting is not modified. Use `tar_config_unset()` to delete a setting.
reporter_outdated	Character of length 1, `reporter` argument to `tar_outdated()` and related functions that do not run the pipeline. If the argument `NULL`, the setting is not modified. Use `tar_config_unset()` to delete a setting.
store	Character of length 1, path to the data store of the pipeline. If `NULL`, the `store` setting is left unchanged in the YAML configuration file (default: `_targets.yaml`). Usually, the data store lives at `_targets`. Set `store` to a custom directory to specify a path other than `_targets/`. The path need not exist before the pipeline begins, and it need not end with "_targets", but it must be writeable. For optimal performance, choose a storage location with fast read/write access. If the argument `NULL`, the setting is not modified. Use `tar_config_unset()` to delete a setting.
shortcut	logical of length 1, default `shortcut` argument to `tar_make()` and related functions. If the argument `NULL`, the setting is not modified. Use `tar_config_unset()` to delete a setting.
script	Character of length 1, path to the target script file that defines the pipeline (`_targets.R` by default). This path should be either an absolute path or a path relative to the project root where you will call `tar_make()` and other functions. When `tar_make()` and friends run the script from the current working directory. If the argument `NULL`, the setting is not modified. Use `tar_config_unset()` to delete a setting.
workers	Positive numeric of length 1, `workers` argument of `tar_make_clustermq()` and related functions that run the pipeline with parallel computing among tar-

gets. If the argument NULL, the setting is not modified. Use tar_config_unset() to delete a setting.

config — Character of length 1, file path of the YAML configuration file with targets project settings. The config argument specifies which YAML configuration file that tar_config_get() reads from or tar_config_set() writes to in a single function call. It does not globally change which configuration file is used in subsequent function calls. The default file path of the YAML file is always _targets.yaml unless you set another default path using the TAR_CONFIG environment variable, e.g. Sys.setenv(TAR_CONFIG = "custom.yaml"). This also has the effect of temporarily modifying the default arguments to other functions such as tar_make() because the default arguments to those functions are controlled by tar_config_get().

project — Character of length 1, name of the current targets project. Thanks to the config R package, targets YAML configuration files can store multiple sets of configuration settings, with each set corresponding to its own project. The project argument allows you to set or get a configuration setting for a specific project for a given call to tar_config_set() or tar_config_get(). The default project is always called "main" unless you set another default project using the TAR_PROJECT environment variable, e.g. Sys.setenv(tar_project = "custom"). This also has the effect of temporarily modifying the default arguments to other functions such as tar_make() because the default arguments to those functions are controlled by tar_config_get().

Value

NULL (invisibly)

Configuration

For several key functions like tar_make(), the default values of arguments are controlled though tar_config_get(). tar_config_get() retrieves data from an optional YAML configuration file. You can control the settings in the YAML file programmatically with tar_config_set(). The default file path of this YAML file is _targets.yaml, and you can set another path globally using the TAR_CONFIG environment variable. The YAML file can store configuration settings for multiple projects, and you can globally set the default project with the TAR_PROJECT environment variable. The structure of the YAML file follows rules similar to the config R package, e.g. projects can inherit settings from one another using the inherits field. Exceptions include:

1. There is no requirement to have a configuration named "default".
2. Other projects do not inherit from the default project‘ automatically.
3. Not all fields need values because targets already has defaults.

targets does not actually invoke the config package. The implementation in targets was written from scratch without viewing or copying any part of the source code of config.

See Also

Other configuration: tar_config_get(), tar_config_unset(), tar_envvars(), tar_option_get(), tar_option_reset(), tar_option_set()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(list(tar_target(x, 1 + 1)))
tar_config_get("store") # NULL (data store defaults to "_targets/")
store_path <- tempfile()
tar_config_set(store = store_path)
tar_config_get("store") # Shows a temp file.
tar_make() # Writes to the custom data store identified in _targets.yaml.
tar_read(x) # tar_read() knows about _targets.yaml too.
file.exists("_targets") # FALSE
file.exists(store_path) # TRUE
})
}
```

---

tar_config_unset *Unset configuration settings.*

Description

Unset (i.e. delete) one or more custom settings for the current project from the optional YAML configuration file. After that, `tar_option_get()` will return the original default values for those settings for the project.

Usage

```
tar_config_unset(
  names = character(0),
  config = Sys.getenv("TAR_CONFIG", "_targets.yaml"),
  project = Sys.getenv("TAR_PROJECT", "main")
)
```

Arguments

`names`	Character vector of configuration settings to delete from the current project.
`config`	Character of length 1, file path of the YAML configuration file with `targets` project settings. The `config` argument specifies which YAML configuration file that `tar_config_get()` reads from or `tar_config_set()` writes to in a single function call. It does not globally change which configuration file is used in subsequent function calls. The default file path of the YAML file is always `_targets.yaml` unless you set another default path using the `TAR_CONFIG` environment variable, e.g. `Sys.setenv(TAR_CONFIG = "custom.yaml")`. This also has the effect of temporarily modifying the default arguments to other functions such as `tar_make()` because the default arguments to those functions are controlled by `tar_config_get()`.

project — Character of length 1, name of the current targets project. Thanks to the config R package, targets YAML configuration files can store multiple sets of configuration settings, with each set corresponding to its own project. The project argument allows you to set or get a configuration setting for a specific project for a given call to tar_config_set() or tar_config_get(). The default project is always called "main" unless you set another default project using the TAR_PROJECT environment variable, e.g. Sys.setenv(tar_project = "custom"). This also has the effect of temporarily modifying the default arguments to other functions such as tar_make() because the default arguments to those functions are controlled by tar_config_get().

Value

NULL (invisibly)

Configuration

For several key functions like tar_make(), the default values of arguments are controlled though tar_config_get(). tar_config_get() retrieves data from an optional YAML configuration file. You can control the settings in the YAML file programmatically with tar_config_set(). The default file path of this YAML file is _targets.yaml, and you can set another path globally using the TAR_CONFIG environment variable. The YAML file can store configuration settings for multiple projects, and you can globally set the default project with the TAR_PROJECT environment variable. The structure of the YAML file follows rules similar to the config R package, e.g. projects can inherit settings from one another using the inherits field. Exceptions include:

1. There is no requirement to have a configuration named "default".
2. Other projects do not inherit from the default project‘ automatically.
3. Not all fields need values because targets already has defaults.

targets does not actually invoke the config package. The implementation in targets was written from scratch without viewing or copying any part of the source code of config.

See Also

Other configuration: tar_config_get(), tar_config_set(), tar_envvars(), tar_option_get(), tar_option_reset(), tar_option_set()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(list(tar_target(x, 1 + 1)))
tar_config_get("store") # "_targets"
store_path <- tempfile()
tar_config_set(store = store_path)
tar_config_get("store") # Shows a temp file.
tar_config_unset("store")
tar_config_get("store") # _targets
})
}
```

`tar_cue` *Declare the rules that cue a target.*

Description

Declare the rules that mark a target as outdated.

Usage

```
tar_cue(
  mode = c("thorough", "always", "never"),
  command = TRUE,
  depend = TRUE,
  format = TRUE,
  repository = TRUE,
  iteration = TRUE,
  file = TRUE
)
```

Arguments

`mode`	Cue mode. If `"thorough"`, all the cues apply unless individually suppressed. If `"always"`, then the target always runs. If `"never"`, then the target does not run unless the metadata does not exist or the last run errored.
`command`	Logical, whether to rerun the target if command changed since last time.
`depend`	Logical, whether to rerun the target if the value of one of the dependencies changed.
`format`	Logical, whether to rerun the target if the user-specified storage format changed. The storage format is user-specified through `tar_target()` or `tar_option_set()`.
`repository`	Logical, whether to rerun the target if the user-specified storage repository changed. The storage repository is user-specified through `tar_target()` or `tar_option_set()`.
`iteration`	Logical, whether to rerun the target if the user-specified iteration method changed. The iteration method is user-specified through `tar_target()` or `tar_option_set()`.
`file`	Logical, whether to rerun the target if the file(s) with the return value changed or at least one is missing.

Target invalidation rules

`targets` uses internal metadata and special cues to decide whether a target is up to date (can skip) or is outdated/invalidated (needs to rerun). By default, `targets` moves through the following list of cues and declares a target outdated if at least one is cue activated.

1. There is no metadata record of the target.
2. The target errored last run.
3. The target has a different class than it did before.

4. The cue mode equals "always".
5. The cue mode does not equal "never".
6. The command metadata field (the hash of the R command) is different from last time.
7. The depend metadata field (the hash of the immediate upstream dependency targets and global objects) is different from last time.
8. The storage format is different from last time.
9. The iteration mode is different from last time.
10. A target's file (either the one in _targets/objects/ or a dynamic file) does not exist or changed since last time.

The user can suppress many of the above cues using the tar_cue() function, which creates the cue argument of tar_target(). Cues objects also constitute more nuanced target invalidation rules. The tarchetypes package has many such examples, including tar_age(), tar_download(), tar_cue_age(), tar_cue_force(), and tar_cue_skip().

Dependency-based invalidation and user-defined functions

If the cue of a target has depend = TRUE (default) then the target is marked invalidated/outdated when its upstream dependencies change. A target's dependencies include upstream targets, user-defined functions, and other global objects populated in the target script file (default: _targets.R). To determine if a given dependency changed since the last run of the pipeline, targets computes hashes. The hash of a target is computed on its files in storage (usually a file in _targets/objects/). The hash of a non-function global object dependency is computed directly on its in-memory data. User-defined functions are hashed in the following way:

1. Deparse the function with targets:::tar_deparse_safe(). This function computes a string representation of the function body and arguments. This string representation is invariant to changes in comments and whitespace, which means trivial changes to formatting do not cue targets to rerun.
2. Manually remove any literal pointers from the function string using targets:::mask_pointers(). Such pointers arise from inline compiled C/C++ functions.
3. Using static code analysis (i.e. tar_deps(), which is based on codetools::findGlobals()) identify any user-defined functions and global objects that the current function depends on. Append the hashes of those dependencies to the string representation of the current function.
4. Compute the hash of the final string representation using targets:::digest_chr64().

Above, (3) is important because user-defined functions have dependencies of their own, such as other user-defined functions and other global objects. (3) ensures that a change to a function's dependencies invalidates the function itself, which in turn invalidates any calling functions and any targets downstream with the depend cue turned on.

See Also

Other targets: tar_format(), tar_target_raw(), tar_target()

Examples

```
# The following target will always run when the pipeline runs.
x <- tar_target(x, download_data(), cue = tar_cue(mode = "always"))
```

tar_definition *For developers only: get the definition of the current target.*

Description

For developers only: get the full definition of the target currently running. This target definition is the same kind of object produced by tar_target().

Usage

```
tar_definition(
  default = targets::tar_target_raw("target_name", quote(identity()))
)
```

Arguments

default	Environment, value to return if tar_definition() is called on its own outside a targets pipeline. Having a default lets users run things without tar_make(), which helps peel back layers of code and troubleshoot bugs.

Details

Most users should not use tar_definition() because accidental modifications could break the pipeline. tar_definition() only exists in order to support third-party interface packages, and even then the returned target definition is not modified..

Value

If called from a running target, tar_definition() returns the target object of the currently running target. See the "Target objects" section for details.

Target objects

Functions like tar_target() produce target objects, special objects with specialized sets of S3 classes. Target objects represent skippable steps of the analysis pipeline as described at https://books.ropensci.org/targets/. Please read the walkthrough at https://books.ropensci.org/targets/walkthrough.html to understand the role of target objects in analysis pipelines.

For developers, https://wlandau.github.io/targetopia/contributing.html#target-factories explains target factories (functions like this one which generate targets) and the design specification at https://books.ropensci.org/targets-design/ details the structure and composition of target objects.

See Also

Other utilities: tar_active(), tar_call(), tar_cancel(), tar_envir(), tar_group(), tar_name(), tar_path(), tar_seed(), tar_source(), tar_store()

Examples

```
class(tar_definition())
tar_definition()$settings$name
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(
  tar_target(x, tar_definition()$settings$memory, memory = "transient")
)
tar_make(x)
tar_read(x)
})
}
```

`tar_delete` *Delete locally stored target return values.*

Description

Delete the return values of targets in `_targets/objects/`. but keep the records in `_targets/meta/meta`.

Usage

```
tar_delete(names, cloud = TRUE, store = targets::tar_config_get("store"))
```

Arguments

`names`	Names of the targets to remove from `_targets/objects/`. You can supply symbols or `tidyselect` helpers like `all_of()` and `starts_with()`.
`cloud`	Logical of length 1, whether to delete objects from the cloud if applicable (e.g. AWS, GCP). If `FALSE`, files are not deleted from the cloud.
`store`	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Details

If you have a small number of data-heavy targets you need to discard to conserve storage, this function can help. Local external files files (i.e. `format = "file"` and `repository = "local"`) are not deleted. For targets with `repository` not equal `"local"`, `tar_delete()` attempts to delete the file and errors out if the deletion is unsuccessful. If deletion fails, either log into the cloud platform and manually delete the file (e.g. the AWS web console in the case of `repository = "aws"`) or call `tar_invalidate()` on that target so that `targets` does not try to delete the object. For patterns recorded in the metadata, all the branches will be deleted. For patterns no longer in the metadata, branches are left alone.

See Also

Other clean: tar_destroy(), tar_invalidate(), tar_prune()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
}, ask = FALSE)
tar_make()
tar_delete(starts_with("y")) # Only deletes y1 and y2.
tar_make() # y1 and y2 rebuild but return same values, so z is up to date.
})
}
```

---

tar_deps *Code dependencies*

Description

List the dependencies of a function or expression.

Usage

```
tar_deps(expr)
```

Arguments

expr	A quoted R expression or function.

Details

targets detects the dependencies of commands using static code analysis. Use tar_deps() to run the code analysis and see the dependencies for yourself.

Value

Character vector of the dependencies of a function or expression.

See Also

Other inspect: tar_deps_raw(), tar_manifest(), tar_network(), tar_outdated(), tar_sitrep(), tar_validate()

Examples

```
tar_deps(x <- y + z)
tar_deps({
  x <- 1
  x + a
})
tar_deps(function(a = b) map_dfr(data, ~do_row(.x)))
```

`tar_deps_raw` *Code dependencies (raw version)*

Description

Same as `tar_deps()` except `expr` must already be an unquoted function or expression object.

Usage

```
tar_deps_raw(expr)
```

Arguments

`expr`	An R expression object or function.

Value

Character vector of the dependencies of a function or expression.

See Also

Other inspect: `tar_deps()`, `tar_manifest()`, `tar_network()`, `tar_outdated()`, `tar_sitrep()`, `tar_validate()`

Examples

```
tar_deps_raw(quote(x <- y + z))
tar_deps_raw(
  quote({
    x <- 1
    x + a
  })
)
tar_deps_raw(function(a = b) map_dfr(data, ~do_row(.x)))
```

tar_destroy *Destroy all or part of the data store.*

Description

Destroy all or part of the data store written by `tar_make()` and similar functions.

Usage

```
tar_destroy(
  destroy = c("all", "cloud", "local", "meta", "process", "progress", "objects",
    "scratch", "workspaces"),
  ask = NULL,
  store = targets::tar_config_get("store")
)
```

Arguments

`destroy`	Character of length 1, what to destroy. Choices: • `"all"`: destroy the entire data store (default: `_targets/`) including cloud data. • `"cloud"`: just try to delete cloud data, e.g. target data from targets with `tar_target(..., repository = "aws")`. • `"local"`: all the local files in the data store but nothing on the cloud. • `"meta"`: just delete the metadata file at `meta/meta` in the data store, which invalidates all the targets but keeps the data. • `"process"`: just delete the progress data file at `meta/process` in the data store, which resets the metadata of the main process. • `"progress"`: just delete the progress data file at `meta/progress` in the data store, which resets the progress tracking info. • `"objects"`: delete all the target return values in `objects/` in the data store but keep progress and metadata. Dynamic files are not deleted this way. • `"scratch"`: temporary files saved during `tar_make()` that should automatically get deleted except if R crashed. • `"workspaces"`: compressed files in `workspaces/` in the data store with the saved workspaces of targets. See `tar_workspace()` for details.
`ask`	Logical of length 1, whether to pause with a menu prompt before deleting files. To disable this menu, set the `TAR_ASK` environment variable to `"false"`. `usethis::edit_r_environ()` can help set environment variables.
`store`	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Details

`tar_destroy()` is a hard reset. Use it if you intend to start the pipeline from scratch without any trace of a previous run in `_targets/`. Global objects and dynamic files outside the data store are unaffected.

Value

Nothing.

See Also

Other clean: `tar_delete()`, `tar_invalidate()`, `tar_prune()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(list(tar_target(x, 1 + 1)), ask = FALSE)
tar_make() # Creates the _targets/ data store.
tar_destroy()
print(file.exists("_targets")) # Should be FALSE.
})
}
```

---

tar_dir *Execute code in a temporary directory.*

Description

Runs code inside a new `tempfile()` directory in order to avoid writing to the user's file space. Used in examples and tests in order to comply with CRAN policies.

Usage

```
tar_dir(code)
```

Arguments

code	User-defined code.

Value

Return value of the user-defined code.

See Also

Other utilities to extend targets: `tar_assert`, `tar_condition`, `tar_language`, `tar_test()`

Examples

```
tar_dir(file.create("only_exists_in_tar_dir"))
file.exists("only_exists_in_tar_dir")
```

---

tar_edit *Open the target script file for editing.*

Description

Open the target script file for editing. Requires the `usethis` package.

Usage

```
tar_edit(script = targets::tar_config_get("script"))
```

Arguments

`script`	Character of length 1, path to the target script file. Defaults to `tar_config_get("script")`, which in turn defaults to `_targets.R`. When you set this argument, the value of `tar_config_get("script")` is temporarily changed for the current function call. See `tar_script()`, `tar_config_get()`, and `tar_config_set()` for details about the target script file and how to set it persistently for a project.

Details

The target script file is an R code file that defines the pipeline. The default path is `_targets.R`, but the default for the current project can be configured with `tar_config_set()`.

See Also

Other scripts: `tar_github_actions()`, `tar_helper_raw()`, `tar_helper()`, `tar_renv()`, `tar_script()`

---

tar_engine_knitr *Target Markdown* `knitr` *engine*

Description

`knitr` language engine that runs `{targets}` code chunks in Target Markdown.

Usage

```
tar_engine_knitr(options)
```

Arguments

`options`	A named list of `knitr` chunk options.

Value

Character, output generated from `knitr::engine_output()`.

Target Markdown interactive mode

Target Markdown has two modes:

1. Non-interactive mode. This is the default when you run `knitr::knit()` or `rmarkdown::render()`. Here, the code in `{targets}` code chunks gets written to special script files in order to set up a `targets` pipeline to run later.
2. Interactive mode: here, no scripts are written to set up a pipeline. Rather, the globals or targets in question are run in the current environment and the values are assigned to that environment.

The mode is interactive if `!isTRUE(getOption("knitr.in.progress"))`, is `TRUE`. The `knitr.in.progress` option is `TRUE` when you run `knitr::knit()` or `rmarkdown::render()` and `NULL` if you are running one chunk at a time interactively in an integrated development environment, e.g. the notebook interface in RStudio: https://bookdown.org/yihui/rmarkdown/notebook.html. You can choose the mode with the `tar_interactive` chunk option. (In `targets` 0.6.0, `tar_interactive` defaults to `interactive()` instead of `!isTRUE(getOption("knitr.in.progress"))`.)

Target Markdown chunk options

Target Markdown introduces the following `knitr` code chunk options. Most other standard `knitr` code chunk options should just work in non-interactive mode. In interactive mode, not all

- `tar_globals`: Logical of length 1, whether to define globals or targets. If `TRUE`, the chunk code defines functions, objects, and options common to all the targets. If `FALSE` or `NULL` (default), then the chunk returns formal targets for the pipeline.
- `tar_interactive`: Logical of length 1, whether to run in interactive mode or non-interactive mode. See the "Target Markdown interactive mode" section of this help file for details.
- `tar_name`: name to use for writing helper script files (e.g. `_targets_r/targets/target_script.R`) and specifying target names if the `tar_simple` chunk option is `TRUE`. All helper scripts and target names must have unique names, so please do not set this option globally with `knitr::opts_chunk$set()`.
- `tar_script`: Character of length 1, where to write the target script file in non-interactive mode. Most users can skip this option and stick with the default `_targets.R` script path. Helper script files are always written next to the target script in a folder with an `"_r"` suffix. The `tar_script` path must either be absolute or be relative to the project root (where you call `tar_make()` or similar). If not specified, the target script path defaults to `tar_config_get("script")` (default: `_targets.R`; helpers default: `_targets_r/`). When you run `tar_make()` etc. with a non-default target script, you must select the correct target script file either with the `script` argument or with `tar_config_set(script = ...)`. The function will `source()` the script file from the current working directory (i.e. with `chdir = FALSE` in `source()`).
- `tar_simple`: Logical of length 1. Set to `TRUE` to define a single target with a simplified interface. In code chunks with `tar_simple` equal to `TRUE`, the chunk label (or the `tar_name` chunk option if you set it) becomes the name, and the chunk code becomes the command. In other words, a code chunk with label `targetname` and command `mycommand()` automatically gets converted to `tar_target(name = targetname, command = mycommand())`. All other arguments of `tar_target()` remain at their default values (configurable with `tar_option_set()` in a `tar_globals = TRUE` chunk).

See Also

https://books.ropensci.org/targets/literate-programming.html

Other Target Markdown: tar_interactive(), tar_noninteractive(), tar_toggle()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
# Register the engine.
if (requireNamespace("knitr", quietly = TRUE)) {
  knitr::knit_engines$set(targets = targets::tar_engine_knitr)
}
# Then, {targets} code chunks in a knitr report will run
# as described at
# <https://books.ropensci.org/targets/literate-programming.html>.
}
```

---

tar_envir *For developers only: get the environment of the current target.*

Description

For developers only: get the environment where a target runs its command. Designed to be called while the target is running. The environment inherits from `tar_option_get("envir")`.

Usage

```
tar_envir(default = parent.frame())
```

Arguments

`default`	Environment, value to return if `tar_envir()` is called on its own outside a `targets` pipeline. Having a default lets users run things without `tar_make()`, which helps peel back layers of code and troubleshoot bugs.

Details

Most users should not use `tar_envir()` because accidental modifications to `parent.env(tar_envir())` could break the pipeline. `tar_envir()` only exists in order to support third-party interface packages, and even then the returned environment is not modified.

Value

If called from a running target, `tar_envir()` returns the environment where the target runs its command. If called outside a pipeline, the return value is whatever the user supplies to `default` (which defaults to `parent.frame()`).

See Also

Other utilities: tar_active(), tar_call(), tar_cancel(), tar_definition(), tar_group(), tar_name(), tar_path(), tar_seed(), tar_source(), tar_store()

Examples

```
tar_envir()
tar_envir(default = new.env(parent = emptyenv()))
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(tar_target(x, tar_envir(default = parent.frame())))
tar_make(x)
tar_read(x)
})
}
```

---

tar_envvars *Show* targets *environment variables.*

Description

Show all the special environment variables available for customizing targets.

Usage

```
tar_envvars(unset = "")
```

Arguments

unset	Character of length 1, value to return for any environment variable that is not set.

Details

You can customize the behavior of targets with special environment variables. The sections in this help file describe each environment variable, and the tar_envvars() function lists their current values.

If you modify environment variables, please set them in project-level .Renviron file so you do not lose your configuration when you restart your R session. Modify the project-level .Renviron file with usethis::edit_r_environ(scope = "project"). Restart your R session after you are done editing.

For targets that run on parallel workers created by tar_make_clustermq() or tar_make_future(), only the environment variables listed by tar_envvars() are specifically exported to the targets. For all other environment variables, you will have to set the values manually, e.g. a project-level .Renviron file (for workers that have access to the local file system).

Value

A data frame with one row per environment variable and columns with the name and current value of each. An unset environment variable will have a value of "" by default. (Customize with the unset argument).

TAR_ASK

The TAR_ASK environment variable accepts values "true" and "false". If TAR_ASK is not set, or if it is set to "true", then targets asks permission in a menu before overwriting certain files, such as the target script file (default: _targets.R) in tar_script(). If TAR_ASK is "false", then targets overwrites the old files with the new ones without asking. Once you are comfortable with tar_script(), tar_github_actions(), and similar functions, you can safely set TAR_ASK to "false" in either a project-level or user-level .Renviron file.

TAR_CONFIG

The TAR_CONFIG environment variable controls the file path to the optional YAML configuration file with project settings. See the help file of tar_config_set() for details.

TAR_PROJECT

The TAR_PROJECT environment variable sets the name of project to set and get settings when working with the YAML configuration file. See the help file of tar_config_set() for details.

TAR_WARN

The TAR_WARN environment variable accepts values "true" and "false". If TAR_WARN is not set, or if it is set to "true", then targets throws warnings in certain edge cases, such as target/global name conflicts and dangerous use of devtools::load_all(). If TAR_WARN is "false", then targets does not throw warnings in these cases. These warnings can detect potentially serious issues with your pipeline, so please do not set TAR_WARN unless your use case absolutely requires it.

See Also

Other configuration: tar_config_get(), tar_config_set(), tar_config_unset(), tar_option_get(), tar_option_reset(), tar_option_set()

Examples

```
tar_envvars()
```

`tar_errored` *List errored targets.*

Description

List targets whose progress is `"errored"`.

Usage

```
tar_errored(names = NULL, store = targets::tar_config_get("store"))
```

Arguments

`names`	Optional, names of the targets. If supplied, the function restricts its output to these targets. You can supply symbols or `tidyselect` helpers like `all_of()` and `starts_with()`.
`store`	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Value

A character vector of errored targets.

See Also

Other progress: `tar_built()`, `tar_canceled()`, `tar_poll()`, `tar_progress_branches()`, `tar_progress_summary()`, `tar_progress()`, `tar_skipped()`, `tar_started()`, `tar_watch_server()`, `tar_watch_ui()`, `tar_watch()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, 2 * x, pattern = map(x))
  )
}, ask = FALSE)
tar_make()
tar_errored()
tar_errored(starts_with("y_")) # see also all_of()
})
}
```

tar_exist_meta *Check if target metadata exists.*

Description

Check if the target metadata file `_targets/meta/meta` exists for the current project.

Usage

```
tar_exist_meta(store = targets::tar_config_get("store"))
```

Arguments

`store`	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Details

To learn more about data storage in `targets`, visit https://books.ropensci.org/targets/data.html.

Value

Logical of length 1, whether the current project's metadata exists.

See Also

Other existence: `tar_exist_objects()`, `tar_exist_process()`, `tar_exist_progress()`, `tar_exist_script()`

Examples

```
tar_exist_meta()
```

tar_exist_objects *Check if local output data exists for one or more targets.*

Description

Check if output target data exists in either `_targets/objects/` or the cloud for one or more targets.

Usage

```
tar_exist_objects(
  names,
  cloud = TRUE,
  store = targets::tar_config_get("store")
)
```

Arguments

names	Character vector of target names.
cloud	Logical of length 1, whether to include cloud targets in the output (e.g. `tar_target(..., repository = "aws")`).
store	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Details

If a target has no metadata or if the `repository` argument of `tar_target()` was set to `"local"`, then the `_targets/objects/` folder is checked. Otherwise, if there is metadata and `repsitory` is not `"local"`, then `tar_exist_objects()` checks the cloud repository selected.

Value

Logical of length `length(names)`, whether each given target has an existing file in either `_targets/objects/` or the cloud.

See Also

Other existence: `tar_exist_meta()`, `tar_exist_process()`, `tar_exist_progress()`, `tar_exist_script()`

Examples

```
tar_exist_objects(c("target1", "target2"))
```

---

tar_exist_process *Check if process metadata exists.*

Description

Check if the process metadata file `_targets/meta/process` exists for the current project.

Usage

```
tar_exist_process(store = targets::tar_config_get("store"))
```

Arguments

store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

To learn more about data storage in targets, visit https://books.ropensci.org/targets/data.html.

Value

Logical of length 1, whether the current project's metadata exists.

See Also

Other existence: tar_exist_meta(), tar_exist_objects(), tar_exist_progress(), tar_exist_script()

Examples

```
tar_exist_process()
```

---

tar_exist_progress *Check if progress metadata exists.*

Description

Check if the progress metadata file _targets/meta/progress exists for the current project.

Usage

```
tar_exist_progress(store = targets::tar_config_get("store"))
```

Arguments

store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

To learn more about data storage in targets, visit https://books.ropensci.org/targets/data.html.

Value

Logical of length 1, whether the current project's metadata exists.

See Also

Other existence: tar_exist_meta(), tar_exist_objects(), tar_exist_process(), tar_exist_script()

Examples

```
tar_exist_progress()
```

`tar_exist_script` *Check if the target script file exists.*

Description

Check if the target script file exists for the current project. The target script is `_targets.R` by default, but the path can be configured for the current project using tar_config_set().

Usage

```
tar_exist_script(script = targets::tar_config_get("script"))
```

Arguments

`script`	Character of length 1, path to the target script file. Defaults to `tar_config_get("script")`, which in turn defaults to `_targets.R`. When you set this argument, the value of `tar_config_get("script")` is temporarily changed for the current function call. See tar_script(), tar_config_get(), and tar_config_set() for details about the target script file and how to set it persistently for a project.

Value

Logical of length 1, whether the current project's metadata exists.

See Also

Other existence: tar_exist_meta(), tar_exist_objects(), tar_exist_process(), tar_exist_progress()

Examples

```
tar_exist_script()
```

tar_format *Define a custom target storage format.*

Description

Define a custom target storage format for the `format` argument of `tar_target()` or `tar_option_set()`.

Usage

```
tar_format(
  read = function(path) {
     readRDS(path)
 },
  write = function(object, path) {
     saveRDS(object = object, file = path, version =
    3L)
 },
  marshal = function(object) {
     identity(object)
 },
  unmarshal = function(object) {
     identity(object)
 },
  repository = NULL
)
```

Arguments

`read`	A function with a single argument named `path`. This function should read and return the target stored at the file in the argument. It should have no side effects. See the "Format functions" section for specific requirements.
`write`	A function with two arguments: `object` and `path`, in that order. This function should save the R object `object` to the file path at `path` and have no other side effects. The return value does not matter. See the "Format functions" section for specific requirements.
`marshal`	A function with a single argument named `object`. This function should marshal the R object and return an in-memory object that can be exported to remote parallel workers. It should not read or write any persistent files. See the Marshalling section for details. See the "Format functions" section for specific requirements.
`unmarshal`	A function with a single argument named `object`. This function should unmarshal the (marshalled) R object and return an in-memory object that is appropriate and valid for use on a parallel worker. It should not read or write any persistent files. See the Marshalling section for details. See the "Format functions" section for specific requirements.
`repository`	Deprecated. Use the `repository` argument of `tar_target()` or `tar_option_set()` instead.

Value

A character string of length 1 encoding the custom format. You can supply this string directly to the `format` argument of `tar_target()` or `tar_option_set()`.

Marshalling

If an object can only be used in the R session where it was created, it is called "non-exportable". Examples of non-exportable R objects are Keras models, Torch objects, `xgboost` matrices, `xml2` documents, `rstan` model objects, `sparklyr` data objects, and database connection objects. These objects cannot be exported to parallel workers (e.g. for `tar_make_future()`) without special treatment. To send an non-exportable object to a parallel worker, the object must be marshalled: converted into a form that can be exported safely (similar to serialization but not always the same). Then, the worker must unmarshal the object: convert it into a form that is usable and valid in the current R session. Arguments `marshal` and `unmarshal` of `tar_format()` let you control how marshalling and unmarshalling happens.

Format functions

In `tar_format()`, functions like `read`, `write`, `marshal`, and `unmarshal` must be perfectly pure and perfectly self-sufficient. They must load or namespace all their own packages, and they must not depend on any custom user-defined functions or objects in the global environment of your pipeline. `targets` converts each function to and from text, so it must not rely on any data in the closure. This disqualifies functions produced by `Vectorize()`, for example.

See Also

Other targets: `tar_cue()`, `tar_target_raw()`, `tar_target()`

Examples

```
# The following target is equivalent to
# tar_target(name, command(), format = "keras"):
tar_target(
  name,
  command(),
  format = tar_format(
    read = function(path) {
       keras::load_model_hdf5(path)
    },
    write = function(object, path) {
      keras::save_model_hdf5(object = object, filepath = path)
    },
    marshal = function(object) {
      keras::serialize_model(object)
    },
    unmarshal = function(object) {
      keras::unserialize_model(object)
    }
  )
)
```

`tar_github_actions` *Set up GitHub Actions to run a targets pipeline*

Description

Writes a GitHub Actions workflow file so the pipeline runs on every push to GitHub. Historical runs accumulate in the `targets-runs` branch, and the latest output is restored before `tar_make()` so up-to-date targets do not rerun.

Usage

```
tar_github_actions(
  path = file.path(".github", "workflows", "targets.yaml"),
  ask = NULL
)
```

Arguments

`path`	Character of length 1, file path to write the GitHub Actions workflow file.
`ask`	Logical, whether to ask before writing if the workflow file already exists. If `NULL`, defaults to `Sys.getenv("TAR_ASK")`. (Set to `"true"` or `"false"` with `Sys.setenv()`). If `ask` and the `TAR_ASK` environment variable are both indeterminate, defaults to `interactive()`.

Details

Steps to set up continuous deployment:

1. Ensure your pipeline stays within the resource limitations of GitHub Actions and repositories, both for storage and compute. For storage, you may wish to reduce the burden with an alternative repository (e.g. `tar_target(..., repository = "aws")`).
2. Ensure Actions are enabled in your GitHub repository. You may have to visit the Settings tab.
3. Call `targets::tar_renv(extras = character(0))` to expose hidden package dependencies.
4. Set up `renv` for your project (with `renv::init()` or `renv::snapshot()`). Details at https://rstudio.github.io/renv/articles/ci.html.
5. Commit the `renv.lock` file to the `main` (recommended) or `master` Git branch.
6. Run `tar_github_actions()` to create the workflow file. Commit this file to `main` (recommended) or `master` in Git.
7. Push your project to GitHub. Verify that a GitHub Actions workflow runs and pushes results to `targets-runs`. Subsequent runs will only recompute the outdated targets.

Value

Nothing (invisibly). This function writes a GitHub Actions workflow file as a side effect.

See Also

Other scripts: tar_edit(), tar_helper_raw(), tar_helper(), tar_renv(), tar_script()

Examples

```
tar_github_actions(tempfile())
```

---

tar_glimpse *Visualize an abridged fast dependency graph.*

Description

Analyze the pipeline defined in the target script file (default: _targets.R) and visualize the directed acyclic graph of targets. Unlike tar_visnetwork(), tar_glimpse() does not account for metadata or progress information, which means the graph renders faster. Also, tar_glimpse() omits functions and other global objects by default (but you can include them with targets_only = FALSE).

Usage

```
tar_glimpse(
  targets_only = TRUE,
  names = NULL,
  shortcut = FALSE,
  allow = NULL,
  exclude = ".Random.seed",
  level_separation = NULL,
  degree_from = 1L,
  degree_to = 1L,
  zoom_speed = 1,
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function),
  envir = parent.frame(),
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

targets_only	Logical, whether to restrict the output to just targets (FALSE) or to also include global functions and objects.
names	Names of targets. The graph visualization will operate only on these targets (and unless shortcut is TRUE, all the targets upstream as well). Selecting a small subgraph using names could speed up the load time of the visualization. Unlike allow, names is invoked before the graph is generated. Set to NULL to check/build all the targets (default). Otherwise, you can supply symbols or tidyselect helpers like starts_with(). Applies to ordinary targets (stem) and whole dynamic branching targets (patterns) but not individual dynamic branches.

shortcut — Logical of length 1, how to interpret the names argument. If shortcut is FALSE (default) then the function checks all targets upstream of names as far back as the dependency graph goes. If TRUE, then the function only checks the targets in names and uses stored metadata for information about upstream dependencies as needed. shortcut = TRUE increases speed if there are a lot of up-to-date targets, but it assumes all the dependencies are up to date, so please use with caution. Also, shortcut = TRUE only works if you set names.

allow — Optional, define the set of allowable vertices in the graph. Unlike names, allow is invoked only after the graph is mostly resolved, so it will not speed up execution. Set to NULL to allow all vertices in the pipeline and environment (default). Otherwise, you can supply symbols or tidyselect helpers like starts_with().

exclude — Optional, define the set of exclude vertices from the graph. Unlike names, exclude is invoked only after the graph is mostly resolved, so it will not speed up execution. Set to NULL to exclude no vertices. Otherwise, you can supply symbols or tidyselect helpers like all_of() and starts_with().

level_separation — Numeric of length 1, levelSeparation argument of visNetwork::visHierarchicalLayout(). Controls the distance between hierarchical levels. Consider changing the value if the aspect ratio of the graph is far from 1. If level_separation is NULL, the levelSeparation argument of visHierarchicalLayout() defaults to 150.

degree_from — Integer of length 1. When you click on a node, the graph highlights a neighborhood of that node. degree_from controls the number of edges the neighborhood extends upstream.

degree_to — Integer of length 1. When you click on a node, the graph highlights a neighborhood of that node. degree_to controls the number of edges the neighborhood extends downstream.

zoom_speed — Positive numeric of length 1, scaling factor on the zoom speed. Above 1 zooms faster than default, below 1 zooms lower than default.

callr_function — A function from callr to start a fresh clean R process to do the work. Set to NULL to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). callr_function needs to be NULL for interactive debugging, e.g. tar_option_set(debug = "your_target"). However, callr_function should not be NULL for serious reproducible work.

callr_arguments — A list of arguments to callr_function.

envir — An environment, where to run the target R script (default: _targets.R) if callr_function is NULL. Ignored if callr_function is anything other than NULL. callr_function should only be NULL for debugging and testing purposes, not for serious runs of a pipeline, etc.

The envir argument of tar_make() and related functions always overrides the current value of tar_option_get("envir") in the current R session just before running the target script file, so whenever you need to set an alternative envir, you should always set it with tar_option_set() from within the target script file. In other words, if you call tar_option_set(envir = envir1) in an interactive session and then tar_make(envir = envir2, callr_function = NULL), then envir2 will be used.

script	Character of length 1, path to the target script file. Defaults to `tar_config_get("script")`, which in turn defaults to `_targets.R`. When you set this argument, the value of `tar_config_get("script")` is temporarily changed for the current function call. See `tar_script()`, `tar_config_get()`, and `tar_config_set()` for details about the target script file and how to set it persistently for a project.
store	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Value

A `visNetwork` HTML widget object.

See Also

Other visualize: `tar_mermaid()`, `tar_visnetwork()`

Examples

```
if (identical(Sys.getenv("TAR_INTERACTIVE_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  tar_option_set()
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
}, ask = FALSE)
tar_glimpse()
tar_glimpse(allow = starts_with("y")) # see also all_of()
})
}
```

---

tar_group *Group a data frame to iterate over subsets of rows.*

Description

Like `dplyr::group_by()`, but for patterns. `tar_group()` allows you to map or cross over subsets of data frames. Requires `iteration = "group"` on the target. See the example.

Usage

```
tar_group(x)
```

Arguments

x	Grouped data frame from dplyr::group_by()

Details

The goal of tar_group() is to post-process the return value of a data frame target to allow downstream targets to branch over subsets of rows. It takes the groups defined by dplyr::group_by() and translates that information into a special tar_group is a column. tar_group is a vector of positive integers from 1 to the number of groups. Rows with the same integer in tar_group belong to the same group, and branches are arranged in increasing order with respect to the integers in tar_group. The assignment of tar_group integers to group levels depends on the orderings inside the grouping variables and not the order of rows in the dataset. dplyr::group_keys() on the grouped data frame shows how the grouping variables correspond to the integers in the tar_group column.

Value

A data frame with a special tar_group column that targets will use to find subsets of your data frame.

See Also

Other utilities: tar_active(), tar_call(), tar_cancel(), tar_definition(), tar_envir(), tar_name(), tar_path(), tar_seed(), tar_source(), tar_store()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
# The tar_group() function simply creates
# a tar_group column to partition the rows
# of a data frame.
data.frame(
  x = seq_len(6),
  id = rep(letters[seq_len(3)], each = 2)
) %>%
  dplyr::group_by(id) %>%
  tar_group()
# We use tar_group() below to branch over
# subsets of a data frame defined with dplyr::group_by().
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
library(dplyr)
list(
  tar_target(
    data,
    data.frame(
      x = seq_len(6),
      id = rep(letters[seq_len(3)], each = 2)
    ) %>%
      group_by(id) %>%
      tar_group(),
```

```
    iteration = "group"
  ),
  tar_target(
    sums,
    sum(data$x),
    pattern = map(data),
    iteration = "vector"
  )
)
})
tar_make()
tar_read(sums) # Should be c(3, 7, 11).
})
}
```

`tar_helper` *Write a helper R script.*

Description

Write a helper R script for a `targets` pipeline. Could be supporting functions or the target script file (default: `_targets.R`) itself.

Usage

```
tar_helper(path = NULL, code = NULL, tidy_eval = TRUE, envir = parent.frame())
```

Arguments

`path`	Character of length 1, path to write (or overwrite) code. If the parent directory does not exist, `tar_helper_raw()` creates it.
`code`	Quoted code to write to `path`. `tar_helper()` overwrites the file if it already exists.
`tidy_eval`	Logical, whether to use tidy evaluation on code. If turned on, you can substitute expressions and symbols using `!!` and `!!!`. See examples below.
`envir`	Environment for tidy evaluation.

Details

`tar_helper()` is a specialized version of `tar_script()` with flexible paths and tidy evaluation.

Value

`NULL` (invisibly)

See Also

Other scripts: `tar_edit()`, `tar_github_actions()`, `tar_helper_raw()`, `tar_renv()`, `tar_script()`

Examples

```
# Without tidy evaluation:
path <- tempfile()
tar_helper(path, x <- 1)
writeLines(readLines(path))
# With tidy evaluation:
y <- 123
tar_helper(path, x <- !!y)
writeLines(readLines(path))
```

`tar_helper_raw` *Write a helper R script (raw version).*

Description

Write a helper R script for a `targets` pipeline. Could be supporting functions or the target script file (default: `_targets.R`) itself.

Usage

```
tar_helper_raw(path = NULL, code = NULL)
```

Arguments

`path`	Character of length 1, path to write (or overwrite) `code`. If the parent directory does not exist, `tar_helper_raw()` creates it.
`code`	Expression object. `tar_helper_raw()` deparses and writes this code to a file at `path`, overwriting it if the file already exists.

Details

`tar_helper_raw()` is a specialized version of `tar_script()` with flexible paths and tidy evaluation. It is like `tar_helper()` except that `code` is an "evaluated" argument rather than a quoted one.

Value

`NULL` (invisibly)

See Also

Other scripts: `tar_edit()`, `tar_github_actions()`, `tar_helper()`, `tar_renv()`, `tar_script()`

Examples

```
path <- tempfile()
tar_helper_raw(path, quote(x <- 1))
writeLines(readLines(path))
```

tar_interactive *Run if Target Markdown interactive mode is on.*

Description

In Target Markdown, run the enclosed code only if interactive mode is activated. Otherwise, do not run the code.

Usage

```
tar_interactive(code)
```

Arguments

code	R code to run if Target Markdown interactive mode is turned on.

Details

Visit <books.ropensci.org/targets/literate-programming.html> to learn about Target Markdown and interactive mode.

Value

If Target Markdown interactive mode is turned on, the function returns the result of running the code. Otherwise, the function invisibly returns NULL.

See Also

Other Target Markdown: tar_engine_knitr(), tar_noninteractive(), tar_toggle()

Examples

```
tar_interactive(message("In interactive mode."))
```

tar_invalidate *Delete one or more metadata records (e.g. to rerun a target).*

Description

Delete the metadata of records in _targets/meta/meta but keep the return values of targets in _targets/objects/.

Usage

```
tar_invalidate(names, store = targets::tar_config_get("store"))
```

Arguments

names	Names of the targets to remove from the metadata list. You can supply symbols or tidyselect helpers like all_of() and starts_with().
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

This function forces one or more targets to rerun on the next tar_make(), regardless of the cues and regardless of how those targets are stored. After tar_invalidate(), you will still be able to locate the data files with tar_path() and manually salvage them in an emergency. However, tar_load() and tar_read() will not be able to read the data into R, and subsequent calls to tar_make() will attempt to rerun those targets. For patterns recorded in the metadata, all the branches will be invalidated. For patterns no longer in the metadata, branches are left alone.

Value

NULL (invisibly).

See Also

Other clean: tar_delete(), tar_destroy(), tar_prune()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
}, ask = FALSE)
tar_make()
tar_invalidate(starts_with("y")) # Only invalidates y1 and y2.
tar_make() # y1 and y2 rerun but return same values, so z is up to date.
})
}
```

tar_language *Language*

Description

These functions help with metaprogramming in packages built on top of `targets`.

Usage

```
tar_deparse_language(expr)

tar_deparse_safe(expr, collapse = "\n", backtick = TRUE)

tar_tidy_eval(expr, envir, tidy_eval)

tar_tidyselect_eval(names_quosure, choices)
```

Arguments

`expr`	A language object to modify or deparse.
`collapse`	Character of length 1, delimiter in deparsing.
`backtick`	logical indicating whether symbolic names should be enclosed in backticks if they do not follow the standard syntax.
`envir`	An environment to find objects for tidy evaluation.
`tidy_eval`	Logical of length 1, whether to apply tidy evaluation.
`names_quosure`	An `rlang` quosure with `tidyselect` expressions.
`choices`	A character vector of choices for character elements returned by tidy evaluation.

Details

- `tar_deparse_language()` is a wrapper around `tar_deparse_safe()` which leaves character vectors and `NULL` objects alone, which helps with subsequent user input validation.
- `tar_deparse_safe()` is a wrapper around `base::deparse()` with a custom set of fast default settings and guardrails to ensure the output always has length 1.
- `tar_tidy_eval()` applies tidy evaluation to a language object and returns another language object.
- `tar_tidyselect_eval()` applies `tidyselect` selection with some special guardrails around `NULL` inputs.

See Also

Other utilities to extend targets: `tar_assert`, `tar_condition`, `tar_dir()`, `tar_test()`

Examples

```
tar_deparse_language(quote(run_model()))
```

tar_load *Load the values of targets.*

Description

Load the return values of targets into the current environment (or the environment of your choosing). For a typical target, the return value lives in a file in `_targets/objects/`. For dynamic files (i.e. `format = "file"`) the paths loaded in place of the values. `tar_load_everything()` is shorthand for `tar_load(everything())` to load all targets.

Usage

```
tar_load(
  names,
  branches = NULL,
  meta = tar_meta(targets_only = TRUE, store = store),
  strict = TRUE,
  silent = FALSE,
  envir = parent.frame(),
  store = targets::tar_config_get("store")
)
```

Arguments

`names`	Names of the targets to load. You may supply `tidyselect` helpers like `all_of()` and `starts_with()`. Names are selected from the metadata in `_targets/meta`, which may include errored targets.
`branches`	Integer of indices of the branches to load for any targets that are patterns.
`meta`	Data frame of metadata from `tar_meta()`. `tar_read()` with the default arguments can be inefficient for large pipelines because all the metadata is stored in a single file. However, if you call `tar_meta()` beforehand and supply it to the `meta` argument, then successive calls to `tar_read()` may run much faster.
`strict`	Logical of length 1, whether to error out if one of the selected targets is in the metadata but cannot be loaded. Set to `FALSE` to just load the targets in the metadata that can be loaded and skip the others.
`silent`	Logical of length 1. Only relevant when `strict` is `FALSE`. If `silent` is `FALSE` and `strict` is `FALSE`, then a message will be printed if a target is in the metadata but cannot be loaded. However, load failures will not stop other targets from being loaded.
`envir`	Environment to put the loaded targets.
`store`	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Value

Nothing.

Limited scope

`tar_read()` and `tar_load()` are only for exploratory analysis and literate programming, and `tar_read_raw()` and `tar_load_raw()` are only for exploratory analysis. `targets` automatically loads the correct dependencies into memory when the pipeline is running, so invoking these functions from inside a target is rarely advisable.

See Also

Other data: `tar_load_everything()`, `tar_load_raw()`, `tar_meta()`, `tar_objects()`, `tar_pid()`, `tar_process()`, `tar_read_raw()`, `tar_read()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
}, ask = FALSE)
tar_make()
ls() # Does not have "y1", "y2", or "z".
tar_load(starts_with("y"))
ls() # Has "y1" and "y2" but not "z".
tar_load(all_of("z"))
ls() # Has "y1", "y2", and "z".
})
}
```

---

tar_load_everything *Load the values of all available targets.*

Description

Shorthand for `tar_load(everything())` to load all targets with entries in the metadata.

Usage

```
tar_load_everything(
  branches = NULL,
  meta = tar_meta(targets_only = TRUE, store = store),
  strict = TRUE,
```

```
  silent = FALSE,
  envir = parent.frame(),
  store = targets::tar_config_get("store")
)
```

Arguments

branches	Integer of indices of the branches to load for any targets that are patterns.
meta	Data frame of metadata from tar_meta(). tar_read() with the default arguments can be inefficient for large pipelines because all the metadata is stored in a single file. However, if you call tar_meta() beforehand and supply it to the meta argument, then successive calls to tar_read() may run much faster.
strict	Logical of length 1, whether to error out if one of the selected targets is in the metadata but cannot be loaded. Set to FALSE to just load the targets in the metadata that can be loaded and skip the others.
silent	Logical of length 1. Only relevant when strict is FALSE. If silent is FALSE and strict is FALSE, then a message will be printed if a target is in the metadata but cannot be loaded. However, load failures will not stop other targets from being loaded.
envir	Environment to put the loaded targets.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

Nothing.

Limited scope

tar_read() and tar_load() are only for exploratory analysis and literate programming, and tar_read_raw() and tar_load_raw() are only for exploratory analysis. targets automatically loads the correct dependencies into memory when the pipeline is running, so invoking these functions from inside a target is rarely advisable.

See Also

Other data: tar_load_raw(), tar_load(), tar_meta(), tar_objects(), tar_pid(), tar_process(), tar_read_raw(), tar_read()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
```

```
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
}, ask = FALSE)
tar_make()
ls() # Does not have "y1", "y2", or "z".
tar_load_everything()
ls() # Has "y1", "y2", and "z".
})
}
```

`tar_load_globals` *Load globals for debugging, testing, and prototyping*

Description

Load user-defined packages, functions, global objects, and settings defined in the target script file (default: `_targets.R`). This function is for debugging, testing, and prototyping only. It is not recommended for use inside a serious pipeline or to report the results of a serious pipeline.

Usage

```
tar_load_globals(
  envir = parent.frame(),
  script = targets::tar_config_get("script")
)
```

Arguments

`envir`	Environment to source the target script (default: `_targets.R`). Defaults to the calling environment.
`script`	Character of length 1, path to the target script file that defines the pipeline (`_targets.R` by default). This path should be either an absolute path or a path relative to the project root where you will call `tar_make()` and other functions. When `tar_make()` and friends run the script from the current working directory. If the argument `NULL`, the setting is not modified. Use `tar_config_unset()` to delete a setting.

Details

This function first sources the target script file (default: `_targets.R`) to loads all user-defined functions, global objects, and settings into the current R process. Then, it loads all the packages defined in `tar_option_get("packages")` (default: `(.packages())`) using `library()` with `lib.loc` defined in `tar_option_get("library")` (default: `NULL`).

Value

`NULL` (invisibly).

See Also

Other debug: tar_traceback(), tar_workspaces(), tar_workspace()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  tar_option_set(packages = "callr")
  analyze_data <- function(data) {
    summary(data)
  }
  list(
    tar_target(x, 1 + 1),
    tar_target(y, 1 + 1)
  )
}, ask = FALSE)
tar_load_globals()
print(analyze_data)
print("callr" %in% (.packages()))
})
}
```

---

tar_load_raw *Load the values of targets (raw version).*

Description

Same as tar_load() except names is a character vector. Do not use in knitr or R Markdown reports with tarchetypes::tar_knit() or tarchetypes::tar_render().

Usage

```
tar_load_raw(
  names,
  branches = NULL,
  meta = tar_meta(store = store),
  strict = TRUE,
  silent = FALSE,
  envir = parent.frame(),
  store = targets::tar_config_get("store")
)
```

Arguments

names	Character vector, names of the targets to load. Names are expected to appear in the metadata in _targets/meta. Any target names not in the metadata are ignored.

branches	Integer of indices of the branches to load for any targets that are patterns.
meta	Data frame of metadata from tar_meta(). tar_read() with the default arguments can be inefficient for large pipelines because all the metadata is stored in a single file. However, if you call tar_meta() beforehand and supply it to the meta argument, then successive calls to tar_read() may run much faster.
strict	Logical of length 1, whether to error out if one of the selected targets is in the metadata but cannot be loaded. Set to FALSE to just load the targets in the metadata that can be loaded and skip the others.
silent	Logical of length 1. Only relevant when strict is FALSE. If silent is FALSE and strict is FALSE, then a message will be printed if a target is in the metadata but cannot be loaded. However, load failures will not stop other targets from being loaded.
envir	Environment to put the loaded targets.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

Nothing.

Limited scope

tar_read() and tar_load() are only for exploratory analysis and literate programming, and tar_read_raw() and tar_load_raw() are only for exploratory analysis. targets automatically loads the correct dependencies into memory when the pipeline is running, so invoking these functions from inside a target is rarely advisable.

See Also

Other data: tar_load_everything(), tar_load(), tar_meta(), tar_objects(), tar_pid(), tar_process(), tar_read_raw(), tar_read()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
}, ask = FALSE)
tar_make()
tar_load_raw(all_of(c("y1", "y2")))
y1
```

```
y2
})
}
```

`tar_make` *Run a pipeline of targets.*

Description

Run the pipeline you defined in the targets script file (default: `_targets.R`). `tar_make()` runs the correct targets in the correct order and stores the return values in `_targets/objects/`. Use `tar_read()` to read a target back into R, and see https://docs.ropensci.org/targets/reference/index.html#clean to manage output files.

Usage

```
tar_make(
  names = NULL,
  shortcut = targets::tar_config_get("shortcut"),
  reporter = targets::tar_config_get("reporter_make"),
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function, reporter),
  envir = parent.frame(),
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

`names`	Names of the targets to build or check. Set to `NULL` to check/build all the targets (default). Otherwise, you can supply `tidyselect` helpers like `all_of()` and `starts_with()`. Because `tar_make()` and friends run the pipeline in a new R session, if you pass a character vector to a tidyselect helper, you will need to evaluate that character vector early with `!!`, e.g. `tar_make(names = all_of(!!your_vector))`. Applies to ordinary targets (stem) and whole dynamic branching targets (patterns) but not to individual dynamic branches.
`shortcut`	Logical of length 1, how to interpret the `names` argument. If `shortcut` is `FALSE` (default) then the function checks all targets upstream of `names` as far back as the dependency graph goes. `shortcut = TRUE` increases speed if there are a lot of up-to-date targets, but it assumes all the dependencies are up to date, so please use with caution. It relies on stored metadata for information about upstream dependencies. `shortcut = TRUE` only works if you set `names`.
`reporter`	Character of length 1, name of the reporter to user. Controls how messages are printed as targets run in the pipeline. Defaults to `tar_config_get("reporter_make")`. Choices: • `"silent"`: print nothing.

- "summary": print a running total of the number of each targets in each status category (queued, started, skipped, build, canceled, or errored). Also show a timestamp ("%H:%M %OS2" strptime() format) of the last time the progress changed and printed to the screen.
- "timestamp": same as the "verbose" reporter except that each .message begins with a time stamp.
- "timestamp_positives": same as the "timestamp" reporter except without messages for skipped targets.
- "verbose": print messages for individual targets as they start, finish, or are skipped.
- "verbose_positives": same as the "verbose" reporter except without messages for skipped targets.

callr_function A function from callr to start a fresh clean R process to do the work. Set to NULL to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). callr_function needs to be NULL for interactive debugging, e.g. tar_option_set(debug = "your_target"). However, callr_function should not be NULL for serious reproducible work.

callr_arguments
A list of arguments to callr_function.

envir An environment, where to run the target R script (default: _targets.R) if callr_function is NULL. Ignored if callr_function is anything other than NULL. callr_function should only be NULL for debugging and testing purposes, not for serious runs of a pipeline, etc.

The envir argument of tar_make() and related functions always overrides the current value of tar_option_get("envir") in the current R session just before running the target script file, so whenever you need to set an alternative envir, you should always set it with tar_option_set() from within the target script file. In other words, if you call tar_option_set(envir = envir1) in an interactive session and then tar_make(envir = envir2, callr_function = NULL), then envir2 will be used.

script Character of length 1, path to the target script file. Defaults to tar_config_get("script"), which in turn defaults to _targets.R. When you set this argument, the value of tar_config_get("script") is temporarily changed for the current function call. See tar_script(), tar_config_get(), and tar_config_set() for details about the target script file and how to set it persistently for a project.

store Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

NULL except if callr_function = callr::r_bg(), in which case a handle to the callr background process is returned. Either way, the value is invisibly returned.

See Also

Other pipeline: tar_make_clustermq(), tar_make_future()

Examples

```
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  tar_option_set()
  list(tar_target(x, 1 + 1))
})
tar_make()
tar_script({
  tar_option_set()
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
}, ask = FALSE)
prefix <- "y"
tar_make(starts_with(!!prefix)) # Only builds y1 and y2.
})
```

---

tar_make_clustermq *Run a pipeline of targets in parallel with persistent* clustermq *workers.*

Description

This function is like tar_make() except that targets run in parallel with persistent clustermq workers. It requires that you set global options like clustermq.scheduler and clustermq.template inside the target script file (default: _targets.R). clustermq is not a strict dependency of targets, so you must install clustermq yourself.

Usage

```
tar_make_clustermq(
  names = NULL,
  shortcut = targets::tar_config_get("shortcut"),
  reporter = targets::tar_config_get("reporter_make"),
  workers = targets::tar_config_get("workers"),
  log_worker = FALSE,
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function, reporter),
  envir = parent.frame(),
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

names	Names of the targets to build or check. Set to NULL to check/build all the targets (default). Otherwise, you can supply tidyselect helpers like all_of() and starts_with(). Because tar_make() and friends run the pipeline in a new R session, if you pass a character vector to a tidyselect helper, you will need to evaluate that character vector early with !!, e.g. tar_make(names = all_of(!!your_vector)). Applies to ordinary targets (stem) and whole dynamic branching targets (patterns) but not to individual dynamic branches.
shortcut	Logical of length 1, how to interpret the names argument. If shortcut is FALSE (default) then the function checks all targets upstream of names as far back as the dependency graph goes. shortcut = TRUE increases speed if there are a lot of up-to-date targets, but it assumes all the dependencies are up to date, so please use with caution. It relies on stored metadata for information about upstream dependencies. shortcut = TRUE only works if you set names.
reporter	Character of length 1, name of the reporter to user. Controls how messages are printed as targets run in the pipeline. Defaults to tar_config_get("reporter_make"). Choices: • "silent": print nothing. • "summary": print a running total of the number of each targets in each status category (queued, started, skipped, build, canceled, or errored). Also show a timestamp ("%H:%M %OS2" strptime() format) of the last time the progress changed and printed to the screen. • "timestamp": same as the "verbose" reporter except that each .message begins with a time stamp. • "timestamp_positives": same as the "timestamp" reporter except without messages for skipped targets. • "verbose": print messages for individual targets as they start, finish, or are skipped. • "verbose_positives": same as the "verbose" reporter except without messages for skipped targets.
workers	Positive integer, number of persistent clustermq workers to create.
log_worker	Logical, whether to write a log file for each worker. Same as the log_worker argument of clustermq::Q() and clustermq::workers().
callr_function	A function from callr to start a fresh clean R process to do the work. Set to NULL to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). callr_function needs to be NULL for interactive debugging, e.g. tar_option_set(debug = "your_target"). However, callr_function should not be NULL for serious reproducible work.
callr_arguments	A list of arguments to callr_function.
envir	An environment, where to run the target R script (default: _targets.R) if callr_function is NULL. Ignored if callr_function is anything other than NULL. callr_function should only be NULL for debugging and testing purposes, not for serious runs of a pipeline, etc.

The envir argument of tar_make() and related functions always overrides the current value of tar_option_get("envir") in the current R session just before running the target script file, so whenever you need to set an alternative envir, you should always set it with tar_option_set() from within the target script file. In other words, if you call tar_option_set(envir = envir1) in an interactive session and then tar_make(envir = envir2, callr_function = NULL), then envir2 will be used.

script — Character of length 1, path to the target script file. Defaults to tar_config_get("script"), which in turn defaults to _targets.R. When you set this argument, the value of tar_config_get("script") is temporarily changed for the current function call. See tar_script(), tar_config_get(), and tar_config_set() for details about the target script file and how to set it persistently for a project.

store — Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

To use with a cluster, you will need to set the global options clustermq.scheduler and clustermq.template inside the target script file (default: _targets.R). To read more about configuring clustermq for your scheduler, visit https://mschubert.github.io/clustermq/articles/userguide.html#configuration # nolint and navigate to the appropriate link under "Setting up the scheduler". Wildcards in the template file are filled in with elements from tar_option_get("resources").

Value

NULL except if callr_function = callr::r_bg(), in which case a handle to the callr background process is returned. Either way, the value is invisibly returned.

See Also

Other pipeline: tar_make_future(), tar_make()

Examples

```
if (!identical(tolower(Sys.info()[["sysname"]]), "windows")) {
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  options(clustermq.scheduler = "multiprocess") # Does not work on Windows.
  tar_option_set()
  list(tar_target(x, 1 + 1))
}, ask = FALSE)
tar_make_clustermq()
})
}
}
```

tar_make_future *Run a pipeline of targets in parallel with transient* future *workers.*

Description

This function is like tar_make() except that targets run in parallel with transient future workers. It requires that you declare your future::plan() inside the target script file (default: _targets.R). future is not a strict dependency of targets, so you must install future yourself.

Usage

```
tar_make_future(
  names = NULL,
  shortcut = targets::tar_config_get("shortcut"),
  reporter = targets::tar_config_get("reporter_make"),
  workers = targets::tar_config_get("workers"),
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function, reporter),
  envir = parent.frame(),
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

names	Names of the targets to build or check. Set to NULL to check/build all the targets (default). Otherwise, you can supply tidyselect helpers like all_of() and starts_with(). Because tar_make() and friends run the pipeline in a new R session, if you pass a character vector to a tidyselect helper, you will need to evaluate that character vector early with !!, e.g. tar_make(names = all_of(!!your_vector)). Applies to ordinary targets (stem) and whole dynamic branching targets (patterns) but not to individual dynamic branches.
shortcut	Logical of length 1, how to interpret the names argument. If shortcut is FALSE (default) then the function checks all targets upstream of names as far back as the dependency graph goes. shortcut = TRUE increases speed if there are a lot of up-to-date targets, but it assumes all the dependencies are up to date, so please use with caution. It relies on stored metadata for information about upstream dependencies. shortcut = TRUE only works if you set names.
reporter	Character of length 1, name of the reporter to user. Controls how messages are printed as targets run in the pipeline. Defaults to tar_config_get("reporter_make"). Choices: • "silent": print nothing. • "summary": print a running total of the number of each targets in each status category (queued, started, skipped, build, canceled, or errored). Also show a timestamp ("%H:%M %OS2" strptime() format) of the last time the progress changed and printed to the screen.

- "timestamp": same as the "verbose" reporter except that each .message begins with a time stamp.
- "timestamp_positives": same as the "timestamp" reporter except without messages for skipped targets.
- "verbose": print messages for individual targets as they start, finish, or are skipped.
- "verbose_positives": same as the "verbose" reporter except without messages for skipped targets.

workers Positive integer, maximum number of transient future workers allowed to run at any given time.

callr_function A function from callr to start a fresh clean R process to do the work. Set to NULL to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). callr_function needs to be NULL for interactive debugging, e.g. tar_option_set(debug = "your_target"). However, callr_function should not be NULL for serious reproducible work.

callr_arguments
A list of arguments to callr_function.

envir An environment, where to run the target R script (default: _targets.R) if callr_function is NULL. Ignored if callr_function is anything other than NULL. callr_function should only be NULL for debugging and testing purposes, not for serious runs of a pipeline, etc.

The envir argument of tar_make() and related functions always overrides the current value of tar_option_get("envir") in the current R session just before running the target script file, so whenever you need to set an alternative envir, you should always set it with tar_option_set() from within the target script file. In other words, if you call tar_option_set(envir = envir1) in an interactive session and then tar_make(envir = envir2, callr_function = NULL), then envir2 will be used.

script Character of length 1, path to the target script file. Defaults to tar_config_get("script"), which in turn defaults to _targets.R. When you set this argument, the value of tar_config_get("script") is temporarily changed for the current function call. See tar_script(), tar_config_get(), and tar_config_set() for details about the target script file and how to set it persistently for a project.

store Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

To configure tar_make_future() with a computing cluster, see the future.batchtools package documentation.

Value

NULL except if callr_function = callr::r_bg(), in which case a handle to the callr background process is returned. Either way, the value is invisibly returned.

See Also

Other pipeline: tar_make_clustermq(), tar_make()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  future::plan(future::multiprocess, workers = 2)
  list(
    tar_target(x, 1 + 1),
    tar_target(y, 1 + 1)
  )
}, ask = FALSE)
tar_make_future()
})
}
```

---

tar_manifest *Produce a data frame of information about your targets.*

Description

Along with tar_visnetwork() and tar_glimpse(), tar_manifest() helps check that you constructed your pipeline correctly.

Usage

```
tar_manifest(
  names = NULL,
  fields = c("name", "command", "pattern"),
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function),
  envir = parent.frame(),
  script = targets::tar_config_get("script")
)
```

Arguments

names	Names of the targets to show. Set to NULL to show all the targets (default). Otherwise, you can supply symbols, a character vector, or tidyselect helpers like all_of() and starts_with().

`fields` Names of the fields, or columns, to show. Set to `NULL` to show all the fields (default). Otherwise, you can supply symbols, a character vector, or `tidyselect` helpers like `starts_with()`. Set to `NULL` to print all the fields. The name of the target is always included as the first column regardless of the selection. Possible fields are below. All of them can be set in `tar_target()`, `tar_target_raw()`, or `tar_option_set()`.

- `name`: Name of the target.
- `command`: the R command that runs when the target builds.
- `pattern`: branching pattern of the target, if applicable.
- `format`: Storage format.
- `repository`: Storage repository.
- `iteration`: Iteration mode for branching.
- `error`: Error mode, what to do when the target fails.
- `memory`: Memory mode, when to keep targets in memory.
- `storage`: Storage mode for high-performance computing scenarios.
- `retrieval`: Retrieval mode for high-performance computing scenarios.
- `deployment`: Where/whether to deploy the target in high-performance computing scenarios.
- `priority`: Numeric of length 1 between 0 and 1. Controls which targets get deployed first when multiple competing targets are ready simultaneously. Targets with priorities closer to 1 get built earlier (and polled earlier in `tar_make_future()`).
- `resources`: A list of target-specific resource requirements for `tar_make_future()`.
- `cue_mode`: Cue mode from `tar_cue()`.
- `cue_depend`: Depend cue from `tar_cue()`.
- `cue_expr`: Command cue from `tar_cue()`.
- `cue_file`: File cue from `tar_cue()`.
- `cue_format`: Format cue from `tar_cue()`.
- `cue_repository`: Repository cue from `tar_cue()`.
- `cue_iteration`: Iteration cue from `tar_cue()`.
- `packages`: List columns of packages loaded before building the target.
- `library`: List column of library paths to load the packages.

`callr_function` A function from `callr` to start a fresh clean R process to do the work. Set to `NULL` to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). `callr_function` needs to be `NULL` for interactive debugging, e.g. `tar_option_set(debug = "your_target")`. However, `callr_function` should not be `NULL` for serious reproducible work.

`callr_arguments`

A list of arguments to `callr_function`.

`envir` An environment, where to run the target R script (default: `_targets.R`) if `callr_function` is `NULL`. Ignored if `callr_function` is anything other than `NULL`. `callr_function` should only be `NULL` for debugging and testing purposes, not for serious runs of a pipeline, etc.

The envir argument of tar_make() and related functions always overrides the current value of tar_option_get("envir") in the current R session just before running the target script file, so whenever you need to set an alternative envir, you should always set it with tar_option_set() from within the target script file. In other words, if you call tar_option_set(envir = envir1) in an interactive session and then tar_make(envir = envir2, callr_function = NULL), then envir2 will be used.

script — Character of length 1, path to the target script file. Defaults to tar_config_get("script"), which in turn defaults to _targets.R. When you set this argument, the value of tar_config_get("script") is temporarily changed for the current function call. See tar_script(), tar_config_get(), and tar_config_set() for details about the target script file and how to set it persistently for a project.

Value

A data frame of information about the targets in the pipeline. Rows appear in topological order (the order they will run without any influence from parallel computing or priorities).

See Also

Other inspect: tar_deps_raw(), tar_deps(), tar_network(), tar_outdated(), tar_sitrep(), tar_validate()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  tar_option_set()
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2),
    tar_target(m, z, pattern = map(z)),
    tar_target(c, z, pattern = cross(z))
  )
}, ask = FALSE)
tar_manifest()
tar_manifest(fields = c("name", "command"))
tar_manifest(fields = "command")
tar_manifest(fields = starts_with("cue"))
})
}
```

---

tar_mermaid — mermaid.js *dependency graph.*

Description

Visualize the dependency graph with a static mermaid.js graph.

Usage

```
tar_mermaid(
  targets_only = FALSE,
  names = NULL,
  shortcut = FALSE,
  allow = NULL,
  exclude = ".Random.seed",
  outdated = TRUE,
  label = NULL,
  legend = TRUE,
  color = TRUE,
  reporter = targets::tar_config_get("reporter_outdated"),
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function),
  envir = parent.frame(),
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

targets_only	Logical, whether to restrict the output to just targets (FALSE) or to also include global functions and objects.
names	Names of targets. The graph visualization will operate only on these targets (and unless shortcut is TRUE, all the targets upstream as well). Selecting a small subgraph using names could speed up the load time of the visualization. Unlike allow, names is invoked before the graph is generated. Set to NULL to check/build all the targets (default). Otherwise, you can supply symbols or tidyselect helpers like starts_with(). Applies to ordinary targets (stem) and whole dynamic branching targets (patterns) but not individual dynamic branches.
shortcut	Logical of length 1, how to interpret the names argument. If shortcut is FALSE (default) then the function checks all targets upstream of names as far back as the dependency graph goes. If TRUE, then the function only checks the targets in names and uses stored metadata for information about upstream dependencies as needed. shortcut = TRUE increases speed if there are a lot of up-to-date targets, but it assumes all the dependencies are up to date, so please use with caution. Also, shortcut = TRUE only works if you set names.
allow	Optional, define the set of allowable vertices in the graph. Unlike names, allow is invoked only after the graph is mostly resolved, so it will not speed up execution. Set to NULL to allow all vertices in the pipeline and environment (default). Otherwise, you can supply symbols or tidyselect helpers like starts_with().
exclude	Optional, define the set of exclude vertices from the graph. Unlike names, exclude is invoked only after the graph is mostly resolved, so it will not speed

up execution. Set to NULL to exclude no vertices. Otherwise, you can supply symbols or tidyselect helpers like all_of() and starts_with().

outdated — Logical, whether to show colors to distinguish outdated targets from up-to-date targets. (Global functions and objects still show these colors.) Looking for outdated targets takes a lot of time for large pipelines with lots of branches, and setting outdated to FALSE is a nice way to speed up the graph if you only want to see dependency relationships and build progress.

label — Character vector of one or more aesthetics to add to the vertex labels. Can contain "time" to show total runtime, "size" to show total storage size, or "branches" to show the number of branches in each pattern. You can choose multiple aesthetics at once, e.g. label = c("time", "branches"). All are disabled by default because they clutter the graph.

legend — Logical of length 1, whether to display the legend.

color — Logical of length 1, whether to color the graph vertices by status.

reporter — Character of length 1, name of the reporter to user. Controls how messages are printed as targets are checked. Choices:

- "silent": print nothing.
- "forecast": print running totals of the checked and outdated targets found so far.

callr_function — A function from callr to start a fresh clean R process to do the work. Set to NULL to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). callr_function needs to be NULL for interactive debugging, e.g. tar_option_set(debug = "your_target"). However, callr_function should not be NULL for serious reproducible work.

callr_arguments

A list of arguments to callr_function.

envir — An environment, where to run the target R script (default: _targets.R) if callr_function is NULL. Ignored if callr_function is anything other than NULL. callr_function should only be NULL for debugging and testing purposes, not for serious runs of a pipeline, etc.

The envir argument of tar_make() and related functions always overrides the current value of tar_option_get("envir") in the current R session just before running the target script file, so whenever you need to set an alternative envir, you should always set it with tar_option_set() from within the target script file. In other words, if you call tar_option_set(envir = envir1) in an interactive session and then tar_make(envir = envir2, callr_function = NULL), then envir2 will be used.

script — Character of length 1, path to the target script file. Defaults to tar_config_get("script"), which in turn defaults to _targets.R. When you set this argument, the value of tar_config_get("script") is temporarily changed for the current function call. See tar_script(), tar_config_get(), and tar_config_set() for details about the target script file and how to set it persistently for a project.

store — Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value

of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Details

`mermaid.js` is a JavaScript library for constructing static visualizations of graphs.

Value

A character vector of lines of code of the `mermaid.js` graph. You can visualize the graph by copying the text into a public online `mermaid.js` editor or a `mermaid` GitHub code chunk (`https://github.blog/2022-02-14-incl`
nolint

See Also

Other visualize: `tar_glimpse()`, `tar_visnetwork()`

Examples

```
if (identical(Sys.getenv("TAR_INTERACTIVE_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  tar_option_set()
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
})
# Copy the text into a mermaid.js online editor
# or a mermaid GitHub code chunk:
tar_mermaid()
})
}
```

---

tar_meta *Read a project's metadata.*

Description

Read the metadata of all recorded targets and global objects.

Usage

```
tar_meta(
  names = NULL,
  fields = NULL,
  targets_only = FALSE,
```

```
  complete_only = FALSE,
  store = targets::tar_config_get("store")
)
```

Arguments

names	Optional, names of the targets. If supplied, `tar_meta()` only returns metadata on these targets. You can supply symbols or `tidyselect` helpers like `all_of()` and `starts_with()`. If `NULL`, all names are selected.
fields	Optional, names of columns/fields to select. If supplied, `tar_meta()` only returns the selected metadata columns. If `NULL`, all fields are selected. You can supply symbols or `tidyselect` helpers like `all_of()` and `starts_with()`. The `name` column is always included first no matter what you select. Choices: • `name`: name of the target or global object. • `type`: type of the object: either `"function"` or `"object"` for global objects, and `"stem"`, `"branch"`, `"map"`, or `"cross"` for targets. • `data`: hash of the output data. • `command`: hash of the target's deparsed command. • `depend`: hash of the immediate upstream dependencies of the target. • `seed`: random number generator seed with which the target was built. A target's random number generator seed is a deterministic function of its name. In this way, each target runs with a reproducible seed so someone else running the same pipeline should get the same results, and no two targets in the same pipeline share the same seed. (Even dynamic branches have different names and thus different seeds.) You can recover the seed of a completed target with `tar_meta(your_target, seed)` and run `set.seed()` on the result to locally recreate the target's initial RNG state. • `path`: A list column of paths to target data. Usually, each element is a single path, but there could be multiple paths per target for dynamic files (i.e. `tar_target(format = "file")`). • `time`: `POSIXct` object with the time the target's data in storage was last modified. If the target stores no local file, then the time stamp corresponds to the time the target last ran successfully. Only targets that run commands have time stamps: just non-branching targets and individual dynamic branches. Displayed in the current time zone of the system. If there are multiple outputs for that target, as with file targets, then the maximum time is shown. • `size`: hash of the sum of all the bytes of the files at `path`. • `bytes`: total file size in bytes of all files in `path`. • `format`: character, one of the admissible data storage formats. See the `format` argument in the `tar_target()` help file for details. • `iteration`: character, either `"list"` or `"vector"` to describe the iteration and aggregation mode of the target. See the `iteration` argument in the `tar_target()` help file for details. • `parent`: for branches, name of the parent pattern. • `children`: list column, names of the children of targets that have them. These include buds of stems and branches of patterns.

- seconds: number of seconds it took to run the target.
- warnings: character string of warning messages from the last run of the target.
- error: character string of the error message if the target errored.

targets_only — Logical, whether to just show information about targets or also return metadata on functions and other global objects.

complete_only — Logical, whether to return only complete rows (no NA values).

store — Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

A metadata row only updates when the target is built. tar_progress() shows information on targets that are running. That is why the number of branches may disagree between tar_meta() and tar_progress() for actively running pipelines.

Value

A data frame with one row per target/object and the selected fields.

See Also

Other data: tar_load_everything(), tar_load_raw(), tar_load(), tar_objects(), tar_pid(), tar_process(), tar_read_raw(), tar_read()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, 2 * x, pattern = map(x))
  )
}, ask = FALSE)
tar_make()
tar_meta()
tar_meta(starts_with("y_")) # see also all_of()
})
}
```

tar_name *Get the name of the target currently running.*

Description

Get the name of the target currently running.

Usage

```
tar_name(default = "target")
```

Arguments

default	Character, value to return if tar_name() is called on its own outside a targets pipeline. Having a default lets users run things without tar_make(), which helps peel back layers of code and troubleshoot bugs.

Value

Character of length 1. If called inside a pipeline, tar_name() returns name of the target currently running. Otherwise, the return value is default.

See Also

Other utilities: tar_active(), tar_call(), tar_cancel(), tar_definition(), tar_envir(), tar_group(), tar_path(), tar_seed(), tar_source(), tar_store()

Examples

```
tar_name()
tar_name(default = "custom_target_name")
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(tar_target(x, tar_name()), ask = FALSE)
tar_make()
tar_read(x)
})
}
```

tar_network *Return the vertices and edges of a pipeline dependency graph.*

Description

Analyze the pipeline defined in the target script file (default: `_targets.R`) and return the vertices and edges of the directed acyclic graph of dependency relationships.

Usage

```
tar_network(
  targets_only = FALSE,
  names = NULL,
  shortcut = FALSE,
  allow = NULL,
  exclude = NULL,
  outdated = TRUE,
  reporter = targets::tar_config_get("reporter_outdated"),
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function, reporter),
  envir = parent.frame(),
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

`targets_only`	Logical, whether to restrict the output to just targets (`FALSE`) or to also include imported global functions and objects.
`names`	Names of targets. The graph visualization will operate only on these targets (and unless `shortcut` is `TRUE`, all the targets upstream as well). Selecting a small subgraph using `names` could speed up the load time of the visualization. Unlike `allow`, `names` is invoked before the graph is generated. Set to NULL to check/build all the targets (default). Otherwise, you can supply symbols or tidyselect helpers like starts_with(). Applies to ordinary targets (stem) and whole dynamic branching targets (patterns) but not individual dynamic branches.
`shortcut`	Logical of length 1, how to interpret the `names` argument. If `shortcut` is `FALSE` (default) then the function checks all targets upstream of `names` as far back as the dependency graph goes. If `TRUE`, then the function only checks the targets in `names` and uses stored metadata for information about upstream dependencies as needed. `shortcut = TRUE` increases speed if there are a lot of up-to-date targets, but it assumes all the dependencies are up to date, so please use with caution. Also, `shortcut = TRUE` only works if you set `names`.
`allow`	Optional, define the set of allowable vertices in the graph. Unlike `names`, `allow` is invoked only after the graph is mostly resolved, so it will not speed up execution. Set to `NULL` to allow all vertices in the pipeline and environment (default). Otherwise, you can supply symbols or `tidyselect` helpers like `starts_with()`.

exclude — Optional, define the set of exclude vertices from the graph. Unlike names, exclude is invoked only after the graph is mostly resolved, so it will not speed up execution. Set to NULL to exclude no vertices. Otherwise, you can supply symbols or tidyselect helpers like all_of() and starts_with().

outdated — Logical, whether to show colors to distinguish outdated targets from up-to-date targets. (Global functions and objects still show these colors.) Looking for outdated targets takes a lot of time for large pipelines with lots of branches, and setting outdated to FALSE is a nice way to speed up the graph if you only want to see dependency relationships and build progress.

reporter — Character of length 1, name of the reporter to user. Controls how messages are printed as targets are checked. Choices:

- "silent": print nothing.
- "forecast": print running totals of the checked and outdated targets found so far.

callr_function — A function from callr to start a fresh clean R process to do the work. Set to NULL to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). callr_function needs to be NULL for interactive debugging, e.g. tar_option_set(debug = "your_target"). However, callr_function should not be NULL for serious reproducible work.

callr_arguments — A list of arguments to callr_function.

envir — An environment, where to run the target R script (default: _targets.R) if callr_function is NULL. Ignored if callr_function is anything other than NULL. callr_function should only be NULL for debugging and testing purposes, not for serious runs of a pipeline, etc.

The envir argument of tar_make() and related functions always overrides the current value of tar_option_get("envir") in the current R session just before running the target script file, so whenever you need to set an alternative envir, you should always set it with tar_option_set() from within the target script file. In other words, if you call tar_option_set(envir = envir1) in an interactive session and then tar_make(envir = envir2, callr_function = NULL), then envir2 will be used.

script — Character of length 1, path to the target script file. Defaults to tar_config_get("script"), which in turn defaults to _targets.R. When you set this argument, the value of tar_config_get("script") is temporarily changed for the current function call. See tar_script(), tar_config_get(), and tar_config_set() for details about the target script file and how to set it persistently for a project.

store — Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

A list with two data frames: `vertices` and `edges`. The vertices data frame has one row per target with fields to denote the type of the target or object (stem, branch, map, cross, function, or object) and the target's status (up to date, outdated, started, canceled, or errored). The edges data frame has one row for every edge and columns `to` and `from` to mark the starting and terminating vertices.

See Also

Other inspect: `tar_deps_raw()`, `tar_deps()`, `tar_manifest()`, `tar_outdated()`, `tar_sitrep()`, `tar_validate()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  tar_option_set()
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
}, ask = FALSE)
tar_network(targets_only = TRUE)
})
}
```

---

tar_newer *List new targets*

Description

List all the targets whose last successful run occurred after a certain point in time.

Usage

```
tar_newer(
  time,
  names = NULL,
  inclusive = FALSE,
  store = targets::tar_config_get("store")
)
```

Arguments

`time`	A `POSIXct` object of length 1, time threshold. Targets newer than this time stamp are returned. For example, if `time = Sys.time - as.difftime(1, units = "weeks")` then `tar_newer()` returns targets newer than one week ago.

names	Names of eligible targets. Targets excluded from names will not be returned even if they are newer than the given time. You can supply symbols or tidyselect helpers like all_of() and starts_with(). If NULL, all names are eligible.
inclusive	Logical of length 1, whether to include targets built at exactly the time given.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

Only applies to targets with recorded time stamps: just non-branching targets and individual dynamic branches. As of targets version 0.6.0, these time stamps are available for these targets regardless of storage format. Earlier versions of targets do not record time stamps for remote storage such as format = "url" or repository = "aws" in tar_target().

Value

A character vector of names of old targets with recorded timestamp metadata.

See Also

Other time: tar_older(), tar_timestamp_raw(), tar_timestamp()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(tar_target(x, seq_len(2)))
}, ask = FALSE)
tar_make()
# targets newer than 1 week ago
tar_newer(Sys.time() - as.difftime(1, units = "weeks"))
# targets newer than 1 week from now
tar_newer(Sys.time() + as.difftime(1, units = "weeks"))
# Everything is still up to date.
tar_make()
# Invalidate all targets targets newer than 1 week ago
# so they run on the next tar_make().
invalidate_these <- tar_newer(Sys.time() - as.difftime(1, units = "weeks"))
tar_invalidate(all_of(invalidate_these))
tar_make()
})
}
```

tar_noninteractive *Run if Target Markdown interactive mode is not on.*

Description

In Target Markdown, run the enclosed code only if interactive mode is not activated. Otherwise, do not run the code.

Usage

```
tar_noninteractive(code)
```

Arguments

code	R code to run if Target Markdown interactive mode is not turned on.

Details

Visit <books.ropensci.org/targets/literate-programming.html> to learn about Target Markdown and interactive mode.

Value

If Target Markdown interactive mode is not turned on, the function returns the result of running the code. Otherwise, the function invisibly returns `NULL`.

See Also

Other Target Markdown: `tar_engine_knitr()`, `tar_interactive()`, `tar_toggle()`

Examples

```
tar_noninteractive(message("Not in interactive mode."))
```

tar_objects *List saved targets*

Description

List targets currently saved to `_targets/objects/` or the cloud. Does not include local files with `tar_target(..., format = "file", repository = "local")`.

Usage

```
tar_objects(
  names = NULL,
  cloud = TRUE,
  store = targets::tar_config_get("store")
)
```

Arguments

names	Optional tidyselect selector such as all_of() or starts_with() to return a tactical subset of target names. If NULL, all names are selected.
cloud	Logical of length 1, whether to include cloud targets in the output (e.g. tar_target(..., repository = "aws")).
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

Character vector of targets saved to _targets/objects/.

See Also

Other data: tar_load_everything(), tar_load_raw(), tar_load(), tar_meta(), tar_pid(), tar_process(), tar_read_raw(), tar_read()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(tar_target(x, "value"))
}, ask = FALSE)
tar_make()
tar_objects()
tar_objects(starts_with("x")) # see also all_of()
})
}
```

---

tar_older *List old targets*

Description

List all the targets whose last successful run occurred before a certain point in time. Combine with tar_invalidate(), you can use tar_older() to automatically rerun targets at regular intervals. See the examples for a demonstration.

Usage

```
tar_older(
  time,
  names = NULL,
  inclusive = FALSE,
  store = targets::tar_config_get("store")
)
```

Arguments

time	A POSIXct object of length 1, time threshold. Targets older than this time stamp are returned. For example, if time = Sys.time() - as.difftime(1, units = "weeks") then tar_older() returns targets older than one week ago.
names	Names of eligible targets. Targets excluded from names will not be returned even if they are old. You can supply symbols or tidyselect helpers like all_of() and starts_with(). If NULL, all names are eligible.
inclusive	Logical of length 1, whether to include targets built at exactly the time given.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

Only applies to targets with recorded time stamps: just non-branching targets and individual dynamic branches. As of targets version 0.6.0, these time stamps are available for these targets regardless of storage format. Earlier versions of targets do not record time stamps for remote storage such as format = "url" or repository = "aws" in tar_target().

Value

A character vector of names of old targets with recorded timestamp metadata.

See Also

Other time: tar_newer(), tar_timestamp_raw(), tar_timestamp()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(tar_target(x, seq_len(2)))
}, ask = FALSE)
tar_make()
# targets older than 1 week ago
tar_older(Sys.time() - as.difftime(1, units = "weeks"))
# targets older than 1 week from now
```

```
tar_older(Sys.time() + as.difftime(1, units = "weeks"))
# Everything is still up to date.
tar_make()
# Invalidate all targets targets older than 1 week from now
# so they run on the next tar_make().
invalidate_these <- tar_older(Sys.time() + as.difftime(1, units = "weeks"))
tar_invalidate(all_of(invalidate_these))
tar_make()
})
}
```

`tar_option_get` *Get a target option.*

Description

Get a target option. These options include default arguments to `tar_target()` such as packages, storage format, iteration type, and cue. Needs to be called before any calls to `tar_target()` in order to take effect.

Usage

```
tar_option_get(name = NULL, option = NULL)
```

Arguments

`name`	Character of length 1, name of an option to get. Must be one of the argument names of `tar_option_set()`.
`option`	Deprecated, use the `name` argument instead.

Details

This function goes well with `tar_target_raw()` when it comes to defining external interfaces on top of the `targets` package to create pipelines.

Value

Value of a target option.

See Also

Other configuration: `tar_config_get()`, `tar_config_set()`, `tar_config_unset()`, `tar_envvars()`, `tar_option_reset()`, `tar_option_set()`

Examples

```
tar_option_get("format") # default format before we set anything
tar_target(x, 1)$settings$format
tar_option_set(format = "fst_tbl") # new default format
tar_option_get("format")
tar_target(x, 1)$settings$format
tar_option_reset() # reset the format
tar_target(x, 1)$settings$format
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  tar_option_set(cue = tar_cue(mode = "always")) # All targets always run.
  list(tar_target(x, 1), tar_target(y, 2))
})
tar_make()
tar_make()
})
}
```

---

tar_option_reset *Reset all target options.*

Description

Reset all target options you previously chose with `tar_option_set()`. These options are mostly configurable default arguments to `tar_target()` and `tar_target_raw()`.

Usage

```
tar_option_reset()
```

Value

`NULL` (invisibly).

See Also

Other configuration: `tar_config_get()`, `tar_config_set()`, `tar_config_unset()`, `tar_envvars()`, `tar_option_get()`, `tar_option_set()`

Examples

```
tar_option_get("format") # default format before we set anything
tar_target(x, 1)$settings$format
tar_option_set(format = "fst_tbl") # new default format
tar_option_get("format")
tar_target(x, 1)$settings$format
tar_option_reset() # reset all options
tar_target(x, 1)$settings$format
```

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  tar_option_set(cue = tar_cue(mode = "always"))
  tar_option_reset() # Undo option above.
  list(tar_target(x, 1), tar_target(y, 2))
})
tar_make()
tar_make()
})
}
```

`tar_option_set` *Set target options.*

Description

Set target options, including default arguments to `tar_target()` such as packages, storage format, iteration type, and cue. Only the non-null arguments are actually set as options. See currently set options with `tar_option_get()`. To use `tar_option_set()` effectively, put it in your workflow's target script file (default: `_targets.R`) before calls to `tar_target()` or `tar_target_raw()`.

Usage

```
tar_option_set(
  tidy_eval = NULL,
  packages = NULL,
  imports = NULL,
  library = NULL,
  envir = NULL,
  format = NULL,
  repository = NULL,
  iteration = NULL,
  error = NULL,
  memory = NULL,
  garbage_collection = NULL,
  deployment = NULL,
  priority = NULL,
  backoff = NULL,
  resources = NULL,
  storage = NULL,
  retrieval = NULL,
  cue = NULL,
  debug = NULL,
  workspaces = NULL,
  workspace_on_error = NULL
)
```

Arguments

tidy_eval	Logical, whether to enable tidy evaluation when interpreting command and pattern. If TRUE, you can use the "bang-bang" operator !! to programmatically insert the values of global objects.
packages	Character vector of packages to load right before the target builds or the output data is reloaded for downstream targets. Use tar_option_set() to set packages globally for all subsequent targets you define.
imports	Character vector of package names to track global dependencies. For example, if you write tar_option_set(imports = "yourAnalysisPackage") early in your target script file (default: _targets.R) then tar_make() will automatically rerun or skip targets in response to changes to the R functions and objects defined in yourAnalysisPackage. Does not account for low-level compiled code such as C/C++ or Fortran. If you supply multiple packages, e.g. tar_option_set(imports = c("p1", "p2")), then the objects in p1 override the objects in p2 if there are name conflicts. Similarly, objects in tar_option_get("envir") override everything in tar_option_get("imports").
library	Character vector of library paths to try when loading packages.
envir	Environment containing functions and global objects common to all targets in the pipeline. The envir argument of tar_make() and related functions always overrides the current value of tar_option_get("envir") in the current R session just before running the target script file, so whenever you need to set an alternative envir, you should always set it with tar_option_set() from within the target script file. In other words, if you call tar_option_set(envir = envir1) in an interactive session and then tar_make(envir = envir2, callr_function = NULL), then envir2 will be used. If envir is the global environment, all the promise objects are diffused before sending the data to parallel workers in tar_make_future() and tar_make_clustermq(), but otherwise the environment is unmodified. This behavior improves performance by decreasing the size of data sent to workers. If envir is not the global environment, then it should at least inherit from the global environment or base environment so targets can access attached packages. In the case of a non-global envir, targets attempts to remove potentially high memory objects that come directly from targets. That includes tar_target() objects of class "tar_target", as well as objects of class "tar_pipeline" or "tar_algorithm". This behavior improves performance by decreasing the size of data sent to workers. Package environments should not be assigned to envir. To include package objects as upstream dependencies in the pipeline, assign the package to the packages and imports arguments of tar_option_set().
format	Optional storage format for the target's return value. With the exception of format = "file", each target gets a file in _targets/objects, and each format is a different way to save and load this file. See the "Storage formats" section for a detailed list of possible data storage formats.
repository	Character of length 1, remote repository for target storage. Choices: • "local": file system of the local machine.

- "aws": Amazon Web Services (AWS) S3 bucket. Can be configured with a non-AWS S3 bucket using the endpoint argument of tar_resources_aws(), but versioning capabilities may be lost in doing so. See the cloud storage section of https://books.ropensci.org/targets/data.html for details for instructions.
- "gcp": Google Cloud Platform storage bucket. See the cloud storage section of https://books.ropensci.org/targets/data.html for details for instructions.

Note: if repository is not "local" and format is "file" then the target should create a single output file. That output file is uploaded to the cloud and tracked for changes where it exists in the cloud. The local file is deleted after the target runs.

iteration Character of length 1, name of the iteration mode of the target. Choices:

- "vector": branching happens with vctrs::vec_slice() and aggregation happens with vctrs::vec_c().
- "list", branching happens with [[]] and aggregation happens with list().
- "group": dplyr::group_by()-like functionality to branch over subsets of a data frame. The target's return value must be a data frame with a special tar_group column of consecutive integers from 1 through the number of groups. Each integer designates a group, and a branch is created for each collection of rows in a group. See the tar_group() function to see how you can create the special tar_group column with dplyr::group_by().

error Character of length 1, what to do if the target stops and throws an error. Options:

- "stop": the whole pipeline stops and throws an error.
- "continue": the whole pipeline keeps going.
- "abridge": any currently running targets keep running, but no new targets launch after that. (Visit https://books.ropensci.org/targets/debugging.html to learn how to debug targets using saved workspaces.)
- "null": The errored target continues and returns NULL. The data hash is deliberately wrong so the target is not up to date for the next run of the pipeline.

memory Character of length 1, memory strategy. If "persistent", the target stays in memory until the end of the pipeline (unless storage is "worker", in which case targets unloads the value from memory right after storing it in order to avoid sending copious data over a network). If "transient", the target gets unloaded after every new target completes. Either way, the target gets automatically loaded into memory whenever another target needs the value. For cloud-based dynamic files (e.g. format = "file" with repository = "aws"), this memory strategy applies to the temporary local copy of the file: "persistent" means it remains until the end of the pipeline and is then deleted, and "transient" means it gets deleted as soon as possible. The former conserves bandwidth, and the latter conserves local storage.

garbage_collection Logical, whether to run base::gc() just before the target runs.

deployment Character of length 1, only relevant to tar_make_clustermq() and tar_make_future(). If "worker", the target builds on a parallel worker. If "main", the target builds on the host machine / process managing the pipeline.

priority — Numeric of length 1 between 0 and 1. Controls which targets get deployed first when multiple competing targets are ready simultaneously. Targets with priorities closer to 1 get built earlier (and polled earlier in tar_make_future()).

backoff — Numeric of length 1, must be greater than or equal to 0.01. Maximum upper bound of the random polling interval for the priority queue (seconds). In high-performance computing (e.g. tar_make_clustermq() and tar_make_future()) it can be expensive to repeatedly poll the priority queue if no targets are ready to process. The number of seconds between polls is runif(1, 0.001, max(backoff, 0.001 * 1.5 ^ index)), where index is the number of consecutive polls so far that found no targets ready to skip or run. (If no target is ready, index goes up by 1. If a target is ready, index resets to 0. For more information on exponential, backoff, visit https://en.wikipedia.org/wiki/Exponential_backoff). Raising backoff is kinder to the CPU etc. but may incur delays in some instances.

resources — Object returned by tar_resources() with optional settings for high-performance computing functionality, alternative data storage formats, and other optional capabilities of targets. See tar_resources() for details.

storage — Character of length 1, only relevant to tar_make_clustermq() and tar_make_future(). Must be one of the following values:

- "main": the target's return value is sent back to the host machine and saved/uploaded locally.
- "worker": the worker saves/uploads the value.
- "none": almost never recommended. It is only for niche situations, e.g. the data needs to be loaded explicitly from another language. If you do use it, then the return value of the target is totally ignored when the target ends, but each downstream target still attempts to load the data file (except when retrieval = "none").
  If you select storage = "none", then the return value of the target's command is ignored, and the data is not saved automatically. As with dynamic files (format = "file") it is the responsibility of the user to write to tar_path() from inside the target. An example target could look something like tar_target(x, saveRDS("value", tar_path(create_dir = TRUE)); "ignored", storage = "none")‘.
  The distinguishing feature of storage = "none" (as opposed to format = "file") is that in the general case, downstream targets will automatically try to load the data from the data store as a dependency. As a corollary, storage = "none" is completely unnecessary if format is "file".

retrieval — Character of length 1, only relevant to tar_make_clustermq() and tar_make_future(). Must be one of the following values:

- "main": the target's dependencies are loaded on the host machine and sent to the worker before the target builds.
- "worker": the worker loads the targets dependencies.
- "none": the dependencies are not loaded at all. This choice is almost never recommended. It is only for niche situations, e.g. the data needs to be loaded explicitly from another language.

cue — An optional object from tar_cue() to customize the rules that decide whether the target is up to date.

debug
: Character vector of names of targets to run in debug mode. To use effectively, you must set `callr_function = NULL` and restart your R session just before running. You should also `tar_make()`, `tar_make_clustermq()`, or `tar_make_future()`. For any target mentioned in debug, `targets` will force the target to build locally (with `tar_cue(mode = "always")` and `deployment = "main"` in the settings) and pause in an interactive debugger to help you diagnose problems. This is like inserting a `browser()` statement at the beginning of the target's expression, but without invalidating any targets.

workspaces
: Character vector of target names. Could be non-branching targets, whole dynamic branching targets, or individual branch names. `tar_make()` and friends will save workspace files for these targets even if the targets are skipped. Workspace files help with debugging. See `tar_workspace()` for details about workspaces.

workspace_on_error
: Logical of length 1, whether to save a workspace file for each target that throws an error. Workspace files help with debugging. See `tar_workspace()` for details about workspaces.

Value

`NULL` (invisibly).

Storage formats

- `"rds"`: Default, uses `saveRDS()` and `readRDS()`. Should work for most objects, but slow.
- `"qs"`: Uses `qs::qsave()` and `qs::qread()`. Should work for most objects, much faster than `"rds"`. Optionally set the preset for `qsave()` through `tar_resources()` and `tar_resources_qs()`.
- `"feather"`: Uses `arrow::write_feather()` and `arrow::read_feather()` (version 2.0). Much faster than `"rds"`, but the value must be a data frame. Optionally set `compression` and `compression_level` in `arrow::write_feather()` through `tar_resources()` and `tar_resources_feather()`. Requires the `arrow` package (not installed by default).
- `"parquet"`: Uses `arrow::write_parquet()` and `arrow::read_parquet()` (version 2.0). Much faster than `"rds"`, but the value must be a data frame. Optionally set `compression` and `compression_level` in `arrow::write_parquet()` through `tar_resources()` and `tar_resources_parquet()`. Requires the `arrow` package (not installed by default).
- `"fst"`: Uses `fst::write_fst()` and `fst::read_fst()`. Much faster than `"rds"`, but the value must be a data frame. Optionally set the compression level for `fst::write_fst()` through `tar_resources()` and `tar_resources_fst()`. Requires the `fst` package (not installed by default).
- `"fst_dt"`: Same as `"fst"`, but the value is a `data.table`. Optionally set the compression level the same way as for `"fst"`.
- `"fst_tbl"`: Same as `"fst"`, but the value is a `tibble`. Optionally set the compression level the same way as for `"fst"`.
- `"keras"`: Uses `keras::save_model_hdf5()` and `keras::load_model_hdf5()`. The value must be a Keras model. Requires the `keras` package (not installed by default).
- `"torch"`: Uses `torch::torch_save()` and `torch::torch_load()`. The value must be an object from the `torch` package such as a tensor or neural network module. Requires the `torch` package (not installed by default).

- `"file"`: A dynamic file. To use this format, the target needs to manually identify or save some data and return a character vector of paths to the data (must be a single file path if `repository` is not `"local"`). (These paths must be existing files and nonempty directories.) Then, `targets` automatically checks those files and cues the appropriate build decisions if those files are out of date. Those paths must point to files or directories, and they must not contain characters `|` or `*`. All the files and directories you return must actually exist, or else `targets` will throw an error. (And if `storage` is `"worker"`, `targets` will first stall out trying to wait for the file to arrive over a network file system.) If the target does not create any files, the return value should be `character(0)`.

  If `repository` is not `"local"` and `format` is `"file"`, then the character vector returned by the target must be of length 1 and point to a single file. (Directories and vectors of multiple file paths are not supported for dynamic files on the cloud.) That output file is uploaded to the cloud and tracked for changes where it exists in the cloud. The local file is deleted after the target runs.
- `"url"`: A dynamic input URL. For this storage format, `repository` is implicitly `"local"`, URL format is like `format = "file"` except the return value of the target is a URL that already exists and serves as input data for downstream targets. Optionally supply a custom `curl` handle through `tar_resources()` and `tar_resources_url()`. in `new_handle()`, `nobody = TRUE` is important because it ensures `targets` just downloads the metadata instead of the entire data file when it checks time stamps and hashes. The data file at the URL needs to have an ETag or a Last-Modified time stamp, or else the target will throw an error because it cannot track the data. Also, use extreme caution when trying to use `format = "url"` to track uploads. You must be absolutely certain the ETag and Last-Modified time stamp are fully updated and available by the time the target's command finishes running. `targets` makes no attempt to wait for the web server.
- A custom format can be supplied with `tar_format()`. For this choice, it is the user's responsibility to provide methods for (un)serialization and (un)marshaling the return value of the target.
- The formats starting with `"aws_"` are deprecated as of 2022-03-13 (`targets` version > `0.10.0`). For cloud storage itory‘ argument instead.

See Also

Other configuration: `tar_config_get()`, `tar_config_set()`, `tar_config_unset()`, `tar_envvars()`, `tar_option_get()`, `tar_option_reset()`

Examples

```
tar_option_get("format") # default format before we set anything
tar_target(x, 1)$settings$format
tar_option_set(format = "fst_tbl") # new default format
tar_option_get("format")
tar_target(x, 1)$settings$format
tar_option_reset() # reset the format
tar_target(x, 1)$settings$format
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  tar_option_set(cue = tar_cue(mode = "always")) # All targets always run.
```

```
  list(tar_target(x, 1), tar_target(y, 2))
})
tar_make()
tar_make()
})
}
```

`tar_outdated` *Check which targets are outdated.*

Description

Checks for outdated targets in the pipeline, targets that will be rerun automatically if you call `tar_make()` or similar. See `tar_cue()` for the rules that decide whether a target needs to rerun.

Usage

```
tar_outdated(
  names = NULL,
  shortcut = targets::tar_config_get("shortcut"),
  branches = FALSE,
  targets_only = TRUE,
  reporter = targets::tar_config_get("reporter_outdated"),
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function, reporter),
  envir = parent.frame(),
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

`names`	Names of the targets. `tar_outdated()` will check these targets and all upstream ancestors in the dependency graph. Set `names` to `NULL` to check/build all the targets (default). Otherwise, you can supply symbols or `tidyselect` helpers like `all_of()` and `starts_with()`. Applies to ordinary targets (stem) and whole dynamic branching targets (patterns) but not to individual dynamic branches.
`shortcut`	Logical of length 1, how to interpret the `names` argument. If `shortcut` is `FALSE` (default) then the function checks all targets upstream of `names` as far back as the dependency graph goes. If `TRUE`, then the function only checks the targets in `names` and uses stored metadata for information about upstream dependencies as needed. `shortcut = TRUE` increases speed if there are a lot of up-to-date targets, but it assumes all the dependencies are up to date, so please use with caution. Also, `shortcut = TRUE` only works if you set `names`.
`branches`	Logical of length 1, whether to include branch names. Including branches could get cumbersome for large pipelines. Individual branch names are still omitted when branch-specific information is not reliable: for example, when a pattern branches over an outdated target.

`targets_only` Logical of length 1, whether to just restrict to targets or to include functions and other global objects from the environment created by running the target script file (default: `_targets.R`).

`reporter` Character of length 1, name of the reporter to user. Controls how messages are printed as targets are checked. Choices:

- `"silent"`: print nothing.
- `"forecast"`: print running totals of the checked and outdated targets found so far.

`callr_function` A function from `callr` to start a fresh clean R process to do the work. Set to `NULL` to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). `callr_function` needs to be `NULL` for interactive debugging, e.g. `tar_option_set(debug = "your_target")`. However, `callr_function` should not be `NULL` for serious reproducible work.

`callr_arguments`
A list of arguments to `callr_function`.

`envir` An environment, where to run the target R script (default: `_targets.R`) if `callr_function` is `NULL`. Ignored if `callr_function` is anything other than `NULL`. `callr_function` should only be `NULL` for debugging and testing purposes, not for serious runs of a pipeline, etc.

The `envir` argument of `tar_make()` and related functions always overrides the current value of `tar_option_get("envir")` in the current R session just before running the target script file, so whenever you need to set an alternative `envir`, you should always set it with `tar_option_set()` from within the target script file. In other words, if you call `tar_option_set(envir = envir1)` in an interactive session and then `tar_make(envir = envir2, callr_function = NULL)`, then `envir2` will be used.

`script` Character of length 1, path to the target script file. Defaults to `tar_config_get("script")`, which in turn defaults to `_targets.R`. When you set this argument, the value of `tar_config_get("script")` is temporarily changed for the current function call. See `tar_script()`, `tar_config_get()`, and `tar_config_set()` for details about the target script file and how to set it persistently for a project.

`store` Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Details

Requires that you define a pipeline with a target script file (default: `_targets.R`). (See `tar_script()` for details.)

Value

Names of the outdated targets.

See Also

Other inspect: tar_deps_raw(), tar_deps(), tar_manifest(), tar_network(), tar_sitrep(), tar_validate()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(list(tar_target(x, 1 + 1)))
tar_outdated()
tar_script({
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
}, ask = FALSE)
tar_outdated()
})
}
```

---

tar_path *Identify the file path where a target will be stored.*

Description

Identify the file path where a target will be stored after the target finishes running in the pipeline.

Usage

```
tar_path(
  name = NULL,
  default = NA_character_,
  create_dir = FALSE,
  store = targets::tar_config_get("store")
)
```

Arguments

name	Symbol, name of a target. If NULL, tar_path() returns the path of the target currently running in a pipeline.
default	Character, value to return if tar_path() is called on its own outside a targets pipeline. Having a default lets users run things without tar_make(), which helps peel back layers of code and troubleshoot bugs.
create_dir	Logical of length 1, whether to create dirname(tar_path()) in tar_path() itself. This is useful if you are writing to tar_path() from inside a storage = "none" target and need the parent directory of the file to exist.

store — Character of length 1, path to the data store if `tar_path()` is called outside a running pipeline. If `tar_path()` is called inside a running pipeline, this argument is ignored and actual the path to the running pipeline's data store is used instead.

Value

Character, file path of the return value of the target. If not called from inside a running target, `tar_path(name = your_target)` just returns `_targets/objects/your_target`, the file path where `your_target` will be saved unless `format` is equal to `"file"` or any of the supported cloud-based storage formats.

For non-cloud storage formats, if you call `tar_path()` with no arguments while target `x` is running, the `name` argument defaults to the name of the running target, so `tar_path()` returns `_targets/objects/x`.

For cloud-backed formats, `tar_path()` returns the path to the staging file in `_targets/scratch/`. That way, even if you select a cloud repository (e.g. `tar_target(..., repository = "aws", storage = "none")`) then you can still manually write to `tar_path(create_dir = TRUE)` and the `targets` package will automatically hash it and upload it to the AWS S3 bucket. This does not apply to `format = "file"`, where you would never need `storage = "none"` anyway.

See Also

Other utilities: `tar_active()`, `tar_call()`, `tar_cancel()`, `tar_definition()`, `tar_envir()`, `tar_group()`, `tar_name()`, `tar_seed()`, `tar_source()`, `tar_store()`

Examples

```
tar_path()
tar_path(your_target)
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(tar_target(returns_path, tar_path()), ask = FALSE)
tar_make()
tar_read(returns_path)
})
}
```

---

tar_pattern *Emulate dynamic branching.*

Description

Emulate the dynamic branching process outside a pipeline. `tar_pattern()` can help you understand the overall branching structure that comes from the `pattern` argument of `tar_target()`.

Usage

```
tar_pattern(pattern, ..., seed = 0L)
```

Arguments

pattern	Function call with the pattern specification.
...	Named integers, each of length 1. Each name is the name of a dependency target, and each integer is the length of the target (number of branches or slices). Names must be unique.
seed	Integer of length 1, random number generator seed to emulate the pattern reproducibly. (The sample() pattern is random). In a real pipeline, the seed is automatically generated from the target name in deterministic fashion.

Details

Dynamic branching is a way to programmatically create multiple new targets based on the values of other targets, all while the pipeline is running. Use the pattern argument of tar_target() to get started. pattern accepts a function call composed of target names and any of the following patterns:

- map(): iterate over one or more targets in sequence.
- cross(): iterate over combinations of slices of targets.
- slice(): select one or more slices by index, e.g. slice(x, index = c(3, 4)) selects the third and fourth slice or branch of x.
- head(): restrict branching to the first few elements.
- tail(): restrict branching to the last few elements.
- sample(): restrict branching to a random subset of elements.

Value

A tibble showing the kinds of dynamic branches that tar_target() would create in a real pipeline with the given pattern. Each row is a dynamic branch, each column is a dependency target, and each element is the name of an upstream bud or branch that the downstream branch depends on. Buds are pieces of non-branching targets ("stems") and branches are pieces of patterns. The returned bud and branch names are not the actual ones you will see when you run the pipeline, but they do communicate the branching structure of the pattern.

See Also

Other branching: tar_branch_index(), tar_branch_names_raw(), tar_branch_names(), tar_branches()

Examples

```
# To use dynamic map for real in a pipeline,
# call map() in a target's pattern.
# The following code goes at the bottom of
# your target script file (default: `_targets.R`).
list(
  tar_target(x, seq_len(2)),
  tar_target(y, head(letters, 2)),
  tar_target(dynamic, c(x, y), pattern = map(x, y)) # 2 branches
)
```

```
# Likewise for more complicated patterns.
list(
  tar_target(x, seq_len(2)),
  tar_target(y, head(letters, 2)),
  tar_target(z, head(LETTERS, 2)),
  tar_target(dynamic, c(x, y, z), pattern = cross(z, map(x, y))) #4 branches
)
# But you can emulate dynamic branching without running a pipeline
# in order to understand the patterns you are creating. Simply supply
# the pattern and the length of each dependency target.
# The returned data frame represents the branching structure of the pattern:
# One row per new branch, one column per dependency target, and
# one element per bud/branch in each dependency target.
tar_pattern(
  cross(x, map(y, z)),
  x = 2,
  y = 3,
  z = 3
)
tar_pattern(
  head(cross(x, map(y, z)), n = 2),
  x = 2,
  y = 3,
  z = 3
)
```

`tar_pid` *Get main process ID.*

Description

Get the process ID (PID) of the most recent main R process to orchestrate the targets of the current project.

Usage

```
tar_pid(store = targets::tar_config_get("store"))
```

Arguments

`store`	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Details

The main process is the R process invoked by `tar_make()` or similar. If `callr_function` is not `NULL`, this is an external process, and the `pid` in the return value will not agree with `Sys.getpid()` in your current interactive session. The process may or may not be alive. You may want to check it with `ps::ps_is_running(ps::ps_handle(targets::tar_pid()))` before running another call to `tar_make()` for the same project.

Value

Integer with the process ID (PID) of the most recent main R process to orchestrate the targets of the current project.

See Also

Other data: `tar_load_everything()`, `tar_load_raw()`, `tar_load()`, `tar_meta()`, `tar_objects()`, `tar_process()`, `tar_read_raw()`, `tar_read()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, 2 * x, pattern = map(x))
  )
}, ask = FALSE)
tar_make()
Sys.getpid()
tar_pid() # Different from the current PID.
})
}
```

---

tar_poll *Repeatedly poll progress in the R console.*

Description

Print the information in `tar_progress_summary()` at regular intervals.

Usage

```
tar_poll(
  interval = 1,
  timeout = Inf,
  fields = c("skipped", "started", "built", "errored", "canceled", "since"),
  store = targets::tar_config_get("store")
)
```

Arguments

interval	Number of seconds to wait between iterations of polling progress.
timeout	How many seconds to run before exiting.
fields	Optional, names of progress data columns to read. Set to NULL to read all fields.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

See Also

Other progress: tar_built(), tar_canceled(), tar_errored(), tar_progress_branches(), tar_progress_summary(), tar_progress(), tar_skipped(), tar_started(), tar_watch_server(), tar_watch_ui(), tar_watch()

Examples

```
if (identical(Sys.getenv("TAR_INTERACTIVE_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(100)),
    tar_target(y, Sys.sleep(0.1), pattern = map(x))
  )
}, ask = FALSE)
px <- tar_make(callr_function = callr::r_bg, reporter = "silent")
tar_poll()
})
}
```

---

tar_process *Get main process info.*

Description

Get info on the most recent main R process to orchestrate the targets of the current project.

Usage

```
tar_process(names = NULL, store = targets::tar_config_get("store"))
```

Arguments

names	Optional, names of the data points to return. If supplied, tar_process() returns only the rows of the names you select. You can supply symbols or tidyselect helpers like all_of() and starts_with(). If NULL, all names are selected.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

The main process is the R process invoked by tar_make() or similar. If callr_function is not NULL, this is an external process, and the pid in the return value will not agree with Sys.getpid() in your current interactive session. The process may or may not be alive. You may want to check the status with tar_pid() %in% ps::ps_pids() before running another call to tar_make() for the same project.

Value

A data frame with metadata on the most recent main R process to orchestrate the targets of the current project. The output includes the pid of the main process.

See Also

Other data: tar_load_everything(), tar_load_raw(), tar_load(), tar_meta(), tar_objects(), tar_pid(), tar_read_raw(), tar_read()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, 2 * x, pattern = map(x))
  )
}, ask = FALSE)
tar_make()
tar_process()
tar_process(pid)
})
}
```

tar_progress *Read progress.*

Description

Read a project's target progress data for the most recent run of `tar_make()` or similar. Only the most recent record is shown.

Usage

```
tar_progress(
  names = NULL,
  fields = "progress",
  store = targets::tar_config_get("store")
)
```

Arguments

`names`	Optional, names of the targets. If supplied, `tar_progress()` only returns progress information on these targets. You can supply symbols or `tidyselect` helpers like `all_of()` and `starts_with()`.
`fields`	Optional, names of progress data columns to read. Set to `NULL` to read all fields.
`store`	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Value

A data frame with one row per target and the following columns:

- `name`: name of the target.
- `type`: type of target: `"stem"` for non-branching targets, `"pattern"` for dynamically branching targets, and `"branch"` for dynamic branches.
- `parent`: name of the target's parent. For branches, this is the name of the associated pattern. For other targets, the pattern is just itself.
- `branches`: number of dynamic branches of a pattern. 0 for non-patterns.
- `progress`: the most recent progress update of that target. Could be `"started"`, `"built"`, `"skipped"`, `"canceled"`, or `"errored"`.

See Also

Other progress: `tar_built()`, `tar_canceled()`, `tar_errored()`, `tar_poll()`, `tar_progress_branches()`, `tar_progress_summary()`, `tar_skipped()`, `tar_started()`, `tar_watch_server()`, `tar_watch_ui()`, `tar_watch()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, 2 * x, pattern = map(x))
  )
}, ask = FALSE)
tar_make()
tar_progress()
tar_progress(starts_with("y_")) # see also all_of()
})
}
```

`tar_progress_branches` *Tabulate the progress of dynamic branches.*

Description

Read a project's target progress data for the most recent run of the pipeline and display the tabulated status of dynamic branches. Only the most recent record is shown.

Usage

```
tar_progress_branches(
  names = NULL,
  fields = NULL,
  store = targets::tar_config_get("store")
)
```

Arguments

`names`	Optional, names of the targets. If supplied, `tar_progress()` only returns progress information on these targets. You can supply symbols or `tidyselect` helpers like `starts_with()`.
`fields`	Optional, names of progress data columns to read. Set to `NULL` to read all fields.
`store`	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Value

A data frame with one row per target per progress status and the following columns.

- `name`: name of the pattern.
- `progress`: progress status: `"started"`, `"built"`, `"cancelled"`, or `"errored"`.
- `branches`: number of branches in the progress category.
- `total`: total number of branches planned for the whole pattern. Values within the same pattern should all be equal.

See Also

Other progress: `tar_built()`, `tar_canceled()`, `tar_errored()`, `tar_poll()`, `tar_progress_summary()`, `tar_progress()`, `tar_skipped()`, `tar_started()`, `tar_watch_server()`, `tar_watch_ui()`, `tar_watch()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, x, pattern = map(x)),
    tar_target(z, stopifnot(y < 1.5), pattern = map(y))
  )
}, ask = FALSE)
try(tar_make())
tar_progress_branches()
})
}
```

---

tar_progress_summary *Summarize target progress.*

Description

Summarize the progress of a run of the pipeline.

Usage

```
tar_progress_summary(
  fields = c("skipped", "started", "built", "errored", "canceled", "since"),
  store = targets::tar_config_get("store")
)
```

Arguments

fields	Optional, names of progress data columns to read. Set to NULL to read all fields.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

A data frame with one row and the following optional columns that can be selected with fields. (time is omitted by default.)

- started: number of targets that started and did not (yet) finish.
- built: number of targets that completed without error or cancellation.
- errored: number of targets that threw an error.
- canceled: number of canceled targets (see tar_cancel()).
- since: how long ago progress last changed (Sys.time() - time).
- time: the time when the progress last changed (modification timestamp of the _targets/meta/progress file).

See Also

Other progress: tar_built(), tar_canceled(), tar_errored(), tar_poll(), tar_progress_branches(), tar_progress(), tar_skipped(), tar_started(), tar_watch_server(), tar_watch_ui(), tar_watch()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, x, pattern = map(x)),
    tar_target(z, stopifnot(y < 1.5), pattern = map(y), error = "continue")
  )
}, ask = FALSE)
try(tar_make())
tar_progress_summary()
})
}
```

tar_prune *Remove targets that are no longer part of the pipeline.*

Description

Remove target values from `_targets/objects/` and the cloud and remove target metadata from `_targets/meta/meta` for targets that are no longer part of the pipeline.

Usage

```
tar_prune(
  cloud = TRUE,
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function),
  envir = parent.frame(),
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

`cloud`	Logical of length 1, whether to delete objects from the cloud if applicable (e.g. AWS, GCP). If `FALSE`, files are not deleted from the cloud.
`callr_function`	A function from `callr` to start a fresh clean R process to do the work. Set to `NULL` to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). `callr_function` needs to be `NULL` for interactive debugging, e.g. `tar_option_set(debug = "your_target")`. However, `callr_function` should not be `NULL` for serious reproducible work.
`callr_arguments`	A list of arguments to `callr_function`.
`envir`	An environment, where to run the target R script (default: `_targets.R`) if `callr_function` is `NULL`. Ignored if `callr_function` is anything other than `NULL`. `callr_function` should only be `NULL` for debugging and testing purposes, not for serious runs of a pipeline, etc. The `envir` argument of `tar_make()` and related functions always overrides the current value of `tar_option_get("envir")` in the current R session just before running the target script file, so whenever you need to set an alternative `envir`, you should always set it with `tar_option_set()` from within the target script file. In other words, if you call `tar_option_set(envir = envir1)` in an interactive session and then `tar_make(envir = envir2, callr_function = NULL)`, then `envir2` will be used.
`script`	Character of length 1, path to the target script file. Defaults to `tar_config_get("script")`, which in turn defaults to `_targets.R`. When you set this argument, the value of `tar_config_get("script")` is temporarily changed for the current function call. See `tar_script()`, `tar_config_get()`, and `tar_config_set()` for details about the target script file and how to set it persistently for a project.

store — Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

This is useful if you recently worked through multiple changes to your project and are now trying to discard irrelevant data while keeping the results that still matter. Global objects and local files with format = "file" outside the data store are unaffected. Also removes _targets/scratch/, which is only needed while tar_make(), tar_make_clustermq(), or tar_make_future() is running.

Value

NULL except if callr_function = callr::r_bg(), in which case a handle to the callr background process is returned. Either way, the value is invisibly returned.

See Also

Other clean: tar_delete(), tar_destroy(), tar_invalidate()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
}, ask = FALSE)
tar_make()
# Remove some targets from the pipeline.
tar_script(list(tar_target(y1, 1 + 1)), ask = FALSE)
# Keep only the remaining targets in the data store.
tar_prune()
})
}
```

---

tar_read *Read a target's value from storage.*

Description

Read a target's return value from its file in _targets/objects/. For dynamic files (i.e. format = "file") the paths are returned.

Usage

```
tar_read(
  name,
  branches = NULL,
  meta = tar_meta(store = store),
  store = targets::tar_config_get("store")
)
```

Arguments

name	Symbol, name of the target to read.
branches	Integer of indices of the branches to load if the target is a pattern.
meta	Data frame of metadata from tar_meta(). tar_read() with the default arguments can be inefficient for large pipelines because all the metadata is stored in a single file. However, if you call tar_meta() beforehand and supply it to the meta argument, then successive calls to tar_read() may run much faster.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

The target's return value from its file in _targets/objects/, or the paths to the custom files and directories if format = "file" was set.

Limited scope

tar_read() and tar_load() are only for exploratory analysis and literate programming, and tar_read_raw() and tar_load_raw() are only for exploratory analysis. targets automatically loads the correct dependencies into memory when the pipeline is running, so invoking these functions from inside a target is rarely advisable.

See Also

Other data: tar_load_everything(), tar_load_raw(), tar_load(), tar_meta(), tar_objects(), tar_pid(), tar_process(), tar_read_raw()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(list(tar_target(x, 1 + 1)), ask = FALSE)
tar_make()
tar_read(x)
})
}
```

tar_read_raw *Read a target's value from storage (raw version)*

Description

Like tar_read() except name is a character string. Do not use in knitr or R Markdown reports with tarchetypes::tar_knit() or tarchetypes::tar_render().

Usage

```
tar_read_raw(
  name,
  branches = NULL,
  meta = tar_meta(store = store),
  store = targets::tar_config_get("store")
)
```

Arguments

name	Character, name of the target to read.
branches	Integer of indices of the branches to load if the target is a pattern.
meta	Data frame of metadata from tar_meta(). tar_read() with the default arguments can be inefficient for large pipelines because all the metadata is stored in a single file. However, if you call tar_meta() beforehand and supply it to the meta argument, then successive calls to tar_read() may run much faster.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

The target's return value from its file in _targets/objects/, or the paths to the custom files and directories if format = "file" was set.

Limited scope

tar_read() and tar_load() are only for exploratory analysis and literate programming, and tar_read_raw() and tar_load_raw() are only for exploratory analysis. targets automatically loads the correct dependencies into memory when the pipeline is running, so invoking these functions from inside a target is rarely advisable.

See Also

Other data: tar_load_everything(), tar_load_raw(), tar_load(), tar_meta(), tar_objects(), tar_pid(), tar_process(), tar_read()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(list(tar_target(x, 1 + 1)), ask = FALSE)
tar_make()
tar_read_raw("x")
})
}
```

---

tar_renv *Set up package dependencies for compatibility with* renv

---

Description

Write package dependencies to a script file (by default, named `_targets_packages.R` in the root project directory). Each package is written to a separate line as a standard `library()` call (e.g. `library(package)`) so `renv` can identify them automatically.

Usage

```
tar_renv(
 extras = c("bs4Dash", "clustermq", "future", "gt", "markdown", "pingr", "rstudioapi",
    "shiny", "shinybusy", "shinyWidgets", "visNetwork"),
  path = "_targets_packages.R",
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function),
  envir = parent.frame(),
  script = targets::tar_config_get("script")
)
```

Arguments

`extras`	Character vector of additional packages to declare as project dependencies.
`path`	Character of length 1, path to the script file to populate with `library()` calls.
`callr_function`	A function from `callr` to start a fresh clean R process to do the work. Set to `NULL` to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). `callr_function` needs to be `NULL` for interactive debugging, e.g. `tar_option_set(debug = "your_target")`. However, `callr_function` should not be `NULL` for serious reproducible work.
`callr_arguments`	A list of arguments to `callr_function`.
`envir`	An environment, where to run the target R script (default: `_targets.R`) if `callr_function` is `NULL`. Ignored if `callr_function` is anything other than `NULL`. `callr_function` should only be `NULL` for debugging and testing purposes, not for serious runs of a pipeline, etc.

The envir argument of tar_make() and related functions always overrides the current value of tar_option_get("envir") in the current R session just before running the target script file, so whenever you need to set an alternative envir, you should always set it with tar_option_set() from within the target script file. In other words, if you call tar_option_set(envir = envir1) in an interactive session and then tar_make(envir = envir2, callr_function = NULL), then envir2 will be used.

script — Character of length 1, path to the target script file. Defaults to tar_config_get("script"), which in turn defaults to _targets.R. When you set this argument, the value of tar_config_get("script") is temporarily changed for the current function call. See tar_script(), tar_config_get(), and tar_config_set() for details about the target script file and how to set it persistently for a project.

Details

This function gets called for its side-effect, which writes package dependencies to a script for compatibility with renv. The generated file should **not** be edited by hand and will be overwritten each time tar_renv() is called.

The behavior of renv is to create and manage a project-local R library and keep a record of project dependencies in a file called renv.lock. To identify dependencies, renv crawls through code to find packages explicitly mentioned using library(), require(), or ::. However, targets manages packages in a way that hides dependencies from renv. tar_renv() finds package dependencies that would be otherwise hidden to renv because they are declared using the targets API. Thus, calling tar_renv this is only necessary if using tar_option_set() or tar_target() to use specialized storage formats or manage packages.

With the script written by tar_renv(), renv is able to crawl the file to identify package dependencies (with renv::dependencies()). tar_renv() only serves to make your targets project compatible with renv, it is still the users responsibility to call renv::init() and renv::snapshot() directly to initialize and manage a project-local R library. This allows your targets pipeline to have its own self-contained R library separate from your standard R library. See https://rstudio.github.io/renv/index.html for more information.

Value

Nothing, invisibly.

See Also

https://rstudio.github.io/renv/articles/renv.html

Other scripts: tar_edit(), tar_github_actions(), tar_helper_raw(), tar_helper(), tar_script()

Examples

```
tar_dir({ # tar_dir() runs code from a temporary directory.
  tar_script({
    tar_option_set(packages = c("tibble", "qs"))
    list()
  }, ask = FALSE)
  tar_renv()
```

```
  writeLines(readLines("_targets_packages.R"))
})
tar_option_reset()
```

`tar_reprex` *Reproducible example of* `targets` *with* `reprex`

Description

Create a reproducible example of a `targets` pipeline with the `reprex` package.

Usage

```
tar_reprex(pipeline = tar_target(example_target, 1), run = tar_make(), ...)
```

Arguments

`pipeline`	R code for the target script file `_targets.R`. `library(targets)` is automatically written at the top.
`run`	R code to inspect and run the pipeline.
`...`	Named arguments passed to `reprex::reprex()`.

Details

The best way to get help with an issue is to create a reproducible example of the problem and post it to https://github.com/ropensci/targets/discussions `tar_reprex()` facilitates this process. It is like `reprex::reprex({targets::tar_script(...); tar_make()})`, but more convenient.

Value

A character vector of rendered the reprex, invisibly.

See Also

Other help: `targets-package`, `use_targets_rmd()`, `use_targets()`

Examples

```
if (identical(Sys.getenv("TAR_INTERACTIVE_EXAMPLES"), "true")) {
tar_reprex(
  pipeline = {
    list(
      tar_target(data, data.frame(x = sample.int(1e3))),
      tar_target(summary, mean(data$x, na.rm = TRUE))
    )
  },
  run = {
```

```
    tar_visnetwork()
    tar_make()
  }
)
}
```

`tar_resources` *Target resources*

Description

Create a `resources` argument for `tar_target()` or `tar_option_set()`.

Usage

```
tar_resources(
  aws = tar_option_get("resources")$aws,
  clustermq = tar_option_get("resources")$clustermq,
  feather = tar_option_get("resources")$feather,
  fst = tar_option_get("resources")$fst,
  future = tar_option_get("resources")$future,
  gcp = tar_option_get("resources")$gcp,
  parquet = tar_option_get("resources")$parquet,
  qs = tar_option_get("resources")$qs,
  url = tar_option_get("resources")$url
)
```

Arguments

`aws`	Output of function `tar_resources_aws()`. Amazon Web Services (AWS) S3 storage settings for `tar_target(..., repository = "aws")`. See the cloud storage section of https://books.ropensci.org/targets/data.html for details for instructions.
`clustermq`	Output of function `tar_resources_clustermq()`. Optional `clustermq` settings for `tar_make_clustermq()`, including the `log_worker` and `template` arguments of `clustermq::workers()`.
`feather`	Output of function `tar_resources_feather()`. Non-default arguments to `arrow::read_feather()` and `arrow::write_feather()` for `arrow`/feather-based storage formats. Applies to all formats ending with the `"_feather"` suffix. For details on formats, see the `format` argument of `tar_target()`.
`fst`	Output of function `tar_resources_fst()`. Non-default arguments to `fst::read_fst()` and `fst::write_fst()` for `fst`-based storage formats. Applies to all formats ending with `"fst"` in the name. For details on formats, see the `format` argument of `tar_target()`.

future — Output of function tar_resources_future(). Optional future settings for tar_make_future(), including the resources argument of future::future(), which can include values to insert in template placeholders in future.batchtools template files. This is how to supply the resources argument of future::future() for targets. Resources supplied through future::plan() and future::tweak() are completely ignored.

gcp — Output of function tar_resources_gcp(). Google Cloud Storage bucket settings for tar_target(..., repository = "gcp"). See the cloud storage section of https://books.ropensci.org/targets/data.html for details for instructions.

parquet — Output of function tar_resources_parquet(). Non-default arguments to arrow::read_parquet() and arrow::write_parquet() for arrow/parquet-based storage formats. Applies to all formats ending with the "_parquet" suffix. For details on formats, see the format argument of tar_target().

qs — Output of function tar_resources_qs(). Non-default arguments to qs::qread() and qs::qsave() for qs-based storage formats. Applies to all formats ending with the "_qs" suffix. For details on formats, see the format argument of tar_target().

url — Output of function tar_resources_url(). Non-default settings for storage formats ending with the "_url" suffix. These settings include the curl handle for extra control over HTTP requests. For details on formats, see the format argument of tar_target().

Value

A list of objects of class "tar_resources" with non-default settings of various optional backends for data storage and high-performance computing.

Resources

Functions tar_target() and tar_option_set() each takes an optional resources argument to supply non-default settings of various optional backends for data storage and high-performance computing. The tar_resources() function is a helper to supply those settings in the correct manner.

In targets version 0.12.2 and above, resources are inherited one-by-one in nested fashion from tar_option_get("resources"). For example, suppose you set tar_option_set(resources = tar_resources(aws = my_aws)), where my_aws equals tar_resources_aws(bucket = "x", prefix = "y"). Then, tar_target(data, get_data() will have bucket "x" and prefix "y". In addition, if new_resources equals tar_resources(aws = tar_resources_aws(bucket = "z"))), then tar_target(data, get_data(), resources = new_resources) will use the new bucket "z", but it will still use the prefix "y" supplied through tar_option_set(). (In targets 0.12.1 and below, options like prefix do not carry over from tar_option_set() if you supply non-default resources to tar_target().)

See Also

Other resources: tar_resources_aws(), tar_resources_clustermq(), tar_resources_feather(), tar_resources_fst(), tar_resources_future(), tar_resources_gcp(), tar_resources_parquet(),

tar_resources_qs(), tar_resources_url()

Examples

```
# Somewhere in you target script file (usually _targets.R):
tar_target(
  name,
  command(),
  format = "qs",
  resources = tar_resources(
    qs = tar_resources_qs(preset = "fast"),
    future = tar_resources_future(resources = list(n_cores = 1))
  )
)
```

---

tar_resources_aws *Target resources: Amazon Web Services (AWS) S3 storage*

Description

Create the aws argument of tar_resources() to specify optional settings to AWS for tar_target(..., repository = "aws"). See the format argument of tar_target() for details.

Usage

```
tar_resources_aws(
  bucket = targets::tar_option_get("resources")$aws$bucket,
  prefix = targets::tar_option_get("resources")$aws$prefix,
  region = targets::tar_option_get("resources")$aws$region,
  part_size = targets::tar_option_get("resources")$aws$part_size,
  endpoint = targets::tar_option_get("resources")$aws$endpoint,
  ...
)
```

Arguments

bucket	Character of length 1, name of an existing bucket to upload and download the return values of the affected targets during the pipeline.
prefix	Character of length 1, "directory path" in the bucket where the target return values are stored. Defaults to targets::tar_path_objects_dir_cloud().
region	Character of length 1, AWS region containing the S3 bucket. Set to NULL to use the default region.
part_size	Positive numeric of length 1, number of bytes for each part of a multipart upload. (Except the last part, which is the remainder.) In a multipart upload, each part must be at least 5 MB. The default value of the part_size argument is 5 * (2 ^ 20).

endpoint — Character of length 1, URL endpoint for S3 storage. Defaults to the Amazon AWS endpoint if NULL. Example: To use the S3 protocol with Google Cloud Storage, set endpoint = "https://storage.googleapis.com" and region = "auto". Also make sure to create HMAC access keys in the Google Cloud Storage console (under Settings => Interoperability) and set the AWS_ACCESS_KEY_ID and AWS_SECRET_ACCESS_KEY environment variables accordingly. After that, you should be able to use S3 storage formats with Google Cloud storage buckets. There is one limitation, however: even if your bucket has object versioning turned on, targets may fail to record object versions. Google Cloud Storage in particular has this incompatibility.

... — Named arguments to functions in paws::s3() to manage S3 storage. The documentation of these specific functions is linked from https://paws-r.github.io/docs/s3/. The configurable functions themselves are:

- paws::s3()$head_object()
- paws::s3()$get_object()
- paws::s3()$delete_object()
- paws::s3()$put_object()
- paws::s3()$create_multipart_upload()
- paws::s3()$abort_multipart_upload()
- paws::s3()$complete_multipart_upload()
- paws::s3()$upload_part() The named arguments in ... must not be any of "bucket", "Bucket", "key", "Key", "prefix", "region", "part_size", "endpoint", "version", "VersionId", "body", "Body", "metadata", "Metadata", "UploadId", "MultipartUpload", or "PartNumber".

Details

See the cloud storage section of https://books.ropensci.org/targets/data.html for details for instructions.

Value

Object of class "tar_resources_aws", to be supplied to the aws argument of tar_resources().

Resources

Functions tar_target() and tar_option_set() each takes an optional resources argument to supply non-default settings of various optional backends for data storage and high-performance computing. The tar_resources() function is a helper to supply those settings in the correct manner.

In targets version 0.12.2 and above, resources are inherited one-by-one in nested fashion from tar_option_get("resources"). For example, suppose you set tar_option_set(resources = tar_resources(aws = my_aws)), where my_aws equals tar_resources_aws(bucket = "x", prefix = "y"). Then, tar_target(data, get_data() will have bucket "x" and prefix "y". In addition, if new_resources equals tar_resources(aws = tar_resources_aws(bucket = "z"))), then tar_target(data, get_data(), resources = new_resources) will use the new bucket "z", but it will still use the prefix "y" supplied through tar_option_set(). (In targets 0.12.1 and below,

options like `prefix` do not carry over from `tar_option_set()` if you supply non-default resources to `tar_target()`.)

See Also

Other resources: `tar_resources_clustermq()`, `tar_resources_feather()`, `tar_resources_fst()`, `tar_resources_future()`, `tar_resources_gcp()`, `tar_resources_parquet()`, `tar_resources_qs()`, `tar_resources_url()`, `tar_resources()`

Examples

```
# Somewhere in you target script file (usually _targets.R):
tar_target(
  name,
  command(),
  format = "qs",
  repository = "aws",
  resources = tar_resources(
    aws = tar_resources_aws(bucket = "yourbucketname"),
    qs = tar_resources_qs(preset = "fast")
  )
)
```

---

tar_resources_clustermq

Target resources: `clustermq` *high-performance computing*

Description

Create the `clustermq` argument of `tar_resources()` to specify optional high-performance computing settings for `tar_make_clustermq()`. For details, see the documentation of the `clustermq` R package and the corresponding argument names in this help file.

Usage

```
tar_resources_clustermq(
  template = targets::tar_option_get("resources")$clustermq$template
)
```

Arguments

`template`	Named list, `template` argument to `clustermq::workers()`. Defaults to an empty list.

Value

Object of class `"tar_resources_clustermq"`, to be supplied to the `clustermq` argument of `tar_resources()`.

Resources

Functions tar_target() and tar_option_set() each takes an optional resources argument to supply non-default settings of various optional backends for data storage and high-performance computing. The tar_resources() function is a helper to supply those settings in the correct manner.

In targets version 0.12.2 and above, resources are inherited one-by-one in nested fashion from tar_option_get("resources"). For example, suppose you set tar_option_set(resources = tar_resources(aws = my_aws)), where my_aws equals tar_resources_aws(bucket = "x", prefix = "y"). Then, tar_target(data, get_data() will have bucket "x" and prefix "y". In addition, if new_resources equals tar_resources(aws = tar_resources_aws(bucket = "z"))), then tar_target(data, get_data(), resources = new_resources) will use the new bucket "z", but it will still use the prefix "y" supplied through tar_option_set(). (In targets 0.12.1 and below, options like prefix do not carry over from tar_option_set() if you supply non-default resources to tar_target().)

See Also

Other resources: tar_resources_aws(), tar_resources_feather(), tar_resources_fst(), tar_resources_future(), tar_resources_gcp(), tar_resources_parquet(), tar_resources_qs(), tar_resources_url(), tar_resources()

Examples

```
# Somewhere in you target script file (usually _targets.R):
tar_target(
  name,
  command(),
  resources = tar_resources(
    clustermq = tar_resources_clustermq(template = list(n_cores = 2))
  )
)
```

---

tar_resources_feather *Target resources: feather storage formats*

Description

Create the feather argument of tar_resources() to specify optional settings for feather data frame storage formats powered by the arrow R package. See the format argument of tar_target() for details.

Usage

```
tar_resources_feather(
  compression = targets::tar_option_get("resources")$feather$compression,
  compression_level = targets::tar_option_get("resources")$feather$compression_level
)
```

Arguments

compression	Character of length 1, compression argument of arrow::write_feather(). Defaults to "default".
compression_level	Numeric of length 1, compression_level argument of arrow::write_feather(). Defaults to NULL.

Value

Object of class "tar_resources_feather", to be supplied to the feather argument of tar_resources().

Resources

Functions tar_target() and tar_option_set() each takes an optional resources argument to supply non-default settings of various optional backends for data storage and high-performance computing. The tar_resources() function is a helper to supply those settings in the correct manner.

In targets version 0.12.2 and above, resources are inherited one-by-one in nested fashion from tar_option_get("resources"). For example, suppose you set tar_option_set(resources = tar_resources(aws = my_aws)), where my_aws equals tar_resources_aws(bucket = "x", prefix = "y"). Then, tar_target(data, get_data() will have bucket "x" and prefix "y". In addition, if new_resources equals tar_resources(aws = tar_resources_aws(bucket = "z"))), then tar_target(data, get_data(), resources = new_resources) will use the new bucket "z", but it will still use the prefix "y" supplied through tar_option_set(). (In targets 0.12.1 and below, options like prefix do not carry over from tar_option_set() if you supply non-default resources to tar_target().)

See Also

Other resources: tar_resources_aws(), tar_resources_clustermq(), tar_resources_fst(), tar_resources_future(), tar_resources_gcp(), tar_resources_parquet(), tar_resources_qs(), tar_resources_url(), tar_resources()

Examples

```
# Somewhere in you target script file (usually _targets.R):
tar_target(
  name,
  command(),
  format = "feather",
  resources = tar_resources(
    feather = tar_resources_feather(compression = "lz4")
  )
)
```

tar_resources_fst *Target resources:* fst *storage formats*

Description

Create the fst argument of tar_resources() to specify optional settings for big data frame storage formats powered by the fst R package. See the format argument of tar_target() for details.

Usage

```
tar_resources_fst(compress = targets::tar_option_get("resources")$fst$compress)
```

Arguments

compress	Numeric of length 1, compress argument of fst::write_fst(). Defaults to 50.

Value

Object of class "tar_resources_fst", to be supplied to the fst argument of tar_resources().

Resources

Functions tar_target() and tar_option_set() each takes an optional resources argument to supply non-default settings of various optional backends for data storage and high-performance computing. The tar_resources() function is a helper to supply those settings in the correct manner.

In targets version 0.12.2 and above, resources are inherited one-by-one in nested fashion from tar_option_get("resources"). For example, suppose you set tar_option_set(resources = tar_resources(aws = my_aws)), where my_aws equals tar_resources_aws(bucket = "x", prefix = "y"). Then, tar_target(data, get_data()) will have bucket "x" and prefix "y". In addition, if new_resources equals tar_resources(aws = tar_resources_aws(bucket = "z"))), then tar_target(data, get_data(), resources = new_resources) will use the new bucket "z", but it will still use the prefix "y" supplied through tar_option_set(). (In targets 0.12.1 and below, options like prefix do not carry over from tar_option_set() if you supply non-default resources to tar_target().)

See Also

Other resources: tar_resources_aws(), tar_resources_clustermq(), tar_resources_feather(), tar_resources_future(), tar_resources_gcp(), tar_resources_parquet(), tar_resources_qs(), tar_resources_url(), tar_resources()

Examples

```
# Somewhere in you target script file (usually _targets.R):
tar_target(
  name,
  command(),
  format = "fst_tbl",
  resources = tar_resources(
    fst = tar_resources_fst(compress = 100)
  )
)
```

`tar_resources_future` *Target resources:* `future` *high-performance computing*

Description

Create the `future` argument of `tar_resources()` to specify optional high-performance computing settings for `tar_make_future()`. This is how to supply the `resources` argument of `future::future()` for `targets`. Resources supplied through `future::plan()` and `future::tweak()` are completely ignored. For details, see the documentation of the `future` R package and the corresponding argument names in this help file.

Usage

```
tar_resources_future(
  plan = NULL,
  resources = targets::tar_option_get("resources")$future$resources
)
```

Arguments

`plan`	A `future::plan()` object or `NULL`, a `target`-specific `future` plan. Defaults to `NULL`.
`resources`	Named list, `resources` argument to `future::future()`. This argument is not supported in some versions of `future`. For versions of `future` where `resources` is not supported, instead supply `resources` to `future::tweak()` and assign the returned plan to the `plan` argument of `tar_resources_future()`. The default value of `resources` in `tar_resources_future()` is an empty list.

Value

Object of class `"tar_resources_future"`, to be supplied to the `future` argument of `tar_resources()`.

Resources

Functions tar_target() and tar_option_set() each takes an optional resources argument to supply non-default settings of various optional backends for data storage and high-performance computing. The tar_resources() function is a helper to supply those settings in the correct manner.

In targets version 0.12.2 and above, resources are inherited one-by-one in nested fashion from tar_option_get("resources"). For example, suppose you set tar_option_set(resources = tar_resources(aws = my_aws)), where my_aws equals tar_resources_aws(bucket = "x", prefix = "y"). Then, tar_target(data, get_data() will have bucket "x" and prefix "y". In addition, if new_resources equals tar_resources(aws = tar_resources_aws(bucket = "z"))), then tar_target(data, get_data(), resources = new_resources) will use the new bucket "z", but it will still use the prefix "y" supplied through tar_option_set(). (In targets 0.12.1 and below, options like prefix do not carry over from tar_option_set() if you supply non-default resources to tar_target().)

See Also

Other resources: tar_resources_aws(), tar_resources_clustermq(), tar_resources_feather(), tar_resources_fst(), tar_resources_gcp(), tar_resources_parquet(), tar_resources_qs(), tar_resources_url(), tar_resources()

Examples

```
# Somewhere in you target script file (usually _targets.R):
tar_target(
  name,
  command(),
  resources = tar_resources(
    future = tar_resources_future(resources = list(n_cores = 2))
  )
)
```

---

tar_resources_gcp *Target resources: Google Cloud Platform (GCP) Google Cloud Storage (GCS)*

Description

Create the gcp argument of tar_resources() to specify optional settings for Google Cloud Storage for targets with tar_target(..., repository = "gcp"). See the format argument of tar_target() for details.

Usage

```
tar_resources_gcp(
  bucket = targets::tar_option_get("resources")$gcp$bucket,
  prefix = targets::tar_option_get("resources")$gcp$prefix,
```

```
  predefined_acl = targets::tar_option_get("resources")$gcp$predefined_acl,
  verbose = targets::tar_option_get("resources")$gcp$verbose
)
```

Arguments

bucket	Character of length 1, name of an existing bucket to upload and download the return values of the affected targets during the pipeline.
prefix	Character of length 1, "directory path" in the bucket where the target return values are stored. Defaults to `targets::tar_path_objects_dir_cloud()`.
predefined_acl	Character of length 1, user access to the object. See ?googleCloudStorageR::gcs_upload for possible values. Defaults to "private".
verbose	Logical of length 1, whether to print extra messages like progress bars during uploads and downloads. Defaults to FALSE.

Details

See the cloud storage section of https://books.ropensci.org/targets/data.html for details for instructions.

Value

Object of class "tar_resources_gcp", to be supplied to the gcp argument of `tar_resources()`.

Resources

Functions `tar_target()` and `tar_option_set()` each takes an optional `resources` argument to supply non-default settings of various optional backends for data storage and high-performance computing. The `tar_resources()` function is a helper to supply those settings in the correct manner.

In `targets` version 0.12.2 and above, resources are inherited one-by-one in nested fashion from `tar_option_get("resources")`. For example, suppose you set `tar_option_set(resources = tar_resources(aws = my_aws))`, where `my_aws` equals `tar_resources_aws(bucket = "x", prefix = "y")`. Then, `tar_target(data, get_data()` will have bucket "x" and prefix "y". In addition, if `new_resources` equals `tar_resources(aws = tar_resources_aws(bucket = "z")))`, then `tar_target(data, get_data(), resources = new_resources)` will use the new bucket "z", but it will still use the prefix "y" supplied through `tar_option_set()`. (In `targets` 0.12.1 and below, options like `prefix` do not carry over from `tar_option_set()` if you supply non-default resources to `tar_target()`.)

See Also

Other resources: `tar_resources_aws()`, `tar_resources_clustermq()`, `tar_resources_feather()`, `tar_resources_fst()`, `tar_resources_future()`, `tar_resources_parquet()`, `tar_resources_qs()`, `tar_resources_url()`, `tar_resources()`

Examples

```
# Somewhere in you target script file (usually _targets.R):
tar_target(
  name,
  command(),
  format = "qs",
  repository = "gcp",
  resources = tar_resources(
    gcp = tar_resources_gcp(bucket = "yourbucketname"),
    qs = tar_resources_qs(preset = "fast")
  )
)
```

---

tar_resources_parquet *Target resources: parquet storage formats*

Description

Create the `parquet` argument of `tar_resources()` to specify optional settings for parquet data frame storage formats powered by the `arrow` R package. See the `format` argument of `tar_target()` for details.

Usage

```
tar_resources_parquet(
  compression = targets::tar_option_get("resources")$parquet$compression,
  compression_level = targets::tar_option_get("resources")$parquet$compression_level
)
```

Arguments

`compression`	Character of length 1, `compression` argument of `arrow::write_parquet()`. Defaults to `"snappy"`.
`compression_level`	Numeric of length 1, `compression_level` argument of `arrow::write_parquet()`. Defaults to `NULL`.

Value

Object of class `"tar_resources_parquet"`, to be supplied to the parquet argument of `tar_resources()`.

Resources

Functions `tar_target()` and `tar_option_set()` each takes an optional `resources` argument to supply non-default settings of various optional backends for data storage and high-performance computing. The `tar_resources()` function is a helper to supply those settings in the correct manner.

In targets version 0.12.2 and above, resources are inherited one-by-one in nested fashion from tar_option_get("resources"). For example, suppose you set tar_option_set(resources = tar_resources(aws = my_aws)), where my_aws equals tar_resources_aws(bucket = "x", prefix = "y"). Then, tar_target(data, get_data() will have bucket "x" and prefix "y". In addition, if new_resources equals tar_resources(aws = tar_resources_aws(bucket = "z"))), then tar_target(data, get_data(), resources = new_resources) will use the new bucket "z", but it will still use the prefix "y" supplied through tar_option_set(). (In targets 0.12.1 and below, options like prefix do not carry over from tar_option_set() if you supply non-default resources to tar_target().)

See Also

Other resources: tar_resources_aws(), tar_resources_clustermq(), tar_resources_feather(), tar_resources_fst(), tar_resources_future(), tar_resources_gcp(), tar_resources_qs(), tar_resources_url(), tar_resources()

Examples

```
# Somewhere in you target script file (usually _targets.R):
tar_target(
  name,
  command(),
  format = "parquet",
  resources = tar_resources(
    parquet = tar_resources_parquet(compression = "lz4")
  )
)
```

---

tar_resources_qs *Target resources: qs storage formats*

Description

Create the qs argument of tar_resources() to specify optional settings for big data storage formats powered by the qs R package. See the format argument of tar_target() for details.

Usage

```
tar_resources_qs(preset = targets::tar_option_get("resources")$qs$preset)
```

Arguments

preset	Character of length 1, preset argument of qs::qsave(). Defaults to "high".

Value

Object of class "tar_resources_qs", to be supplied to the qs argument of tar_resources().

Resources

Functions tar_target() and tar_option_set() each takes an optional resources argument to supply non-default settings of various optional backends for data storage and high-performance computing. The tar_resources() function is a helper to supply those settings in the correct manner.

In targets version 0.12.2 and above, resources are inherited one-by-one in nested fashion from tar_option_get("resources"). For example, suppose you set tar_option_set(resources = tar_resources(aws = my_aws)), where my_aws equals tar_resources_aws(bucket = "x", prefix = "y"). Then, tar_target(data, get_data() will have bucket "x" and prefix "y". In addition, if new_resources equals tar_resources(aws = tar_resources_aws(bucket = "z"))), then tar_target(data, get_data(), resources = new_resources) will use the new bucket "z", but it will still use the prefix "y" supplied through tar_option_set(). (In targets 0.12.1 and below, options like prefix do not carry over from tar_option_set() if you supply non-default resources to tar_target().)

See Also

Other resources: tar_resources_aws(), tar_resources_clustermq(), tar_resources_feather(), tar_resources_fst(), tar_resources_future(), tar_resources_gcp(), tar_resources_parquet(), tar_resources_url(), tar_resources()

Examples

```
# Somewhere in you target script file (usually _targets.R):
tar_target(
  name,
  command(),
  format = "qs",
  resources = tar_resources(
    qs = tar_resources_qs(preset = "fast")
  )
)
```

---

tar_resources_url *Target resources: URL storage formats*

Description

Create the url argument of tar_resources() to specify optional settings for URL storage formats. See the format argument of tar_target() for details.

Usage

```
tar_resources_url(handle = targets::tar_option_get("resources")$url$handle)
```

Arguments

handle	Object returned by curl::new_handle or NULL. Defaults to NULL.

Value

Object of class "tar_resources_url", to be supplied to the url argument of tar_resources().

Resources

Functions tar_target() and tar_option_set() each takes an optional resources argument to supply non-default settings of various optional backends for data storage and high-performance computing. The tar_resources() function is a helper to supply those settings in the correct manner.

In targets version 0.12.2 and above, resources are inherited one-by-one in nested fashion from tar_option_get("resources"). For example, suppose you set tar_option_set(resources = tar_resources(aws = my_aws)), where my_aws equals tar_resources_aws(bucket = "x", prefix = "y"). Then, tar_target(data, get_data() will have bucket "x" and prefix "y". In addition, if new_resources equals tar_resources(aws = tar_resources_aws(bucket = "z"))), then tar_target(data, get_data(), resources = new_resources) will use the new bucket "z", but it will still use the prefix "y" supplied through tar_option_set(). (In targets 0.12.1 and below, options like prefix do not carry over from tar_option_set() if you supply non-default resources to tar_target().)

See Also

Other resources: tar_resources_aws(), tar_resources_clustermq(), tar_resources_feather(), tar_resources_fst(), tar_resources_future(), tar_resources_gcp(), tar_resources_parquet(), tar_resources_qs(), tar_resources()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
# Somewhere in you target script file (usually _targets.R):
tar_target(
  name,
  command(),
  format = "url",
  resources = tar_resources(
    url = tar_resources_url(handle = curl::new_handle())
  )
)
}
```

---

tar_script *Write a target script file.*

Description

The tar_script() function is a convenient way to create the required target script file (default: _targets.R) in the current working directory. It always overwrites the existing target script, and it requires you to be in the working directory where you intend to write the file, so be careful. See the "Target script" section for details.

Usage

```
tar_script(
  code = NULL,
  library_targets = TRUE,
  ask = NULL,
  script = targets::tar_config_get("script")
)
```

Arguments

code	R code to write to the target script file. If NULL, an example target script file is written instead.
library_targets	logical, whether to write a library(targets) line at the top of the target script file automatically (recommended). If TRUE, you do not need to explicitly put library(targets) in code.
ask	Logical, whether to ask before writing if the target script file already exists. If NULL, defaults to Sys.getenv("TAR_ASK"). (Set to "true" or "false" with Sys.setenv()). If ask and the TAR_ASK environment variable are both indeterminate, defaults to interactive().
script	Character of length 1, where to write the target script file. Defaults to tar_config_get("script"), which in turn defaults to _targets.R.

Value

NULL (invisibly).

Target script file

Every targets project requires a target script file. The target script file is usually a file called _targets.R Functions tar_make() and friends look for the target script and run it to set up the pipeline just prior to the main task. Every target script file should run the following steps in the order below: 1. Package: load the targets package. This step is automatically inserted at the top of the target script file produced by tar_script() if library_targets is TRUE, so you do not need to explicitly include it in code. 1. Globals: load custom functions and global objects into memory. Usually, this section is a bunch of calls to source() that run scripts defining user-defined functions. These functions support the R commands of the targets. 2. Options: call tar_option_set() to set defaults for targets-specific settings such as the names of required packages. Even if you have no specific options to set, it is still recommended to call tar_option_set() in order to register the proper environment. 3. Targets: define one or more target objects using tar_target(). 4. Pipeline: call list() to bring the targets from (3) together in a pipeline object. Every target script file must return a pipeline object, which usually means ending with a call to list(). In practice, (3) and (4) can be combined together in the same function call.

See Also

Other scripts: tar_edit(), tar_github_actions(), tar_helper_raw(), tar_helper(), tar_renv()

Examples

```
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script() # Writes an example target script file.
# Writes a user-defined target script:
tar_script({
  x <- tar_target(x, 1 + 1)
  tar_option_set()
  list(x)
}, ask = FALSE)
writeLines(readLines("_targets.R"))
})
```

---

tar_seed *Get the random number generator seed of the target currently running.*

Description

Get the random number generator seed of the target currently running.

Usage

```
tar_seed(default = 1L)
```

Arguments

`default`	Integer, value to return if `tar_seed()` is called on its own outside a `targets` pipeline. Having a default lets users run things without `tar_make()`, which helps peel back layers of code and troubleshoot bugs.

Details

A target's random number generator seed is a deterministic function of its name. In this way, each target runs with a reproducible seed so someone else running the same pipeline should get the same results, and no two targets in the same pipeline share the same seed. (Even dynamic branches have different names and thus different seeds.) You can retrieve the seed of a completed target with `tar_meta(your_target, seed)` and run `set.seed()` on the result to locally recreate the target's initial RNG state.

Value

Integer of length 1. If invoked inside a `targets` pipeline, the return value is the seed of the target currently running, which is a deterministic function of the target name. Otherwise, the return value is `default`.

See Also

Other utilities: `tar_active()`, `tar_call()`, `tar_cancel()`, `tar_definition()`, `tar_envir()`, `tar_group()`, `tar_name()`, `tar_path()`, `tar_source()`, `tar_store()`

Examples

```
tar_seed()
tar_seed(default = 123L)
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(tar_target(returns_seed, tar_seed()), ask = FALSE)
tar_make()
tar_read(returns_seed)
})
}
```

---

tar_sitrep *Show the cue-by-cue status of each target.*

Description

For each target, report which cues are activated. Except for the `never` cue, the target will rerun in `tar_make()` if any cue is activated. The target is suppressed if the `never` cue is `TRUE`. See `tar_cue()` for details.

Usage

```
tar_sitrep(
  names = NULL,
  fields = NULL,
  shortcut = targets::tar_config_get("shortcut"),
  reporter = targets::tar_config_get("reporter_outdated"),
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function, reporter),
  envir = parent.frame(),
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

`names`	Optional, names of the targets. If supplied, `tar_sitrep()` only returns metadata on these targets. You can supply symbols or `tidyselect` helpers like `starts_with()`.
`fields`	Optional, names of columns/fields to select. If supplied, `tar_sitrep()` only returns the selected metadata columns. You can supply symbols or `tidyselect` helpers like `all_of()` and `starts_with()`. The `name` column is always included first no matter what you select. Choices: • `name`: name of the target or global object. • `record`: Whether the `record` cue is activated: `TRUE` if the target is not in the metadata (`tar_meta()`), or if the target errored during the last `tar_make()`, or if the class of the target changed.

- always: Whether mode in tar_cue() is "always". If TRUE, tar_make() always runs the target.
- never: Whether mode in tar_cue() is "never". If TRUE, tar_make() will only run if the record cue activates.
- command: Whether the target's command changed since last time. Always TRUE if the record cue is activated. Otherwise, always FALSE if the command cue is suppressed.
- depend: Whether the data/output of at least one of the target's dependencies changed since last time. Dependencies are targets, functions, and global objects directly upstream. Call tar_outdated(targets_only = FALSE) or tar_visnetwork(targets_only = FALSE) to see exactly which dependencies are outdated. Always NA if the record cue is activated. Otherwise, always FALSE if the depend cue is suppressed.
- format: Whether the storage format of the target is different from last time. Always NA if the record cue is activated. Otherwise, always FALSE if the format cue is suppressed.
- repository: Whether the storage repository of the target is different from last time. Always NA if the record cue is activated. Otherwise, always FALSE if the format cue is suppressed.
- iteration: Whether the iteration mode of the target is different from last time. Always NA if the record cue is activated. Otherwise, always FALSE if the iteration cue is suppressed.
- file: Whether the file(s) with the target's return value are missing or different from last time. Always NA if the record cue is activated. Otherwise, always FALSE if the file cue is suppressed.

shortcut — Logical of length 1, how to interpret the names argument. If shortcut is FALSE (default) then the function checks all targets upstream of names as far back as the dependency graph goes. If TRUE, then the function only checks the targets in names and uses stored metadata for information about upstream dependencies as needed. shortcut = TRUE increases speed if there are a lot of up-to-date targets, but it assumes all the dependencies are up to date, so please use with caution. Use with caution. shortcut = TRUE only works if you set names.

reporter — Character of length 1, name of the reporter to user. Controls how messages are printed as targets are checked. Choices:

- "silent": print nothing.
- "forecast": print running totals of the checked and outdated targets found so far.

callr_function — A function from callr to start a fresh clean R process to do the work. Set to NULL to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). callr_function needs to be NULL for interactive debugging, e.g. tar_option_set(debug = "your_target"). However, callr_function should not be NULL for serious reproducible work.

callr_arguments — A list of arguments to callr_function.

envir — An environment, where to run the target R script (default: `_targets.R`) if `callr_function` is `NULL`. Ignored if `callr_function` is anything other than `NULL`. `callr_function` should only be `NULL` for debugging and testing purposes, not for serious runs of a pipeline, etc.
The `envir` argument of `tar_make()` and related functions always overrides the current value of `tar_option_get("envir")` in the current R session just before running the target script file, so whenever you need to set an alternative `envir`, you should always set it with `tar_option_set()` from within the target script file. In other words, if you call `tar_option_set(envir = envir1)` in an interactive session and then `tar_make(envir = envir2, callr_function = NULL)`, then `envir2` will be used.

script — Character of length 1, path to the target script file. Defaults to `tar_config_get("script")`, which in turn defaults to `_targets.R`. When you set this argument, the value of `tar_config_get("script")` is temporarily changed for the current function call. See `tar_script()`, `tar_config_get()`, and `tar_config_set()` for details about the target script file and how to set it persistently for a project.

store — Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Details

Caveats:

- `tar_cue()` allows you to change/suppress cues, so the return value will depend on the settings you supply to `tar_cue()`.
- If a pattern tries to branches over a target that does not exist in storage, then the branches are omitted from the output.
- `tar_sitrep()` is myopic. It only considers what happens to the immediate target and its immediate upstream dependencies, and it makes no attempt to propagate invalidation downstream.

Value

A data frame with one row per target/object and one column per cue. Each element is a logical to indicate whether the cue is activated for the target. See the `field` argument in this help file for details.

See Also

Other inspect: `tar_deps_raw()`, `tar_deps()`, `tar_manifest()`, `tar_network()`, `tar_outdated()`, `tar_validate()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
```

```
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, 2 * x, pattern = map(x))
  )
}, ask = FALSE)
tar_make()
tar_sitrep()
tar_meta(starts_with("y_")) # see also all_of()
})
}
```

`tar_skipped` *List skipped targets.*

Description

List targets whose progress is `"skipped"`.

Usage

```
tar_skipped(names = NULL, store = targets::tar_config_get("store"))
```

Arguments

`names`	Optional, names of the targets. If supplied, the function restricts its output to these targets. You can supply symbols or `tidyselect` helpers like `all_of()` and `starts_with()`.
`store`	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Value

A character vector of skipped targets.

See Also

Other progress: `tar_built()`, `tar_canceled()`, `tar_errored()`, `tar_poll()`, `tar_progress_branches()`, `tar_progress_summary()`, `tar_progress()`, `tar_started()`, `tar_watch_server()`, `tar_watch_ui()`, `tar_watch()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, 2 * x, pattern = map(x))
  )
}, ask = FALSE)
tar_make()
tar_skipped()
tar_skipped(starts_with("y_")) # see also all_of()
})
}
```

---

tar_source *Run R scripts.*

Description

Run all the R scripts in a directory in the environment specified.

Usage

```
tar_source(files = "R", envir = targets::tar_option_get("envir"))
```

Arguments

files	Character vector of file and directory paths to look for R scripts to run.
envir	Environment to run the scripts. Defaults to `tar_option_get("envir")`, the environment of the pipeline.

Details

`tar_source()` is a convenient way to load R scripts in `_targets.R` to make custom functions available to the pipeline. `tar_source()` recursively looks for files ending in `.R` or `.r`, and it runs each with `eval(parse(text = readLines(script_file, warn = FALSE)), envir)`.

Value

`NULL` (invisibly)

See Also

Other utilities: `tar_active()`, `tar_call()`, `tar_cancel()`, `tar_definition()`, `tar_envir()`, `tar_group()`, `tar_name()`, `tar_path()`, `tar_seed()`, `tar_store()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
# Running in tar_dir(), these files are written in tempdir().
dir.create("R")
writeLines("f <- function(x) x + 1", file.path("R", "functions.R"))
tar_script({
  tar_source()
  list(tar_target(x, f(1)))
})
tar_make()
tar_read(x) # 2
})
}
```

---

tar_started *List started targets.*

Description

List targets whose progress is "started".

Usage

```
tar_started(names = NULL, store = targets::tar_config_get("store"))
```

Arguments

names	Optional, names of the targets. If supplied, the function restricts its output to these targets. You can supply symbols or tidyselect helpers like all_of() and starts_with().
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

A character vector of started targets.

See Also

Other progress: tar_built(), tar_canceled(), tar_errored(), tar_poll(), tar_progress_branches(), tar_progress_summary(), tar_progress(), tar_skipped(), tar_watch_server(), tar_watch_ui(), tar_watch()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(
    tar_target(x, seq_len(2)),
    tar_target(y, 2 * x, pattern = map(x))
  )
}, ask = FALSE)
tar_make()
tar_started()
tar_started(starts_with("y_")) # see also all_of()
})
}
```

---

tar_store *Current data store path*

Description

Identify the file path to the data store of the pipeline currently running.

Usage

```
tar_store()
```

Value

Character, file path to the data store of the pipeline currently running. If called outside of the pipeline currently running, `tar_store()` returns `tar_config_get("store")`.

See Also

Other utilities: `tar_active()`, `tar_call()`, `tar_cancel()`, `tar_definition()`, `tar_envir()`, `tar_group()`, `tar_name()`, `tar_path()`, `tar_seed()`, `tar_source()`

Examples

```
tar_store()
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(tar_target(x, tar_store()), ask = FALSE)
store <- tempfile()
tar_make(store = store)
tar_read(x, store = store)
})
}
```

`tar_target` *Declare a target.*

Description

A target is a single step of computation in a pipeline. It runs an R command and returns a value. This value gets treated as an R object that can be used by the commands of targets downstream. Targets that are already up to date are skipped. See the user manual for more details.

Usage

```
tar_target(
  name,
  command,
  pattern = NULL,
  tidy_eval = targets::tar_option_get("tidy_eval"),
  packages = targets::tar_option_get("packages"),
  library = targets::tar_option_get("library"),
  format = targets::tar_option_get("format"),
  repository = targets::tar_option_get("repository"),
  iteration = targets::tar_option_get("iteration"),
  error = targets::tar_option_get("error"),
  memory = targets::tar_option_get("memory"),
  garbage_collection = targets::tar_option_get("garbage_collection"),
  deployment = targets::tar_option_get("deployment"),
  priority = targets::tar_option_get("priority"),
  resources = targets::tar_option_get("resources"),
  storage = targets::tar_option_get("storage"),
  retrieval = targets::tar_option_get("retrieval"),
  cue = targets::tar_option_get("cue")
)
```

Arguments

`name`	Symbol, name of the target. A target name must be a valid name for a symbol in R, and it must not start with a dot. Subsequent targets can refer to this name symbolically to induce a dependency relationship: e.g. `tar_target(downstream_target, f(upstream_target))` is a target named `downstream_target` which depends on a target `upstream_target` and a function `f()`. In addition, a target's name determines its random number generator seed. In this way, each target runs with a reproducible seed so someone else running the same pipeline should get the same results, and no two targets in the same pipeline share the same seed. (Even dynamic branches have different names and thus different seeds.) You can recover the seed of a completed target with `tar_meta(your_target, seed)` and run `set.seed()` on the result to locally recreate the target's initial RNG state.
`command`	R code to run the target.

`pattern` Language to define branching for a target. For example, in a pipeline with numeric vector targets `x` and `y`, `tar_target(z, x + y, pattern = map(x, y))` implicitly defines branches of `z` that each compute `x[1] + y[1]`, `x[2] + y[2]`, and so on. See the user manual for details.

`tidy_eval` Logical, whether to enable tidy evaluation when interpreting `command` and `pattern`. If `TRUE`, you can use the "bang-bang" operator `!!` to programmatically insert the values of global objects.

`packages` Character vector of packages to load right before the target builds or the output data is reloaded for downstream targets. Use `tar_option_set()` to set packages globally for all subsequent targets you define.

`library` Character vector of library paths to try when loading `packages`.

`format` Optional storage format for the target's return value. With the exception of `format = "file"`, each target gets a file in `_targets/objects`, and each format is a different way to save and load this file. See the "Storage formats" section for a detailed list of possible data storage formats.

`repository` Character of length 1, remote repository for target storage. Choices:

- `"local"`: file system of the local machine.
- `"aws"`: Amazon Web Services (AWS) S3 bucket. Can be configured with a non-AWS S3 bucket using the `endpoint` argument of `tar_resources_aws()`, but versioning capabilities may be lost in doing so. See the cloud storage section of https://books.ropensci.org/targets/data.html for details for instructions.
- `"gcp"`: Google Cloud Platform storage bucket. See the cloud storage section of https://books.ropensci.org/targets/data.html for details for instructions.

Note: if `repository` is not `"local"` and `format` is `"file"` then the target should create a single output file. That output file is uploaded to the cloud and tracked for changes where it exists in the cloud. The local file is deleted after the target runs.

`iteration` Character of length 1, name of the iteration mode of the target. Choices:

- `"vector"`: branching happens with `vctrs::vec_slice()` and aggregation happens with `vctrs::vec_c()`.
- `"list"`, branching happens with `[[]]` and aggregation happens with `list()`.
- `"group"`: `dplyr::group_by()`-like functionality to branch over subsets of a data frame. The target's return value must be a data frame with a special `tar_group` column of consecutive integers from 1 through the number of groups. Each integer designates a group, and a branch is created for each collection of rows in a group. See the `tar_group()` function to see how you can create the special `tar_group` column with `dplyr::group_by()`.

`error` Character of length 1, what to do if the target stops and throws an error. Options:

- `"stop"`: the whole pipeline stops and throws an error.
- `"continue"`: the whole pipeline keeps going.
- `"abridge"`: any currently running targets keep running, but no new targets launch after that. (Visit https://books.ropensci.org/targets/debugging.html to learn how to debug targets using saved workspaces.)

- `"null"`: The errored target continues and returns `NULL`. The data hash is deliberately wrong so the target is not up to date for the next run of the pipeline.

`memory` Character of length 1, memory strategy. If `"persistent"`, the target stays in memory until the end of the pipeline (unless `storage` is `"worker"`, in which case `targets` unloads the value from memory right after storing it in order to avoid sending copious data over a network). If `"transient"`, the target gets unloaded after every new target completes. Either way, the target gets automatically loaded into memory whenever another target needs the value. For cloud-based dynamic files (e.g. `format = "file"` with `repository = "aws"`), this memory strategy applies to the temporary local copy of the file: `"persistent"` means it remains until the end of the pipeline and is then deleted, and `"transient"` means it gets deleted as soon as possible. The former conserves bandwidth, and the latter conserves local storage.

`garbage_collection`
Logical, whether to run `base::gc()` just before the target runs.

`deployment` Character of length 1, only relevant to `tar_make_clustermq()` and `tar_make_future()`. If `"worker"`, the target builds on a parallel worker. If `"main"`, the target builds on the host machine / process managing the pipeline.

`priority` Numeric of length 1 between 0 and 1. Controls which targets get deployed first when multiple competing targets are ready simultaneously. Targets with priorities closer to 1 get built earlier (and polled earlier in `tar_make_future()`).

`resources` Object returned by `tar_resources()` with optional settings for high-performance computing functionality, alternative data storage formats, and other optional capabilities of `targets`. See `tar_resources()` for details.

`storage` Character of length 1, only relevant to `tar_make_clustermq()` and `tar_make_future()`. Must be one of the following values:

- `"main"`: the target's return value is sent back to the host machine and saved/uploaded locally.
- `"worker"`: the worker saves/uploads the value.
- `"none"`: almost never recommended. It is only for niche situations, e.g. the data needs to be loaded explicitly from another language. If you do use it, then the return value of the target is totally ignored when the target ends, but each downstream target still attempts to load the data file (except when `retrieval = "none"`).
  If you select `storage = "none"`, then the return value of the target's command is ignored, and the data is not saved automatically. As with dynamic files (`format = "file"`) it is the responsibility of the user to write to `tar_path()` from inside the target. An example target could look something like tar_target(x, saveRDS("value", tar_path(create_dir = TRUE)); "ignored", storage = "none")‘.
  The distinguishing feature of `storage = "none"` (as opposed to `format = "file"`) is that in the general case, downstream targets will automatically try to load the data from the data store as a dependency. As a corollary, `storage = "none"` is completely unnecessary if `format` is `"file"`.

`retrieval` Character of length 1, only relevant to `tar_make_clustermq()` and `tar_make_future()`. Must be one of the following values:

- "main": the target's dependencies are loaded on the host machine and sent to the worker before the target builds.
- "worker": the worker loads the targets dependencies.
- "none": the dependencies are not loaded at all. This choice is almost never recommended. It is only for niche situations, e.g. the data needs to be loaded explicitly from another language.

cue An optional object from tar_cue() to customize the rules that decide whether the target is up to date.

Value

A target object. Users should not modify these directly, just feed them to list() in your target script file (default: _targets.R).

Target objects

Functions like tar_target() produce target objects, special objects with specialized sets of S3 classes. Target objects represent skippable steps of the analysis pipeline as described at https://books.ropensci.org/targets/. Please read the walkthrough at https://books.ropensci.org/targets/walkthrough.html to understand the role of target objects in analysis pipelines.

For developers, https://wlandau.github.io/targetopia/contributing.html#target-factories explains target factories (functions like this one which generate targets) and the design specification at https://books.ropensci.org/targets-design/ details the structure and composition of target objects.

Storage formats

- "rds": Default, uses saveRDS() and readRDS(). Should work for most objects, but slow.
- "qs": Uses qs::qsave() and qs::qread(). Should work for most objects, much faster than "rds". Optionally set the preset for qsave() through tar_resources() and tar_resources_qs().
- "feather": Uses arrow::write_feather() and arrow::read_feather() (version 2.0). Much faster than "rds", but the value must be a data frame. Optionally set compression and compression_level in arrow::write_feather() through tar_resources() and tar_resources_feather(). Requires the arrow package (not installed by default).
- "parquet": Uses arrow::write_parquet() and arrow::read_parquet() (version 2.0). Much faster than "rds", but the value must be a data frame. Optionally set compression and compression_level in arrow::write_parquet() through tar_resources() and tar_resources_parquet(). Requires the arrow package (not installed by default).
- "fst": Uses fst::write_fst() and fst::read_fst(). Much faster than "rds", but the value must be a data frame. Optionally set the compression level for fst::write_fst() through tar_resources() and tar_resources_fst(). Requires the fst package (not installed by default).
- "fst_dt": Same as "fst", but the value is a data.table. Optionally set the compression level the same way as for "fst".
- "fst_tbl": Same as "fst", but the value is a tibble. Optionally set the compression level the same way as for "fst".

- `"keras"`: Uses `keras::save_model_hdf5()` and `keras::load_model_hdf5()`. The value must be a Keras model. Requires the `keras` package (not installed by default).
- `"torch"`: Uses `torch::torch_save()` and `torch::torch_load()`. The value must be an object from the `torch` package such as a tensor or neural network module. Requires the `torch` package (not installed by default).
- `"file"`: A dynamic file. To use this format, the target needs to manually identify or save some data and return a character vector of paths to the data (must be a single file path if `repository` is not `"local"`). (These paths must be existing files and nonempty directories.) Then, `targets` automatically checks those files and cues the appropriate build decisions if those files are out of date. Those paths must point to files or directories, and they must not contain characters `|` or `*`. All the files and directories you return must actually exist, or else `targets` will throw an error. (And if `storage` is `"worker"`, `targets` will first stall out trying to wait for the file to arrive over a network file system.) If the target does not create any files, the return value should be `character(0)`.

  If `repository` is not `"local"` and `format` is `"file"`, then the character vector returned by the target must be of length 1 and point to a single file. (Directories and vectors of multiple file paths are not supported for dynamic files on the cloud.) That output file is uploaded to the cloud and tracked for changes where it exists in the cloud. The local file is deleted after the target runs.
- `"url"`: A dynamic input URL. For this storage format, `repository` is implicitly `"local"`, URL format is like `format = "file"` except the return value of the target is a URL that already exists and serves as input data for downstream targets. Optionally supply a custom `curl` handle through `tar_resources()` and `tar_resources_url()`. in `new_handle()`, `nobody = TRUE` is important because it ensures `targets` just downloads the metadata instead of the entire data file when it checks time stamps and hashes. The data file at the URL needs to have an ETag or a Last-Modified time stamp, or else the target will throw an error because it cannot track the data. Also, use extreme caution when trying to use `format = "url"` to track uploads. You must be absolutely certain the ETag and Last-Modified time stamp are fully updated and available by the time the target's command finishes running. `targets` makes no attempt to wait for the web server.
- A custom format can be supplied with `tar_format()`. For this choice, it is the user's responsibility to provide methods for (un)serialization and (un)marshaling the return value of the target.
- The formats starting with `"aws_"` are deprecated as of 2022-03-13 (`targets` version > `0.10.0`). For cloud storage itory‘ argument instead.

See Also

Other targets: `tar_cue()`, `tar_format()`, `tar_target_raw()`

Examples

```
# Defining targets does not run them.
data <- tar_target(target_name, get_data(), packages = "tidyverse")
analysis <- tar_target(analysis, analyze(x), pattern = map(x))
# Pipelines accept targets.
pipeline <- list(data, analysis)
# Tidy evaluation
```

```
tar_option_set(envir = environment())
n_rows <- 30L
data <- tar_target(target_name, get_data(!!n_rows))
print(data)
# Disable tidy evaluation:
data <- tar_target(target_name, get_data(!!n_rows), tidy_eval = FALSE)
print(data)
tar_option_reset()
# In a pipeline:
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(tar_target(x, 1 + 1), ask = FALSE)
tar_make()
tar_read(x)
})
}
```

`tar_target_raw` *Define a target using unrefined names and language objects.*

Description

`tar_target_raw()` is just like `tar_target()` except it avoids non-standard evaluation for the arguments: `name` is a character string, `command` and `pattern` are language objects, and there is no `tidy_eval` argument. Use `tar_target_raw()` instead of `tar_target()` if you are creating entire batches of targets programmatically (metaprogramming, static branching).

Usage

```
tar_target_raw(
  name,
  command,
  pattern = NULL,
  packages = targets::tar_option_get("packages"),
  library = targets::tar_option_get("library"),
  deps = NULL,
  string = NULL,
  format = targets::tar_option_get("format"),
  repository = targets::tar_option_get("repository"),
  iteration = targets::tar_option_get("iteration"),
  error = targets::tar_option_get("error"),
  memory = targets::tar_option_get("memory"),
  garbage_collection = targets::tar_option_get("garbage_collection"),
  deployment = targets::tar_option_get("deployment"),
  priority = targets::tar_option_get("priority"),
  resources = targets::tar_option_get("resources"),
  storage = targets::tar_option_get("storage"),
  retrieval = targets::tar_option_get("retrieval"),
```

```
  cue = targets::tar_option_get("cue")
)
```

Arguments

name	Character of length 1, name of the target. A target name must be a valid name for a symbol in R, and it must not start with a dot. Subsequent targets can refer to this name symbolically to induce a dependency relationship: e.g. `tar_target(downstream_target, f(upstream_target))` is a target named `downstream_target` which depends on a target `upstream_target` and a function `f()`. In addition, a target's name determines its random number generator seed. In this way, each target runs with a reproducible seed so someone else running the same pipeline should get the same results, and no two targets in the same pipeline share the same seed. (Even dynamic branches have different names and thus different seeds.) You can recover the seed of a completed target with `tar_meta(your_target, seed)` and run `set.seed()` on the result to locally recreate the target's initial RNG state.
command	Similar to the `command` argument of `tar_target()` except the object must already be an expression instead of informally quoted code. `base::expression()` and `base::quote()` can produce such objects.
pattern	Similar to the `pattern` argument of `tar_target()` except the object must already be an expression instead of informally quoted code. `base::expression()` and `base::quote()` can produce such objects.
packages	Character vector of packages to load right before the target builds or the output data is reloaded for downstream targets. Use `tar_option_set()` to set packages globally for all subsequent targets you define.
library	Character vector of library paths to try when loading `packages`.
deps	Optional character vector of the adjacent upstream dependencies of the target, including targets and global objects. If `NULL`, dependencies are resolved automatically as usual.
string	Optional string representation of the command. Internally, the string gets hashed to check if the command changed since last run, which helps `targets` decide whether the target is up to date. External interfaces can take control of `string` to ignore changes in certain parts of the command. If `NULL`, the strings is just deparsed from `command` (default).
format	Optional storage format for the target's return value. With the exception of `format = "file"`, each target gets a file in `_targets/objects`, and each format is a different way to save and load this file. See the "Storage formats" section for a detailed list of possible data storage formats.
repository	Character of length 1, remote repository for target storage. Choices: • `"local"`: file system of the local machine. • `"aws"`: Amazon Web Services (AWS) S3 bucket. Can be configured with a non-AWS S3 bucket using the `endpoint` argument of `tar_resources_aws()`, but versioning capabilities may be lost in doing so. See the cloud storage section of https://books.ropensci.org/targets/data.html for details for instructions.

- "gcp": Google Cloud Platform storage bucket. See the cloud storage section of https://books.ropensci.org/targets/data.html for details for instructions.

Note: if repository is not "local" and format is "file" then the target should create a single output file. That output file is uploaded to the cloud and tracked for changes where it exists in the cloud. The local file is deleted after the target runs.

iteration Character of length 1, name of the iteration mode of the target. Choices:

- "vector": branching happens with vctrs::vec_slice() and aggregation happens with vctrs::vec_c().
- "list", branching happens with [[]] and aggregation happens with list().
- "group": dplyr::group_by()-like functionality to branch over subsets of a data frame. The target's return value must be a data frame with a special tar_group column of consecutive integers from 1 through the number of groups. Each integer designates a group, and a branch is created for each collection of rows in a group. See the tar_group() function to see how you can create the special tar_group column with dplyr::group_by().

error Character of length 1, what to do if the target stops and throws an error. Options:

- "stop": the whole pipeline stops and throws an error.
- "continue": the whole pipeline keeps going.
- "abridge": any currently running targets keep running, but no new targets launch after that. (Visit https://books.ropensci.org/targets/debugging.html to learn how to debug targets using saved workspaces.)
- "null": The errored target continues and returns NULL. The data hash is deliberately wrong so the target is not up to date for the next run of the pipeline.

memory Character of length 1, memory strategy. If "persistent", the target stays in memory until the end of the pipeline (unless storage is "worker", in which case targets unloads the value from memory right after storing it in order to avoid sending copious data over a network). If "transient", the target gets unloaded after every new target completes. Either way, the target gets automatically loaded into memory whenever another target needs the value. For cloud-based dynamic files (e.g. format = "file" with repository = "aws"), this memory strategy applies to the temporary local copy of the file: "persistent" means it remains until the end of the pipeline and is then deleted, and "transient" means it gets deleted as soon as possible. The former conserves bandwidth, and the latter conserves local storage.

garbage_collection
Logical, whether to run base::gc() just before the target runs.

deployment Character of length 1, only relevant to tar_make_clustermq() and tar_make_future(). If "worker", the target builds on a parallel worker. If "main", the target builds on the host machine / process managing the pipeline.

priority Numeric of length 1 between 0 and 1. Controls which targets get deployed first when multiple competing targets are ready simultaneously. Targets with priorities closer to 1 get built earlier (and polled earlier in tar_make_future()).

resources — Object returned by `tar_resources()` with optional settings for high-performance computing functionality, alternative data storage formats, and other optional capabilities of `targets`. See `tar_resources()` for details.

storage — Character of length 1, only relevant to `tar_make_clustermq()` and `tar_make_future()`. Must be one of the following values:

- `"main"`: the target's return value is sent back to the host machine and saved/uploaded locally.
- `"worker"`: the worker saves/uploads the value.
- `"none"`: almost never recommended. It is only for niche situations, e.g. the data needs to be loaded explicitly from another language. If you do use it, then the return value of the target is totally ignored when the target ends, but each downstream target still attempts to load the data file (except when `retrieval = "none"`).
  If you select `storage = "none"`, then the return value of the target's command is ignored, and the data is not saved automatically. As with dynamic files (`format = "file"`) it is the responsibility of the user to write to `tar_path()` from inside the target. An example target could look something like tar_target(x, saveRDS("value", tar_path(create_dir = TRUE)); "ignored", storage = "none")‘.
  The distinguishing feature of `storage = "none"` (as opposed to `format = "file"`) is that in the general case, downstream targets will automatically try to load the data from the data store as a dependency. As a corollary, `storage = "none"` is completely unnecessary if `format` is `"file"`.

retrieval — Character of length 1, only relevant to `tar_make_clustermq()` and `tar_make_future()`. Must be one of the following values:

- `"main"`: the target's dependencies are loaded on the host machine and sent to the worker before the target builds.
- `"worker"`: the worker loads the targets dependencies.
- `"none"`: the dependencies are not loaded at all. This choice is almost never recommended. It is only for niche situations, e.g. the data needs to be loaded explicitly from another language.

cue — An optional object from `tar_cue()` to customize the rules that decide whether the target is up to date.

Value

A target object. Users should not modify these directly, just feed them to `list()` in your target script file (default: `_targets.R`). See the "Target objects" section for details.

Target objects

Functions like `tar_target()` produce target objects, special objects with specialized sets of S3 classes. Target objects represent skippable steps of the analysis pipeline as described at https://books.ropensci.org/targets/. Please read the walkthrough at https://books.ropensci.org/targets/walkthrough.html to understand the role of target objects in analysis pipelines.

For developers, https://wlandau.github.io/targetopia/contributing.html#target-factories explains target factories (functions like this one which generate targets) and the design specification at https://books.ropensci.org/targets-design/ details the structure and composition of target objects.

See Also

Other targets: tar_cue(), tar_format(), tar_target()

Examples

```
  # The following are equivalent.
  y <- tar_target(y, sqrt(x), pattern = map(x))
  y <- tar_target_raw("y", expression(sqrt(x)), expression(map(x)))
  # Programmatically create a chain of interdependent targets
  target_list <- lapply(seq_len(4), function(i) {
    tar_target_raw(
      letters[i + 1],
      substitute(do_something(x), env = list(x = as.symbol(letters[i])))
    )
  })
  print(target_list[[1]])
  print(target_list[[2]])
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(tar_target_raw("x", quote(1 + 1)), ask = FALSE)
tar_make()
tar_read(x)
})
}
```

---

tar_test *Test code in a temporary directory.*

Description

Runs a `test_that()` unit test inside a temporary directory to avoid writing to the user's file space. This helps ensure compliance with CRAN policies. Also isolates `tar_option_set()` options and environment variables specific to `targets` and skips the test on Solaris. Useful for writing tests for targetopia packages (extensions to `targets` tailored to specific use cases).

Usage

```
tar_test(label, code)
```

Arguments

`label`	Character of length 1, label for the test.
`code`	User-defined code for the test.

Value

NULL (invisibly).

See Also

Other utilities to extend targets: tar_assert, tar_condition, tar_dir(), tar_language

Examples

```
tar_test("example test", {
  testing_variable_cafecfcb <- "only defined inside tar_test()"
  file.create("only_exists_in_tar_test")
})
exists("testing_variable_cafecfcb")
file.exists("only_exists_in_tar_test")
```

---

tar_timestamp *Get the timestamp(s) of a target.*

Description

Get the timestamp associated with a target's last successful run.

Usage

```
tar_timestamp(
  name = NULL,
  format = NULL,
  tz = NULL,
  parse = NULL,
  store = targets::tar_config_get("store")
)
```

Arguments

name	Symbol, name of the target. If NULL (default) then tar_timestamp() will attempt to return the timestamp of the target currently running. Must be called inside a target's command or a supporting function in order to work.
format	Deprecated in targets version 0.6.0 (2021-07-21).
tz	Deprecated in targets version 0.6.0 (2021-07-21).
parse	Deprecated in targets version 0.6.0 (2021-07-21).
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

tar_timestamp() checks the metadata in _targets/meta/meta, not the actual returned data of the target. The timestamp depends on the storage format of the target. If storage is local, e.g. formats like "rds" and "file", then the time stamp is the latest modification time of the target data files at the time the target last successfully ran. For non-local storage as with repository = "aws" and format = "url", targets chooses instead to simply record the time the target last successfully ran.

Value

If the target is not recorded in the metadata or cannot be parsed correctly, then tar_timestamp() returns a POSIXct object at 1970-01-01 UTC.

See Also

Other time: tar_newer(), tar_older(), tar_timestamp_raw()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(tar_target(x, 1))
}, ask = FALSE)
tar_make()
# Get the timestamp.
tar_timestamp(x)
# We can use the timestamp to cancel the target
# if it already ran within the last hour.
# Be sure to set `cue = tar_cue(mode = "always")`
# if you want the target to always check the timestamp.
tar_script({
  list(
  tar_target(
    x,
    tar_cancel((Sys.time() - tar_timestamp()) < 3600),
    cue = tar_cue(mode = "always")
  )
)}, ask = FALSE)
tar_make()
})
}
```

---

tar_timestamp_raw *Get the timestamp(s) of a target (raw version).*

Description

Get the time that a target last ran successfully.

Usage

```
tar_timestamp_raw(
  name = NULL,
  format = NULL,
  tz = NULL,
  parse = NULL,
  store = targets::tar_config_get("store")
)
```

Arguments

name	Character of length 1, name of the target.
format	Deprecated in targets version 0.6.0 (2021-07-21).
tz	Deprecated in targets version 0.6.0 (2021-07-21).
parse	Deprecated in targets version 0.6.0 (2021-07-21).
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Details

tar_timestamp_raw() is like tar_timestamp() except it accepts a character string for name instead of a symbol. tar_timestamp_raw() checks the metadata in _targets/meta/meta, not the actual data. Time stamps are recorded only for targets that run commands: just non-branching targets and individual dynamic branches.

Value

If the target is not recorded in the metadata or cannot be parsed correctly, then tar_timestamp_raw() returns a POSIXct object at 1970-01-01 UTC.

See Also

Other time: tar_newer(), tar_older(), tar_timestamp()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  list(tar_target(x, 1))
}, ask = FALSE)
tar_make()
# Get the timestamp.
tar_timestamp_raw("x")
# We can use the timestamp to cancel the target
# if it already ran within the last hour.
```

```
# Be sure to set `cue = tar_cue(mode = "always")`
# if you want the target to always check the timestamp.
tar_script({
  list(
  tar_target(
    x,
    tar_cancel((Sys.time() - tar_timestamp_raw()) < 3600),
    cue = tar_cue(mode = "always")
  )
)}, ask = FALSE)
tar_make()
})
}
```

`tar_toggle` *Choose code to run based on Target Markdown mode.*

Description

Run one piece of code if Target Markdown mode interactive mode is turned on and another piece of code otherwise.

Usage

```
tar_toggle(interactive, noninteractive)
```

Arguments

`interactive`	R code to run if Target Markdown interactive mode is activated.
`noninteractive`	R code to run if Target Markdown interactive mode is not activated.

Details

Visit <books.ropensci.org/targets/literate-programming.html> to learn about Target Markdown and interactive mode.

Value

If Target Markdown interactive mode is not turned on, the function returns the result of running the code. Otherwise, the function invisibly returns `NULL`.

See Also

Other Target Markdown: `tar_engine_knitr()`, `tar_interactive()`, `tar_noninteractive()`

Examples

```
tar_toggle(
  message("In interactive mode."),
  message("Not in interactive mode.")
)
```

`tar_traceback` *Get a target's traceback*

Description

Return the saved traceback of a target. Assumes the target errored out in a previous run of the pipeline with workspaces enabled for that target. See `tar_workspace()` for details.

Usage

```
tar_traceback(
  name,
  envir = NULL,
  packages = NULL,
  source = NULL,
  characters = getOption("width"),
  store = targets::tar_config_get("store")
)
```

Arguments

`name`	Symbol, name of the target whose workspace to read.
`envir`	Deprecated in `targets` > 0.3.1 (2021-03-28).
`packages`	Logical, whether to load the required packages of the target.
`source`	Logical, whether to run the target script file (default: `_targets.R`) to load user-defined global object dependencies into `envir`. If `TRUE`, then `envir` should either be the global environment or inherit from the global environment.
`characters`	Positive integer. Each line of the traceback is shortened to this number of characters.
`store`	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Value

Character vector, the traceback of a failed target if it exists.

See Also

Other debug: tar_load_globals(), tar_workspaces(), tar_workspace()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tmp <- sample(1)
tar_script({
  tar_option_set(workspace_on_error = TRUE)
  list(
    tar_target(x, "loaded"),
    tar_target(y, stop(x))
  )
}, ask = FALSE)
try(tar_make())
tar_traceback(y, characters = 60)
})
}
```

---

tar_unscript *Remove target script helper files.*

Description

Remove target script helper files (default: `_targets_r/`) that were created by Target Markdown.

Usage

```
tar_unscript(script = targets::tar_config_get("script"))
```

Arguments

`script`	Character of length 1, path to the target script file. Defaults to `tar_config_get("script")`, which in turn defaults to `_targets.R`. When you set this argument, the value of `tar_config_get("script")` is temporarily changed for the current function call. See `tar_script()`, `tar_config_get()`, and `tar_config_set()` for details about the target script file and how to set it persistently for a project.

Details

Target Markdown code chunks create R scripts in a folder called `_targets_r/` in order to aid the automatically supplied `_targets.R` file. Over time, the number of script files starts to build up, and `targets` has no way of automatically removing helper script files that are no longer necessary. To keep your pipeline up to date with the code chunks in the Target Markdown document(s), it is good practice to call `tar_unscript()` at the beginning of your first Target Markdown document. That way, extraneous/discarded targets are automatically removed from the pipeline when the document starts render.

If the target script is at some alternative path, e.g. `custom/script.R`, the helper scripts are in `custom/script_r/`. `tar_unscript()` works on the helper scripts as long as your project configuration settings correctly identify the correct target script.

Value

`NULL` (invisibly).

Examples

```
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_unscript()
})
```

`tar_validate` *Validate a pipeline of targets.*

Description

Inspect the pipeline for issues and throw an error or warning if a problem is detected.

Usage

```
tar_validate(
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function),
  envir = parent.frame(),
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

`callr_function`	A function from `callr` to start a fresh clean R process to do the work. Set to `NULL` to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). `callr_function` needs to be `NULL` for interactive debugging, e.g. `tar_option_set(debug = "your_target")`. However, `callr_function` should not be `NULL` for serious reproducible work.
`callr_arguments`	A list of arguments to `callr_function`.
`envir`	An environment, where to run the target R script (default: `_targets.R`) if `callr_function` is `NULL`. Ignored if `callr_function` is anything other than `NULL`. `callr_function` should only be `NULL` for debugging and testing purposes, not for serious runs of a pipeline, etc. The `envir` argument of `tar_make()` and related functions always overrides the current value of `tar_option_get("envir")` in the current R session just before

running the target script file, so whenever you need to set an alternative `envir`, you should always set it with `tar_option_set()` from within the target script file. In other words, if you call `tar_option_set(envir = envir1)` in an interactive session and then `tar_make(envir = envir2, callr_function = NULL)`, then `envir2` will be used.

`script` Character of length 1, path to the target script file. Defaults to `tar_config_get("script")`, which in turn defaults to `_targets.R`. When you set this argument, the value of `tar_config_get("script")` is temporarily changed for the current function call. See `tar_script()`, `tar_config_get()`, and `tar_config_set()` for details about the target script file and how to set it persistently for a project.

`store` Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Value

`NULL` except if `callr_function = callr::r_bg()`, in which case a handle to the `callr` background process is returned. Either way, the value is invisibly returned.

See Also

Other inspect: `tar_deps_raw()`, `tar_deps()`, `tar_manifest()`, `tar_network()`, `tar_outdated()`, `tar_sitrep()`

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script(list(tar_target(x, 1 + 1)), ask = FALSE)
tar_validate()
})
}
```

---

tar_visnetwork *visNetwork dependency graph.*

Description

Visualize the pipeline dependency graph with a `visNetwork` HTML widget.

Usage

```
tar_visnetwork(
  targets_only = FALSE,
  names = NULL,
  shortcut = FALSE,
  allow = NULL,
  exclude = ".Random.seed",
  outdated = TRUE,
  label = NULL,
  level_separation = NULL,
  degree_from = 1L,
  degree_to = 1L,
  zoom_speed = 1,
  reporter = targets::tar_config_get("reporter_outdated"),
  callr_function = callr::r,
  callr_arguments = targets::tar_callr_args_default(callr_function),
  envir = parent.frame(),
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

targets_only	Logical, whether to restrict the output to just targets (FALSE) or to also include global functions and objects.
names	Names of targets. The graph visualization will operate only on these targets (and unless shortcut is TRUE, all the targets upstream as well). Selecting a small subgraph using names could speed up the load time of the visualization. Unlike allow, names is invoked before the graph is generated. Set to NULL to check/build all the targets (default). Otherwise, you can supply symbols or tidyselect helpers like starts_with(). Applies to ordinary targets (stem) and whole dynamic branching targets (patterns) but not individual dynamic branches.
shortcut	Logical of length 1, how to interpret the names argument. If shortcut is FALSE (default) then the function checks all targets upstream of names as far back as the dependency graph goes. If TRUE, then the function only checks the targets in names and uses stored metadata for information about upstream dependencies as needed. shortcut = TRUE increases speed if there are a lot of up-to-date targets, but it assumes all the dependencies are up to date, so please use with caution. Also, shortcut = TRUE only works if you set names.
allow	Optional, define the set of allowable vertices in the graph. Unlike names, allow is invoked only after the graph is mostly resolved, so it will not speed up execution. Set to NULL to allow all vertices in the pipeline and environment (default). Otherwise, you can supply symbols or tidyselect helpers like starts_with().
exclude	Optional, define the set of exclude vertices from the graph. Unlike names, exclude is invoked only after the graph is mostly resolved, so it will not speed up execution. Set to NULL to exclude no vertices. Otherwise, you can supply symbols or tidyselect helpers like all_of() and starts_with().

`outdated` Logical, whether to show colors to distinguish outdated targets from up-to-date targets. (Global functions and objects still show these colors.) Looking for outdated targets takes a lot of time for large pipelines with lots of branches, and setting `outdated` to `FALSE` is a nice way to speed up the graph if you only want to see dependency relationships and build progress.

`label` Character vector of one or more aesthetics to add to the vertex labels. Can contain `"time"` to show total runtime, `"size"` to show total storage size, or `"branches"` to show the number of branches in each pattern. You can choose multiple aesthetics at once, e.g. `label = c("time", "branches")`. All are disabled by default because they clutter the graph.

`level_separation` Numeric of length 1, `levelSeparation` argument of `visNetwork::visHierarchicalLayout()`. Controls the distance between hierarchical levels. Consider changing the value if the aspect ratio of the graph is far from 1. If `level_separation` is `NULL`, the `levelSeparation` argument of `visHierarchicalLayout()` defaults to `150`.

`degree_from` Integer of length 1. When you click on a node, the graph highlights a neighborhood of that node. `degree_from` controls the number of edges the neighborhood extends upstream.

`degree_to` Integer of length 1. When you click on a node, the graph highlights a neighborhood of that node. `degree_to` controls the number of edges the neighborhood extends downstream.

`zoom_speed` Positive numeric of length 1, scaling factor on the zoom speed. Above 1 zooms faster than default, below 1 zooms lower than default.

`reporter` Character of length 1, name of the reporter to user. Controls how messages are printed as targets are checked. Choices:

- `"silent"`: print nothing.
- `"forecast"`: print running totals of the checked and outdated targets found so far.

`callr_function` A function from `callr` to start a fresh clean R process to do the work. Set to `NULL` to run in the current session instead of an external process (but restart your R session just before you do in order to clear debris out of the global environment). `callr_function` needs to be `NULL` for interactive debugging, e.g. `tar_option_set(debug = "your_target")`. However, `callr_function` should not be `NULL` for serious reproducible work.

`callr_arguments` A list of arguments to `callr_function`.

`envir` An environment, where to run the target R script (default: `_targets.R`) if `callr_function` is `NULL`. Ignored if `callr_function` is anything other than `NULL`. `callr_function` should only be `NULL` for debugging and testing purposes, not for serious runs of a pipeline, etc.

The `envir` argument of `tar_make()` and related functions always overrides the current value of `tar_option_get("envir")` in the current R session just before running the target script file, so whenever you need to set an alternative `envir`, you should always set it with `tar_option_set()` from within the target script file. In other words, if you call `tar_option_set(envir = envir1)` in an interactive session and then `tar_make(envir = envir2, callr_function = NULL)`, then `envir2` will be used.

script — Character of length 1, path to the target script file. Defaults to `tar_config_get("script")`, which in turn defaults to `_targets.R`. When you set this argument, the value of `tar_config_get("script")` is temporarily changed for the current function call. See `tar_script()`, `tar_config_get()`, and `tar_config_set()` for details about the target script file and how to set it persistently for a project.

store — Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Value

A `visNetwork` HTML widget object.

See Also

Other visualize: `tar_glimpse()`, `tar_mermaid()`

Examples

```
if (identical(Sys.getenv("TAR_INTERACTIVE_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  tar_option_set()
  list(
    tar_target(y1, 1 + 1),
    tar_target(y2, 1 + 1),
    tar_target(z, y1 + y2)
  )
})
tar_visnetwork()
tar_visnetwork(allow = starts_with("y")) # see also all_of()
})
}
```

---

tar_watch *Shiny app to watch the dependency graph.*

Description

Launches a background process with a Shiny app that calls `tar_visnetwork()` every few seconds. To embed this app in other apps, use the Shiny module in `tar_watch_ui()` and `tar_watch_server()`.

Usage

```
tar_watch(
  seconds = 10,
  seconds_min = 1,
  seconds_max = 60,
  seconds_step = 1,
  targets_only = FALSE,
  exclude = ".Random.seed",
  outdated = FALSE,
  label = NULL,
  level_separation = 150,
  degree_from = 1L,
  degree_to = 1L,
  config = Sys.getenv("TAR_CONFIG", "_targets.yaml"),
  project = Sys.getenv("TAR_PROJECT", "main"),
  height = "650px",
  display = "summary",
  displays = c("summary", "branches", "progress", "graph", "about"),
  background = TRUE,
  browse = TRUE,
  host = getOption("shiny.host", "127.0.0.1"),
  port = getOption("shiny.port", targets::tar_random_port()),
  verbose = TRUE,
  supervise = TRUE,
  poll_connection = TRUE,
  stdout = "|",
  stderr = "|"
)
```

Arguments

seconds	Numeric of length 1, default number of seconds between refreshes of the graph. Can be changed in the app controls.
seconds_min	Numeric of length 1, lower bound of seconds in the app controls.
seconds_max	Numeric of length 1, upper bound of seconds in the app controls.
seconds_step	Numeric of length 1, step size of seconds in the app controls.
targets_only	Logical, whether to restrict the output to just targets (FALSE) or to also include global functions and objects.
exclude	Character vector of nodes to omit from the graph.
outdated	Logical, whether to show colors to distinguish outdated targets from up-to-date targets. (Global functions and objects still show these colors.) Looking for outdated targets takes a lot of time for large pipelines with lots of branches, and setting outdated to FALSE is a nice way to speed up the graph if you only want to see dependency relationships and build progress.
label	Label argument to tar_visnetwork().

level_separation
: Numeric of length 1, levelSeparation argument of visNetwork::visHierarchicalLayout(). Controls the distance between hierarchical levels. Consider changing the value if the aspect ratio of the graph is far from 1. If level_separation is NULL, the levelSeparation argument of visHierarchicalLayout() defaults to 150.

degree_from
: Integer of length 1. When you click on a node, the graph highlights a neighborhood of that node. degree_from controls the number of edges the neighborhood extends upstream.

degree_to
: Integer of length 1. When you click on a node, the graph highlights a neighborhood of that node. degree_to controls the number of edges the neighborhood extends downstream.

config
: Character of length 1, file path of the YAML configuration file with targets project settings. The config argument specifies which YAML configuration file that tar_config_get() reads from or tar_config_set() writes to in a single function call. It does not globally change which configuration file is used in subsequent function calls. The default file path of the YAML file is always _targets.yaml unless you set another default path using the TAR_CONFIG environment variable, e.g. Sys.setenv(TAR_CONFIG = "custom.yaml"). This also has the effect of temporarily modifying the default arguments to other functions such as tar_make() because the default arguments to those functions are controlled by tar_config_get().

project
: Character of length 1, name of the current targets project. Thanks to the config R package, targets YAML configuration files can store multiple sets of configuration settings, with each set corresponding to its own project. The project argument allows you to set or get a configuration setting for a specific project for a given call to tar_config_set() or tar_config_get(). The default project is always called "main" unless you set another default project using the TAR_PROJECT environment variable, e.g. Sys.setenv(tar_project = "custom"). This also has the effect of temporarily modifying the default arguments to other functions such as tar_make() because the default arguments to those functions are controlled by tar_config_get().

height
: Character of length 1, height of the visNetwork widget and branches table.

display
: Character of length 1, which display to show first.

displays
: Character vector of choices for the display. Elements can be any of "graph", "summary", "branches", or "about".

background
: Logical, whether to run the app in a background process so you can still use the R console while the app is running.

browse
: Whether to open the app in a browser when the app is ready. Only relevant if background is TRUE.

host
: Character of length 1, IPv4 address to listen on. Only relevant if background is TRUE.

port
: Positive integer of length 1, TCP port to listen on. Only relevant if background is TRUE.

verbose
: whether to print a spinner and informative messages. Only relevant if background is TRUE.

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.

poll_connection — Whether to have a control connection to the process. This is used to transmit messages from the subprocess to the main process.

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 --slave 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 print() 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 message() 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 stdout, in which case they will be correctly interleaved. If this is the string "2>&1", then standard error is redirected to standard output.

Details

The controls of the app are in the left panel. The seconds control is the number of seconds between refreshes of the graph, and the other settings match the arguments of tar_visnetwork().

Value

A handle to callr::r_bg() background process running the app.

See Also

Other progress: tar_built(), tar_canceled(), tar_errored(), tar_poll(), tar_progress_branches(), tar_progress_summary(), tar_progress(), tar_skipped(), tar_started(), tar_watch_server(), tar_watch_ui()

Examples

```
if (identical(Sys.getenv("TAR_INTERACTIVE_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  sleep_run <- function(...) {
    Sys.sleep(10)
  }
  list(
    tar_target(settings, sleep_run()),
    tar_target(data1, sleep_run(settings)),
    tar_target(data2, sleep_run(settings))
  )
}, ask = FALSE)
# Launch the app in a background process.
tar_watch(seconds = 10, outdated = FALSE, targets_only = TRUE)
# Run the pipeline.
tar_make()
})
}
```

tar_watch_server *Shiny module server for tar_watch()*

Description

Use tar_watch_ui() and tar_watch_server() to include tar_watch() as a Shiny module in an app.

Usage

```
tar_watch_server(
  id,
  height = "650px",
  exclude = ".Random.seed",
  config = Sys.getenv("TAR_CONFIG", "_targets.yaml"),
  project = Sys.getenv("TAR_PROJECT", "main")
)
```

Arguments

id	Character of length 1, ID corresponding to the UI function of the module.
height	Character of length 1, height of the visNetwork widget and branches table.
exclude	Character vector of nodes to omit from the graph.
config	Character of length 1, file path of the YAML configuration file with targets project settings. The config argument specifies which YAML configuration file that tar_config_get() reads from or tar_config_set() writes to in a single function call. It does not globally change which configuration file is used in subsequent function calls. The default file path of the YAML file is always _targets.yaml unless you set another default path using the TAR_CONFIG environment variable, e.g. Sys.setenv(TAR_CONFIG = "custom.yaml"). This also has the effect of temporarily modifying the default arguments to other functions such as tar_make() because the default arguments to those functions are controlled by tar_config_get().
project	Character of length 1, name of the current targets project. Thanks to the config R package, targets YAML configuration files can store multiple sets of configuration settings, with each set corresponding to its own project. The project argument allows you to set or get a configuration setting for a specific project for a given call to tar_config_set() or tar_config_get(). The default project is always called "main" unless you set another default project using the TAR_PROJECT environment variable, e.g. Sys.setenv(tar_project = "custom"). This also has the effect of temporarily modifying the default arguments to other functions such as tar_make() because the default arguments to those functions are controlled by tar_config_get().

Value

A Shiny module server.

See Also

Other progress: tar_built(), tar_canceled(), tar_errored(), tar_poll(), tar_progress_branches(), tar_progress_summary(), tar_progress(), tar_skipped(), tar_started(), tar_watch_ui(), tar_watch()

---

tar_watch_ui *Shiny module UI for tar_watch()*

Description

Use tar_watch_ui() and tar_watch_server() to include tar_watch() as a Shiny module in an app.

Usage

```
tar_watch_ui(
  id,
  label = "tar_watch_label",
  seconds = 10,
  seconds_min = 1,
  seconds_max = 60,
  seconds_step = 1,
  targets_only = FALSE,
  outdated = FALSE,
  label_tar_visnetwork = NULL,
  level_separation = 150,
  degree_from = 1L,
  degree_to = 1L,
  height = "650px",
  display = "summary",
  displays = c("summary", "branches", "progress", "graph", "about")
)
```

Arguments

id	Character of length 1, ID corresponding to the UI function of the module.
label	Label for the module.
seconds	Numeric of length 1, default number of seconds between refreshes of the graph. Can be changed in the app controls.
seconds_min	Numeric of length 1, lower bound of seconds in the app controls.
seconds_max	Numeric of length 1, upper bound of seconds in the app controls.
seconds_step	Numeric of length 1, step size of seconds in the app controls.
targets_only	Logical, whether to restrict the output to just targets (FALSE) or to also include global functions and objects.

outdated — Logical, whether to show colors to distinguish outdated targets from up-to-date targets. (Global functions and objects still show these colors.) Looking for outdated targets takes a lot of time for large pipelines with lots of branches, and setting `outdated` to `FALSE` is a nice way to speed up the graph if you only want to see dependency relationships and build progress.

label_tar_visnetwork — Character vector, `label` argument to `tar_visnetwork()`.

level_separation — Numeric of length 1, `levelSeparation` argument of `visNetwork::visHierarchicalLayout()`. Controls the distance between hierarchical levels. Consider changing the value if the aspect ratio of the graph is far from 1. If `level_separation` is `NULL`, the `levelSeparation` argument of `visHierarchicalLayout()` defaults to `150`.

degree_from — Integer of length 1. When you click on a node, the graph highlights a neighborhood of that node. `degree_from` controls the number of edges the neighborhood extends upstream.

degree_to — Integer of length 1. When you click on a node, the graph highlights a neighborhood of that node. `degree_to` controls the number of edges the neighborhood extends downstream.

height — Character of length 1, height of the `visNetwork` widget and branches table.

display — Character of length 1, which display to show first.

displays — Character vector of choices for the display. Elements can be any of `"graph"`, `"summary"`, `"branches"`, or `"about"`.

Value

A Shiny module UI.

See Also

Other progress: `tar_built()`, `tar_canceled()`, `tar_errored()`, `tar_poll()`, `tar_progress_branches()`, `tar_progress_summary()`, `tar_progress()`, `tar_skipped()`, `tar_started()`, `tar_watch_server()`, `tar_watch()`

---

tar_workspace *Load a saved workspace and seed for debugging.*

Description

Load the packages, workspace, and random number generator seed of target attempted with a workspace file.

Usage

```
tar_workspace(
  name,
  envir = parent.frame(),
  packages = TRUE,
  source = TRUE,
  script = targets::tar_config_get("script"),
  store = targets::tar_config_get("store")
)
```

Arguments

name	Symbol, name of the target whose workspace to read.
envir	Environment in which to put the objects.
packages	Logical, whether to load the required packages of the target.
source	Logical, whether to run `_targets.R` to load user-defined global object dependencies into `envir`. If `TRUE`, then `envir` should either be the global environment or inherit from the global environment.
script	Character of length 1, path to the target script file. Defaults to `tar_config_get("script")`, which in turn defaults to `_targets.R`. When you set this argument, the value of `tar_config_get("script")` is temporarily changed for the current function call. See `tar_script()`, `tar_config_get()`, and `tar_config_set()` for details about the target script file and how to set it persistently for a project.
store	Character of length 1, path to the `targets` data store. Defaults to `tar_config_get("store")`, which in turn defaults to `_targets/`. When you set this argument, the value of `tar_config_get("store")` is temporarily changed for the current function call. See `tar_config_get()` and `tar_config_set()` for details about how to set the data store path persistently for a project.

Details

If you activate workspaces through the `workspaces` argument of `tar_option_set()`, then under the circumstances you specify, `targets` will save a special workspace file to a location in in `_targets/workspaces/`. The workspace file is a compact reference that allows `tar_workspace()` to load the target's dependencies and random number generator seed as long as the data objects are still in the data store (usually files in `_targets/objects/`). When you are done debugging, you can remove the workspace files using `tar_destroy(destroy = "workspaces")`.

Value

This function returns `NULL`, but it does load the target's required packages, as well as multiple objects into the environment (`envir` argument) in order to replicate the workspace where the error happened. These objects include the global objects at the time `tar_make()` was called and the dependency targets. The random number generator seed for the target is also assigned with `set.seed()`.

See Also

Other debug: tar_load_globals(), tar_traceback(), tar_workspaces()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tmp <- sample(1)
tar_script({
  tar_option_set(workspace_on_error = TRUE)
  list(
    tar_target(x, "loaded"),
    tar_target(y, stop(x))
  )
}, ask = FALSE)
# The following code throws an error for demonstration purposes.
try(tar_make())
exists("x") # Should be FALSE.
tail(.Random.seed) # for comparison to the RNG state after tar_workspace(y)
tar_workspace(y)
exists("x") # Should be TRUE.
print(x) # "loaded"
# Should be different: tar_workspace() runs set.seed(tar_meta(y, seed)$seed)
tail(.Random.seed)
})
}
```

---

tar_workspaces *List saved target workspaces.*

Description

List target workspaces currently saved to `_targets/workspaces/`. See tar_workspace() for more information.

Usage

```
tar_workspaces(names = NULL, store = targets::tar_config_get("store"))
```

Arguments

names	Optional tidyselect selector to return a tactical subset of workspace names. If NULL, all names are selected.
store	Character of length 1, path to the targets data store. Defaults to tar_config_get("store"), which in turn defaults to _targets/. When you set this argument, the value of tar_config_get("store") is temporarily changed for the current function call. See tar_config_get() and tar_config_set() for details about how to set the data store path persistently for a project.

Value

Character vector of available workspaces to load with tar_workspace().

See Also

Other debug: tar_load_globals(), tar_traceback(), tar_workspace()

Examples

```
if (identical(Sys.getenv("TAR_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
tar_script({
  tar_option_set(workspace_on_error = TRUE)
  list(
    tar_target(x, "value"),
    tar_target(y, x)
  )
}, ask = FALSE)
tar_make()
tar_workspaces()
tar_workspaces(contains("x"))
})
}
```

---

use_targets *Use targets*

Description

Set up targets for an existing project.

Usage

```
use_targets(
  script = targets::tar_config_get("script"),
  scheduler = targets::use_targets_scheduler(),
  open = interactive(),
  overwrite = FALSE,
  job_name = targets::tar_random_name()
)
```

Arguments

script	Character of length 1, where to write the target script file. Defaults to tar_config_get("script"), which in turn defaults to _targets.R.
scheduler	Character of length 1, type of scheduler for parallel computing. See <books.ropensci.org/targets/hpc.html> for details. The default is automatically detected from your system (but PBS and Torque cannot be distinguished from SGE, and SGE is the default among the three). Possible values:

- "multicore": local forked processes on Linux-like systems (but same as "multiprocess" for tar_make_future() options).
- "multiprocess": local platform-independent and multi-process.
- "slurm": SLURM clusters.
- "sge": Sun Grid Engine clusters.
- "lsf": LSF clusters.
- "pbs": PBS clusters. (batchtools template file not available.)
- "torque": Torque clusters.

open — Logical, whether to open the file for editing in the RStudio IDE.

overwrite — Logical of length 1, whether to overwrite the targets file and supporting files if they already exist.

job_name — Character of length 1, job name to supply to schedulers like SLURM.

Details

To set up a project-oriented function-oriented workflow for targets, use_targets() writes:

1. A target script _targets.R tailored to your system.
2. Template files "clustermq.tmpl" and "future.tmpl" to configure tar_make_clustermq() and tar_make_future() to a resource manager if detected on your system. They should work out of the box on most systems, but you may need to modify them by hand if you encounter errors.
3. Script run.R to conveniently execute the pipeline using tar_make(). You can change this to tar_make_clustermq() or tar_make_future() and supply the workers argument to either.
4. Script run.sh to conveniently call run.R in a persistent background process. Enter ./run.sh in the shell to run it.
5. If you have a high-performance computing scheduler like Sun Grid Engine (SGE) (or select one using the scheduler argument of use_targets()), then script job.sh is created. job.sh conveniently executes run.R as a job on a cluster. For example, to run the pipeline as a job on an SGE cluster, enter qsub job.sh in the terminal. job.sh should work out of the box on most systems, but you may need to modify it by hand if you encounter errors.

After you call use_targets(), there is still configuration left to do:

1. Open _targets.R and edit by hand. Follow the comments to write any options, packages, and target definitions that your pipeline requires.
2. Edit run.R and choose which pipeline function to execute (tar_make(), tar_make_clustermq(), or tar_make_future()).
3. If applicable, edit clustermq.tmpl and/or future.tmpl to configure settings for your resource manager.
4. If applicable, configure job.sh, "clustermq.tmpl", and/or "future.tmpl" for your resource manager.

After you finished configuring your project, follow the steps at https://books.ropensci.org/targets/walkthrough.html#inspect-the-pipeline: # nolint

1. Run tar_glimpse() and tar_manifest() to check that the targets in the pipeline are defined correctly.
2. Run the pipeline. You may wish to call a tar_make*() function directly, or you may run run.R or run.sh.
3. Inspect the target output using tar_read() and/or tar_load().
4. Develop the pipeline as needed by manually editing _targets.R and the scripts in R/ and repeating steps (1) through (3).

Value

NULL (invisibly).

See Also

Other help: tar_reprex(), targets-package, use_targets_rmd()

Examples

```
if (identical(Sys.getenv("TAR_INTERACTIVE_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
use_targets(open = FALSE)
})
}
```

---

use_targets_rmd *Use targets with Target Markdown.*

Description

Create an example Target Markdown report to get started with targets.

Usage

```
use_targets_rmd(path = "_targets.Rmd", open = interactive())
```

Arguments

path	Character of length 1, output path of the Target Markdown report relative to the current active project.
open	Logical, whether to open the file for editing in the RStudio IDE.

Value

NULL (invisibly).

See Also

Other help: tar_reprex(), targets-package, use_targets()

Examples

```
if (identical(Sys.getenv("TAR_INTERACTIVE_EXAMPLES"), "true")) {
tar_dir({ # tar_dir() runs code from a temporary directory.
use_targets(open = FALSE)
})
}
```

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