

# Package ‘sevenbridges’

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**Type** Package

**Title** R Client for Seven Bridges Platform API and CWL Tool builder in R

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**Description** R client and utilities for Seven Bridges platform API, from cancer genomics cloud to other Seven Bridges supported platforms.

**License** Apache License 2.0

**VignetteBuilder** knitr

**URL** <https://www.sevenbridges.com>

**BugReports** <https://github.com/sbg/sevenbridges-r/issues>

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**R topics documented:**

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sevenbridges-package *R Client for Seven Bridges Genomics API*

---

### Description

R Client for Seven Bridges Genomics API

### Details

The vignette can be opened with `vignette('sevenbridges')`.

Package: sevenbridges  
Type: Package  
License: MIT

### Author(s)

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---

*addIdNum* *add # prefix to id*

---

**Description**

add # prefix to id

**Usage**

```
addIdNum(x)
```

**Arguments**

x (character) with # or not.

**Value**

a character with # prefix.

**Examples**

```
addIdNum(c("bam", "#fastq"))
```

---

api

*wrapper of http logic for SBG API*

---

**Description**

wrapper of http logic for SBG API

**Usage**

```
api(token = NULL, version = "1.1", path = NULL, method = c("GET",
  "POST", "PUT", "DELETE", "PATCH"), query = NULL, body = list(),
  encode = "json", limit = getOption("sevenbridges")$limit,
  offset = getOption("sevenbridges")$offset,
  base_url = paste0("https://api.sbgenomics.com/", version, "/"), ...)
```

**Arguments**

token	authenticate token string.
version	API version number, default 1.1.
path	path connected with base_url.
method	one of 'GET', 'POST', 'PUT', 'Delete'
query	Passed to httr package GET/POST call.
body	Passed to httr package GET/POST/PUT/DELETE call.

encode	If the body is a named list, how should it be encoded? Default here is "json". Can be one of form (application/x-www-form-urlencoded), multipart, (multipart/form-data), or json (application/json). For "multipart", list elements can be strings or objects created by <code>upload_file</code> . For "form", elements are coerced to strings and escaped, use <code>I()</code> to prevent double-escaping. For "json", parameters are automatically "unboxed" (i.e. length 1 vectors are converted to scalars). To preserve a length 1 vector as a vector, wrap in <code>I()</code> .
limit	how many results to return
offset	the point at which to start displaying them
base_url	default is 'https://api.sbgenomics.com/1.1'
...	passed to GET/PUT/DELETE/PATCH/POST call.

### Details

Used for advanced users and the core method for higher level API in this package, please refer to the easy api manual and the two vignettes pages for more convenient usage.

### Value

returned request list of httr

### References

<https://docs.sbgenomics.com/display/developerhub/API>

### Examples

```
token <- "fake_token"

## list projects
api(token = token, path = 'project', method = "GET")
```

---

App-class

*App class*

---

### Description

App class

### Value

App object.

**Fields**

id app id.  
 project project id  
 name app name  
 revision app revision  
 raw raw cwl list, if doesn't have any, call cwl() method.

**Examples**

```

## Not run:
a = Auth(url = "https://api.sbggenomics.com/v2/",
         token = "fake_token")
## get a flow
app = a$public_app(id = "admin/sbg-public-data/rna-seq-alignment-star")
app$input_matrix()
app$output_matrix()
## get a flow
app = a$public_app(id = "admin/sbg-public-data/star")
app$input_matrix()
app$output_matrix()

## End(Not run)

```

---

asList

---

*Convert a object slots/fields to a list, json, yaml file*


---

**Description**

Doesn't like as.list, only fields and slots are converted, prepare a object to be converted to YAML/JSON.

**Usage**

```

asList(object, ...)

## S4 method for signature 'ANY'
asList(object, ...)

## S4 method for signature 'CWL'
asList(object, ...)

## S4 method for signature 'SingleEnum'
asList(object, ...)

## S4 method for signature 'SimpleList'
asList(object, ...)

```

```
asYAML(object, ...)  
  
## S4 method for signature 'ANY'  
asYAML(object, ...)  
  
asJSON(object, ...)  
  
## S4 method for signature 'ANY'  
asJSON(object, ...)  
  
## S4 method for signature 'DSCList'  
asList(object, ...)
```

### Arguments

object            object, could be S4/R5 object, for example, class CWL, SimpleList.  
...               other parameters passed to as.yaml or toJSON.

### Value

a list object or json or yaml file.

### Examples

```
## define a S4 object  
A <- setClass("A", slots = list(a = "character", b = "numeric"))  
## define a reference object which extends 'CWL' class  
B <- setRefClass("B", fields = list(x = "character", y = "A"), contains = "CWL")  
## new instances  
a <- A(a = "hello", b = 123)  
b <- B(x = "world", y = a)  
  
## show  
b  
b$show("JSON")  
b$show("YAML")  
  
## You can convert slots/fields into a list  
asList(a)  
asList(b)  
b$toList()  
  
##asYAML  
asYAML(a)  
asYAML(b)  
b$toYAML()  
  
##asJSON  
asJSON(a)  
asJSON(b)
```

b\$toJSON()

---

Auth-class

*Class Auth*

---

## Description

Auth token object

get Token from config files and option list

Read Auth config file to options

## Usage

```
getToken(platform = NULL, username = NULL)
```

```
updateAuthList(config = ".sbg.auth.yml")
```

## Arguments

platform	which platform you are using, by default it is cgc platform, it tries to search your .sbg.auth.yml file to parse platform id your deinfed there.
username	username defined in .sbg.auth.yml file
config	file location, default is ".sbg.auth.yml" at home folder.

## Details

Every object could be requested from this Auth object and any action could start from this object using cascading style. Please check vignette 'easy-api' for more information.

Current config file is set on home directory with the name .sbg.auth.yml

## Value

a token string.

## Fields

token [character] your auth token.

url [character] basic url used for API, by default it's <https://api.sbggenomics.com/1.1/>

version url version number

platform which platform you are using, by default it is cgc platform, it tries to search your .sbg.auth.yml file to parse platform id your deinfed there.

fs FS object, for mount and unmount file system.

## Methods

- `api(..., limit = getOption("sevenbridges")$limit, offset = getOption("sevenbridges")$offset, complete = TRUE)`  
 This call returns all API paths, and pass arguments to `api()` function and input token and url automatically
- `billing(id = NULL, breakdown = FALSE, ...)` if no id provided, This call returns a list of paths used to access billing information via the API. else, This call lists all your billing groups, including groups that are pending or have been disabled. if `breakdown = TRUE`, This call returns a breakdown of spending per-project for the billing group specified by `billing_group`. For each project that the billing group is associated with, information is shown on the tasks run, including their initiating user (the runner), start and end times, and cost.
- `file(name = NULL, id = NULL, project = NULL, exact = FALSE, detail = FALSE, metadata = list(), original = FALSE)`  
 This call returns a list of all files in a specified project that you can access. For each file, the call returns: 1) Its ID 2) Its filename The project is specified as a query parameter in the call.
- `invoice(id = NULL, ...)` no id provided, This call returns a list of invoices, with information about each, including whether or not the invoice is pending and the billing period it covers.  
 The call returns information about all your available invoices, unless you use the query parameter `bg_id` to specify the ID of a particular billing group, in which case it will return the invoice incurred by that billing group only.  
 if id provided, This call retrieves information about a selected invoice, including the costs for analysis and storage, and the invoice period.
- `project(name = NULL, id = NULL, index = NULL, ignore.case = TRUE, exact = FALSE, owner = NULL, details = FALSE)`  
 If no id or name provided, this call returns a list of all projects you are a member of. Each project's `project_id` and URL on the CGC will be returned. If name or id provided, we did a match search the list
- `project_new(name = NULL, billing_group_id = NULL, description = name, tags = list(), type = "v2", ...)`  
 Create new projects, required parameters: name, `billing_group_id`, optional parameters: tags and description, type.
- `project_owner(owner = NULL, ...)` List the projects owned by and accessible to a particular user. Each project's ID and URL will be returned.
- `rate_limit(...)` This call returns information about your current rate limit. This is the number of API calls you can make in one hour.
- `user(username = NULL, ...)` This call returns a list of the resources, such as projects, billing groups, and organizations, that are accessible to you.  
 If you are not an administrator, this call will only return a successful response if username is replaced with your own username. If you are an administrator, you can replace username with the username of any CGC user, to return information on their resources.
- `volume(name = NULL, id = NULL, index = NULL, ignore.case = TRUE, exact = FALSE, detail = FALSE, ...)`  
 If no id or name provided, this call returns a list of all volumes you are a member of. If name or id provided, we did a match search the list

## Examples

```
## replace it with real token
token <- "aef7e9e3f6c54fb1b338ac4ecddf1a56"
a <- Auth(token)
```

---

batch	<i>batch function for task batch execution</i>
-------	--

---

**Description**

batch function for task batch execution

**Usage**

```
batch(input = NULL, criteria = NULL, type = c("ITEM", "CRITERIA"))
```

**Arguments**

input	character, ID of the input on which you wish to batch on. You would usually batch on the input containing a list of files. If left out, default batching criteria defined in the app is used.
criteria	a character vector, for example. <code>c("metadata.sample_id", "metadata.library_id")</code> . The meaning of the above <code>batch_by</code> dictionary is - group inputs (usually files) first on sample ID and then on library ID. If NULL, using type "ITEM" by default.
type	Criteria on which to batch on - can be in two formats. "ITEM" and "CRITERIA". If you wish to batch per item in the input (usually a file) using "ITEM". If you wish a more complex criteria, specify the "CRITERIA" on which you wish to group inputs on. Please check examples.

**Value**

a list of 'batch\_input' and 'batch\_by' used for task batch

**Examples**

```
batch(input = "fastq") # by ITEM
batch(input = "fastq", c("metadata.sample_id", "metadata.library_id"))
## shorthand for this
batch(input = "fastq", c("metadata.sample_id", "metadata.library_id"), type = "CRITERIA")
```

---

Binding-class	<i>Binding</i>
---------------	----------------

---

**Description**

Binding

**Fields**

`loadContents` [logical] Only applies when type is File. Read up to the first 64 KiB of text from the file and place it in the "contents" field of the file object for manipulation by expressions.

`secondaryFiles` [] Only applies when type is File. Describes files that must be included alongside the primary file. If the value is Expression, the context of the expression is the input or output File parameter to which this binding applies. Where the value is a string, it specifies that the following pattern should be applied to the primary file: If string begins with one or more caret characters, for each caret, remove the last file extension from the path (the last period . and all following characters). If there are no file extensions, the path is unchanged. Append the remainder of the string to the end of the file path.

**Examples**

```
Binding(loadContents = TRUE, secondaryFiles = "./test.txt")
```

---

 CCBList

*characterORCommandLineBindingList Class*


---

**Description**

characterORCommandLineBindingList Class

**Usage**

```
CCBList(...)
```

**Arguments**

... element or list of the element.

**Value**

CCBList

**Examples**

```
CCBList("-o output.bam")
```

**Description**

Shorthand functions for cwl packages constructors

**Arguments**

type	[ANY] Specify valid types of data that may be assigned to this parameter.
label	[character] A short, human-readable label of this parameter object.
description	[character] A long, human-readable description of this parameter object.
streamable	[logical] Currently only applies if type is File. A value of true indicates that the file is read or written sequentially without seeking. An implementation may use this flag to indicate whether it is valid to stream file contents using a named pipe. Default: false.
default	[ANY] The default value for this parameter if not provided in the input object.
...	For InputParameter, it will be passed to [CommandLineBinding], which could be created by command CLB. For parameters that accepted please check CommandLineBinding in cwl package. For your convenience, this manual also contain a section for CommandLineBinding. For OutPar or OutputParameter, it will be passed to CommandOutputParameter. Please check the following section as well.

**Shorthand**

```
CLB <- CommandLineBinding argslist <- CLBList <- CommandLineBindingList COB <- CommandOutputBinding IPList <- InputParameterList OPList <- OutputParameterList InPar <- InputParameter OutPar <- OutputParameter
```

**CommandLineBinding**

**position** [integer] The sorting key. Default position is 0.

**prefix** [character] Command line prefix to add before the value.

**separate** [logical] If true (default) then the prefix and value must be added as separate command line arguments; if false, prefix and value must be concatenated into a single command line argument.

**itemSeparator** [character] Join the array elements into a single string with the elements separated by by itemSeparator.

**valueFrom** [characterOrExpression] If valueFrom is a constant string value, use this as the value and apply the binding rules above. If valueFrom is an expression, evaluate the expression to yield the actual value to use to build the command line and apply the binding rules above. If the inputBinding is associated with an input parameter, the "context" of the expression will be the value of the input parameter. When a binding is part of the CommandLineTool.arguments field, the valueFrom field is required.

**CommandOutputParameter**

- glob** [characterORExpression] Find files relative to the output directory, using POSIX glob(3) path-name matching. If provided an array, match all patterns in the array. If provided an expression, the expression must return a string or an array of strings, which will then be evaluated as a glob pattern. Only files which actually exist will be matched and returned.
- outputEval** [Expression] Evaluate an expression to generate the output value. If glob was specified, the script context will be an array containing any files that were matched. Additionally, if loadContents is true, the file objects will include up to the first 64 KiB of file contents in the contents field. Following fields inherited from Binding
- loadContents** [logical] Only applies when type is File. Read up to the first 64 KiB of text from the file and place it in the "contents" field of the file object for manipulation by expressions.
- secondaryFiles** Only applies when type is File. Describes files that must be included alongside the primary file. If the value is Expression, the context of the expression is the input or output File parameter to which this binding applies. Where the value is a string, it specifies that the following pattern should be applied to the primary file: If string begins with one or more caret characters, for each caret, remove the last file extension from the path (the last period . and all following characters). If there are no file extensions, the path is unchanged. Append the remainder of the string to the end of the file path.

**Examples**

```
ipl <- IPList(
  input(id = "bam",
        type = "File",
        label = "Bam file",
        description = "Input bam file",
        position = 1L,
        separate = TRUE),
  input(id = "level",
        type = "Integer",
        label = "Compression Level",
        description = "Set compression level, from 0 (uncompressed) to 9 (best)",
        position = 2L),
  input(id = "prefix",
        type = "String",
        label = "Prefix",
        description = "Write temporary files to PREFIX.nnnn.bam",
        position = 3L)
)
```

---

CommandInputParameter-class

*CommandInputParameter Class*

---

**Description**

An input parameter for a CommandLineTool.

**Examples**

```

ipl <- InputParameterList(
  CommandInputParameter(id = "BAM", type = "File",
    label = "input bam",
    description = "input bam",
    inputBinding = CommandLineBinding(
      position = 1L
    )),
  CommandInputParameter(id = "level", type = "Integer",
    label = "Compression level",
    description = "Compression level",
    inputBinding = CommandLineBinding(
      position = 2L,
      prefix = "-l"
    ))
)

```

---

CommandInputSchema-class

*CommandInputSchema Class*

---

**Description**

CommandInputSchema Class

**Examples**

```
CommandInputSchema()
```

---

CommandLineBinding-class

*CommandLineBinding Class*

---

**Description**

When listed under `inputBinding` in the input schema, the term "value" refers to the the corresponding value in the input object. For binding objects listed in `CommandLineTool.arguments`, the term "value" refers to the effective value after evaluating `valueFrom`.

**Details**

The binding behavior when building the command line depends on the data type of the value. If there is a mismatch between the type described by the input schema and the effective value, such as resulting from an expression evaluation, an implementation must use the data type of the effective value.

- characterAdd prefix and the string to the command line.
- numericAdd prefix and decimal representation to command line.
- logicalIf true, add prefix to the command line. If false, add nothing.
- FileAdd prefix and the value of File.path to the command line.
- \*ArrayIf itemSeparator is specified, add prefix and the join the array into a single string with itemSeparator separating the items. Otherwise add prefix and recursively add individual elements.
- \*objectAdd prefix only, and recursively add object fields for which inputBinding is specified.
- nullAdd nothing.

### Fields

position [integer] The sorting key. Default position is 0.

prefix [character] Command line prefix to add before the value.

separate [logical] If true (default) then the prefix and value must be added as separate command line arguments; if false, prefix and value must be concatenated into a single command line argument.

itemSeparator [character] Join the array elements into a single string with the elements separated by by itemSeparator.

valueFrom [characterOrExpression] If valueFrom is a constant string value, use this as the value and apply the binding rules above. If valueFrom is an expression, evaluate the expression to yield the actual value to use to build the command line and apply the binding rules above. If the inputBinding is associated with an input parameter, the "context" of the expression will be the value of the input parameter. When a binding is part of the CommandLineTool.arguments field, the valueFrom field is required.

### Examples

```
CommandLineBinding(position = 1L, prefix = "-l")
```

---

CommandLineTool-class *CommandLineTool Class*

---

### Description

A CommandLineTool process is a process implementation for executing a non-interactive application in a POSIX environment. To help accommodate of the enormous variety in syntax and semantics for input, runtime environment, invocation, and output of arbitrary programs, CommandLineTool provides the concept of "input binding" to describe how to translate input parameters to an actual program invocation, and "output binding" to describe how generate output parameters from program output.

## Fields

- `baseCommand` (character) Specifies the program to execute. If the value is an array, the first element is the program to execute, and subsequent elements are placed at the beginning of the command line in prior to any command line bindings. If the program includes a path separator character it must be an absolute path, otherwise it is an error. If the program does not include a path separator, search the `$PATH` variable in the runtime environment find the absolute path of the executable.
- `arguments` [characterORCommandLineBinding] Command line bindings which are not directly associated with input parameters.
- `stdin` [characterORExpression] A path to a file whose contents must be piped into the command's standard input stream.
- `stdout` [characterORExpression] Capture the command's standard output stream to a file written to the designated output directory. If `stdout` is a string, it specifies the file name to use. If `stdout` is an expression, the expression is evaluated and must return a string with the file name to use to capture stdout. If the return value is not a string, or the resulting path contains illegal characters (such as the path separator `/`) it is an error.
- `successCodes` [integer] Exit codes that indicate the process completed successfully.
- `temporaryFailCodes` [integer] Exit codes that indicate the process failed due to a possibly temporary condition, where executing the process with the same runtime environment and inputs may produce different results.
- `permanentFailCodes` [integer] Exit codes that indicate the process failed due to a permanent logic error, where executing the process with the same runtime environment and same inputs is expected to always fail.

## Input binding

The tool command line is built by applying command line bindings to the input object. Bindings are listed either as part of an input parameter using the `inputBinding` field, or separately using the `arguments` field of the `CommandLineTool`.

The algorithm to build the command line is as follows. In this algorithm, the sort key is a list consisting of one or more numeric and string elements. Strings are sorted lexicographically based on UTF-8 encoding.

- Collect `CommandLineBinding` objects from arguments. Assign a sorting key [position, i] where position is `CommandLineBinding.position` and the i is the index in the arguments list.
- Collect `CommandLineBinding` objects from the inputs schema and associate them with values from the input object. Where the input type is a record, array, or map, recursively walk the schema and input object, collecting nested `CommandLineBinding` objects and associating them with values from the input object.
- Assign a sorting key for each leaf binding object by appending nested position fields together with the array index, or map key of the data at each nesting level. If two bindings have the same position, the tie must be broken using the lexicographic ordering of the field or parameter name immediately containing the binding.
- Sort elements using the assigned sorting keys. Numeric entries sort before strings.

- In the sorted order, apply the rules defined in `CommandLineBinding` to convert bindings to actual command line elements.
- Insert elements from `baseCommand` at the beginning of the command line.

### Runtime environment

All files listed in the input object must be made available in the runtime environment. The implementation may use a shared or distributed file system or transfer files via explicit download. Implementations may choose not to provide access to files not explicitly specified by the input object or process requirements.

Output files produced by tool execution must be written to the designated output directory.

The initial current working directory when executing the tool must be the designated output directory.

The `TMPDIR` environment variable must be set in the runtime environment to the designated temporary directory. Any files written to the designated temporary directory may be deleted by the workflow platform when the tool invocation is complete.

An implementation may forbid the tool from writing to any location in the runtime environment file system other than the designated temporary directory and designated output directory. An implementation may provide read-only input files, and disallow in-place update of input files.

The standard input stream and standard output stream may be redirected as described in the `stdin` and `stdout` fields.

### Extensions

`DockerRequirement`, `CreateFileRequirement`, and `EnvVarRequirement`, are available as standard extensions to core command line tool semantics for defining the runtime environment.

### Execution

Once the command line is built and the runtime environment is created, the actual tool is executed.

The standard error stream and standard output stream (unless redirected by setting `stdout`) may be captured by platform logging facilities for storage and reporting.

Tools may be multithreaded or spawn child processes; however, when the parent process exits, the tool is considered finished regardless of whether any detached child processes are still running. Tools must not require any kind of console, GUI, or web based user interaction in order to start and run to completion.

The exit code of the process indicates if the process completed successfully. By convention, an exit code of zero is treated as success and non-zero exit codes are treated as failure. This may be customized by providing the fields `successCodes`, `temporaryFailCodes`, and `permanentFailCodes`. An implementation may choose to default unspecified non-zero exit codes to either `temporaryFailure` or `permanentFailure`.

### Output binding

If the output directory contains a file called `"cwl.output.json"`, that file must be loaded and used as the output object. Otherwise, the output object must be generated by walking the parameters listed

in outputs and applying output bindings to the tool output. Output bindings are associated with output parameters using the `outputBinding` field. See `CommandOutputBinding` for details.

### Examples

```
ipl <- InputParameterList(
  InputParameter(id = "BAM", type = "File",
    label = "input bam",
    description = "input bam",
    inputBinding = CommandLineBinding(
      position = 1L
    )),
  InputParameter(id = "level", type = "Integer",
    label = "Compression level",
    description = "Compression level",
    inputBinding = CommandLineBinding(
      position = 2L,
      prefix = "-l"
    ))
)

clt <- CommandLineTool(inputs = ipl, baseCommand = "samtools sort")
```

---

CommandOutputBinding-class

*CommandOutputBinding Class*

---

### Description

Describes how to generate an output parameter based on the files produced by a `CommandLineTool`. The output parameter is generated by applying these operations in the following order: `glob`, `loadContents`, `outputEval`

### Fields

`glob` [characterORExpression] Find files relative to the output directory, using POSIX `glob(3)` pathname matching. If provided an array, match all patterns in the array. If provided an expression, the expression must return a string or an array of strings, which will then be evaluated as a glob pattern. Only files which actually exist will be matched and returned.

`outputEval` [Expression] Evaluate an expression to generate the output value. If `glob` was specified, the script context will be an array containing any files that were matched. Additionally, if `loadContents` is true, the file objects will include up to the first 64 KiB of file contents in the `contents` field.

### Examples

```
CommandOutputBinding(glob = "*.bam")
```

---

CommandOutputParameter-class

*CommandOutputParameter Class*

---

### **Description**

CommandOutputParameter Class

### **Fields**

outputBinding [CommandOutputBinding] Describes how to handle the concrete outputs of a process step (such as files created by a program) and describe them in the process output parameter.

### **Examples**

```
CommandOutputParameter(outputBinding = CommandOutputBinding(glob = "*.bam"))
```

---

CommandOutputSchema-class

*CommandOutputSchema*

---

### **Description**

CommandOutputSchema

### **Fields**

outputBinding [CommandOutputBinding] Describes how to handle the concrete outputs of a process step (such as files created by a program) and describe them in the process output parameter.

### **Examples**

```
CommandOutputSchema()
```

---

`convert_app`*Convert App or a cwl JSON file to Tool or Flow object*

---

**Description**

Convert App or a cwl JSON file to Tool or Flow object

**Usage**

```
convert_app(from)
```

```
appType(x)
```

**Arguments**

`from` an App object or a cwl JSON

`x` a App object

**Details**

This function import cwl JSON file, based on its class: `CommandLineTool` or `Workflow` to relevant object in R, Tool object or Flow object.

**Value**

Tool or Flow object depends on cwl type.

**appType**

this function return class of a App object.

**Examples**

```
tool.in = system.file("extdata/app", "tool_star.json", package = "sevenbridges")
flow.in = system.file("extdata/app", "flow_star.json", package = "sevenbridges")
## convert to Tool object
convert_app(tool.in)
## convert to Flow object
convert_app(flow.in)
```

---

 CPURequirement-class *Rabix specific Requirements*


---

**Description**

Extends ProcessRequirements. CPURequirement and MemRequirement to setup CPU and Memory requirements.

requirements and hints

**Usage**

```
docker(pull = NULL, imageId = NULL, load = NULL, file = NULL,
       output = NULL, dockerPull = pull, dockerImageId = imageId,
       dockerLoad = load, dockerFile = file, dockerOutputDirectory = output,
       ...)
```

```
requirements(...)
```

```
fileDef(name = NULL, content = NULL)
```

**Arguments**

pull	[short form argument] Docker Repository[:Tag] like rocker/r-base
imageId	[short form argument] The image id that will be used for docker run, imageId Optionally set the id of image you get from SDK
load	[short form argument] Specify a HTTP URL from which to download a Docker image using docker load
file	[short form argument] Supply the contents of a Dockerfile which will be built using docker build.
output	[short form argument] Set the designated output directory to a specific location inside the Docker container
dockerPull	Docker Repository[:Tag] like rocker/r-base
dockerImageId	The image id that will be used for docker run, imageId Optionally set the id of image you get from SDK
dockerLoad	Specify a HTTP URL from which to download a Docker image using docker load
dockerFile	Supply the contents of a Dockerfile which will be built using docker build.
dockerOutputDirectory	Set the designated output directory to a specific location inside the Docker container
...	extra arguments passed
name	file name
content	file content, could be script

**Details**

It constructs ProecessRequirementList object, or from a returned raw list contains or requirements.

**Value**

A Requirement subclass.

**Fields**

value [Integer] for CPU default is 1L, if 0L, use all CPU. For mem, default is 1000L. Note: for CPU, 0L means multi-tread, and non-zero value will be converted to 1L, which means single thread.

**Examples**

```
cpu(1)
CPURequirement(value = 1L)
docker("rocker/r-base")
requirements(docker("rocker/r-base"), cpu(1), mem(1024))
mem(2000)
MemRequirement(value = 2000L)
aws("c3.8xlarge")
anyReq("any")
```

---

CWL-class

*Class CWL*

---

**Description**

Define CWL class and generic methods, no fields defeind.

**Methods**

getFields(values) return fields as a list, used for following conversion, does not assume the value is primitive type.

toJSON(...) Covert object to JSON

toList(...) Covert object to a list of simple data types

toYAML(...) Covert object to YAML

**Examples**

```
## no fields, only to provide methods to be extended
x <- CWL()
```

---

delete	<i>Delete file or files</i>
--------	-----------------------------

---

**Description**

Delete file

**Usage**

```
delete(obj)

## S4 method for signature 'SimpleList'
delete(obj)

## S4 method for signature 'Files'
delete(obj)

## S4 method for signature 'Task'
delete(obj)
```

**Arguments**

obj                    single File or FileList

**Value**

system message

**Examples**

```
## Not run:
a$project("demo")$file("omni")$delete()
## or
delete(a$project("demo")$file("omni"))

## End(Not run)
```

---

download	<i>Download file or files</i>
----------	-------------------------------

---

**Description**

Download file

**Usage**

```
download(obj, ...)

## S4 method for signature 'FileList'
download(obj, ...)

## S4 method for signature 'Files'
download(obj, ...)
```

**Arguments**

```
obj          single File or FileList
...          passed to download()
```

**Value**

system message

**Examples**

```
## Not run:
a$project("demo")$file("omni")$download()
## or
download(a$project("demo")$file("omni"))

## End(Not run)
```

---

DSCList

*DSC list*


---

**Description**

Contains DatatypeSingleEnum, Schema, character

**Usage**

```
DSCList(...)
```

**Arguments**

```
...          element or list of the element.
```

**Value**

a DSCList

**Examples**

```
DSCList("test", DatatypeEnum(), Schema())
```

---

Expression-class      *Expression Class*

---

### Description

Define an expression that will be evaluated and used to modify the behavior of a tool or workflow. See Expressions for more information about expressions and ExpressionEngineRequirement for information on how to define a expression engine.

### Fields

engine (JsonPointerORcharacter) Either cwl:JsonPointer or a reference to an ExpressionEngineRequirement defining which engine to use.

script (character) The code to be executed by the expression engine.

### Examples

```
Expression(engine = "#cwl-js-engine", script = "$job.inputs['threads']")
```

---

ExpressionTool-class      *ExpressionTool Class*

---

### Description

Execute an expression as a process step.

### Fields

expression (Expression) The expression to execute. The expression must return a JSON object which matches the output parameters of the ExpressionTool.

### Examples

```
ExpressionTool(expression =  
    Expression(engine = "cwl:JsonPointer",  
        script = "$job.inputs['threads']"))
```

FileList

*FileList Class***Description**

FileList Class

File Class

**Usage**

FileList(...)

**Arguments**

... element or list of the element.

**Value**

File class generator

**Fields**`class` (character) Must be File to indicate this object describes a file.`path` (character) The path to the file.`checksum` [character] Optional hash code for validating file integrity. Currently must be in the form "sha1\$ + hexadecimal string" using the SHA-1 algorithm.`size` [numeric] Optional file size.`secondaryFile` [FileList] A list of additional files that are associated with the primary file and must be transferred alongside the primary file. Examples include indexes of the primary file, or external references which must be included when loading primary document. A file object listed in `secondaryFiles` may itself include `secondaryFiles` for which the same rules apply.**Examples**

```

library(jsonlite)
library(yaml)
f1 <- File()
f2 <- File(path = "./out.bam", checksum = "test",
           size = 3L, secondaryFile = FileList(File(path = "./out.bai")))
f1 <- FileList(f1, f2)
asList(f1)
writeLines(asYAML(f1))
asJSON(f1)
f1
f2
f1

```

Files-class

*Files class***Description**

Files Class

**Usage**

FilesList(...)

**Arguments**

... one or more Files objects

**Details**

Files class (has 's') contains CWL File class, it's usually returned by the API call which returns Files. A group of Files is defined as FilesList. Users don't usually need to construct Files or FilesList manually, most time it's generated from a API call.

**Value**

Files object

**Fields**

id character used as file id

name string used as file name

metdata a list for metdata associated with the file

project project id if any, when returned by a API call, it usually return the project id and stored with the object.

url url

created\_on date created on

modified\_on data modified on

origin list as origin

**Methods**

add\_tag(x, ...) add new tags while keeping old tags

copy\_to(project = NULL, name = NULL) copy a file to a project (id) with new name

download(destfile, ..., method = "curl") see help(download.file) for more options

meta() get metadata from a file

setMeta(..., overwrite = FALSE) set metadata with provided list, when overwrite is set to TRUE, it overwrites the metadata

`set_meta(..., overwrite = FALSE)` set metadata with provided list, when `overwrite` is set to `TRUE`, it overwrites the metadata

`set_tag(x = NULL, overwrite = TRUE, ...)` set a tag for a file, your tag need to be a list or vector

`tag()` get tag from a file

`update(name = NULL, metadata = NULL, tags = NULL)` This call updates the name, the full set metadata, and tags for a specified file.

### Examples

```
Files(id = "test_id", name = "test.bam")
```

---

FS-class

*FS class*

---

### Description

FS class

### Arguments

`server_address` placeholder  
`api_address` placeholder  
`vsfs_jar` placeholder  
`cache_dir` placeholder  
`cache_size` placeholder  
`project_id` placeholder

### Methods

`file(id = NULL)` given project id, show all files in it

`mount(mount_point = NULL, project_id = NULL, ignore.stdout = TRUE, sudo = TRUE, ...)`  
 mount a specific project if `project_id` is provided, otherwise mount all projects

`path(id = NULL)` list path for all mounted projects, for easy copy/paste of file path; if project id is provided, show project path and files path

`unmount(mount_cmd = NULL, project_id = NULL, ...)` unmount a project if `project_id` is provided, otherwise unmount all

---

get_cwl_class	<i>get class from cwl json file</i>
---------------	-------------------------------------

---

**Description**

get class from cwl json file

**Usage**

```
get_cwl_class(input)
```

**Arguments**

input	cwl json file path
-------	--------------------

**Value**

character for cwl class "Workflow" or "CommandLineTool"

**Examples**

```
tool.in = system.file("extdata/app", "tool_unpack_fastq.json", package = "sevenbridges")
flow.in = system.file("extdata/app", "flow_star.json", package = "sevenbridges")
get_cwl_class(tool.in)
is_commandlinetool(tool.in)
is_workflow(tool.in)
get_cwl_class(flow.in)
is_commandlinetool(flow.in)
is_workflow(flow.in)
```

---

Handler-class	<i>Handler instance</i>
---------------	-------------------------

---

**Description**

Create Handler instance

**Details**

Used for parse R markdown and lift into command line interface, dockerfile, docker container and cwl json.

**Value**

a Handler object

**Fields**

dockerfileHandler a function or NULL, how you handle Dockerfile, for example, push it to github

dockerHandler a function or NULL, how you handle local docker container, for example, push it to dockerhub

cwlHandler a function or NULL, how you handle cwl json file or yaml file, for example, push it sevenbridges platform as app.

---

 Item-class

*Class Item*


---

**Description**

Class Item

**Details**

To describe a set of objects, Project, Task, Pipeline, File etc.

**Fields**

response save the raw response from a request.

auth\_token propagate the auth\_token from parent.

href api href

---

 lift\_dcopt

*lift a dcopt string*


---

**Description**

lift a dcopt string used for command line

**Usage**

```
lift_dcopt(input)
```

**Arguments**

input input Rmarkdown file or a function name (character)

**Details**

parse Rmarkdown header from rabix field

**Value**

a string used for docopt

**Examples**

```
## Not run:
fl = system.file("examples/runif.Rmd", package = "liftr")
opts = lift_docopt(fl)
require(docopt)
docopt(opts)
docopt(lift_docopt("mean.default"))

## End(Not run)
```

---

link	<i>link two nodes to form a new Workflow</i>
------	--

---

**Description**

link two nodes to form a new Workflow

**Usage**

```
link(from, to, ...)
```

```
## S4 method for signature 'Tool,Tool'
link(from, to, id1, id2, flow_id = NULL,
      flow_label = NULL, flow_input = NULL, flow_output = NULL)
```

```
## S4 method for signature 'Tool,Workflow'
link(from, to, id1, id2, flow_id = NULL,
      flow_label = NULL, flow_input = NULL, flow_output = NULL)
```

```
## S4 method for signature 'Workflow,Tool'
link(from, to, id1, id2, flow_id = NULL,
      flow_label = NULL, flow_input = NULL, flow_output = NULL)
```

```
## S4 method for signature 'Workflow,Workflow'
link(from, to, id1, id2)
```

```
## S4 method for signature 'App,ToolORWorkflow'
link(from, to, id1, id2)
```

```
## S4 method for signature 'ToolORWorkflow,App'
link(from, to, id1, id2)
```

**Arguments**

from	either Tool App or Workflow object
to	either Tool App or Workflow object
...	more arguments
id1	id to be connected from the output of the first node
id2	id to be connected from the input of the second first node
flow_id	workflow id, if ignored, going to create one by joining tool id.
flow_label	workflow label, if ignored, going to create one by joining tool labels.
flow_input	full flow input id, e.g. "#SBG_Unpack_FASTQs.input_archive_file"
flow_output	full flow output id, e.g. "#STAR.log_files"

**Details**

Flexible enough to allow users to connect two objects by ids

**Value**

A Workflow object

**Examples**

```
t1 = system.file("extdata/app", "tool_unpack_fastq.json", package = "sevenbridges")
t2 = system.file("extdata/app", "tool_star.json", package = "sevenbridges")
t1 = convert_app(t1)
t2 = convert_app(t2)
## check possible link
link_what(t1, t2)
## link
f1 = link(t1, t2, "output_fastq_files", "reads")
## link
f2 = link(t1, t2, "output_fastq_files", "reads",
         flow_input = "#SBG_Unpack_FASTQs.input_archive_file",
         flow_output = "#STAR.log_files")
```

---

link\_what

*List possible linking methods*

---

**Description**

List possible linking methods

shows potential link methods by providing grouped inputs/outputs

**Usage**

```

link_what(from, to, ...)

## S4 method for signature 'Tool,Tool'
link_what(from, to)

## S4 method for signature 'Tool,SBGWorkflow'
link_what(from, to)

## S4 method for signature 'SBGWorkflow,Tool'
link_what(from, to)

## S4 method for signature 'SBGWorkflow,SBGWorkflow'
link_what(from, to)

```

**Arguments**

from	either Tool App or SBGWorkflow object
to	either Tool App or Workflow object
...	more arguments

**Details**

Given two object of Tool, Flow or App, list all possible input/output match.

**Value**

A Workflow object

**Examples**

```

t1 = system.file("extdata/app", "tool_unpack_fastq.json",
                 package = "sevenbridges")
t2 = system.file("extdata/app", "tool_star.json",
                 package = "sevenbridges")
t1 = convert_app(t1)
t2 = convert_app(t2)
link_what(t1, t2)
tool.in = system.file("extdata/app", "tool_unpack_fastq.json", package = "sevenbridges")
flow.in = system.file("extdata/app", "flow_star.json", package = "sevenbridges")
t1 = convert_app(tool.in)
f2 = convert_app(flow.in)
link_what(t1, f2)
tool.in = system.file("extdata/app", "tool_unpack_fastq.json", package = "sevenbridges")
flow.in = system.file("extdata/app", "flow_star.json", package = "sevenbridges")
t1 = convert_app(tool.in)
f2 = convert_app(flow.in)
link_what(f2, t1)

```

---

Metadata-class	<i>Meta schema</i>
----------------	--------------------

---

### Description

Meta schema

### Details

V2 version for meta data schema

### Examples

```
## show schema (you can still provide customized one)
## empty because they are all NULL
Metadata()
## show schema
Metadata()$show(TRUE)
## or
names(Metadata())$asList(TRUE)
## returned meta field is actually define as function too, directly
## call them will give you details
platform()
paired_end()
quality_scale()
## check their suggested value and construct your metadata
Metadata(platform = "Affymetrix SNP Array 6.0", paired_end = 1, quality_scale = "sanger")
```

---

misc_get_token	<i>Opens browser to copy the auth token</i>
----------------	---

---

### Description

Click 'Generate Token' button, copy and paste the generated token string to the R console. The function will return the token string.

### Usage

```
misc_get_token()
```

### Value

auth token

**Examples**

```
# Paste the auth token into R
# console then press enter:
token = NULL
token = misc_get_token()
```

---

misc_get_uploader	<i>Download SBG uploader and extract to a specified directory</i>
-------------------	---

---

**Description**

Download SBG uploader and extract to a specified directory.

**Usage**

```
misc_get_uploader(destdir = NULL)
```

**Arguments**

destdir	The directory to extract SBG uploader to. If not present, it will be created automatically.
---------	---

**Value**

0L if the SBG CLI uploader is successfully downloaded and unarchived.

**Examples**

```
dir = '~/sbg-uploader/'
misc_get_uploader(dir)
```

---

misc_make_metadata	<i>Specify the parameters of the file metadata and return a list, JSON string, or write to a file</i>
--------------------	---

---

**Description**

Specify the parameters of the file metadata and return a list, JSON string, or write to a file.

**Usage**

```
misc_make_metadata(output = c("list", "json", "metafile"), destfile = NULL,
  name = NULL, file_type = c("text", "binary", "fasta", "csfasta", "fastq",
  "qual", "xsq", "sff", "bam", "bam_index", "illumina_export", "vcf", "sam",
  "bed", "archive", "juncs", "gtf", "gff", "enlis_genome"),
  qual_scale = c("sanger", "illumina13", "illumina15", "illumina18",
  "solexa"), seq_tech = c("454", "Helicos", "Illumina", "Solid",
  "IonTorrent"), sample = NULL, library = NULL, platform_unit = NULL,
  paired_end = NULL)
```

**Arguments**

output	Output format, could be 'list', 'json', or 'metafile'.
destfile	Filename to write to. Must be specified when output = 'metafile'.
name	File name.
file_type	File type. This metadata parameter is mandatory for each file.
qual_scale	Quality scale encoding. For FASTQ files, you must either specify the quality score encoding sch which contains the FASTQ quality scale detector wrapper. In that case, you can specify the quality score encoding scheme by setting qual_scale inside the pipeline. For BAM files, this value should always be 'sanger'.
seq_tech	Sequencing technology. The seq_tech parameter allows you to specify the sequencing technology used. This metadata parameter is only required by some the tools and pipelines; however, it is strongly recommended that you set it whenever possible, unless you are certain that your pipeline will work without it.
sample	Sample ID. You can use the sample parameter to specify the sample identifier. The value supplied in this field will be written to the read group tag (@RG:SM) in SAM/BAM files generated from reads with the specified Sample ID. AddOrReplaceReadGroups will use this parameter as the value for the read group tag in a SAM/BAM file.
library	Library. You can set the library for the read using the library parameter. The value supplied in this field will be written to the read group tag (@RG:LB) in SAM/BAM files generated from reads with the specified Library ID. AddOrReplaceReadGroups will use this parameter as the value for the read group tag in a SAM/BAM file.
platform_unit	Platform unit. You can set the platform unit (e.g. lane for Illumina, or slide for SOLiD) using the platform_unit parameter. The value supplied in this field will be written to the read group tag (@RG:PU) in SAM/BAM files generated from the reads with the specified Platform Unit. AddOrReplaceReadGroups will use this parameter as the value for the read group tag of a SAM/BAM file.
paired_end	Paired end. With paired-end reads, this parameter indicates if the read file is left end (1) or right end (2). For SOLiD CSFASTA files, paired end files 1 and 2 correspond to R3 and F3 files, respectively.

**Details**

For more information about file metadata, please check the File Metadata Documentation: <https://developer.sbgenomics.com/platform/metadata>.

**Value**

list, JSON string, or a file.

**References**

<https://developer.sbgenomics.com/platform/metadata>

**Examples**

```
destfile = '~/c.elegans_chr2_test.fastq.meta'
misc_make_metadata(output = 'metafile',
                  destfile = destfile,
                  name = 'c.elegans_chr2_test.fastq',
                  file_type = 'fastq', qual_scale = 'illumina13',
                  seq_tech = 'Illumina')
```

---

misc\_upload\_cli      *Upload files using SBG uploader*

---

**Description**

Upload files using SBG uploader.

**Usage**

```
misc_upload_cli(token = NULL, uploader = NULL, file = NULL,
               project_id = NULL, proxy = NULL)
```

**Arguments**

token	auth token
uploader	The directory where the SBG uploader is located (the directory that contains the bin/ directory).
file	The location of the file to upload.
project_id	The project ID to upload the files to. If you do not supply this, then the uploader will place the incoming files in your "My Files" section.
proxy	Allows you to specify a proxy server through which the uploader should connect. About the details the proxy parameter format, see <a href="https://developer.sbgenomics.com/tools/uploader/documentation">https://developer.sbgenomics.com/tools/uploader/documentation</a> .

**Value**

The uploaded file's ID number.

**References**

<https://developer.sbgenomics.com/tools/uploader/documentation>

**Examples**

```
token = '420b4672ebfc43bab48dc0d18a32fb6f'
misc_upload_cli(token = token,
               uploader = '~/sbg-uploader/',
               file = '~/example.fastq', project_id = '1234')
```

---

Parameter-class	<i>Parameter class (reference class)</i>
-----------------	--

---

**Description**

Define an input or output parameter to a process.

InputParameterList

OutputParameterList

InputParameter Class

OutputParameter Class

**Usage**

InputParameterList(...)

OutputParameterList(...)

**Arguments**

... element or list of the element.

**Value**

Parameter object

**Fields**

`type` [ANY] Specify valid types of data that may be assigned to this parameter.

`label` [character] A short, human-readable label of this parameter object.

`description` [character] A long, human-readable description of this parameter object.

`streamable` [logical] Currently only applies if `type` is File. A value of true indicates that the file is read or written sequentially without seeking. An implementation may use this flag to indicate whether it is valid to stream file contents using a named pipe. Default: false.

`default` [ANY] The default value for this parameter if not provided in the input object.

`id` (character) The unique identifier for this parameter object.

`inputBinding` [Binding] Describes how to handle the inputs of a process and convert them into a concrete form for execution, such as command line parameters.

`id` (character) The unique identifier for this parameter object.

**Examples**

```

Parameter(type = "integer", label = "thread",
           description = "Specify the thread #",
           default = 0)

ipl <- InputParameterList(
  InputParameter(id = "BAM", type = "File",
                 label = "input bam",
                 description = "input bam",
                 inputBinding = CommandLineBinding(
                   position = 1L
                 )),
  InputParameter(id = "level", type = "Integer",
                 label = "Compression level",
                 description = "Compression level",
                 inputBinding = CommandLineBinding(
                   position = 2L,
                   prefix = "-l"
                 ))
)
ipl

```

---

 PrimitiveSingleEnum-class

*Pre-defiend enums*


---

**Description**

Please check `cwl:::CWL.Pritimive`, `cwl:::CWL.Complex`.

**Examples**

```

PrimitiveEnum()
PrimitiveEnum("boolean")
ComplexEnum("record")
DatatypeEnum("map")

```

---

 Process-class

*Process Class*


---

**Description**

The base executable type in CWL is the Process object defined by the document. Note that the Process object is abstract and cannot be directly executed.

**Fields**

- `id` [character] The unique identifier for this process object.
- `inputs` (InputParameterList) Defines the input parameters of the process. The process is ready to run when all required input parameters are associated with concrete values. Input parameters include a schema for each parameter and is used to validate the input object, it may also be used build a user interface for constructing the input object.
- `outputs` (OutputParameterList) Defines the parameters representing the output of the process. May be used to generate and/or validate the output object.
- `requirements` [ProcessRequirementList] Declares requirements that apply to either the runtime environment or the workflow engine that must be met in order to execute this process. If an implementation cannot satisfy all requirements, or a requirement is listed which is not recognized by the implementation, it is a fatal error and the implementation must not attempt to run the process, unless overridden at user option.
- `hints` [ANY] Declares hints applying to either the runtime environment or the workflow engine that may be helpful in executing this process. It is not an error if an implementation cannot satisfy all hints, however the implementation may report a warning.
- `label` [character] A short, human-readable label of this process object.
- `description` [character] A long, human-readable description of this process object.

**Examples**

```

ipl <- InputParameterList(
  InputParameter(id = "BAM", type = "File",
    label = "input bam",
    description = "input bam",
    inputBinding = CommandLineBinding(
      position = 1L
    )),
  InputParameter(id = "level", type = "Integer",
    label = "Compression level",
    description = "Compression level",
    inputBinding = CommandLineBinding(
      position = 2L,
      prefix = "-l"
    ))
)
ipl
p <- Process(id = "process", inputs = ipl)
p

```

**Description**

ProcessRequirement Class  
 DockerRequirement Class  
 ProcessRequirementList

**Usage**

FileDefList(...)  
 EnvironmentDefList(...)  
 ProcessRequirementList(...)

**Arguments**

... element or list of the element.

**Value**

a ProcessRequirement object or subclass object.

**ProcessRequirement**

A process requirement modifies the semantics or runtime environment of a process. If an implementation cannot satisfy all requirements, or a requirement is listed which is not recognized by the implementation, it is a fatal error and the implementation must not attempt to run the process, unless overridden at user option.

(character) The specific requirement type.

**DockerRequirement Class**

class Indicates that a workflow component should be run in a Docker container, and specifies how to fetch or build the image. If a CommandLineTool lists DockerRequirement under hints or requirements, it may (or must) be run in the specified Docker container. The platform must first acquire or install the correct Docker image, as described by DockerRequirement. The platform must execute the tool in the container using docker run with the appropriate Docker image and the tool command line. The workflow platform may provide input files and the designated output directory through the use of volume bind mounts. The platform may rewrite file paths in the input object to correspond to the Docker bind mounted locations. When running a tool contained in Docker, the workflow platform must not assume anything about the contents of the Docker container, such as the presence or absence of specific software, except to assume that the generated command line represents a valid command within the runtime environment of the container.

(character) Get a Docker image using docker pull

dockerPull (character) Specify a HTTP URL from which to download a Docker image using docker load.

dockerFile (character) Supply the contents of a Dockerfile which will be build using docker build.

`dockerImageId` (character) The image id that will be used for docker run. May be a human-readable image name or the image identifier hash. May be skipped if `dockerPull` is specified, in which case the `dockerPull` image id will be used.

`dockerOutputDirectory` (character) Set the designated output directory to a specific location inside the Docker container.

### SubworkflowFeatureRequirement Class

Indicates that the workflow platform must support nested workflows in the run field of (WorkflowStep)(#workflowstep).

### FileDef Class

Define a file that must be placed by in the designated output directory prior to executing the command line tool. May be the result of executing an expression, such as building a configuration file from a template.

(characterORExpression) The name of the file to create in the output directory.

`fileContent` (characterORExpression) If the value is a string literal or an expression which evaluates to a string, a new file must be created with the string as the file contents. If the value is an expression that evaluates to a File object, this indicates the referenced file should be added to the designated output directory prior to executing the tool. Files added in this way may be read-only, and may be implemented through bind mounts or file system links in such a way as to avoid unnecessary copying of the input file.

### CreateFileRequirement Class

Define a list of files that must be created and placed by the workflow platform in the designated output directory prior to executing the command line tool. See FileDef for details.

(FileDefList) The list of files.

### EnvironmentDef Class

`fileDef` Define an environment variable that will be set in the runtime environment by the workflow platform when executing the command line tool. May be the result of executing an expression, such as getting a parameter from input.

(character) The environment variable name.

`envName/value` (characterORExpression) The environment variable value.

### EnvVarRequirement Class

Define a list of environment variables which will be set in the execution environment of the tool. See EnvironmentDef for details.

(EnvironmentDefList) The list of environment variables.

### ScatterFeatureRequirement Class

`envDef` Indicates that the workflow platform must support the scatter and scatterMethod fields of (WorkflowStep)(#workflowstep).

**ExpressionEngineRequirement Class**

Define an expression engine, as described in Expressions.

(character) Used to identify the expression engine in the engine field of Expressions.

requirements [ProcessRequirement]Requirements to run this expression engine, such as Docker-Requirement for specifying a container with the engine.

engineCommand [character] The command line to invoke the expression engine.

engineConfig [character] Additional configuration or code fragments that will also be passed to the expression engine. The semantics of this field are defined by the underlying expression engine. Intended for uses such as providing function definitions that will be called from CWL expressions.

**Examples**

```
dkr <- DockerRequirement(dockerImageId = "testid")
cfr <- CreateFileRequirement(fileDef =
  FileDefList(FileDef(filename = "hello.txt")))
sfr <- SubworkflowFeatureRequirement()
evr <- EnvVarRequirement(envDef = EnvironmentDefList(
  EnvironmentDef(envName = "path",
    envValue = "testpath")
))
safr <- ScatterFeatureRequirement()
eer <- ExpressionEngineRequirement(id = "hello")
ProcessRequirementList(dkr, cfr, sfr, evr, safr, eer)
```

---

project\_details

*Returns the details of the project*

---

**Description**

Returns the details of the project.

**Usage**

```
project_details(token = NULL, project_id = NULL, ...)
```

**Arguments**

token	auth token
project_id	ID of a project you want to access.
...	parameters passed to api function

**Value**

parsed list of the returned json

**Examples**

```
token = '420b4672ebfc43bab48dc0d18a32fb6f'
req = project_details(token,
                      project_id = 'b0b3a611-6bb0-47e5-add7-a83402cf7858')
```

---

project_members	<i>Returns a list of all users invited to the project and their privileges</i>
-----------------	--

---

**Description**

Returns a list of all users invited to the project and their privileges. Project ID is specified as path parameter. Call returns ID and username of the user with privileges.

**Usage**

```
project_members(token = NULL, project_id = NULL, ...)
```

**Arguments**

token	auth token
project_id	ID of a project you want to access.
...	parameters passed to api function

**Value**

parsed list of the returned json

**Examples**

```
token = '420b4672ebfc43bab48dc0d18a32fb6f'
req = project_members(token,
                      project_id = 'b0b3a611-6bb0-47e5-add7-a83402cf7858')
```

---

response	<i>Get raw response from an Item object</i>
----------	---

---

**Description**

Get raw response from an Item object

**Usage**

```
response(x)

response(x) <- value

## S4 method for signature 'ANY'
response(x)

## S4 replacement method for signature 'ANY'
response(x) <- value

## S4 method for signature 'Item'
response(x)

## S4 replacement method for signature 'Item'
response(x) <- value

## S4 method for signature 'SimpleList'
response(x)

## S4 replacement method for signature 'SimpleList'
response(x) <- value
```

**Arguments**

x	object that may have response.
value	value to be replaced.

**Value**

a raw response from htrr

**Examples**

```
## Not run:
response(x)

## End(Not run)
```

---

SBGWorkflow-class	<i>Build workflow</i>
-------------------	-----------------------

---

**Description**

Build workflow

**Usage**

```

Flow(..., graph = TRUE, x.width = 1000, y.width = 400, x.start = 100,
      y.start = 200, canvas_zoom = 1, canvas_x = 40, canvas_y = 130)

## S4 method for signature 'Tool,Tool'
e1 + e2

## S4 method for signature 'WorkflowStepList,Tool'
e1 + e2

## S4 method for signature 'WorkflowStepList,WorkflowStepList'
e1 + e2

## S4 method for signature 'App,App'
e1 + e2

## S4 method for signature 'WorkflowStepList,App'
e1 + e2

e1 %>>% e2

## S4 method for signature 'Tool,Tool'
e1 %>>% e2

## S4 method for signature 'Workflow,Tool'
e1 %>>% e2

## S4 method for signature 'Workflow,Workflow'
e1 %>>% e2

## S4 method for signature 'App,App'
e1 %>>% e2

## S4 method for signature 'Workflow,App'
e1 %>>% e2

```

**Arguments**

...	extra arguments passed to SBGWorkflow
graph	if add graph coordinates or not, used for visualization on seven bridges platform.
x.width	x scale width
y.width	y scale width
x.start	node x start point for a flow
y.start	node y start point for a flow
canvas_zoom	zoom factor
canvas_x	canvas x

canvas_y	canvas y
e1	either Tool App or Workflow object
e2	either Tool App or Workflow object

**Value**

a SBGWorkflow object.

**Methods**

copy\_obj() this is a hack to make copy of reference cwl object

get\_input(ids, force = FALSE) get input by pure input id from all steps

get\_input\_exposed() exposed input id other than file

get\_input\_node() get input file nodes id

get\_input\_port() show included port of all inputs

get\_output(ids, force = FALSE) get output by pure output id from all steps

get\_output\_node() get output file nodes id

get\_required() show flow required input id and types

get\_step(name = NULL, id = NULL) get step object by name or id, name support pattern match

get\_tool(name = NULL, id = NULL) get a tool object by name or id, name support pattern match

input\_id() show input id

input\_matrix(new.order = c("id", "label", "type", "required", "prefix", "fileTypes"), required = NULL) this return a matrix of input parameters, by default, following the order id, label, type, required, prefix, fileTypes. new.order accept names of column you want to print, but it has to be a field of inputs. When its set to NULL, it prints all fields. when required = TRUE, only print required field.

input\_type() show a vector of flow input type, names of them are input id

link\_map() show a table of all linked nodes

linked\_input\_id() input id that linked to an output

linked\_output\_id() output id that linked to an input

list\_tool() list all tools included in this flow

output\_id() show output id

output\_matrix(new.order = c("id", "label", "type", "fileTypes")) this return a matrix of output parameters, by default, following the order id, label, type, fileTypes. new.order accept names of column you want to print, but it has to be a field of outputs. When its set to NULL, it prints all fields. when required = TRUE, only print required field.

output\_type() show a vector of flow output type, names of them are output id

run(run\_inputs = list(), engine = c("bunny", "rabix", "cwlrun")) run this tool with inputs locally. engine supported: bunny, rabix, cwlrun. inputs accept list or json

set\_batch(input = NULL, criteria = NULL, type = c("ITEM", "CRITERIA")) set a flow input node into a batch mode, this now is required before you execute a batch task on a batch-not-enabled flow

`set_flow_input(iid = NULL, add = TRUE)` expose tool input node as flow input, default is additive, if `add = FALSE` this will overwrite and only made provided id inputs of flow  
`set_flow_output(oid = NULL, add = TRUE)` expose tool output node as flow output, default is additive, if `add = FALSE` this will overwrite and only made provided id outputs of flow  
`set_input_port(ids, include = TRUE)` set included port for provided input id(s)  
`set_required(ids, required = TRUE)` set a input node required (TRUE) or not required (FALSE) this require full input id (with tool id prefix) such as #STAR.alignIntronMax  
`step_input_id(full = FALSE)` show step input id, default names of them is tool id. when `full = TRUE` show full name then names of vector is type.  
`step_output_id(full = FALSE)` show step output id, default names of them is tool id. when `full = TRUE` show full name then names of vector is type.

### Examples

```

f1 = system.file("extdata/app", "flow_star.json", package = "sevenbridges")
f1 = convert_app(f1)
## input matrix
f1$input_matrix()
## by name
f1$input_matrix(c("id", "type", "required", "link_to"))
## return only required
f1$input_matrix(required = TRUE)
## return everything
f1$input_matrix(NULL)
## return a output matrix with more informtion
f1$output_matrix()
## return only a few fields
f1$output_matrix(c("id", "type"))
## return everything
f1$output_matrix(NULL)
## flow inputs
f1$input_type()
## flow outputs
f1$output_type()
## flow input id
f1$input_id()
## linked input id
f1$link_input_id()
## flow output id
f1$output_id()
## linked output id
f1$link_output_id()
## link_map
f1$link_map()
## all step input id
f1$step_input_id()
## all step input full id with type
f1$step_input_id(TRUE)
## all step output id
f1$step_output_id()
  
```

```

## all step output full id with type
f1$step_output_id(TRUE)
## get inputs objects
f1$get_input("#clip3pNbases")
f1$get_input(c("#clip3pNbases", "#chimScoreMin"))
f1$get_input(c("#clip3pNbases", "#chimScoreMin", "#STAR.outFilterMismatchNoverLmax"))
## get outputs objects
f1$get_output("#log_files")
f1$get_output(c("#log_files", "intermediate_genome"))
f1$get_output(c("#log_files", "intermediate_genome", "#STAR.unmapped_reads"))
f1$get_output("#log_files")
## set flow input
f1$set_flow_input("#SBG_FASTQ_Quality_Detector.fastq")
f1$set_flow_output(c("#log_files", "intermediate_genome"))
## get required node
f1$get_required()
## set required node
f1$steps[[1]]$run$set_required("genomeChrBinNbits")
f1$get_required()
f1$steps[[1]]$run$set_required("genomeChrBinNbits", FALSE)
f1$get_required()
## get Tool object from Flow by id and name
f1$list_tool()
## return two
f1$get_tool("STAR")
## return one
f1$get_tool("^STAR$")
## get included input ports
f1$get_input_port()
## set included input ports
f1$set_input_port(c("#STAR.alignSJDBoverhangMin", "chimScoreSeparation"))
f1$get_input_port()
f1$set_input_port(c("#STAR.alignSJDBoverhangMin", "chimScoreSeparation"), FALSE)
f1$get_input_port()
f1$get_input_node()
f1$get_output_node()
f1$get_input_exposed()
f1$step_input_id(TRUE)
f1$input_id()
f1$set_flow_input("#STAR.reads")
f1$input_id()
## batch
f1$set_batch("sjdbGTFFfile", c("metadata.sample_id", "metadata.library_id"))
f1$set_batch("sjdbGTFFfile", type = "ITEM")
## add source to id
f1$link_map()
f1$add_source_to_id(c("test1", "test2"), c("#STAR.genome", "#STAR.reads"))
f1$link_map()

```

**Description**

SchemaList

A schema defines a parameter type.

SchemaDef Class

SchemaDefList

InputSchema Class

OutputSchema Class

**Usage**

SchemaList(...)

SchemaDefList(...)

**Arguments**

... element or list of the element.

**Value**

a Schema object or sbuclass object.

**Fields**

type [ANY] The data type of this parameter.

fields [SchemaList] When type is record, defines the fields of the record.

symbols [character] When type is enum, defines the set of valid symbols.

items [ANY] When type is array, defines the type of the array elements.

values [ANY] When type is map, defines the value type for the key/value pairs.

inputBinding [Binding] Describes how to handle a value in the input object convert it into a concrete form for execution, such as command line parameters.

**Examples**

```
Schema(fields = SchemaList(SchemaDef(name = "schema")))
```

---

setListClass	<i>List Class generator.</i>
--------------	------------------------------

---

**Description**

Extends IRanges SimpleList class and return constructor.

**Usage**

```
setListClass(elementType = NULL, suffix = "List", contains = NULL,
             where = topev(parent.frame()))
```

**Arguments**

elementType	[character]
suffix	[character] default is "List"
contains	[character] class name.
where	environment.

**Value**

S4 class constructor

---

setTaskHook	<i>set task function hook</i>
-------------	-------------------------------

---

**Description**

set task function hook according to

**Usage**

```
setTaskHook(status = c("queued", "draft", "running", "completed", "aborted",
                       "failed"), fun)
```

```
getTaskHook(status = c("queued", "draft", "running", "completed", "aborted",
                       "failed"))
```

**Arguments**

status	one of ("queued", "draft", "running", "completed", "aborted", "failed")
fun	function it must return a TRUE or FALSE in the end of function body, when it's TRUE this function will also terminate monitor process, if FALSE, function called, but not going to terminate task monitoring process.

**Value**

object from setHook and getHook.

**Examples**

```
getTaskHook("completed")
setTaskHook("completed", function(){
  message("completed")
  return(TRUE)
})
```

---

 set\_tag

*set file tags*


---

**Description**

set file tags

add new file tags and keep the old tags

**Usage**

```
set_tag(obj, ...)
```

```
## S4 method for signature 'FileList'
set_tag(obj, ...)
```

```
## S4 method for signature 'Files'
set_tag(obj, ...)
```

```
add_tag(obj, ...)
```

```
## S4 method for signature 'FileList'
add_tag(obj, ...)
```

```
## S4 method for signature 'Files'
add_tag(obj, ...)
```

**Arguments**

obj	single File or FileList
...	passed to obj\$set_tag() or obj\$add_tag()

**Value**

tag list

tag list

**Examples**

```
## Not run:
fl = a$project("demo")$file("omni")
set_tag(fl, "new tag")
set_tag(fl, list("new tag", "new tag 2"))

## End(Not run)
## Not run:
fl = a$project("demo")$file("omni")
add_tag(fl, "new tag")
add_tag(fl, list("new tag", "new tag 2"))

## End(Not run)
```

---

set\_test\_env

*Set testing env*


---

**Description**

Checks if docker is installed, is running and has required images downloaded and if do creates container

**Usage**

```
set_test_env(type, docker_image, data_dir)
```

**Arguments**

type	"dind" or "host"
docker_image	required docker image with pre-installed bunny, default: tengfei/testenv
data_dir	directory with data to mount (also will be execution directory)

**Value**

docker stdout

**Examples**

```
## Not run:
set_test_env("dind", "tengfei/testenv", "/Users/<user>/tools")

## End(Not run)
```

---

test_tool_bunny	<i>Test tools in rabix/bunny</i>
-----------------	----------------------------------

---

**Description**

Test tools locally in rabix/bunny inside docker container

**Usage**

```
test_tool_bunny(rabix_tool, inputs)
```

**Arguments**

rabix_tool	rabix tool from Tool class
inputs	input parameters declared as json (or yaml) string

**Value**

bunny stdout

**Examples**

```
## Not run:
inputs <- '{"counts_file": {"class": "File", "path": "./FPKM.txt"}, "gene_names": "BRCA1"}'
rbx <- <define rabix tool>
set_test_env("tengfei/testenv", "<mount_dir>")
test_tool_bunny(rbx, inputs)

## End(Not run)
```

---

test_tool_cwlr	<i>Test tools with cwl-runner</i>
----------------	-----------------------------------

---

**Description**

Test tools locally cwl-runner (<https://github.com/common-workflow-language/cwltool>)

**Usage**

```
test_tool_cwlr(rabix_tool, inputs = list())
```

**Arguments**

rabix_tool	rabix tool from Tool class
inputs	input parameters declared as json (or yaml) string

**Value**

cwl-runner stdout

**Examples**

```
## Not run:
inputs <- '{"counts_file": {"class": "File", "path": "./FPKM.txt"}, "gene_names": "BRCA1"}'
rbx <- <define rabix tool>
set_test_env("tengfei/testenv", "<mount_dir>")
test_tool_cwlrun(rbx, inputs)

## End(Not run)
```

---

test_tool_rabix	<i>Test tools in rabix/rabix-devel (DEPRECATED)</i>
-----------------	---

---

**Description**

Test tools locally in rabix/rabix-devel python executor (DEPRECATED)

**Usage**

```
test_tool_rabix(rabix_tool, inputs = list())
```

**Arguments**

rabix_tool	rabix tool from Tool class
inputs	input parameters declared as json (or yaml) string

**Value**

rabix stdout

**Examples**

```
## Not run:
inputs <- '{"counts_file": {"class": "File", "path": "./FPKM.txt"}, "gene_names": "BRCA1"}'
rbx <- <define rabix tool>
set_test_env("tengfei/testenv", "<mount_dir>")
test_tool_rabix(rbx, inputs)

## End(Not run)
```

---

 Tool-class

*Tool Class*


---

### Description

codeTool class extends CommandLineTool with more seven bridges flavored fields the SBG class. `obj$toJSON()` `obj$toJSON(pretty = TRUE)` or `obj$toYAML()` will convert a Tool object into a text JSON/YAML file.

### Value

a Tool object.

### Fields

`context` [character] by default: "https://github.com/common-workflow-language/common-workflow-language/blob/draft-1/specification/tool-description.md"

`owner` [list] a list of owner names.

`contributor` [list] a list of contributor names.

### Methods

`copy_obj()` this is a hack to make copy of reference cwl object

`get_input(name = NULL, id = NULL)` get input objects by names or id

`get_input_port()` the inputs node with `sbg:includeInPorts` equals TRUE

`get_output(name = NULL, id = NULL)` get output objects by names or id

`get_required()` return required input fields types, names of them are input id

`input_id(full = FALSE, requiredOnly = FALSE)` get input id from a Tool, when `full = TRUE`, connect tool id with input id e.g. if `requiredOnly = TRUE`, returne required field only

`input_matrix(new.order = c("id", "label", "type", "required", "prefix", "fileTypes"), required = NULL)` this return a matrix of input parameters, by default, following the order id, label, type, required, prefix, fileTypes. `new.order` accept names of column you want to print, but it has to be a field of inputs. When its set to NULL, it prints all fields. when `required = TRUE`, only print required field.

`input_type()` this return a vector of types, names of them are input id

`output_id(full = FALSE)` get output id from a Tool, when `full = TRUE`, connect tool id with input id e.g.

`output_matrix(new.order = c("id", "label", "type", "fileTypes"))` this return a matrix of output parameters, by default, following the order id, label, type, fileTypes. `new.order` accept names of column you want to print, but it has to be a field of outputs. When its set to NULL, it prints all fields. when `required = TRUE`, only print required field.

`output_type()` this return a vector of types, names of them are output id

`run(run_inputs = list(), engine = c("bunny", "rabix", "cwlrun"))` run this tool with inputs locally. engine supported: bunny, rabix, cwlrun. inputs accept list or json

`set_input_port(ids, include = TRUE)` set inputs ports field `sbg:includeInPorts` to the value of `include`, default is `TRUE`

`set_required(ids, required = TRUE)` set an input node required or not required. The first parameter takes single input id or more than one ids. the second parameters `required` is the value you want to set to inputs. `TRUE` means set to required.

## Examples

```
t1 = system.file("extdata/app", "tool_star.json", package = "sevenbridges")
## convert json file into a Tool object
t1 = convert_app(t1)
## get input type information
t1$input_type()
## get output type information
t1$output_type()
## return a input matrix with more informtion
t1$input_matrix()
## return only a few fields
t1$input_matrix(c("id", "type", "required"))
## return only required
t1$input_matrix(required = TRUE)
## return everything
t1$input_matrix(NULL)
## return a output matrix with more informtion
t1$output_matrix()
## return only a few fields
t1$output_matrix(c("id", "type"))
## return everything
t1$output_matrix(NULL)
## get input id
t1$input_id()
## get full input id with Tool name
t1$input_id(TRUE)
## get output id
t1$output_id()
## get full output id
t1$output_id(TRUE)
## get required input id
t1$get_required()
## set input required
t1$set_required(c("#reads", "winFlankNbins"))
t1$get_required()
t1$set_required("reads", FALSE)
t1$get_required()
t1$get_input(name = "ins")
t1$get_input(id = "#winFlankNbins")
t1$get_output(name = "gene")
t1$get_output(id = "#aligned_reads")
## get a tool from a flow
f1 = system.file("extdata/app", "flow_star.json", package = "sevenbridges")
## convert json file into a Tool object
f1 = convert_app(f1)
```

```

t2 = f1$get_tool("STAR$")
oid = t2$get_input_port()
oid
## set new ports
t2$input_id()
t2$set_input_port("#chimScoreSeparation")
t2$get_input_port()
t2$set_input_port("#chimScoreSeparation", FALSE)
t2$get_input_port()
## run the tool locally with example data
## Not run:
t3 = system.file("extdata/app/dna2protein", "translate.cwl.json", package = "sevenbridges")
t3 = convert_app(t3)
f1 = system.file("extdata/app/dna2protein/data", "input.txt", package = "sevenbridges")
set_test_env("dind", "tengfei/testenv", "~/mounts")
t3$input_type()
t3$run(list(input_file = Files(f1))) ## Not File

## End(Not run)

```

---

upload\_complete\_all    *Reports the complete file upload*

---

### Description

If the whole parts are uploaded, and the provided ETags are correct, then the file is assembled and made available on the SBG platform.

### Usage

```
upload_complete_all(token = NULL, upload_id = NULL, ...)
```

### Arguments

token	auth token
upload_id	ID of the upload
...	parameters passed to api function

### Value

parsed list of the returned json

### Examples

```

token = '58aeb140-1970-0130-6386-001f5b34aa78'
req = upload_complete_all(token,
  upload_id = '8D7sQJxQk14ubsEnKaoeQZ1RvV6ouQtMzBwaQNJdxPDLypUC3WogwtJdncevHxnT')

```

---

upload\_complete\_part    *Reports the completion of the part upload*

---

### Description

The ETag is provided for the correctness check upon completion of the whole upload. Value for the ETag is provided by AWS S3 service when uploading the file in the ETag header.

### Usage

```
upload_complete_part(token = NULL, upload_id = NULL, part_number = NULL,
  e_tag = NULL, ...)
```

### Arguments

token	auth token
upload_id	ID of the upload
part_number	ID of the part you wish to report as completed
e_tag	Value of the ETag header returned by AWS S3 when uploading part of the file.
...	parameters passed to api function

### Value

parsed list of the returned json

### Examples

```
token = '58aeb140-1970-0130-6386-001f5b34aa78'
req = upload_complete_part(token,
  upload_id = '8D7sQJxQk14ubsEnKaoeQZlRvV6ouQtMzBwaQNJdxPDLypUC3WogwtJdncevHxnt',
  part_number = '1',
  e_tag = 'd41d8cd98f00b204e9800998ecf8427e')
```

---

upload\_delete    *Aborts the upload*

---

### Description

All upload records and the file are deleted.

### Usage

```
upload_delete(token = NULL, upload_id = NULL, ...)
```

**Arguments**

token	auth token
upload_id	ID of the upload
...	parameters passed to api function

**Value**

parsed list of the returned json

**Examples**

```
token = '420b4672ebfc43bab48dc0d18a32fb6f'  
req = upload_delete(token,  
    upload_id = '8D7sQJxQk14ubsEnKaoeQZ1RvV6ouQtMzBwaQNJdxPDLypUC3WogwtJdncevHxnT')
```

---

upload_info	<i>Returns upload information for the ongoing upload</i>
-------------	--

---

**Description**

Returns the upload information for the ongoing upload.

**Usage**

```
upload_info(token = NULL, upload_id = NULL, ...)
```

**Arguments**

token	auth token
upload_id	ID of the upload
...	parameters passed to api function

**Value**

parsed list of the returned json

**Examples**

```
token = '420b4672ebfc43bab48dc0d18a32fb6f'  
req = upload_info(token,  
    upload_id = '8D7sQJxQk14ubsEnKaoeQZ1RvV6ouQtMzBwaQNJdxPDLypUC3WogwtJdncevHxnT')
```

---

upload_info_part	<i>Returns AWS S3 signed URL for a part of the file upload</i>
------------------	--

---

**Description**

Gets the signed URL for the upload of the specified part. Note that URLs are valid for 60 seconds only and that you should initiate upload to the signed URL in this time frame.

**Usage**

```
upload_info_part(token = NULL, upload_id = NULL, part_number = NULL, ...)
```

**Arguments**

token	auth token
upload_id	ID of the upload
part_number	Number of the upload file part that you wish to access
...	parameters passed to api function

**Value**

parsed list of the returned json

**Examples**

```
token = '420b4672ebfc43bab48dc0d18a32fb6f'
req = upload_info_part(token,
                      upload_id = 'aVluXRqSX2bse6va3AFFgVApp0CQ9IABeA8HnyyiEw85j6pNyV989H4xvJpr53xa',
                      part_number = 1)
```

---

upload_init	<i>Initializes the upload of the specified file</i>
-------------	---

---

**Description**

This is the first operation performed when you wish to upload a file. Operation is initialized by providing file name, project id where you wish the file to be uploaded to (if not specified, defaults to user's stash) and optionally by providing wanted part size. You may wish to set your part size to a low value if you experience problems with uploading large file parts, although default value of 5MB should be good enough for most users.

**Usage**

```
upload_init(token = NULL, project_id = NULL, name = NULL, size = NULL,
            part_size = NULL, ...)
```

**Arguments**

token	auth token
project_id	ID of the project you wish to upload to
name	Name of the file you wish to upload
size	Size of the file you wish to upload
part_size	Requested part size. Note that API may reject your requested part size and return proper one in response.
...	parameters passed to api function

**Details**

Limits:

- Maximum number of parts is 10000
- Maximum file size is 5TB
- Maximum part size is 5GB
- Default part size is 5MB

**Value**

parsed list of the returned json

**Examples**

```
token = '58aeb140-1970-0130-6386-001f5b34aa78'
req = upload_init(token,
                  project_id = 'f0eb447f-3511-4b28-9253-eba96191d432',
                  name = 'Sample1_RNASeq_chr20.pe_1.fastq', size = 5242880)
```

---

WorkflowOutputParameter-class  
*Workflow*

---

**Description**

A workflow is a process consisting of one or more steps. Each step has input and output parameters defined by the inputs and outputs fields. A workflow executes as described in execution model.

**Usage**

```
WorkflowOutputParameterList(...)
```

**Arguments**

```
... element or list of the element.
```

**Value**

a Workflow object.

**Fields**

`outputs` (WorkflowOutputParameterList) Defines the parameters representing the output of the process. May be used to generate and/or validate the output object. Inherited from Process

`steps` (WorkflowStepList) The individual steps that make up the workflow. Steps are executed when all input data links are fulfilled. An implementation may choose to execute the steps in a different order than listed and/or execute steps concurrently, provided that dependencies between steps are met.

**WorkflowOutputParameter Class**

Describe an output parameter of a workflow. The parameter must be connected to one or more parameters defined in the workflow that will provide the value of the output parameter.

[character] Specifies one or more workflow parameters that will provide this output value.

`sourceMerge` [LinkMergeMethod] The method to use to merge multiple inbound links into a single array. If not specified, the default method is `merge_nested`:

**Dependencies**

Dependencies between parameters are expressed using the source field on workflow step input parameters and workflow output parameters.

The source field expresses the dependency of one parameter on another such that when a value is associated with the parameter specified by source, that value is propagated to the destination parameter. When all data links inbound to a given step are fulfilled, the step is ready to execute.

**Extensions**

ScatterFeatureRequirement and SubworkflowFeatureRequirement are available as standard extensions to core workflow semantics.

**Examples**

```
## need better examples here
ws <- WorkflowStepList(WorkflowStep(id = "step1", label = "align-and-sort",
  description = "align and sort",
  inputs = WorkflowStepInputList(
    WorkflowStepInput(id = "id1"),
    WorkflowStepInput(id = "id2")
  )))
Workflow(steps = ws)
```

---

 WorkflowStepInput-class

*WorkflowStepInputList*


---

### Description

WorkflowStepInputList

WorkflowStepOutputList

WorkflowStepList

A workflow step is an executable element of a workflow. It specifies the underlying process implementation (such as `CommandLineTool`) in the `run` field and connects the input and output parameters of the underlying process to workflow parameters.

### Usage

`WorkflowStepInputList(...)`

`WorkflowStepOutputList(...)`

`WorkflowStepList(...)`

### Arguments

... element or list of the element.

### Value

a `WorkflowStep` object or subclass object.

### Fields

`id` [character] The unique identifier for this workflow step.

`inputs` (`WorkflowStepInputList`) Defines the input parameters of the workflow step. The process is ready to run when all required input parameters are associated with concrete values. Input parameters include a schema for each parameter and is used to validate the input object, it may also be used build a user interface for constructing the input object.

`outputs` (`WorkflowStepOutputList`) Defines the parameters representing the output of the process. May be used to generate and/or validate the output object.

`requirements` [`ProcessRequirement`] Declares requirements that apply to either the runtime environment or the workflow engine that must be met in order to execute this workflow step. If an implementation cannot satisfy all requirements, or a requirement is listed which is not recognized by the implementation, it is a fatal error and the implementation must not attempt to run the process, unless overridden at user option.

`hints` [ANY] Declares hints applying to either the runtime environment or the workflow engine that may be helpful in executing this workflow step. It is not an error if an implementation cannot satisfy all hints, however the implementation may report a warning.

label [character] A short, human-readable label of this process object.  
 description [character] A long, human-readable description of this process object.  
 run (CommandLineToolORExpressionToolORWorkflow) Specifies the process to run.  
 scatter [character]  
 scatterMethod [ScatterMethod] Required if scatter is an array of more than one element.

### WorkflowStepInput Class

The input of a workflow step connects an upstream parameter (from the workflow inputs, or the outputs of other workflows steps) with the input parameters of the underlying process.

If the sink parameter is an array, or named in a workflow scatter operation, there may be multiple inbound data links listed in the connect field. The values from the input links are merged depending on the method specified in the linkMerge field. If not specified, the default method is merge\_nested:

The input shall be an array consisting of exactly one entry for each input link. If merge\_nested is specified with a single link, the value from the link is wrapped in a single-item list.

**merge\_nested** **merge\_flattened** 1) The source and sink parameters must be compatible types, or the source type must be compatible with single element from the "items" type of the destination array parameter. 2) Source parameters which are arrays are concatenated; source parameters which are single element types are appended as single elements.

Fields:

id (character) A unique identifier for this workflow input parameter.  
 source [character] Specifies one or more workflow parameters that will provide input to the underlying process parameter.  
 linkMerge [LineMergeMethod] The method to use to merge multiple inbound links into a single array. If not specified, the default method is merge\_nested:  
 default [ANY] The default value for this parameter if there is no source field.

### WorkflowStepOutput Class

Associate an output parameter of the underlying process with a workflow parameter. The workflow parameter (given in the id field) be may be used as a source to connect with input parameters of other workflow steps, or with an output parameter of the process.

(character) A unique identifier for this workflow output parameter. This is the identifier to use in the source field of WorkflowStepInput to connect the output value to downstream parameters.

### Scatter/gather

id To use scatter/gather, ScatterFeatureRequirement must be specified in the workflow or workflow step requirements.

A "scatter" operation specifies that the associated workflow step or subworkflow should execute separately over a list of input elements. Each job making up a scatter operation is independent and may be executed concurrently.

The scatter field specifies one or more input parameters which will be scattered. An input parameter may be listed more than once. The declared type of each input parameter is implicitly wrapped in

an array for each time it appears in the scatter field. As a result, upstream parameters which are connected to scattered parameters may be arrays.

All output parameters types are also implicitly wrapped in arrays; each job in the scatter results in an entry in the output array.

If scatter declares more than one input parameter, scatterMethod describes how to decompose the input into a discrete set of jobs.

- `dotproduct` specifies that each the input arrays are aligned and one element taken from each array to construct each job. It is an error if all input arrays are not the same length.
- `nested_crossproducts` specifies the cartesian product of the inputs, producing a job for every combination of the scattered inputs. The output must be nested arrays for each level of scattering, in the order that the input arrays are listed in the scatter field.
- `flat_crossproducts` specifies the cartesian product of the inputs, producing a job for every combination of the scattered inputs. The output arrays must be flattened to a single level, but otherwise listed in the order that the input arrays are listed in the scatter field.

### Subworkflows

To specify a nested workflow as part of a workflow step, `SubworkflowFeatureRequirement` must be specified in the workflow or workflow step requirements.

### Examples

```
ws <- WorkflowStepList(WorkflowStep(id = "step1", label = "align-and-sort",
  description = "align and sort",
  inputs = WorkflowStepInputList(
    WorkflowStepInput(id = "id1"),
    WorkflowStepInput(id = "id2")
  )))
```

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