
Brewtils Documentation

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Brewtils is the Python library for interfacing with Beergarden systems. If you are planning on writing beer-garden plugins, this is the correct library for you. In addition to writing plugins, it provides simple ways to query the API and is officially supported by the beer-garden team.

1.1 Features

Brewtils helps you interact with beer-garden.

- Easy way to create beer-garden plugins
- Full support of the entire Beer-Garden API
- Officially supported by the beer-garden team

1.2 Installation

To install brewtils, run this command in your terminal:

```
$ pip install brewtils
```

Or add it to your `requirements.txt`

```
$ cat brewtils >> requirements.txt  
$ pip install -r requirements.txt
```

1.3 Quick Start

You can create your own beer-garden plugins without much problem at all. To start, we'll create the obligatory hello-world plugin. Creating a plugin is as simple as:

```
from brewtils.decorators import system, parameter, command
from brewtils.plugin import RemotePlugin

@system
class HelloWorld(object):

    @parameter(key="message", description="The message to echo", type="String")
    def say_hello(self, message="World!"):
        print("Hello, %s!" % message)
        return "Hello, %s!" % message

if __name__ == "__main__":
    client = HelloWorld()
    plugin = RemotePlugin(client,
                          name="hello",
                          version="0.0.1",
                          bg_host='127.0.0.1',
                          bg_port=2337)

    plugin.run()
```

Assuming you have a Beer Garden running on port 2337 on localhost, running this will register and start your plugin! You now have your first plugin running in beer-garden. Let's use another part of the `brewtils` library to exercise your plugin from python.

The `SystemClient` is designed to help you interact with registered Systems as if they were native Python objects.

```
from brewtils.rest.system_client import SystemClient

hello_client = SystemClient('localhost', 2337, 'hello')

request = hello_client.say_hello(message="from system client")

print(request.status) # 'SUCCESS'
print(request.output) # Hello, from system client!
```

In the background, the `SystemClient` has executed an HTTP POST with the payload required to get beer-garden to execute your command. The `SystemClient` is how most people interact with beer-garden when they are in the context of python and want to be making requests.

Of course, the rest of the API is accessible through the `brewtils` package. The `EasyClient` provides simple convenient methods to call the API and auto-serialize the responses. Suppose you want to get a list of all the commands on all systems:

```
from brewtils.rest.easy_client import EasyClient

client = EasyClient('localhost', 2337)

systems = client.find_systems()

for system in systems:
    for command in system.commands:
        print(command.name)
```

This is just a small taste of what is possible with the `EasyClient`. Feel free to explore all the methods that are exposed.

For more detailed information and better walkthroughs, checkout the full documentation!

1.4 Documentation

- Full Beer Garden documentation is available at <https://beer-garden.io>
- Brewtils Documentation is available at <https://brewtils.readthedocs.io>

2.1 Stable release

To install Brewtils, run this command in your terminal:

```
$ pip install brewtils
```

This is the preferred method to install Brewtils, as it will always install the most recent stable release.

If you don't have [pip](#) installed, this [Python installation guide](#) can guide you through the process.

2.2 From sources

The sources for Brewtils can be downloaded from the [Github repo](#).

You can either clone the public repository:

```
$ git clone git@github.com:beer-garden/brewtils.git
```

Or download the [tarball](#):

```
$ curl -OL https://github.com/beer-garden/brewtils/tarball/master
```

Once you have a copy of the source, you can install it with:

```
$ python setup.py install
```


3.1 brewtils package

3.1.1 Subpackages

brewtils.resolvers package

Submodules

brewtils.resolvers.bytes module

```
class brewtils.resolvers.bytes.BytesResolver (easy_client)  
    Bases: brewtils.resolvers.ResolverBase  
    Resolver that uses the Beergarden file API  
    download (value, definition)  
    should_download (value, definition)  
    should_upload (value, definition)  
    upload (value, definition)
```

brewtils.resolvers.chunks module

```
class brewtils.resolvers.chunks.ChunksResolver (easy_client)  
    Bases: brewtils.resolvers.ResolverBase  
    Resolver that uses the Beergarden chunks API  
    download (value, definition)  
    should_download (value, definition)
```

should_upload (*value*, *definition*)

Parameter type must be Base64 and the value must be either:

- String representation of a valid filename.
- An IOBase object

upload (*value*, *definition*)

brewtils.resolvers.identity module

class `brewtils.resolvers.identity.IdentityResolver`

Bases: `brewtils.resolvers.ResolverBase`

Resolver that doesn't actually resolve anything

On the upload side this is used to ensure that Resolvables always work when used in a SystemClient. For example, if you're using a SystemClient to execute a command with a Bytes parameter but you already have a Resolvable for that parameter, this makes that work.

On the download side this is used to support autoreolve=False parameters. If a definition specifies "autoreolve": False as part of the type_info dictionary then the parameter WILL NOT be resolved before the command function is invoked. Instead, the Resolvable itself will be passed as that parameter. This might be useful if you wanted to farm out a bytes object to multiple children commands without needing to re-upload the same bytes every time.

download (*value*, *definition*)

should_download (*value*, *definition*)

should_upload (*value*, *definition*)

upload (*value*, *definition*)

brewtils.resolvers.manager module

class `brewtils.resolvers.manager.ResolutionManager` (***kwargs*)

Bases: `object`

Parameter resolution manager

This class is used under-the-hood for various plugin functions. Its purpose is to remove all the various cleanup and housekeeping steps involved in resolving parameters. An example of an unresolved parameter is a dictionary which represents a bytes object. In this case the user wants the open file descriptor, not the random dictionary that they don't know how to process. The parameter resolver helps handle these scenarios.

This is intended for internal use for the plugin class.

resolve (*values*, *definitions=None*, *upload=True*)

Iterate through parameters, resolving as necessary

Parameters

- **values** – Dictionary of request parameter values
- **definitions** – Parameter definitions
- **upload** – Controls which methods will be called on resolvers

Returns The resolved parameter dict

`brewtils.resolvers.manager.build_resolver_map(easy_client=None)`
Builds all resolvers

Module contents

class `brewtils.resolvers.ResolverBase`
Bases: `object`
Base for all Resolver implementations
download (*value, definition*)
should_download (*value, definition*)
should_upload (*value, definition*)
upload (*value, definition*)

brewtils.rest package

Submodules

brewtils.rest.client module

class `brewtils.rest.client.RestClient` (*args, **kwargs)
Bases: `object`

HTTP client for communicating with Beer-garden.

This is the low-level client responsible for making the actual REST calls. Other clients (e.g. `brewtils.rest.easy_client.EasyClient`) build on this by providing useful abstractions.

Parameters

- **bg_host** (*str*) – Beer-garden hostname
- **bg_port** (*int*) – Beer-garden port
- **bg_url_prefix** (*str*) – URL path that will be used as a prefix when communicating with Beer-garden. Useful if Beer-garden is running on a URL other than `'/'`.
- **ssl_enabled** (*bool*) – Whether to use SSL for Beer-garden communication
- **ca_cert** (*str*) – Path to certificate file containing the certificate of the authority that issued the Beer-garden server certificate
- **ca_verify** (*bool*) – Whether to verify Beer-garden server certificate
- **client_cert** (*str*) – Path to client certificate to use when communicating with Beer-garden
- **api_version** (*int*) – Beer-garden API version to use
- **client_timeout** (*int*) – Max time to wait for Beer-garden server response
- **username** (*str*) – Username for Beer-garden authentication
- **password** (*str*) – Password for Beer-garden authentication
- **access_token** (*str*) – Access token for Beer-garden authentication
- **refresh_token** (*deprecated*) – Refresh token for Beer-garden authentication

```
JSON_HEADERS = {'Accept': 'text/plain', 'Content-type': 'application/json'}
```

```
LATEST_VERSION = 1
```

```
can_connect (**kwargs)
```

Determine if a connection to the Beer-garden server is possible

Parameters ****kwargs** – Keyword arguments to pass to Requests session call

Returns A bool indicating if the connection attempt was successful. Will return False only if a ConnectionError is raised during the attempt. Any other exception will be re-raised.

Raises `requests.exceptions.RequestException` – The connection attempt resulted in an exception that indicates something other than a basic connection error. For example, an error with certificate verification.

```
delete_chunked_file (*args, **kwargs)
```

Performs a GET on the specific File URL

Parameters

- **file_id** – File ID
- ****kwargs** – Query parameters to be used in the GET request

Returns Requests Response object

```
delete_file (*args, **kwargs)
```

Performs a DELETE on the specific File URL

Parameters **file_id** – File ID

Returns Requests Response object

```
delete_garden (*args, **kwargs)
```

Performs a DELETE on a Garden URL

Parameters **garden_name** – Name of Garden to delete

Returns Requests Response object

```
delete_instance (*args, **kwargs)
```

Performs a DELETE on an Instance URL

Parameters **instance_id** – Instance ID

Returns Requests Response object

```
delete_job (*args, **kwargs)
```

Performs a DELETE on a Job URL

Parameters **job_id** – Job ID

Returns Requests Response object

```
delete_queue (*args, **kwargs)
```

Performs a DELETE on a specific Queue URL

Parameters **queue_name** – Queue name

Returns Requests Response object

```
delete_queues (*args, **kwargs)
```

Performs a DELETE on the Queues URL

Returns Requests Response object

delete_system (*args, **kwargs)

Performs a DELETE on a System URL

Parameters **system_id** – System ID

Returns Requests Response object

get_chunked_file (*args, **kwargs)

Performs a GET on the specific File URL

Parameters

- **file_id** – File ID
- ****kwargs** – Query parameters to be used in the GET request

Returns Requests Response object

get_command (*args, **kwargs)

Performs a GET on the Command URL

Parameters **command_id** – Command ID

Returns Requests Response object

get_commands (*args, **kwargs)

Performs a GET on the Commands URL

Returns Requests Response object

get_config (*args, **kwargs)

Perform a GET to the config URL

Parameters ****kwargs** (*deprecated*) – Unused. Accepted for compatibility.

Returns Requests Response object

get_file (*args, **kwargs)

Performs a GET on the specific File URL

Parameters

- **file_id** – File ID
- ****kwargs** – Query parameters to be used in the GET request

Returns Requests Response object

get_garden (*args, **kwargs)

Performs a GET on the Garden URL

Parameters

- **garden_name** – Name of garden to retrieve
- ****kwargs** – Query parameters to be used in the GET request

Returns Requests Response object

get_gardens (*args, **kwargs)

Preform a GET on the Garden URL

This fetches all gardens.

Returns Requests Response object

get_instance (*args, **kwargs)

Performs a GET on the Instance URL

Parameters `instance_id` – Instance ID

Returns Requests Response object

get_job (**args*, ***kwargs*)

Performs a GET on the Job URL

Parameters `job_id` – Job ID

Returns Requests Response object

get_jobs (**args*, ***kwargs*)

Performs a GET on the Jobs URL.

Parameters *****kwargs*** – Query parameters to be used in the GET request

Returns Requests Response object

get_logging_config (**args*, ***kwargs*)

Perform a GET to the logging config URL

Parameters *****kwargs*** – Query parameters to be used in the GET request

Returns Requests Response object

get_queues (**args*, ***kwargs*)

Performs a GET on the Queues URL

Returns Requests Response object

get_request (**args*, ***kwargs*)

Performs a GET on the Request URL

Parameters `request_id` – Request ID

Returns Requests Response object

get_requests (**args*, ***kwargs*)

Performs a GET on the Requests URL

Parameters *****kwargs*** – Query parameters to be used in the GET request

Returns Requests Response object

get_system (**args*, ***kwargs*)

Performs a GET on the System URL

Parameters

- **`system_id`** – System ID
- *****kwargs*** – Query parameters to be used in the GET request

Returns Requests Response object

get_systems (**args*, ***kwargs*)

Perform a GET on the System collection URL

Parameters *****kwargs*** – Query parameters to be used in the GET request

Returns Requests Response object

get_tokens (*username=None*, *password=None*)

Use a username and password to get access and refresh tokens

Parameters

- **`username`** – Beergarden username

- **password** – Beergarden password

Returns Requests Response object

get_user (*args, **kwargs)

Performs a GET on the specific User URL

Parameters **user_identifier** – User ID or username

Returns Requests Response object

get_version (*args, **kwargs)

Perform a GET to the version URL

Parameters ****kwargs** (*deprecated*) – Unused. Accepted for compatibility.

Returns Requests Response object

patch_admin (*args, **kwargs)

Performs a PATCH on the admin URL

Parameters **payload** – Serialized PatchOperation

Returns Requests Response object

patch_garden (*args, **kwargs)

Perform a PATCH on a Garden URL

Parameters

- **garden_name** – Garden name
- **payload** – Serialized patch operation

Returns Request Response object

patch_instance (*args, **kwargs)

Performs a PATCH on the instance URL

Parameters

- **instance_id** – Instance ID
- **payload** – Serialized PatchOperation

Returns Requests Response object

patch_job (*args, **kwargs)

Performs a PATCH on the Job URL

Parameters

- **job_id** – Job ID
- **payload** – Serialized PatchOperation

Returns Requests Response object

patch_request (*args, **kwargs)

Performs a PATCH on the Request URL

Parameters

- **request_id** – Request ID
- **payload** – Serialized PatchOperation

Returns Requests Response object

patch_system (*args, **kwargs)

Performs a PATCH on a System URL

Parameters

- **system_id** – System ID
- **payload** – Serialized PatchOperation

Returns Requests Response object

post_chunked_file (*args, **kwargs)

Performs a POST on the file URL.

Parameters

- **fd** – A file descriptor
- **file_params** – Metadata about the file
- **current_position** – The current cursor position for the file object

Returns A Requests Response object

post_event (*args, **kwargs)

Performs a POST on the event URL

Parameters

- **payload** – Serialized new event definition
- **publishers** – Array of publishers to use

Returns Requests Response object

post_execute_job (job_id, reset_interval=False)

Performs a POST on the Job Execute URL

Parameters

- **job_id** – The ID of the Job
- **reset_interval** – Sets interval of job to restart now

Returns Request Response object

post_export_jobs (*args, **kwargs)

Perform a POST on the Job export URL.

Parameters **payload** – Serialized list of Jobs

Returns Requests Response object

post_file (*args, **kwargs)

Performs a PUT on the file URL

Parameters **data** – Data bytes

Returns A Requests Response object

post_forward (*args, **kwargs)

Performs a POST on the Forward URL

Parameters

- **payload** – The operation to be executed
- ****kwargs** – Keyword arguments to pass to Requests session call

Returns The API response

post_gardens (*args, **kwargs)

Performs a POST on the Garden URL

Parameters **payload** – New Garden definition

Returns Requests Response object

post_import_jobs (*args, **kwargs)

Perform a POST on the Job import URL.

Parameters **payload** – Serialized list of job definitions

Returns Requests Response object

post_jobs (*args, **kwargs)

Performs a POST on the Job URL

Parameters **payload** – New Job definition

Returns Requests Response object

post_requests (*args, **kwargs)

Performs a POST on the Request URL

Parameters

- **payload** – New Request definition
- ****kwargs** – Extra request parameters

Keyword Arguments

- **blocking** – Wait for request to complete
- **timeout** – Maximum seconds to wait

Returns Requests Response object

post_systems (*args, **kwargs)

Performs a POST on the System URL

Parameters **payload** – New System definition

Returns Requests Response object

class brewtils.rest.client.**TimeoutAdapter** (**kwargs)

Bases: requests.adapters.HTTPAdapter

Transport adapter with a default request timeout

send (*args, **kwargs)

Sends PreparedRequest object with specified timeout.

brewtils.rest.client.**enable_auth** (method)

Decorate methods with this to enable using authentication

brewtils.rest.easy_client module

class brewtils.rest.easy_client.**EasyClient** (*args, **kwargs)

Bases: object

Client for simplified communication with Beergarden

This class is intended to be a middle ground between the RestClient and SystemClient. It provides a ‘cleaner’ interface to some common Beergarden operations than is exposed by the lower-level RestClient. On the other hand, the SystemClient is much better for generating Beergarden Requests.

Parameters

- **bg_host** (*str*) – Beer-garden hostname
- **bg_port** (*int*) – Beer-garden port
- **bg_url_prefix** (*str*) – URL path that will be used as a prefix when communicating with Beer-garden. Useful if Beer-garden is running on a URL other than ‘/’.
- **ssl_enabled** (*bool*) – Whether to use SSL for Beer-garden communication
- **ca_cert** (*str*) – Path to certificate file containing the certificate of the authority that issued the Beer-garden server certificate
- **ca_verify** (*bool*) – Whether to verify Beer-garden server certificate
- **client_cert** (*str*) – Path to client certificate to use when communicating with Beer-garden
- **api_version** (*int*) – Beer-garden API version to use
- **client_timeout** (*int*) – Max time to wait for Beer-garden server response
- **username** (*str*) – Username for Beer-garden authentication
- **password** (*str*) – Password for Beer-garden authentication
- **access_token** (*str*) – Access token for Beer-garden authentication
- **refresh_token** (*str*) – Refresh token for Beer-garden authentication

can_connect (***kwargs*)

Determine if the Beergarden server is responding.

Parameters ***kwargs* – Keyword arguments passed to the underlying Requests method

Returns A bool indicating if the connection attempt was successful. Will return False only if a ConnectionError is raised during the attempt. Any other exception will be re-raised.

Raises `requests.exceptions.RequestException` – The connection attempt resulted in an exception that indicates something other than a basic connection error. For example, an error with certificate verification.

clear_all_queues ()

Cancel and remove all Requests in all queues

Returns True if the clear was successful

Return type bool

clear_queue (*queue_name*)

Cancel and remove all Requests from a message queue

Parameters **queue_name** (*str*) – The name of the queue to clear

Returns True if the clear was successful

Return type bool

create_garden (*garden*)

Create a new Garden

Parameters **garden** (*Garden*) – The Garden to create

Returns The newly-created Garden

Return type *Garden*

create_job (*job*)

Create a new Job

Parameters **job** (*Job*) – New Job definition

Returns The newly-created Job

Return type *Job*

create_request (*request*, ***kwargs*)

Create a new Request

Parameters

- **request** – New request definition
- ****kwargs** – Extra request parameters

Keyword Arguments

- **blocking** (*bool*) – Wait for request to complete before returning
- **timeout** (*int*) – Maximum seconds to wait for completion

Returns The newly-created Request

Return type *Request*

create_system (*system*)

Create a new System

Parameters **system** (*System*) – The System to create

Returns The newly-created system

Return type *System*

delete_chunked_file (*file_id*)

Delete a given file on the Beer Garden server.

Parameters **file_id** – The beer garden-assigned file id.

Returns The API response

download_bytes (*file_id*)

Download bytes

Parameters **file_id** – Id of bytes to download

Returns The bytes data

download_chunked_file (*file_id*)

Download a chunked file from the Beer Garden server.

Parameters **file_id** – The beer garden-assigned file id.

Returns A file object

download_file (*file_id*, *path*)

Download a file

Parameters

- **file_id** – The File id.

- **path** – Location for downloaded file

Returns Path to downloaded file

execute_job (*job_id*, *reset_interval=False*)

Execute a Job

Parameters

- **job_id** (*str*) – The Job ID
- **reset_interval** (*bool*) – Restarts the job's interval time to now if the job's trigger is an interval

Returns The returned request

Return type *Request*

export_jobs (*job_id_list=None*)

Export jobs from an optional job ID list.

If *job_id_list* is None or empty, definitions for all jobs are returned.

Parameters **job_id_list** – A list of job IDS, optional

Returns A list of job definitions

find_jobs (***kwargs*)

Find Jobs using keyword arguments as search parameters

Parameters ****kwargs** – Search parameters

Returns List of Jobs matching the search parameters

Return type List[*Job*]

find_requests (***kwargs*)

Find Requests using keyword arguments as search parameters

Parameters ****kwargs** – Search parameters

Returns List of Systems matching the search parameters

Return type List[*Request*]

find_systems (***kwargs*)

Find Systems using keyword arguments as search parameters

Parameters ****kwargs** – Search parameters

Returns List of Systems matching the search parameters

Return type List[*System*]

find_unique_request (***kwargs*)

Find a unique request

Note: If 'id' is a given keyword argument then all other parameters will be ignored.

Parameters ****kwargs** – Search parameters

Returns The Request if found, None otherwise

Return type *Request*, None

Raises *FetchError* – More than one matching Request was found

find_unique_system (***kwargs*)

Find a unique system

Note: If 'id' is a given keyword argument then all other parameters will be ignored.

Parameters ****kwargs** – Search parameters

Returns The System if found, None otherwise

Return type *System*, None

Raises *FetchError* – More than one matching System was found

forward (*operation*, ***kwargs*)

Forwards an Operation

Parameters

- **operation** – The Operation to be forwarded
- ****kwargs** – Keyword arguments to pass to Requests session call

Returns The API response

get_config ()

Get configuration

Returns Configuration dictionary

Return type dict

get_garden (*garden_name*)

Get a Garden

Parameters **garden_name** – Name of garden to retrieve

Returns The Garden

get_gardens ()

Get all Gardens.

Returns A list of all the Gardens

get_instance (*instance_id*)

Get an Instance

Parameters **instance_id** – The Id

Returns The Instance

get_instance_status (*instance_id*)

Get an Instance's status

Parameters **instance_id** – The Id

Returns The Instance's status

get_logging_config (*system_name=None*, *local=False*)

Get a logging configuration

Note that the system_name is not relevant and is only provided for backward-compatibility.

Parameters **system_name** (*str*) – UNUSED

Returns The configuration object

Return type dict

get_queues ()

Retrieve all queue information

Returns List of all Queues

Return type List[*Queue*]

get_request (*request_id*)

Get a Request

Parameters **request_id** – The Id

Returns The Request

get_system (*system_id*)

Get a Garden

Parameters **system_id** – The Id

Returns The System

get_user (*user_identifier*)

Find a user

Parameters **user_identifier** (*str*) – User ID or username

Returns The User

Return type *Principal*

get_version (***kwargs*)

Get Bartender, Brew-view, and API version information

Parameters ****kwargs** – Extra parameters

Returns Response object with version information in the body

Return type dict

import_jobs (*job_list*)

Import job definitions from a list of Jobs.

Parameters **job_list** – A list of jobs to import

Returns A list of the job IDs created

initialize_instance (*instance_id, runner_id=None*)

Start an Instance

Parameters

- **instance_id** (*str*) – The Instance ID
- **runner_id** (*str*) – The PluginRunner ID, if any

Returns The updated Instance

Return type *Instance*

instance_heartbeat (*instance_id*)

Send an Instance heartbeat

Parameters **instance_id** (*str*) – The Instance ID

Returns True if the heartbeat was successful

Return type bool

pause_job (*job_id*)

Pause a Job

Parameters **job_id** (*str*) – The Job ID

Returns The updated Job

Return type *Job*

publish_event (**args*, ***kwargs*)

Publish a new event

Parameters

- ***args** – If a positional argument is given it's assumed to be an Event and will be used
- ****kwargs** – Will be used to construct a new Event to publish if no Event is given in the positional arguments

Keyword Arguments **_publishers** (*Optional[List[str]]*) – List of publisher names. If given the Event will only be published to the specified publishers. Otherwise all publishers known to Beergarden will be used.

Returns True if the publish was successful

Return type bool

remove_garden (*garden_name*)

Remove a unique Garden

Parameters **garden_name** (*String*) – Name of Garden to remove

Returns True if removal was successful

Return type bool

Raises `NotFoundError` – Couldn't find a Garden matching given name

remove_instance (*instance_id*)

Remove an Instance

Parameters **instance_id** (*str*) – The Instance ID

Returns True if the remove was successful

Return type bool

remove_job (*job_id*)

Remove a unique Job

Parameters **job_id** (*str*) – The Job ID

Returns True if removal was successful

Return type bool

Raises `DeleteError` – Couldn't remove Job

remove_system (***kwargs*)

Remove a unique System

Parameters ****kwargs** – Search parameters

Returns True if removal was successful

Return type bool

Raises `FetchError` – Couldn't find a System matching given parameters

rescan()

Rescan local plugin directory

Returns True if rescan was successful

Return type bool

resume_job(job_id)

Resume a Job

Parameters **job_id**(*str*) – The Job ID

Returns The updated Job

Return type *Job*

update_garden(garden)

update_instance(instance_id, **kwargs)

Update an Instance status

Parameters **instance_id**(*str*) – The Instance ID

Keyword Arguments

- **new_status**(*str*) – The new status
- **metadata**(*dict*) – Will be added to existing instance metadata

Returns The updated Instance

Return type *Instance*

update_instance_status(instance_id, new_status)

Get an Instance's status

Parameters

- **instance_id**(*str*) – The Instance ID
- **new_status**(*str*) – The new status

Returns The updated Instance

Return type *Instance*

update_request(request_id, status=None, output=None, error_class=None)

Update a Request

Parameters

- **request_id**(*str*) – The Request ID
- **status**(*Optional[str]*) – New Request status
- **output**(*Optional[str]*) – New Request output
- **error_class**(*Optional[str]*) – New Request error class

Returns The updated response

Return type Response

update_system(system_id, new_commands=None, **kwargs)

Update a System

Parameters

- **system_id**(*str*) – The System ID

- **new_commands** (*Optional[List[Command]]*) – New System commands

Keyword Arguments

- **add_instance** (*Instance*) – An Instance to append
- **metadata** (*dict*) – New System metadata
- **description** (*str*) – New System description
- **display_name** (*str*) – New System display name
- **icon_name** (*str*) – New System icon name
- **template** (*str*) – New System template

Returns The updated system

Return type *System*

upload_bytes (*data*)

Upload a file

Parameters **data** – The bytes to upload

Returns The bytes Resolvable

upload_chunked_file (*file_to_upload, desired_filename=None, file_params=None*)

Upload a given file to the Beer Garden server.

Parameters

- **file_to_upload** – Can either be an open file descriptor or a path.
- **desired_filename** – The desired filename, if none is provided it
- **use the basename of the file_to_upload** (*will*) –
- **file_params** – The metadata surrounding the file. Valid Keys: See brewtils File model

Returns A BG file ID.

upload_file (*path*)

Upload a file

Parameters **path** – Path to file

Returns The file Resolvable

who_am_i ()

Find user using the current set of credentials

Returns The User

Return type *Principal*

`brewtils.rest.easy_client.get_easy_client(**kwargs)`

Easy way to get an EasyClient

The benefit to this method over creating an EasyClient directly is that this method will also search the environment for parameters. Kwargs passed to this method will take priority, however.

Parameters ****kwargs** – Options for configuring the EasyClient

Returns The configured client

Return type *brewtils.rest.easy_client.EasyClient*

```
brewtils.rest.easy_client.handle_response_failure(response,      default_exc=<class  
                                                    'brewtils.errors.RestError'>,  
                                                    raise_404=True)
```

Deal with a response with non-2xx status code

Parameters

- **response** – The response object
- **default_exc** – The exception to raise if no specific exception is warranted
- **raise_404** – If True a response with status code 404 will raise a `NotFoundError`. If False the method will return `None`.

Returns `None` - this function will always raise

Raises

- `NotFoundError` – Status code 404 and `raise_404` is `True`
- `WaitExceededError` – Status code 408
- `ConflictError` – Status code 409
- `TooLargeError` – Status code 413
- `ValidationError` – Any other 4xx status codes
- `RestConnectionError` – Status code 503
- `default_exc` – Any other status code

```
brewtils.rest.easy_client.wrap_response(return_boolean=False,    parse_method=None,  
                                          parse_many=False,      default_exc=<class  
                                          'brewtils.errors.RestError'>, raise_404=True)
```

Decorator to consolidate response parsing and error handling

Parameters

- **return_boolean** – If `True`, a successful response will also return `True`
- **parse_method** – Response json will be passed to this method of the `SchemaParser`
- **parse_many** – Will be passed as the 'many' parameter when parsing the response
- **default_exc** – Will be passed to `handle_response_failure` for failed responses
- **raise_404** – Will be passed to `handle_response_failure` for failed responses

Returns

- `True` if `return_boolean` is `True` and the response status code is 2xx.
- The response object if `return_boolean` is `False` and `parse_method` is `""`
- A parsed Brewtils model if `return_boolean` is `False` and `parse_method` is defined

Raises `RestError` – The response has a non-2xx status code. Note that the specific exception raised depends on the response status code and the argument passed as the `default_exc` parameter.

brewtils.rest.system_client module

```
class brewtils.rest.system_client.SystemClient(*args, **kwargs)
```

Bases: `object`

High-level client for generating requests for a Beer-garden System.

SystemClient creation: This class is intended to be the main way to create Beer-garden requests. Create an instance with Beer-garden connection information and a system name:

```
client = SystemClient(
    system_name='example_system',
    system_namespace='default',
    bg_host="host",
    bg_port=2337,
)
```

Note: Passing an empty string as the `system_namespace` parameter will evaluate to the local garden's default namespace.

Pass additional keyword arguments for more granularity:

version_constraint: Allows specifying a particular system version. Can be a version literal ('1.0.0') or the special value 'latest.' Using 'latest' will allow the SystemClient to retry a request if it fails due to a missing system (see Creating Requests).

default_instance: The instance name to use when creating a request if no other instance name is specified. Since each request must be addressed to a specific instance this is a convenience to prevent needing to specify the instance for each request.

always_update: If True the SystemClient will always attempt to reload the system definition before making a request. This is useful to ensure Requests are always made against the latest version of the system. If not set the System definition will be loaded when making the first request and will only be reloaded if a Request fails.

Loading the System: The System definition is lazily loaded, so nothing happens until the first attempt to send a Request. At that point the SystemClient will query Beer-garden to get a system definition that matches the `system_name` and `version_constraint`. If no matching System can be found a `FetchError` will be raised. If `always_update` was set to True this will happen before making each request, not only the first.

Making a Request: The standard way to create and send requests is by calling object attributes:

```
request = client.example_command(param_1='example_param')
```

In the normal case this will block until the request completes. Request completion is determined by periodically polling Beer-garden to check the Request status. The time between polling requests starts at 0.5s and doubles each time the request has still not completed, up to `max_delay`. If a timeout was specified and the Request has not completed within that time a `ConnectionTimeoutError` will be raised.

It is also possible to create the SystemClient in non-blocking mode by specifying `blocking=False`. In this case the request creation will immediately return a Future and will spawn a separate thread to poll for Request completion. The `max_concurrent` parameter is used to control the maximum threads available for polling.

```
# Create a SystemClient with blocking=False
client = SystemClient(
    system_name='example_system',
    system_namespace='default',
    bg_host="localhost",
    bg_port=2337,
    blocking=False,
)

# Create and send 5 requests without waiting for request completion
futures = [client.example_command(param_1=number) for number in range(5)]
```

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```
# Now wait on all requests to complete
concurrent.futures.wait(futures)
```

If the request creation process fails (e.g. the command failed validation) and `version_constraint` is ‘latest’ then the `SystemClient` will check to see if a newer version is available, and if so it will attempt to make the request on that version. This is so users of the `SystemClient` that don’t necessarily care about the target system version don’t need to be restarted every time the target system is updated.

It’s also possible to control what happens when a Request results in an `ERROR`. If the `raise_on_error` parameter is set to `False` (the default) then Requests that are not successful simply result in a Request with a status of `ERROR`, and it is the plugin developer’s responsibility to check for this case. However, if `raise_on_error` is set to `True` then this will result in a `RequestFailedError` being raised. This will happen regardless of the value of the `blocking` flag.

Tweaking Beer-garden Request Parameters: There are several parameters that control how beer-garden routes / processes a request. To denote these as intended for Beer-garden itself (rather than a parameter to be passed to the Plugin) prepend a leading underscore to the argument name.

Sending to another instance:

```
request = client.example_command(
    _instance_name="instance_2", param_1="example_param"
)
```

Request with a comment:

```
request = client.example_command(
    _comment="I'm a beer-garden comment!", param_1="example_param"
)
```

Without the leading underscore the arguments would be treated the same as “`param_1`” - another parameter to be passed to the plugin.

Request that raises:

```
client = SystemClient(
    system_name="foo",
    system_namespace='default',
    bg_host="localhost",
    bg_port=2337,
)

try:
    client.command_that_errors(_raise_on_error=True)
except RequestFailedError:
    print("I could have just ignored this")
```

Parameters

- **system_name** (*str*) – Name of the System to make Requests on
- **system_namespace** (*str*) – Namespace of the System to make Requests on
- **version_constraint** (*str*) – System version to make Requests on. Can be specific (‘1.0.0’) or ‘latest’.
- **default_instance** (*str*) – Name of the Instance to make Requests on

- **always_update** (*bool*) – Whether to check if a newer version of the System exists before making each Request. Only relevant if `version_constraint='latest'`
- **timeout** (*int*) – Seconds to wait for a request to complete. 'None' means wait forever.
- **max_delay** (*int*) – Maximum number of seconds to wait between status checks for a created request
- **blocking** (*bool*) – Flag indicating whether creation will block until the Request is complete or return a Future that will complete when the Request does
- **max_concurrent** (*int*) – Maximum number of concurrent requests allowed. Only has an effect when `blocking=False`.
- **raise_on_error** (*bool*) – Flag controlling whether created Requests that complete with an ERROR state should raise an exception
- **bg_host** (*str*) – Beer-garden hostname
- **bg_port** (*int*) – Beer-garden port
- **bg_url_prefix** (*str*) – URL path that will be used as a prefix when communicating with Beer-garden. Useful if Beer-garden is running on a URL other than '/'.
- **ssl_enabled** (*bool*) – Whether to use SSL for Beer-garden communication
- **ca_cert** (*str*) – Path to certificate file containing the certificate of the authority that issued the Beer-garden server certificate
- **ca_verify** (*bool*) – Whether to verify Beer-garden server certificate
- **client_cert** (*str*) – Path to client certificate to use when communicating with Beer-garden
- **api_version** (*int*) – Beer-garden API version to use
- **client_timeout** (*int*) – Max time to wait for Beer-garden server response
- **username** (*str*) – Username for Beer-garden authentication
- **password** (*str*) – Password for Beer-garden authentication
- **access_token** (*str*) – Access token for Beer-garden authentication
- **refresh_token** (*str*) – Refresh token for Beer-garden authentication

bg_default_instance

bg_system

create_bg_request (*command_name*, ***kwargs*)

Create a callable that will execute a Beer-garden request when called.

Normally you interact with the SystemClient by accessing attributes, but there could be certain cases where you want to create a request without sending it.

Example:

```
client = SystemClient(host, port, 'system', blocking=False)

# Create two callables - one with a parameter and one without
uncreated_requests = [
    client.create_bg_request('command_1', arg_1='Hi!'),
    client.create_bg_request('command_2'),
]
```

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```
# Calling creates and sends the request
# The result of each is a future because blocking=False on the SystemClient
futures = [req() for req in uncreated_requests]

# Wait for all the futures to complete
concurrent.futures.wait(futures)
```

Parameters

- **command_name** (*str*) – Name of the Command to send
- **kwargs** (*dict*) – Will be passed as parameters when creating the Request

Returns Partial that will create and execute a Beer-garden request when called

Raises `AttributeError` – System does not have a Command with the given `command_name`

load_bg_system()

Query beer-garden for a System definition

This method will make the query to beer-garden for a System matching the name and version constraints specified during `SystemClient` instance creation.

If this method completes successfully the `SystemClient` will be ready to create and send Requests.

Returns `None`

Raises `FetchError` – Unable to find a matching System

send_bg_request(*args, **kwargs)

Actually create a Request and send it to Beer-garden

Note: This method is intended for advanced use only, mainly cases where you’re using the `SystemClient` without a predefined System. It assumes that everything needed to construct the request is being passed in `kwargs`. If this doesn’t sound like what you want you should check out `create_bg_request`.

Parameters

- **args** (*list*) – Unused. Passing positional parameters indicates a bug
- **kwargs** (*dict*) – All necessary request parameters, including Beer-garden internal parameters

Returns A completed Request object `blocking=False`: A future that will be completed when the Request does

Return type `blocking=True`

Raises `ValidationError` – Request creation failed validation on the server

Module contents**brewtils.rest.normalize_url_prefix(url_prefix)**

Enforce a consistent URL representation

The normalized prefix will begin and end with ‘/’. If there is no prefix the normalized form will be ‘/’.

Examples

INPUT	NORMALIZED
None	'/'
'	'/'
'/'	'/'
'example'	'/example/'
'/example'	'/example/'
'example/'	'/example/'
'/example/'	'/example/'

Parameters `url_prefix` (*str*) – The prefix

Returns The normalized prefix

Return type `str`

brewtils.test package

Submodules

brewtils.test.comparable module

Module to simplify model comparisons.

Warning: This module was created to simplify testing. As such, it's not recommended for production use.

Warning: This module subject to change outside of the normal deprecation cycle.

Seriously, this is a 'use at your own risk' kind of thing.

`brewtils.test.comparable.assert_instance_equal(obj1, obj2, do_raise=False, **kwargs)`

Wrapper that will translate AssertionError to a boolean.

This is a safety measure in case these functions are used outside of a testing context. This isn't recommended, but naked asserts are still unacceptable in any packaged code. This method will translate the various comparison functions to a simple boolean return.

Note that in a testing context the AssertionError is re-raised. This is because it's much more helpful to know the specific assertion that failed, as it could be something nested several levels deep.

Parameters

- **obj1** – Passed through to `_assert_equal`
- **obj2** – Passed through to `_assert_equal`
- **expected_type** – Both objects will be checked (using `isinstance`) against this type
- **do_raise** – If True, re-raise any raised AssertionError. This helps with nested comparisons.
- ****kwargs** – Passed through to `_assert_equal`

Returns

True if the comparison was equal. False if

- The comparison was not equal and
- `do_raise` is False and
- called from outside of a testing context

Return type bool

Raises `AssertionError` – The comparison was not equal. Assertion will be translated to a boolean False if `do_raise` is False and called from outside of a testing context.

`brewtils.test.comparable.assert_choices_equal(obj1, obj2, do_raise=False, **kwargs)`
Wrapper that will translate `AssertionError` to a boolean.

This is a safety measure in case these functions are used outside of a testing context. This isn't recommended, but naked asserts are still unacceptable in any packaged code. This method will translate the various comparison functions to a simple boolean return.

Note that in a testing context the `AssertionError` is re-raised. This is because it's much more helpful to know the specific assertion that failed, as it could be something nested several levels deep.

Parameters

- **obj1** – Passed through to `_assert_equal`
- **obj2** – Passed through to `_assert_equal`
- **expected_type** – Both objects will be checked (using `isinstance`) against this type
- **do_raise** – If True, re-raise any raised `AssertionError`. This helps with nested comparisons.
- ****kwargs** – Passed through to `_assert_equal`

Returns

True if the comparison was equal. False if

- The comparison was not equal and
- `do_raise` is False and
- called from outside of a testing context

Return type bool

Raises `AssertionError` – The comparison was not equal. Assertion will be translated to a boolean False if `do_raise` is False and called from outside of a testing context.

`brewtils.test.comparable.assert_patch_equal(obj1, obj2, do_raise=False, **kwargs)`
Wrapper that will translate `AssertionError` to a boolean.

This is a safety measure in case these functions are used outside of a testing context. This isn't recommended, but naked asserts are still unacceptable in any packaged code. This method will translate the various comparison functions to a simple boolean return.

Note that in a testing context the `AssertionError` is re-raised. This is because it's much more helpful to know the specific assertion that failed, as it could be something nested several levels deep.

Parameters

- **obj1** – Passed through to `_assert_equal`
- **obj2** – Passed through to `_assert_equal`

- **expected_type** – Both objects will be checked (using isinstance) against this type
- **do_raise** – If True, re-raise any raised AssertionError. This helps with nested comparisons.
- ****kwargs** – Passed through to `_assert_equal`

Returns

True if the comparison was equal. False if

- The comparison was not equal and
- `do_raise` is False and
- called from outside of a testing context

Return type bool

Raises `AssertionError` – The comparison was not equal. Assertion will be translated to a boolean False if `do_raise` is False and called from outside of a testing context.

```
brewtils.test.comparable.assert_logging_config_equal(obj1, obj2, do_raise=False,
                                                    **kwargs)
```

Wrapper that will translate `AssertionError` to a boolean.

This is a safety measure in case these functions are used outside of a testing context. This isn't recommended, but naked asserts are still unacceptable in any packaged code. This method will translate the various comparison functions to a simple boolean return.

Note that in a testing context the `AssertionError` is re-raised. This is because it's much more helpful to know the specific assertion that failed, as it could be something nested several levels deep.

Parameters

- **obj1** – Passed through to `_assert_equal`
- **obj2** – Passed through to `_assert_equal`
- **expected_type** – Both objects will be checked (using isinstance) against this type
- **do_raise** – If True, re-raise any raised `AssertionError`. This helps with nested comparisons.
- ****kwargs** – Passed through to `_assert_equal`

Returns

True if the comparison was equal. False if

- The comparison was not equal and
- `do_raise` is False and
- called from outside of a testing context

Return type bool

Raises `AssertionError` – The comparison was not equal. Assertion will be translated to a boolean False if `do_raise` is False and called from outside of a testing context.

```
brewtils.test.comparable.assert_event_equal(obj1, obj2, do_raise=False)
```

```
brewtils.test.comparable.assert_queue_equal(obj1, obj2, do_raise=False, **kwargs)
```

Wrapper that will translate `AssertionError` to a boolean.

This is a safety measure in case these functions are used outside of a testing context. This isn't recommended, but naked asserts are still unacceptable in any packaged code. This method will translate the various comparison functions to a simple boolean return.

Note that in a testing context the `AssertionError` is re-raised. This is because it's much more helpful to know the specific assertion that failed, as it could be something nested several levels deep.

Parameters

- **obj1** – Passed through to `_assert_equal`
- **obj2** – Passed through to `_assert_equal`
- **expected_type** – Both objects will be checked (using `isinstance`) against this type
- **do_raise** – If True, re-raise any raised `AssertionError`. This helps with nested comparisons.
- ****kwargs** – Passed through to `_assert_equal`

Returns

True if the comparison was equal. False if

- The comparison was not equal and
- `do_raise` is False and
- called from outside of a testing context

Return type bool

Raises `AssertionError` – The comparison was not equal. Assertion will be translated to a boolean False if `do_raise` is False and called from outside of a testing context.

`brewtils.test.comparable.assert_request_template_equal(obj1, obj2, do_raise=False, **kwargs)`

Wrapper that will translate `AssertionError` to a boolean.

This is a safety measure in case these functions are used outside of a testing context. This isn't recommended, but naked asserts are still unacceptable in any packaged code. This method will translate the various comparison functions to a simple boolean return.

Note that in a testing context the `AssertionError` is re-raised. This is because it's much more helpful to know the specific assertion that failed, as it could be something nested several levels deep.

Parameters

- **obj1** – Passed through to `_assert_equal`
- **obj2** – Passed through to `_assert_equal`
- **expected_type** – Both objects will be checked (using `isinstance`) against this type
- **do_raise** – If True, re-raise any raised `AssertionError`. This helps with nested comparisons.
- ****kwargs** – Passed through to `_assert_equal`

Returns

True if the comparison was equal. False if

- The comparison was not equal and
- `do_raise` is False and
- called from outside of a testing context

Return type bool

Raises `AssertionError` – The comparison was not equal. Assertion will be translated to a boolean `False` if `do_raise` is `False` and called from outside of a testing context.

`brewtils.test.comparable.assert_trigger_equal(obj1, obj2, do_raise=False, **kwargs)`
 Wrapper that will translate `AssertionError` to a boolean.

This is a safety measure in case these functions are used outside of a testing context. This isn't recommended, but naked asserts are still unacceptable in any packaged code. This method will translate the various comparison functions to a simple boolean return.

Note that in a testing context the `AssertionError` is re-raised. This is because it's much more helpful to know the specific assertion that failed, as it could be something nested several levels deep.

Parameters

- **obj1** – Passed through to `_assert_equal`
- **obj2** – Passed through to `_assert_equal`
- **expected_type** – Both objects will be checked (using `isinstance`) against this type
- **do_raise** – If `True`, re-raise any raised `AssertionError`. This helps with nested comparisons.
- ****kwargs** – Passed through to `_assert_equal`

Returns

True if the comparison was equal. False if

- The comparison was not equal and
- `do_raise` is `False` and
- called from outside of a testing context

Return type bool

Raises `AssertionError` – The comparison was not equal. Assertion will be translated to a boolean `False` if `do_raise` is `False` and called from outside of a testing context.

`brewtils.test.comparable.assert_command_equal(obj1, obj2, do_raise=False)`
`brewtils.test.comparable.assert_parameter_equal(obj1, obj2, do_raise=False)`
`brewtils.test.comparable.assert_principal_equal(obj1, obj2, do_raise=False)`
`brewtils.test.comparable.assert_request_equal(obj1, obj2, do_raise=False)`
 Assert that two requests are 'equal'.

This is the most complicated due to how we serialize parent and children requests to avoid reference loops.

Parent fields will not serialize their children. That's why `compare_parent` asserts that the `children` field is `None`.

The requests in the `children` field will not serialize their parents or children. That's why `compare_child` asserts that both the `parent` and `children` fields are `None`.

`brewtils.test.comparable.assert_role_equal(obj1, obj2, do_raise=False)`
`brewtils.test.comparable.assert_system_equal(obj1, obj2, do_raise=False)`
`brewtils.test.comparable.assert_job_equal(obj1, obj2, do_raise=False)`
`brewtils.test.comparable.assert_request_file_equal(obj1, obj2, do_raise=False, **kwargs)`

Wrapper that will translate `AssertionError` to a boolean.

This is a safety measure in case these functions are used outside of a testing context. This isn't recommended, but naked asserts are still unacceptable in any packaged code. This method will translate the various comparison functions to a simple boolean return.

Note that in a testing context the `AssertionError` is re-raised. This is because it's much more helpful to know the specific assertion that failed, as it could be something nested several levels deep.

Parameters

- **obj1** – Passed through to `_assert_equal`
- **obj2** – Passed through to `_assert_equal`
- **expected_type** – Both objects will be checked (using `isinstance`) against this type
- **do_raise** – If True, re-raise any raised `AssertionError`. This helps with nested comparisons.
- ****kwargs** – Passed through to `_assert_equal`

Returns

True if the comparison was equal. False if

- The comparison was not equal and
- `do_raise` is False and
- called from outside of a testing context

Return type bool

Raises `AssertionError` – The comparison was not equal. Assertion will be translated to a boolean False if `do_raise` is False and called from outside of a testing context.

```
brewtils.test.comparable.assert_operation_equal(obj1, obj2, do_raise=False)
```

```
brewtils.test.comparable.assert_runner_equal(obj1, obj2, do_raise=False, **kwargs)
```

Wrapper that will translate `AssertionError` to a boolean.

This is a safety measure in case these functions are used outside of a testing context. This isn't recommended, but naked asserts are still unacceptable in any packaged code. This method will translate the various comparison functions to a simple boolean return.

Note that in a testing context the `AssertionError` is re-raised. This is because it's much more helpful to know the specific assertion that failed, as it could be something nested several levels deep.

Parameters

- **obj1** – Passed through to `_assert_equal`
- **obj2** – Passed through to `_assert_equal`
- **expected_type** – Both objects will be checked (using `isinstance`) against this type
- **do_raise** – If True, re-raise any raised `AssertionError`. This helps with nested comparisons.
- ****kwargs** – Passed through to `_assert_equal`

Returns

True if the comparison was equal. False if

- The comparison was not equal and
- `do_raise` is False and

- called from outside of a testing context

Return type bool

Raises `AssertionError` – The comparison was not equal. Assertion will be translated to a boolean `False` if `do_raise` is `False` and called from outside of a testing context.

brewtils.test.fixtures module

`brewtils.test.fixtures.bg_choices(*args, **kwargs)`
Use the `bg_command` fixture instead.

`brewtils.test.fixtures.bg_command_2(*args, **kwargs)`
Use the `bg_command` fixture instead.

`brewtils.test.fixtures.bg_cron_job(*args, **kwargs)`
A beer garden cron job

`brewtils.test.fixtures.bg_cron_trigger(*args, **kwargs)`
A cron trigger as a model.

`brewtils.test.fixtures.bg_date_trigger(*args, **kwargs)`
A date trigger as a model.

`brewtils.test.fixtures.bg_event(*args, **kwargs)`
An event as a model.

`brewtils.test.fixtures.bg_garden(*args, **kwargs)`
An operation as a model.

`brewtils.test.fixtures.bg_instance(*args, **kwargs)`
An instance as a model.

`brewtils.test.fixtures.bg_interval_job(*args, **kwargs)`
A beer garden interval job

`brewtils.test.fixtures.bg_interval_trigger(*args, **kwargs)`
An interval trigger as a model.

`brewtils.test.fixtures.bg_job(*args, **kwargs)`
A job as a model.

`brewtils.test.fixtures.bg_job_defns_list(*args, **kwargs)`
A list of job definitions

`brewtils.test.fixtures.bg_job_ids(*args, **kwargs)`
A list of job IDs

`brewtils.test.fixtures.bg_logging_config(*args, **kwargs)`
A logging config as a model.

`brewtils.test.fixtures.bg_operation(*args, **kwargs)`
An operation as a model.

`brewtils.test.fixtures.bg_parameter(*args, **kwargs)`
Parameter based on the `parameter_dict`

`brewtils.test.fixtures.bg_patch(*args, **kwargs)`
A patch as a model.

`brewtils.test.fixtures.bg_patch2 (*args, **kwargs)`
A patch as a model.

`brewtils.test.fixtures.bg_principal (*args, **kwargs)`

`brewtils.test.fixtures.bg_queue (*args, **kwargs)`
A queue as a model.

`brewtils.test.fixtures.bg_request (*args, **kwargs)`
A request as a model.

`brewtils.test.fixtures.bg_request_file (*args, **kwargs)`
A request file as a model

`brewtils.test.fixtures.bg_request_template (*args, **kwargs)`
Request template as a bg model.

`brewtils.test.fixtures.bg_resolvable (*args, **kwargs)`

`brewtils.test.fixtures.bg_resolvable_chunk (*args, **kwargs)`

`brewtils.test.fixtures.bg_role (*args, **kwargs)`

`brewtils.test.fixtures.bg_runner (*args, **kwargs)`
A runner as a model.

`brewtils.test.fixtures.bg_system (*args, **kwargs)`
A system as a model.

`brewtils.test.fixtures.bg_system_2 (*args, **kwargs)`
A system with a different version.

`brewtils.test.fixtures.child_request (*args, **kwargs)`
A child request as a model.

`brewtils.test.fixtures.child_request_dict (*args, **kwargs)`
A child request represented as a dictionary.

`brewtils.test.fixtures.choices_dict (*args, **kwargs)`
Choices as a dictionary.

`brewtils.test.fixtures.command_dict (*args, **kwargs)`
A command represented as a dictionary.

`brewtils.test.fixtures.command_dict_2 (*args, **kwargs)`
A second command represented as a dictionary.

`brewtils.test.fixtures.cron_job_dict (*args, **kwargs)`
A cron job represented as a dictionary.

`brewtils.test.fixtures.cron_trigger_dict (*args, **kwargs)`
A cron trigger as a dictionary.

`brewtils.test.fixtures.date_trigger_dict (*args, **kwargs)`
A cron trigger as a dictionary.

`brewtils.test.fixtures.event_dict (*args, **kwargs)`
An event represented as a dictionary.

`brewtils.test.fixtures.garden_dict (*args, **kwargs)`
A garden as a dictionary.

`brewtils.test.fixtures.instance_dict (*args, **kwargs)`
An instance represented as a dictionary.

`brewtils.test.fixtures.interval_job_dict(*args, **kwargs)`
An interval job represented as a dictionary.

`brewtils.test.fixtures.interval_trigger_dict(*args, **kwargs)`
An interval trigger as a dictionary.

`brewtils.test.fixtures.job_dfn_list_dict(*args, **kwargs)`
A job definition list represented as a dictionary.

`brewtils.test.fixtures.job_dict(*args, **kwargs)`
A date job represented as a dictionary.

`brewtils.test.fixtures.job_dict_for_import(*args, **kwargs)`
A job dict but some keys and values are missing.

`brewtils.test.fixtures.job_id_list_dict(*args, **kwargs)`
A job ID list represented as a dictionary.

`brewtils.test.fixtures.job_ids_dict(*args, **kwargs)`
A list of job IDs represented as a dictionary.

`brewtils.test.fixtures.legacy_role_dict(*args, **kwargs)`

`brewtils.test.fixtures.logging_config_dict(*args, **kwargs)`
A logging config represented as a dictionary.

`brewtils.test.fixtures.nested_parameter_dict(*args, **kwargs)`
Nested Parameter as a dictionary.

`brewtils.test.fixtures.operation_dict(*args, **kwargs)`
An operation as a dictionary.

`brewtils.test.fixtures.parameter_dict(*args, **kwargs)`
Non-nested parameter as a dictionary.

`brewtils.test.fixtures.parent_request(*args, **kwargs)`
A parent request as a model.

`brewtils.test.fixtures.parent_request_dict(*args, **kwargs)`
A parent request represented as a dictionary.

`brewtils.test.fixtures.patch_dict(*args, **kwargs)`
A patch represented as a dictionary.

`brewtils.test.fixtures.patch_dict_no_envelop(*args, **kwargs)`
A patch without an envelope represented as a dictionary.

`brewtils.test.fixtures.patch_dict_no_envelop2(*args, **kwargs)`
A patch without an envelope represented as a dictionary.

`brewtils.test.fixtures.patch_many_dict(*args, **kwargs)`
Multiple patches represented as a dictionary.

`brewtils.test.fixtures.principal_dict(*args, **kwargs)`

`brewtils.test.fixtures.queue_dict(*args, **kwargs)`
A queue represented as a dictionary.

`brewtils.test.fixtures.request_dict(*args, **kwargs)`
A request represented as a dictionary.

`brewtils.test.fixtures.request_file_dict(*args, **kwargs)`
A request file represented as a dictionary.

`brewtils.test.fixtures.request_template_dict(*args, **kwargs)`
Request template as a dictionary.

`brewtils.test.fixtures.resolvable_chunk_dict(*args, **kwargs)`
A resolvable as a dictionary.

`brewtils.test.fixtures.resolvable_dict(*args, **kwargs)`
A resolvable as a dictionary.

`brewtils.test.fixtures.runner_dict(*args, **kwargs)`
A runner as a dictionary.

`brewtils.test.fixtures.system_dict(*args, **kwargs)`
A system represented as a dictionary.

`brewtils.test.fixtures.system_id(*args, **kwargs)`

`brewtils.test.fixtures.ts_2_dt(*args, **kwargs)`
Feb 2, 2017 as a naive datetime.

`brewtils.test.fixtures.ts_2_dt_utc(*args, **kwargs)`
Feb 2, 2017 UTC as timezone-aware datetime.

`brewtils.test.fixtures.ts_2_epoch(*args, **kwargs)`
Feb 2, 2017 UTC as epoch milliseconds.

`brewtils.test.fixtures.ts_dt(*args, **kwargs)`
Jan 1, 2016 as a naive datetime.

`brewtils.test.fixtures.ts_dt_eastern(*args, **kwargs)`
Jan 1, 2016 US/Eastern as timezone-aware datetime.

`brewtils.test.fixtures.ts_dt_utc(*args, **kwargs)`
Jan 1, 2016 UTC as timezone-aware datetime.

`brewtils.test.fixtures.ts_epoch(*args, **kwargs)`
Jan 1, 2016 UTC as epoch milliseconds.

`brewtils.test.fixtures.ts_epoch_eastern(*args, **kwargs)`
Jan 1, 2016 US/Eastern as epoch milliseconds.

Module contents

3.1.2 Submodules

3.1.3 brewtils.choices module

```
class brewtils.choices.FunctionTransformer
    Bases: lark.visitors.Transformer

    static arg_pair(s)

    static func(s)

    func_args
        alias of __builtin__.list

    static reference(s)

    static url(s)
```

url_argsalias of `__builtin__.list``brewtils.choices.parse(input_string, parse_as=None)`

Attempt to parse a string into a choices dictionary.

Parameters

- **input_string** – The string to parse
- **parse_as** – String specifying how to parse *input_string*. Valid values are ‘func’ or ‘url’. Will try all valid values if None.

Returns Dictionary containing the parse results**Raises** `lark.common.ParseError` – Unable to find a valid parsing of *input_string*`brewtils.choices.process_choices(choices)`

Process a choices definition into a usable Choices object

Parameters **choices** – Raw choices definition, usually from a decorator**Returns** Dictionary that fully describes a choices specification**Return type** *Choices*

3.1.4 brewtils.config module

`brewtils.config.get_argument_parser()`

Get an ArgumentParser pre-populated with Brewtils arguments

This is helpful if you’re expecting additional command line arguments to a plugin startup script.

This enables doing something like:

```
def main():
    parser = get_argument_parser()
    parser.add_argument('positional_arg')

    parsed_args = parser.parse_args(sys.argv[1:])

    # Now you can use the extra argument
    client = MyClient(parsed_args.positional_arg)

    # But you'll need to be careful when using the 'normal' Brewtils
    # configuration loading methods:

    # Option 1: Tell Brewtils about your customized parser
    connection = get_connection_info(cli_args=sys.argv[1:],
                                     argument_parser=parser)

    # Option 2: Use the parsed CLI as a dictionary
    connection = get_connection_info(**vars(parsed_args))

    # Now specify connection kwargs like normal
    plugin = RemotePlugin(client, name=...
                           **connection)
```

IMPORTANT: Note that in both cases the returned `connection` object **will not** contain your new value. Both options just prevent normal CLI parsing from failing on the unknown argument.

Returns Argument parser with Brewtils arguments loaded

Return type `ArgumentParser`

`brewtils.config.get_connection_info(cli_args=None, argument_parser=None, **kwargs)`

Wrapper around `load_config` that returns only connection parameters

Parameters

- **cli_args** (*list, optional*) – List of command line arguments for configuration loading
- **argument_parser** (*ArgumentParser, optional*) – Argument parser to use when parsing `cli_args`. Supplying this allows adding additional arguments prior to loading the configuration. This can be useful if your startup script takes additional arguments.
- ****kwargs** – Additional configuration overrides

Returns Parameters needed to make a connection to Beergarden

Return type `dict`

`brewtils.config.load_config(cli_args=True, environment=True, argument_parser=None, bootstrap=False, **kwargs)`

Load configuration using `Yapconf`

Configuration will be loaded from these sources, with earlier sources having higher priority:

1. ****kwargs** passed to this method
2. Command line arguments (if `cli_args` argument is not `False`)
3. **Environment variables using the BG_ prefix (if `environment` argument is not `False`)**
4. Default values in the brewtils specification

Parameters

- **cli_args** (*Union[bool, list], optional*) – Specifies whether command line should be used as a configuration source - `True`: Argparse will use the standard `sys.argv[1:]` - `False`: Command line arguments will be ignored when loading configuration - List of strings: Will be parsed as CLI args (instead of using `sys.argv`)
- **environment** (*bool*) – Specifies whether environment variables (with the `BG_` prefix) should be used when loading configuration
- **argument_parser** (*ArgumentParser, optional, deprecated*) – Argument parser to use when parsing `cli_args`. Supplying this allows adding additional arguments prior to loading the configuration. This can be useful if your startup script takes additional arguments. See `get_argument_parser` for additional information.
- ****kwargs** – Additional configuration overrides

Returns The resolved configuration object

Return type `box.Box`

3.1.5 brewtils.decorators module

`brewtils.decorators.client(_wrapped=None, bg_name=None, bg_version=None)`

Class decorator that marks a class as a beer-garden Client

Using this decorator is no longer strictly necessary. It was previously required in order to mark a class as being a Beer-garden Client, and contained most of the logic that currently resides in the `parse_client` function. However, that's no longer the case and this currently exists mainly for back-compatibility reasons.

Applying this decorator to a client class does have the nice effect of preventing linters from complaining if any special attributes are used. So that's something.

Those special attributes are below. Note that these are just placeholders until the actual values are populated when the client instance is assigned to a Plugin:

- `_bg_name`: an optional system name
- `_bg_version`: an optional system version
- `_bg_commands`: holds all registered commands
- `_current_request`: Reference to the currently executing request

Parameters

- **`_wrapped`** – The class to decorate. This is handled as a positional argument and shouldn't be explicitly set.
- **`bg_name`** – Optional plugin name
- **`bg_version`** – Optional plugin version

Returns The decorated class

```
brewtils.decorators.command(_wrapped=None, description=None, parameters=None, command_type='ACTION', output_type='STRING', schema=None, form=None, template=None, icon_name=None, hidden=False, metadata=None)
```

Decorator for specifying Command details

For example:

```
@command(output_type='JSON')
def echo_json(self, message):
    return message
```

Parameters

- **`_wrapped`** – The function to decorate. This is handled as a positional argument and shouldn't be explicitly set.
- **`description`** – The command description. If not given the first line of the method docstring will be used.
- **`parameters`** – A list of Command parameters. It's recommended to use `@parameter` decorators to declare Parameters instead of declaring them here, but it is allowed. Any Parameters given here will be merged with Parameters sourced from decorators and inferred from the method signature.
- **`command_type`** – The command type. Valid options are `Command.COMMAND_TYPES`.
- **`output_type`** – The output type. Valid options are `Command.OUTPUT_TYPES`.
- **`schema`** – A custom schema definition.
- **`form`** – A custom form definition.
- **`template`** – A custom template definition.
- **`icon_name`** – The icon name. Should be either a FontAwesome or a Glyphicon name.
- **`hidden`** – Flag controlling whether the command is visible on the user interface.

- **metadata** – Free-form dictionary

Returns The decorated function

```
brewtils.decorators.parameter(_wrapped=None, key=None, type=None, multi=None,
                               display_name=None, optional=None, default=None, de-
                               scription=None, choices=None, parameters=None, nul-
                               lable=None, maximum=None, minimum=None, regex=None,
                               form_input_type=None, type_info=None, is_kwarg=None,
                               model=None)
```

Decorator for specifying Parameter details

For example:

```
@parameter (
    key="message",
    description="Message to echo",
    optional=True,
    type="String",
    default="Hello, World!",
)
def echo(self, message):
    return message
```

Parameters

- **_wrapped** – The function to decorate. This is handled as a positional argument and shouldn't be explicitly set.
- **key** – String specifying the parameter identifier. If the decorated object is a method the key must match an argument name.
- **type** – String indicating the type to use for this parameter.
- **multi** – Boolean indicating if this parameter is a multi. See documentation for discussion of what this means.
- **display_name** – String that will be displayed as a label in the user interface.
- **optional** – Boolean indicating if this parameter must be specified.
- **default** – The value this parameter will be assigned if not overridden when creating a request.
- **description** – An additional string that will be displayed in the user interface.
- **choices** – List or dictionary specifying allowed values. See documentation for more information.
- **parameters** – Any nested parameters. See also: the 'model' argument.
- **nullable** – Boolean indicating if this parameter is allowed to be null.
- **maximum** – Integer indicating the maximum value of the parameter.
- **minimum** – Integer indicating the minimum value of the parameter.
- **regex** – String describing a regular expression constraint on the parameter.
- **form_input_type** – Specify the form input field type (e.g. textarea). Only used for string fields.
- **type_info** – Type-specific information. Mostly reserved for future use.

- **is_kwarg** – Boolean indicating if this parameter is meant to be part of the decorated function’s kwargs. Only applies when the decorated object is a method.
- **model** – Class to be used as a model for this parameter. Must be a Python type object, not an instance.

Returns The decorated function

`brewtils.decorators.parameters(*args, **kwargs)`

Deprecated since version 3.0: Will be removed in version 4.0. Please use `@command` instead.

Decorator for specifying multiple Parameter definitions at once

This can be useful for commands which have a large number of complicated parameters but aren’t good candidates for a Model.

```
@parameter(**params[cmd1][param1])
@parameter(**params[cmd1][param2])
@parameter(**params[cmd1][param3])
def cmd1(self, **kwargs):
    pass
```

Can become:

```
@parameters(params[cmd1])
def cmd1(self, **kwargs):
    pass
```

Parameters

- ***args** (*iterable*) – Positional arguments The first (and only) positional argument must be a list containing dictionaries that describe parameters.
- ****kwargs** – Used for bookkeeping. Don’t set any of these yourself!

Returns The decorated function

Return type func

`brewtils.decorators.system(_wrapped=None, bg_name=None, bg_version=None)`

Class decorator that marks a class as a beer-garden Client

Using this decorator is no longer strictly necessary. It was previously required in order to mark a class as being a Beer-garden Client, and contained most of the logic that currently resides in the `parse_client` function. However, that’s no longer the case and this currently exists mainly for back-compatibility reasons.

Applying this decorator to a client class does have the nice effect of preventing linters from complaining if any special attributes are used. So that’s something.

Those special attributes are below. Note that these are just placeholders until the actual values are populated when the client instance is assigned to a Plugin:

- `_bg_name`: an optional system name
- `_bg_version`: an optional system version
- `_bg_commands`: holds all registered commands
- `_current_request`: Reference to the currently executing request

Parameters

- **_wrapped** – The class to decorate. This is handled as a positional argument and shouldn't be explicitly set.
- **bg_name** – Optional plugin name
- **bg_version** – Optional plugin version

Returns The decorated class

3.1.6 brewtils.display module

`brewtils.display.resolve_form(form=None, base_dir=None)`

Resolve a form attribute

Returns Dictionary that fully describes a form

`brewtils.display.resolve_schema(schema=None, base_dir=None)`

Resolve a schema attribute

Returns Dictionary that fully describes a schema

`brewtils.display.resolve_template(template=None, base_dir=None)`

Resolve a template attribute

Returns Dictionary that fully describes a template

3.1.7 brewtils.errors module

exception `brewtils.errors.AckAndContinueException`

Bases: `brewtils.errors.RequestProcessException`

exception `brewtils.errors.AckAndDieException`

Bases: `brewtils.errors.RequestProcessException`

exception `brewtils.errors.AuthorizationRequired`

Bases: `brewtils.errors.RestClientError`

Error indicating a 401 was raised on the server

`brewtils.errors.BGConflictError`

alias of `brewtils.errors.ConflictError`

exception `brewtils.errors.BGGivesUpError`

Bases: `brewtils.errors.RequestProcessException`

Special exception that indicates Beer-garden is giving up

This exception is not raised directly, instead it's a special value for a request's `error_class` attribute. It indicates the request may have information that has not been persisted to the database, but Beer-garden is choosing to abandon further attempts to update it.

Typically indicates a request output is too large or the maximum number of update retry attempts has been reached.

`brewtils.errors.BGNotFoundError`

alias of `brewtils.errors.NotFoundError`

`brewtils.errors.BGRequestFailedError`

alias of `brewtils.errors.RequestFailedError`

exception `brewtils.errors.BrewtilsException`

Bases: `exceptions.Exception`

Base exception

exception `brewtils.errors.ConflictError`

Bases: `brewtils.errors.RestClientError`

Error indicating a 409 was raised on the server

`brewtils.errors.ConnectionTimeoutError`

alias of `brewtils.errors.TimeoutExceededError`

exception `brewtils.errors.DeleteError`

Bases: `brewtils.errors.RestServerError`

Error Indicating a server Error occurred performing a DELETE

exception `brewtils.errors.DiscardMessageException`

Bases: `brewtils.errors.RequestProcessException`

Raising an instance will result in a message not being queued

exception `brewtils.errors.ErrorLogLevelCritical`

Bases: `exceptions.Exception`

Mixin to log an exception at the CRITICAL level

exception `brewtils.errors.ErrorLogLevelDebug`

Bases: `exceptions.Exception`

Mixin to log an exception at the DEBUG level

exception `brewtils.errors.ErrorLogLevelError`

Bases: `exceptions.Exception`

Mixin to log an exception at the ERROR level

exception `brewtils.errors.ErrorLogLevelInfo`

Bases: `exceptions.Exception`

Mixin to log an exception at the INFO level

exception `brewtils.errors.ErrorLogLevelWarning`

Bases: `exceptions.Exception`

Mixin to log an exception at the WARNING level

exception `brewtils.errors.FetchError`

Bases: `brewtils.errors.RestError`

Error Indicating a server Error occurred performing a GET

exception `brewtils.errors.ModelError`

Bases: `brewtils.errors.BrewtilsException`

Base exception for model errors

exception `brewtils.errors.ModelValidationError`

Bases: `brewtils.errors.ModelError`

Invalid model

exception `brewtils.errors.NoAckAndDieException`

Bases: `brewtils.errors.RequestProcessException`

exception `brewtils.errors.NotFoundError`

Bases: `brewtils.errors.RestClientError`

Error Indicating a 404 was raised on the server

exception `brewtils.errors.PluginError`

Bases: `brewtils.errors.BrewtilsException`

Generic error class

exception `brewtils.errors.PluginParamError`

Bases: `brewtils.errors.PluginError`

Error used when plugins have illegal parameters

exception `brewtils.errors.PluginValidationError`

Bases: `brewtils.errors.PluginError`

Plugin could not be validated successfully

exception `brewtils.errors.RepublishRequestException` (*request, headers*)

Bases: `brewtils.errors.RequestProcessException`

Republish to the end of the message queue

Parameters

- **request** – The Request to republish
- **headers** – A dictionary of headers to be used by `brewtils.pika.PikaConsumer`

exception `brewtils.errors.RequestFailedError` (*request*)

Bases: `brewtils.errors.RestError`

Request returned with a 200, but the status was ERROR

exception `brewtils.errors.RequestForbidden`

Bases: `brewtils.errors.RestClientError`

Error indicating a 403 was raised on the server

exception `brewtils.errors.RequestProcessException`

Bases: `brewtils.errors.BrewtilsException`

Base for exceptions that occur during request processing

exception `brewtils.errors.RequestProcessingError`

Bases: `brewtils.errors.AckAndContinueException`

exception `brewtils.errors.RequestPublishException`

Bases: `brewtils.errors.BrewtilsException`

Error while publishing request

exception `brewtils.errors.RequestStatusTransitionError`

Bases: `brewtils.errors.ModelValidationError`

A status update was an invalid transition

exception `brewtils.errors.RestClientError`

Bases: `brewtils.errors.RestError`

Wrapper for all 4XX errors

exception `brewtils.errors.RestConnectionError`

Bases: `brewtils.errors.RestServerError`

Error indicating a connection error while performing a request

exception `brewtils.errors.RestError`

Bases: `brewtils.errors.BrewtilsException`

Base exception for REST errors

exception `brewtils.errors.RestServerError`

Bases: `brewtils.errors.RestError`

Wrapper for all 5XX errors

exception `brewtils.errors.SaveError`

Bases: `brewtils.errors.RestServerError`

Error Indicating a server Error occurred performing a POST/PUT

exception `brewtils.errors.SuppressStacktrace`

Bases: `exceptions.Exception`

Mixin that will suppress stacktrace logging

exception `brewtils.errors.TimeoutExceededError`

Bases: `brewtils.errors.RestClientError`

Error indicating a timeout occurred waiting for a request to complete

exception `brewtils.errors.TooLargeError`

Bases: `brewtils.errors.RestClientError`

Error indicating a 413 was raised on the server

exception `brewtils.errors.ValidationError`

Bases: `brewtils.errors.RestClientError`

Error Indicating a client (400) Error occurred performing a POST/PUT

`brewtils.errors.WaitExceededError`

alias of `brewtils.errors.TimeoutExceededError`

`brewtils.errors.parse_exception_as_json(exc)`

Attempt to parse an Exception to a JSON string.

If the exception has a single argument, no attributes, and the attribute can be converted to a valid JSON string, then that will be returned.

Otherwise, a string version of the following form will be returned:

```
{
  "message": "",
  "arguments": [],
  "attributes": {}
}
```

Where “message” is just `str(exc)`, “arguments” is a list of all the arguments passed to the exception attempted to be converted to a valid JSON string, and “attributes” are the attributes of the exception class.

If parsing fails at all, then a simple `str()` will be applied either the argument or attribute value.

Note: On python version 2, errors with custom attributes do not list those attributes as arguments.

Parameters `exc` (*Exception*) – The exception you would like to format as JSON.

Raises `ValueError` – If the exception passed in is not an Exception.

Returns A valid JSON string representing (the best we can) the exception.

3.1.8 brewtils.log module

Brewtils Logging Utilities

This module streamlines loading logging configuration from Beergarden.

Example

To use this just call `configure_logging` sometime before you initialize your Plugin object:

```
from brewtils import configure_logging, get_connection_info, Plugin

# Load BG connection info from environment and command line args
connection_info = get_connection_info(sys.argv[1:])

configure_logging(system_name='systemX', **connection_info)

plugin = Plugin(
    my_client,
    name='systemX',
    version='0.0.1',
    **connection_info
)
plugin.run()
```

```
brewtils.log.configure_logging(raw_config, namespace=None, system_name=None, sys-
                             tem_version=None, instance_name=None)
```

Load and enable a logging configuration from Beergarden

WARNING: This method will modify the current logging configuration.

The configuration will be template substituted using the keyword arguments passed to this function. For example, a handler like this:

```
handlers:
  file:
    backupCount: 5
    class: "logging.handlers.RotatingFileHandler"
    encoding: utf8
    formatter: default
    level: INFO
    maxBytes: 10485760
    filename: "$system_name.log"
```

Will result in logging to a file with the same name as the given `system_name`.

This will also ensure that directories exist for any file-based handlers. Default behavior for the Python logging module is to not create directories that do not already exist, which would dramatically lower the utility of templating.

Parameters

- **raw_config** – Configuration to apply
- **namespace** – Used for configuration templating

- **system_name** – Used for configuration templating
- **system_version** – Used for configuration templating
- **instance_name** – Used for configuration templating

Returns None

`brewtils.log.convert_logging_config(logging_config)`

Transform a LoggingConfig object into a Python logging configuration

Parameters `logging_config` – Beergarden logging config

Returns The logging configuration

Return type dict

`brewtils.log.default_config(level='INFO')`

Get a basic logging configuration with the given level

`brewtils.log.find_log_file()`

Find the file name for the first file handler attached to the root logger

`brewtils.log.get_logging_config(system_name=None, **kwargs)`

Retrieve a logging configuration from Beergarden

Parameters

- **system_name** – Name of the system to load
- ****kwargs** – Beergarden connection parameters

Returns The logging configuration for the specified system

Return type dict

`brewtils.log.get_python_logging_config(bg_host, bg_port, system_name, ca_cert=None, client_cert=None, ssl_enabled=None)`

DEPRECATED: Get Beergarden's logging configuration

This method is deprecated - consider using `get_logging_config()`

Parameters

- **bg_host** (*str*) – Beergarden host
- **bg_port** (*int*) – Beergarden port
- **system_name** (*str*) – Name of the system
- **ca_cert** (*str*) – Path to CA certificate file
- **client_cert** (*str*) – Path to client certificate file
- **ssl_enabled** (*bool*) – Use SSL when connection to Beergarden

Returns The logging configuration for the specified system

Return type dict

`brewtils.log.read_log_file(log_file, start_line=None, end_line=None)`

Read lines from a log file

Parameters

- **log_file** – The file to read from
- **start_line** – Starting line to read
- **end_line** – Ending line to read

Returns Lines read from the file

```
brewtils.log.setup_logger(bg_host, bg_port, system_name, ca_cert=None, client_cert=None,
                          ssl_enabled=None)
```

DEPRECATED: Set Python logging to use configuration from Beergarden API

This method is deprecated - consider using `configure_logging()`

This method will overwrite the current logging configuration.

Parameters

- **bg_host** (*str*) – Beergarden host
- **bg_port** (*int*) – Beergarden port
- **system_name** (*str*) – Name of the system
- **ca_cert** (*str*) – Path to CA certificate file
- **client_cert** (*str*) – Path to client certificate file
- **ssl_enabled** (*bool*) – Use SSL when connection to Beergarden

Returns: None

3.1.9 brewtils.models module

```
class brewtils.models.BaseModel
```

Bases: object

schema = None

```
class brewtils.models.System(name=None, description=None, version=None, id=None,
                             max_instances=None, instances=None, commands=None,
                             icon_name=None, display_name=None, metadata=None, names-
                             pace=None, local=None, template=None)
```

Bases: `brewtils.models.BaseModel`

```
get_command_by_name(command_name)
```

Retrieve a particular command from the system

Parameters **command_name** (*str*) – The command name

Returns The command if it exists, None otherwise

Return type *Command*

```
get_instance(name)
```

```
get_instance_by_id(id, raise_missing=False)
```

Get an instance that currently exists in the system

Parameters

- **id** (*str*) – The instance id
- **raise_missing** (*bool*) – If True, raise an exception if an Instance with the
- **id is not found. If False, will return None in that case.**
(*given*) –

Returns The instance if it exists, None otherwise

Return type *Instance*

Raises `ModelError` – Instance was not found and `raise_missing=True`

get_instance_by_name (*name*, *raise_missing=False*)

Get an instance that currently exists in the system

Parameters

- **name** (*str*) – The instance name
- **raise_missing** (*bool*) – If True, raise an exception if an Instance with the
- **name is not found. If False, will return None in that case.** (*given*) –

Returns The instance if it exists, None otherwise

Return type *Instance*

Raises `ModelError` – Instance was not found and `raise_missing=True`

has_different_commands (*commands*)

Check if a set of commands is different than the current commands

Parameters **commands** (*Sequence[Command]*) – Command collection for comparison

Returns True if the given Commands differ, False if they are identical

Return type *bool*

has_instance (*name*)

Determine if an instance currently exists in the system

Parameters **name** (*str*) – The instance name

Returns True if an instance with the given name exists, False otherwise

Return type *bool*

instance_names

schema = 'SystemSchema'

```
class brewtils.models.Instance(name=None, description=None, id=None, status=None,
                               status_info=None, queue_type=None, queue_info=None,
                               icon_name=None, metadata=None)
```

Bases: *brewtils.models.BaseModel*

INSTANCE_STATUSES = set(['DEAD', 'INITIALIZING', 'PAUSED', 'RUNNING', 'STARTING', 'STOPPED'])

schema = 'InstanceSchema'

```
class brewtils.models.Command(name=None, description=None, parameters=None, command_type=None,
                              output_type=None, schema=None, form=None, template=None, icon_name=None, hidden=False,
                              metadata=None)
```

Bases: *brewtils.models.BaseModel*

COMMAND_TYPES = ('ACTION', 'INFO', 'EPHEMERAL', 'ADMIN')

OUTPUT_TYPES = ('STRING', 'JSON', 'XML', 'HTML', 'JS', 'CSS')

get_parameter_by_key (*key*)

Lookup a Parameter using a given key

Parameters **key** (*str*) – The Parameter key to use

Returns

A Parameter with the given key

If a Parameter with the given key does not exist None will be returned.

Return type *Parameter* (Optional)

has_different_parameters (*parameters*)

Determine if parameters differ from the current parameters

Parameters *parameters* (*Sequence* [*Parameter*]) – Parameter collection for comparison

Returns True if the given Parameters differ, False if they are identical

Return type bool

parameter_keys ()

Get a list of all Parameter keys

Returns A list containing each Parameter's key attribute

Return type list[str]

parameter_keys_by_type (*desired_type*)

Get a list of all Parameter keys, filtered by Parameter type

Parameters *desired_type* (*str*) – Parameter type

Returns A list containing matching Parameters' key attribute

Return type list[str]

schema = 'CommandSchema'

```
class brewtils.models.Parameter(key=None, type=None, multi=None, display_name=None,
                                optional=None, default=None, description=None,
                                choices=None, parameters=None, nullable=None,
                                maximum=None, minimum=None, regex=None,
                                form_input_type=None, type_info=None, is_kwarg=None,
                                model=None)
```

Bases: *brewtils.models.BaseModel*

FORM_INPUT_TYPES = ('textarea',)

TYPES = ('String', 'Integer', 'Float', 'Boolean', 'Any', 'Dictionary', 'Date', 'DateTime')

is_different (*other*)

keys_by_type (*desired_type*)

Gets all keys by the specified type.

Since parameters can be nested, this method will also return all keys of all nested parameters. The return value is a possibly nested list, where the first value of each list is going to be a string, while the next value is a list.

Parameters *desired_type* (*str*) – Desired type

Returns An empty list if the type does not exist, otherwise it will be a list containing at least one entry which is a string, each subsequent entry is a nested list with the same structure.

schema = 'ParameterSchema'


```
class brewtils.models.Request(system=None, system_version=None, instance_name=None,
                              namespace=None, command=None, id=None, parent=None, chil-
                              dren=None, parameters=None, comment=None, output=None,
                              output_type=None, status=None, command_type=None, cre-
                              ated_at=None, error_class=None, metadata=None, hid-
                              den=None, updated_at=None, status_updated_at=None,
                              has_parent=None, requester=None)
```

Bases: `brewtils.models.RequestTemplate`

```
COMMAND_TYPES = ('ACTION', 'INFO', 'EPHEMERAL', 'ADMIN')
```

```
COMPLETED_STATUSES = ('CANCELED', 'SUCCESS', 'ERROR', 'INVALID')
```

```
OUTPUT_TYPES = ('STRING', 'JSON', 'XML', 'HTML', 'JS', 'CSS')
```

```
STATUS_LIST = ('CREATED', 'RECEIVED', 'IN_PROGRESS', 'CANCELED', 'SUCCESS', 'ERROR', '')
```

```
classmethod from_template(template, **kwargs)
```

Create a Request instance from a RequestTemplate

Parameters

- **template** – The RequestTemplate to use
- ****kwargs** – Optional overrides to use in place of the template’s attributes

Returns The new Request instance

```
is_ephemeral
```

```
is_json
```

```
schema = 'RequestSchema'
```

```
status
```

```
class brewtils.models.PatchOperation(operation=None, path=None, value=None)
```

Bases: `brewtils.models.BaseModel`

```
schema = 'PatchSchema'
```

```
class brewtils.models.Choices(type=None, display=None, value=None, strict=None, de-
                              tails=None)
```

Bases: `brewtils.models.BaseModel`

```
DISPLAYS = ('select', 'typeahead')
```

```
TYPES = ('static', 'url', 'command')
```

```
schema = 'ChoicesSchema'
```

```
class brewtils.models.LoggingConfig(level=None, handlers=None, formatters=None, log-
                                     gers=None)
```

Bases: `brewtils.models.BaseModel`

```
DEFAULT_FORMAT = '%(asctime)s - %(name)s - %(levelname)s - %(message)s'
```

```
DEFAULT_HANDLER = {'class': 'logging.StreamHandler', 'formatter': 'default', 'stream'
```

```
LEVELS = ('DEBUG', 'INFO', 'WARN', 'ERROR')
```

```
SUPPORTED_HANDLERS = ('stdout', 'file', 'logstash')
```

```
formatter_names
```

```
get_plugin_log_config(**kwargs)
```

Get a specific plugin logging configuration.

It is possible for different systems to have different logging configurations. This method will create the correct plugin logging configuration and return it. If a specific logger is not found for a system, then the current logging configuration will be returned.

Keyword Arguments information for a system (*Identifying*) –

Returns The logging configuration for this system

```
handler_names
schema = 'LoggingConfigSchema'
class brewtils.models.Event(name=None, namespace=None, garden=None, metadata=None,
                             timestamp=None, payload_type=None, payload=None, error=None,
                             error_message=None)
    Bases: brewtils.models.BaseModel
    schema = 'EventSchema'
class brewtils.models.Events
    Bases: enum.Enum
    ALL_QUEUES_CLEARED = 15
    BARTENDER_STARTED = 3
    BARTENDER_STOPPED = 4
    BREWVIEW_STARTED = 1
    BREWVIEW_STOPPED = 2
    DB_CREATE = 16
    DB_DELETE = 18
    DB_UPDATE = 17
    ENTRY_STARTED = 31
    ENTRY_STOPPED = 32
    FILE_CREATED = 24
    GARDEN_CREATED = 19
    GARDEN_ERROR = 28
    GARDEN_NOT_CONFIGURED = 29
    GARDEN_REMOVED = 21
    GARDEN_STARTED = 25
    GARDEN_STOPPED = 26
    GARDEN_SYNC = 30
    GARDEN_UNREACHABLE = 27
    GARDEN_UPDATED = 20
    INSTANCE_INITIALIZED = 8
    INSTANCE_STARTED = 9
    INSTANCE_STOPPED = 10
    INSTANCE_UPDATED = 23
```

```

JOB_CREATED = 33
JOB_DELETED = 34
JOB_EXECUTED = 43
JOB_PAUSED = 35
JOB_RESUMED = 36
JOB_UPDATED = 41
PLUGIN_LOGGER_FILE_CHANGE = 37
QUEUE_CLEARED = 14
REQUEST_CANCELED = 42
REQUEST_COMPLETED = 7
REQUEST_CREATED = 5
REQUEST_STARTED = 6
REQUEST_UPDATED = 22
RUNNER_REMOVED = 40
RUNNER_STARTED = 38
RUNNER_STOPPED = 39
SYSTEM_CREATED = 11
SYSTEM_REMOVED = 13
SYSTEM_UPDATED = 12
USERS_IMPORTED = 45
USER_UPDATED = 44

class brewtils.models.Queue(name=None, system=None, version=None, instance=None, system_id=None, display=None, size=None)
    Bases: brewtils.models.BaseModel
    schema = 'QueueSchema'

class brewtils.models.Principal(id=None, username=None, roles=None, permissions=None, preferences=None, metadata=None)
    Bases: brewtils.models.BaseModel
    schema = 'PrincipalSchema'

class brewtils.models.LegacyRole(id=None, name=None, description=None, permissions=None)
    Bases: brewtils.models.BaseModel
    schema = 'LegacyRoleSchema'

class brewtils.models.RefreshToken(id=None, issued=None, expires=None, payload=None)
    Bases: brewtils.models.BaseModel
    schema = 'RefreshTokenSchema'

```

```
class brewtils.models.Job(id=None, name=None, trigger_type=None, trigger=None, re-
                        quest_template=None, misfire_grace_time=None, coalesce=None,
                        next_run_time=None, success_count=None, error_count=None,
                        status=None, max_instances=None, timeout=None)
    Bases: brewtils.models.BaseModel

    STATUS_TYPES = set(['PAUSED', 'RUNNING'])

    TRIGGER_TYPES = set(['cron', 'date', 'file', 'interval'])

    schema = 'JobSchema'

class brewtils.models.RequestFile(storage_type=None, filename=None, id=None)
    Bases: brewtils.models.BaseModel

    schema = 'RequestFileSchema'

class brewtils.models.File(id=None, owner_id=None, owner_type=None, updated_at=None,
                        file_name=None, file_size=None, chunks=None, chunk_size=None,
                        owner=None, job=None, request=None)
    Bases: brewtils.models.BaseModel

    schema = 'FileSchema'

class brewtils.models.FileChunk(id=None, file_id=None, offset=None, data=None,
                                owner=None)
    Bases: brewtils.models.BaseModel

    schema = 'FileChunkSchema'

class brewtils.models.FileStatus(owner_id=None, owner_type=None, updated_at=None,
                                file_name=None, file_size=None, chunks=None,
                                chunk_size=None, chunk_id=None, file_id=None, off-
                                set=None, data=None, valid=None, missing_chunks=None,
                                expected_max_size=None, size_ok=None, ex-
                                pected_number_of_chunks=None, number_of_chunks=None,
                                chunks_ok=None, operation_complete=None, mes-
                                sage=None)
    Bases: brewtils.models.BaseModel

    schema = 'FileStatusSchema'

class brewtils.models.RequestTemplate(system=None, system_version=None, in-
                                stance_name=None, namespace=None, com-
                                mand=None, command_type=None, parame-
                                ters=None, comment=None, metadata=None,
                                output_type=None)
    Bases: brewtils.models.BaseModel

    TEMPLATE_FIELDS = ['system', 'system_version', 'instance_name', 'namespace', 'command'

    schema = 'RequestTemplateSchema'

class brewtils.models.DateTrigger(run_date=None, timezone=None)
    Bases: brewtils.models.BaseModel

    scheduler_attributes

    scheduler_kwargs

    schema = 'DateTriggerSchema'
```

```

class brewtils.models.CronTrigger (year=None, month=None, day=None, week=None,
                                   day_of_week=None, hour=None, minute=None, second=None,
                                   start_date=None, end_date=None, time_zone=None, jitter=None)
    Bases: brewtils.models.BaseModel
    scheduler_attributes
    scheduler_kwargs
    schema = 'CronTriggerSchema'

class brewtils.models.IntervalTrigger (weeks=None, days=None, hours=None, minutes=None,
                                       seconds=None, start_date=None, end_date=None,
                                       timezone=None, jitter=None, reschedule_on_finish=None)
    Bases: brewtils.models.BaseModel
    scheduler_attributes
    scheduler_kwargs
    schema = 'IntervalTriggerSchema'

class brewtils.models.FileTrigger (pattern=None, path=None, recursive=None, callbacks=None)
    Bases: brewtils.models.BaseModel
    scheduler_attributes
    scheduler_kwargs
    schema = 'FileTriggerSchema'

class brewtils.models.Garden (id=None, name=None, status=None, status_info=None,
                              naces=None, systems=None, connection_type=None, connection_params=None)
    Bases: brewtils.models.BaseModel
    GARDEN_STATUSES = set(['BLOCKED', 'ERROR', 'INITIALIZING', 'NOT_CONFIGURED', 'RUNNING'])
    schema = 'GardenSchema'

class brewtils.models.Operation (model=None, model_type=None, args=None, kwargs=None,
                                 target_garden_name=None, source_garden_name=None, operation_type=None)
    Bases: brewtils.models.BaseModel
    schema = 'OperationSchema'

class brewtils.models.Resolvable (id=None, type=None, storage=None, details=None)
    Bases: brewtils.models.BaseModel
    TYPES = ('Base64', 'Bytes')
    schema = 'ResolvableSchema'

```

3.1.10 brewtils.pika module

```

class brewtils.pika.PikaClient (host='localhost', port=5672, user='guest', password='guest',
                                connection_attempts=3, heartbeat_interval=3600, virtual_host='/',
                                exchange='beer_garden', ssl=None, blocked_connection_timeout=None, **kwargs)
    Bases: object

```

Base class for connecting to RabbitMQ using Pika

Parameters

- **host** – RabbitMQ host
- **port** – RabbitMQ port
- **user** – RabbitMQ user
- **password** – RabbitMQ password
- **connection_attempts** – Maximum number of retry attempts
- **heartbeat** – Time between RabbitMQ heartbeats
- **heartbeat_interval** – DEPRECATED, use heartbeat
- **virtual_host** – RabbitMQ virtual host
- **exchange** – Default exchange that will be used
- **ssl** – SSL Options
- **blocked_connection_timeout** – If not None, the value is a non-negative timeout, in seconds, for the connection to remain blocked (triggered by `Connection.Blocked` from broker); if the timeout expires before connection becomes unblocked, the connection will be torn down, triggering the adapter-specific mechanism for informing client app about the closed connection (e.g., `on_close_callback` or `ConnectionClosed` exception) with *reason_code* of `InternalCloseReasons.BLOCKED_CONNECTION_TIMEOUT`.

connection_parameters (**kwargs)

Get `ConnectionParameters` associated with this client

Will construct a `ConnectionParameters` object using parameters passed at initialization as defaults. Any parameters passed in kwargs will override initialization parameters.

Parameters ****kwargs** – Overrides for specific parameters

Returns `ConnectionParameters` object

Return type `pika.ConnectionParameters`

connection_url

Connection URL for this client's connection information

Type `str`

class `brewtils.pika.PikaConsumer` (*amqp_url=None, queue_name=None, panic_event=None, logger=None, thread_name=None, **kwargs*)

Bases: `brewtils.request_handling.RequestConsumer`

Pika message consumer

This consumer is designed to be fault-tolerant - if RabbitMQ closes the connection the consumer will attempt to reopen it. There are limited reasons why the connection may be closed from the broker side and usually indicates permission related issues or socket timeouts.

Unexpected channel closures can indicate a problem with a command that was issued.

Parameters

- **amqp_url** – (str) The AMQP url to connect to
- **queue_name** – (str) The name of the queue to connect to
- **on_message_callback** (*func*) – function called to invoke message

- **Must return a Future.** (*processing.*) –
- **panic_event** (*threading.Event*) – Event to be set on a catastrophic failure
- **logger** (*logging.Logger*) – A configured Logger
- **thread_name** (*str*) – Name to use for this thread
- **max_concurrent** – (int) Maximum requests to process concurrently
- **max_reconnect_attempts** (*int*) – Number of times to attempt reconnection to message queue before giving up (default -1 aka never)
- **max_reconnect_timeout** (*int*) – Maximum time to wait before reconnect attempt
- **starting_reconnect_timeout** (*int*) – Time to wait before first reconnect attempt

finish_message (*basic_deliver, future*)

Finish processing a message

This should be invoked as the final part of message processing. It's responsible for acking / nacking messages back to the broker.

The main complexity here depends on whether the request processing future has an exception:

- If there is no exception it acks the message
- **If there is an exception**
 - If the exception is an instance of `DiscardMessageException` it acks the message and does not requeue it
 - If the exception is an instance of `RepublishRequestException` it will construct an entirely new `BlockingConnection`, use that to publish a new message, and then ack the original message
 - If the exception is not an instance of either the `panic_event` is set and the consumer will self-destruct

Also, if there's ever an error acking a message the `panic_event` is set and the consumer will self-destruct.

Parameters

- **basic_deliver** –
- **future** – Completed future

Returns None

is_connected ()

Determine if the underlying connection is open

Returns True if the connection exists and is open, False otherwise

on_channel_closed (*channel, *args*)

Channel closed callback

This method is invoked by pika when the channel is closed. Channels are usually closed as a result of something that violates the protocol, such as attempting to re-declare an exchange or queue with different parameters.

This indicates that something has gone wrong, so just close the connection (if it's still open) to reset.

Parameters

- **channel** – The channel

- **args** – Tuple of arguments describing why the channel closed For `pika < 1`: `reply_code` (Numeric code indicating close reason), `reply_text` (String describing close reason). For `pika >= 1` `exc` (Exception describing close).

Returns None

on_channel_open (*channel*)

Channel open success callback

This will add a close callback (`on_channel_closed`) the channel and will call `start_consuming` to begin receiving messages.

Parameters **channel** – The opened channel object

Returns None

on_connection_closed (*connection*, **args*)

Connection closed callback

This method is invoked by pika when the connection to RabbitMQ is closed.

If the connection is closed we terminate its IOloop to stop the PikaConsumer. In the case of an unexpected connection closure we'll wait 5 seconds before terminating with the expectation that the plugin will attempt to restart the consumer once it's dead.

Parameters

- **connection** – The connection
- **args** – Tuple of arguments describing why the connection closed For `pika < 1`: `reply_code` (Numeric code indicating close reason), `reply_text` (String describing close reason). For `pika >= 1` `exc` (Exception describing close).

Returns None

on_connection_open (*connection*)

Connection open success callback

This method is called by pika once the connection to RabbitMQ has been established.

The only thing this actually does is call the `open_channel` method.

Parameters **connection** – The connection object

Returns None

on_consumer_cancelled (*method_frame*)

Consumer cancelled callback

This is only invoked if the consumer is cancelled by the broker. Since that effectively ends the request consuming we close the channel to start the process of terminating the PikaConsumer.

Parameters **method_frame** (*pika.frame.Method*) – The Basic.Cancel frame

Returns None

on_message (*channel*, *basic_deliver*, *properties*, *body*)

Invoked when a message is delivered from the queueing service

Invoked by pika when a message is delivered from RabbitMQ. The channel is passed for your convenience. The `basic_deliver` object that is passed in carries the exchange, routing key, delivery tag and a redelivered flag for the message. the properties passed in is an instance of `BasicProperties` with the message properties and the body is the message that was sent.

Parameters

- **channel** (*pika.channel.Channel*) – The channel object
- **basic_deliver** (*pika.Spec.Basic.Deliver*) – basic_deliver method
- **properties** (*pika.Spec.BasicProperties*) – Message properties
- **body** (*bytes*) – The message body

on_message_callback_complete (*basic_deliver, future*)

Invoked when the future returned by `_on_message_callback` completes.

This method will be invoked from the threadpool context. It's only purpose is to schedule the final processing steps to take place on the connection's ioloop.

Parameters

- **basic_deliver** –
- **future** – Completed future

Returns None

open_channel ()

Open a channel

open_connection ()

Opens a connection to RabbitMQ

This method immediately returns the connection object. However, whether the connection was successful is not know until a callback is invoked (either `on_open_callback` or `on_open_error_callback`).

Returns The SelectConnection object

run ()

Run the consumer

This method creates a connection to RabbitMQ and starts the IOLoop. The IOLoop will block and allow the SelectConnection to operate. This means that to stop the PikaConsumer we just need to stop the IOLoop.

If the connection closed unexpectedly (the shutdown event is not set) then this will wait a certain amount of time and before attempting to restart it.

Finally, if the maximum number of reconnect attempts have been reached the panic event will be set, which will end the PikaConsumer as well as the Plugin.

Returns None

start_consuming ()

Begin consuming messages

The RabbitMQ prefetch is set to the maximum number of concurrent consumers. This ensures that messages remain in RabbitMQ until a consuming thread is available to process them.

An `on_cancel_callback` is registered so that the consumer is notified if it is canceled by the broker.

Returns None

stop ()

Cleanly shutdown

It's a good idea to call `stop_consuming` before this to prevent new messages from being processed during shutdown.

This sets the `shutdown_event` to let callbacks know that this is an orderly (requested) shutdown. It then schedules a channel close on the `IOLoop` - the channel's `on_close` callback will close the connection, and the connection's `on_close` callback will terminate the `IOLoop` which will end the `PikaConsumer`.

Returns None

stop_consuming()

Stop consuming messages

Sends a `Basic.Cancel` command to the broker, which causes the broker to stop sending the consumer messages.

Returns None

class `brewtils.pika.TransientPikaClient` (**kwargs)

Bases: `brewtils.pika.PikaClient`

Client implementation that creates new connection and channel for each action

declare_exchange()

is_alive()

publish (message, **kwargs)

Publish a message

Parameters

- **message** – Message to publish
- **kwargs** – Additional message properties

Keyword Arguments

- **routing_key** -- (*) – Routing key to use when publishing
- **headers** -- (*) – Headers to be included as part of the message properties
- **expiration** -- (*) – Expiration to be included as part of the message properties
- **confirm** -- (*) – Flag indicating whether to operate in publisher-acknowledgements mode
- **mandatory** -- (*) – Raise if the message can not be routed to any queues
- **priority** -- (*) – Message priority

setup_queue (queue_name, queue_args, routing_keys)

Create a new queue with `queue_args` and bind it to `routing_keys`

3.1.11 brewtils.plugin module

class `brewtils.plugin.Plugin` (client=None, system=None, logger=None, **kwargs)

Bases: `object`

A Beer-garden Plugin

This class represents a Beer-garden Plugin - a continuously-running process that can receive and process Requests.

To work, a Plugin needs a Client instance - an instance of a class defining which Requests this plugin can accept and process. The easiest way to define a Client is by annotating a class with the `@system` decorator.

A Plugin needs certain pieces of information in order to function correctly. These can be grouped into two high-level categories: identifying information and connection information.

Identifying information is how Beer-garden differentiates this Plugin from all other Plugins. If you already have fully-defined System model you can pass that directly to the Plugin (`system=my_system`). However, normally it's simpler to pass the pieces directly:

- `name` (required)
- `version` (required)
- `instance_name` (required, but defaults to “default”)
- `namespace`
- `description`
- `icon_name`
- `metadata`
- `display_name`

Connection information tells the Plugin how to communicate with Beer-garden. The most important of these is the `bg_host` (to tell the plugin where to find the Beer-garden you want to connect to):

- `bg_host`
- `bg_port`
- `bg_url_prefix`
- `ssl_enabled`
- `ca_cert`
- `ca_verify`
- `client_cert`

An example plugin might look like this:

```
Plugin(
    name="Test",
    version="1.0.0",
    instance_name="default",
    namespace="test_plugins",
    description="A Test",
    bg_host="localhost",
)
```

Plugins use [Yapconf](#) for configuration loading, which means that values can be discovered from sources other than direct argument passing. Config can be passed as command line arguments:

```
python my_plugin.py --bg-host localhost
```

Values can also be specified as environment variables with a “BG_” prefix:

```
BG_HOST=localhost python my_plugin.py
```

Plugins service requests using a `concurrent.futures.ThreadPoolExecutor`. The maximum number of threads available is controlled by the `max_concurrent` argument.

Warning: Normally the processing of each Request occurs in a distinct thread context. If you need to access shared state please be careful to use appropriate concurrency mechanisms.

Warning: The default value for `max_concurrent` is 5, but setting it to 1 is allowed. This means that a Plugin will essentially be single-threaded, but realize this means that if the Plugin invokes a Command on itself in the course of processing a Request then the Plugin **will** deadlock!

Parameters

- **client** – Instance of a class annotated with `@system`.
- **bg_host** (*str*) – Beer-garden hostname
- **bg_port** (*int*) – Beer-garden port
- **bg_url_prefix** (*str*) – URL path that will be used as a prefix when communicating with Beer-garden. Useful if Beer-garden is running on a URL other than `'/'`.
- **ssl_enabled** (*bool*) – Whether to use SSL for Beer-garden communication
- **ca_cert** (*str*) – Path to certificate file containing the certificate of the authority that issued the Beer-garden server certificate
- **ca_verify** (*bool*) – Whether to verify Beer-garden server certificate
- **client_cert** (*str*) – Path to client certificate to use when communicating with Beer-garden
- **api_version** (*int*) – Beer-garden API version to use
- **client_timeout** (*int*) – Max time to wait for Beer-garden server response
- **username** (*str*) – Username for Beer-garden authentication
- **password** (*str*) – Password for Beer-garden authentication
- **access_token** (*str*) – Access token for Beer-garden authentication
- **refresh_token** (*str*) – Refresh token for Beer-garden authentication
- **system** (*brewtils.models.System*) – A Beer-garden System definition. Incompatible with `name`, `version`, `description`, `display_name`, `icon_name`, `max_instances`, and `metadata` parameters.
- **name** (*str*) – System name
- **version** (*str*) – System version
- **description** (*str*) – System description
- **display_name** (*str*) – System display name
- **icon_name** (*str*) – System icon name
- **max_instances** (*int*) – System maximum instances
- **metadata** (*dict*) – System metadata
- **instance_name** (*str*) – Instance name
- **namespace** (*str*) – Namespace name
- **logger** (*logging.Logger*) – Logger that will be used by the Plugin. Passing a logger will prevent the Plugin from performing any additional logging configuration.
- **worker_shutdown_timeout** (*int*) – Time to wait during shutdown to finish processing
- **max_concurrent** (*int*) – Maximum number of requests to process concurrently

- **max_attempts** (*int*) – Number of times to attempt updating of a Request before giving up. Negative numbers are interpreted as no maximum.
- **max_timeout** (*int*) – Maximum amount of time to wait between Request update attempts. Negative numbers are interpreted as no maximum.
- **starting_timeout** (*int*) – Initial time to wait between Request update attempts. Will double on subsequent attempts until reaching max_timeout.
- **mq_max_attempts** (*int*) – Number of times to attempt reconnection to message queue before giving up. Negative numbers are interpreted as no maximum.
- **mq_max_timeout** (*int*) – Maximum amount of time to wait between message queue reconnect attempts. Negative numbers are interpreted as no maximum.
- **mq_starting_timeout** (*int*) – Initial time to wait between message queue reconnect attempts. Will double on subsequent attempts until reaching mq_max_timeout.
- **working_directory** (*str*) – Path to a preferred working directory. Only used when working with bytes parameters.

bg_host

Deprecated since version 3.0: bg_host is now in `_config` (`plugin._config.bg_host`)

Provided for backward-comptibility

bg_port

Deprecated since version 3.0: bg_port is now in `_config` (`plugin._config.bg_port`)

Provided for backward-comptibility

bg_url_prefix

Deprecated since version 3.0: bg_url_prefix is now in `_config` (`plugin._config.bg_url_prefix`)

Provided for backward-comptibility

bm_client

Deprecated since version 3.0: bm_client attribute has been renamed to `_ez_client`.

Provided for backward-comptibility

ca_cert

Deprecated since version 3.0: ca_cert is now in `_config` (`plugin._config.ca_cert`)

Provided for backward-comptibility

ca_verify

Deprecated since version 3.0: ca_verify is now in `_config` (`plugin._config.ca_verify`)

Provided for backward-comptibility

client**client_cert**

Deprecated since version 3.0: client_cert is now in `_config` (`plugin._config.client_cert`)

Provided for backward-comptibility

connection_parameters

Deprecated since version 3.0: connection_parameters has been removed. Please use `_config`

Provided for backward-comptibility

instance

instance_name

Deprecated since version 3.0: instance_name is now in _config (plugin._config.instance_name)

Provided for backward-comptibility

logger

Deprecated since version 3.0: logger attribute has been renamed to _logger.

Provided for backward-comptibility

max_attempts

Deprecated since version 3.0: max_attempts is now in _config (plugin._config.max_attempts)

Provided for backward-comptibility

max_concurrent

Deprecated since version 3.0: max_concurrent is now in _config (plugin._config.max_concurrent)

Provided for backward-comptibility

max_timeout

Deprecated since version 3.0: max_timeout is now in _config (plugin._config.max_timeout)

Provided for backward-comptibility

metadata

Deprecated since version 3.0: metadata is now part of the system attribute (plugin.system.metadata)

Provided for backward-comptibility

run()**shutdown_event**

Deprecated since version 3.0: shutdown_event attribute has been renamed to _shutdown_event.

Provided for backward-comptibility

ssl_enabled

Deprecated since version 3.0: ssl_enabled is now in _config (plugin._config.ssl_enabled)

Provided for backward-comptibility

starting_timeout

Deprecated since version 3.0: starting_timeout is now in _config (plugin._config.starting_timeout)

Provided for backward-comptibility

system**unique_name**

class brewtils.plugin.**PluginBase**(*args, **kwargs)

Bases: *brewtils.plugin.Plugin*

Deprecated since version 3.0: Will be removed in version 4.0. Please use Plugin instead.

Plugin alias Provided for backward-comptibility

class brewtils.plugin.**RemotePlugin**(*args, **kwargs)

Bases: *brewtils.plugin.Plugin*

Deprecated since version 3.0: Will be removed in version 4.0. Please use `Plugin` instead.

`Plugin` alias Provided for backward-comptibility

3.1.12 brewtils.queues module

This module currently exists to maintain backwards compatibility.

```
class brewtils.queues.PikaClient (host='localhost',          port=5672,          user='guest',
                                   password='guest',          connection_attempts=3,
                                   heartbeat_interval=3600,          virtual_host='/',
                                   exchange='beer_garden',          ssl=None,
                                   blocked_connection_timeout=None, **kwargs)
```

Bases: `object`

Base class for connecting to RabbitMQ using Pika

Parameters

- **host** – RabbitMQ host
- **port** – RabbitMQ port
- **user** – RabbitMQ user
- **password** – RabbitMQ password
- **connection_attempts** – Maximum number of retry attempts
- **heartbeat** – Time between RabbitMQ heartbeats
- **heartbeat_interval** – DEPRECATED, use **heartbeat**
- **virtual_host** – RabbitMQ virtual host
- **exchange** – Default exchange that will be used
- **ssl** – SSL Options
- **blocked_connection_timeout** – If not `None`, the value is a non-negative timeout, in seconds, for the connection to remain blocked (triggered by `Connection.Blocked` from broker); if the timeout expires before connection becomes unblocked, the connection will be torn down, triggering the adapter-specific mechanism for informing client app about the closed connection (e.g., `on_close_callback` or `ConnectionClosed` exception) with *reason_code* of `InternalCloseReasons.BLOCKED_CONNECTION_TIMEOUT`.

connection_parameters (***kwargs*)

Get `ConnectionParameters` associated with this client

Will construct a `ConnectionParameters` object using parameters passed at initialization as defaults. Any parameters passed in `kwargs` will override initialization parameters.

Parameters ***kwargs* – Overrides for specific parameters

Returns `ConnectionParameters` object

Return type `pika.ConnectionParameters`

connection_url

Connection URL for this client's connection information

Type `str`

3.1.13 brewtils.request_handling module

```
class brewtils.request_handling.AdminProcessor(target, updater, consumer, validation_funcs=None, logger=None, plugin_name=None, max_workers=None, resolver=None, system=None)
```

Bases: *brewtils.request_handling.RequestProcessor*

RequestProcessor with slightly modified process method

```
process_message(target, request, headers)
```

Process a message. Intended to be run on an Executor.

Will invoke the command and set the final status / output / error_class.

Will NOT set the status to IN_PROGRESS or set the request context.

Parameters

- **target** – The object to invoke received commands on
- **request** – The parsed Request
- **headers** – Dictionary of headers from the *PikaConsumer*

Returns None

```
class brewtils.request_handling.HTTPRequestUpdater(ez_client, shutdown_event, **kwargs)
```

Bases: *brewtils.request_handling.RequestUpdater*

RequestUpdater implementation based around an EasyClient.

Parameters

- **ez_client** – EasyClient to use for communication
- **shutdown_event** – *threading.Event* to allow for timely shutdowns
- **logger** – A logger

Keyword Arguments

- **logger** – A logger
- **max_attempts** – Max number of unsuccessful updates before discarding the message
- **max_timeout** – Maximum amount of time (seconds) to wait between update attempts
- **starting_timeout** – Starting time to wait (seconds) between update attempts

```
shutdown()
```

```
update_request(request, headers)
```

Sends a Request update to beer-garden

Ephemeral requests do not get updated, so we simply skip them.

If brew-view appears to be down, it will wait for brew-view to come back up before updating.

If this is the final attempt to update, we will attempt a known, good request to give some information to the user. If this attempt fails then we simply discard the message.

Parameters

- **request** – The request to update
- **headers** – A dictionary of headers from the *PikaConsumer*

Returns None

Raises `RepublishMessageException` – The Request update failed (any reason)

```
class brewtils.request_handling.NoopUpdater(*args, **kwargs)
```

Bases: `brewtils.request_handling.RequestUpdater`

RequestUpdater implementation that explicitly does not update.

shutdown()

update_request(request, headers)

```
class brewtils.request_handling.RequestConsumer(*args, **kwargs)
```

Bases: `threading.Thread`

Base class for consumers

Classes deriving from this are expected to provide a concrete implementation for a specific queue type.

After the consumer is created it will be passed to a `RequestProcessor`. The processor will then set the `on_message_callback` property of the consumer to the correct method.

This means when the consumer receives a message it should invoke its own `_on_message_callback` method with the message body and headers as parameters:

```
self._on_message_callback(body, properties.headers)
```

static create(connection_type=None, **kwargs)

Factory method for consumer creation

Currently the only supported `connection_type` is “rabbitmq”, which will return an instance of `brewtils.pika.PikaConsumer`.

Parameters

- **connection_type** (*str*) – String describing connection type
- **kwargs** – Keyword arguments to be passed to the Consumer initializer

Returns Concrete instance of `RequestConsumer`

Raises `ValueError` – The specified `connection_type` does not map to a consumer class

on_message_callback

stop()

stop_consuming()

```
class brewtils.request_handling.RequestProcessor(target, updater, consumer,
                                                validation_funcs=None, logger=None,
                                                plugin_name=None, max_workers=None,
                                                resolver=None, system=None)
```

Bases: `object`

Class responsible for coordinating Request processing

The `RequestProcessor` is responsible for the following:

- Defining `on_message_received` callback that will be invoked by the `PikaConsumer`
- Parsing the request
- Invoking the command on the target
- Formatting the output
- Reporting request updates to Beergarden (using a `RequestUpdater`)

Parameters

- **target** – Incoming requests will be invoked on this object

- **updater** – RequestUpdater that will be used for updating requests
- **validation_funcs** – List of functions that will called before invoking a command
- **logger** – A logger
- **plugin_name** – The Plugin's unique name
- **max_workers** – Max number of threads to use in the executor pool

on_message_received (*message, headers*)

Callback function that will be invoked for received messages

This will attempt to parse the message and then run the parsed Request through all validation functions that this RequestProcessor knows about.

If the request parses cleanly and passes validation it will be submitted to this RequestProcessor's Thread-PoolExecutor for processing.

Parameters

- **message** – The message string
- **headers** – The header dictionary

Returns A future that will complete when processing finishes

Raises

- `DiscardMessageException` – The request failed to parse correctly
- `RequestProcessException` – Validation failures should raise a subclass of this

process_message (*target, request, headers*)

Process a message. Intended to be run on an Executor.

Will set the status to IN_PROGRESS, invoke the command, and set the final status / output / error_class.

Parameters

- **target** – The object to invoke received commands on
- **request** – The parsed Request
- **headers** – Dictionary of headers from the *PikaConsumer*

Returns None

shutdown ()

Stop the RequestProcessor

startup ()

Start the RequestProcessor

class brewtils.request_handling.**RequestUpdater**

Bases: object

shutdown ()

update_request (*request, headers*)

3.1.14 brewtils.schema_parser module

class brewtils.schema_parser.**SchemaParser**

Bases: object

Serialize and deserialize Brewtils models

`logger = <logging.Logger object>`

classmethod `parse` (*data*, *model_class*, *from_string=False*, ***kwargs*)

Convert a JSON string or dictionary into a model object

Parameters

- **data** – The raw input
- **model_class** – Class object of the desired model type
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A model object

classmethod `parse_command` (*command*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a command model object

Parameters

- **command** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A Command object

classmethod `parse_event` (*event*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to an event model object

Parameters

- **event** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns An Event object

classmethod `parse_file` (*file*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a file model object

Parameters

- **file** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A File object

classmethod `parse_garden` (*garden*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a garden model object

Parameters

- **garden** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A Garden object

classmethod `parse_instance` (*instance*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to an instance model object

Parameters

- **instance** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns An Instance object

classmethod `parse_job` (*job*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a job model object

Parameters

- **job** – Raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A Job object.

classmethod `parse_job_ids` (*job_id_json*, *from_string=False*, ***kwargs*)

Convert raw JSON string containing a list of strings to a list of job ids.

Passes a list of strings through unaltered if from_string is False.

Parameters

- **job_id_json** – Raw input
- **from_string** – True if input is a JSON string, False otherwise
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A dictionary containing a list of job ids

classmethod `parse_logging_config` (*logging_config*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a logging config model object

Parameters

- **logging_config** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A LoggingConfig object

classmethod `parse_operation` (*operation*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a garden model object

Parameters

- **operation** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns An Operation object

classmethod `parse_parameter` (*parameter*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a parameter model object

Parameters

- **parameter** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns An Parameter object

classmethod `parse_patch` (*patch, from_string=False, **kwargs*)
Convert raw JSON string or dictionary to a patch model object

Note: for our patches, many is *always* set to True. We will always return a list from this method.

Parameters

- **patch** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A PatchOperation object

classmethod `parse_principal` (*principal, from_string=False, **kwargs*)
Convert raw JSON string or dictionary to a principal model object

Parameters

- **principal** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A Principal object

classmethod `parse_queue` (*queue, from_string=False, **kwargs*)
Convert raw JSON string or dictionary to a queue model object

Parameters

- **queue** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A Queue object

classmethod `parse_refresh_token` (*refresh_token, from_string=False, **kwargs*)
Convert raw JSON string or dictionary to a refresh token object

Parameters

- **refresh_token** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A RefreshToken object

classmethod `parse_request` (*request, from_string=False, **kwargs*)
Convert raw JSON string or dictionary to a request model object

Parameters

- **request** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A Request object

classmethod **parse_request_file** (*request_file*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a request file model object

Parameters

- **request_file** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A RequestFile object

classmethod **parse_resolvable** (*resolvable*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a runner model object

Parameters

- **resolvable** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A Resolvable object

classmethod **parse_role** (*role*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a role model object

Parameters

- **role** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A Role object

classmethod **parse_runner** (*runner*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a runner model object

Parameters

- **runner** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A Runner object

classmethod **parse_system** (*system*, *from_string=False*, ***kwargs*)

Convert raw JSON string or dictionary to a system model object

Parameters

- **system** – The raw input
- **from_string** – True if input is a JSON string, False if a dictionary

- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns A System object

classmethod `serialize` (*model*, *to_string=False*, *schema_name=None*, ***kwargs*)

Convert a model object or list of models into a dictionary or JSON string.

This is potentially recursive - here's how this should work:

- Determine the correct schema to use for serializing. This can be explicitly passed as an argument, or it can be determined by inspecting the model to serialize.
- **Determine if the model to serialize is a collection or a single object.**
 - If it's a single object, serialize it and return that.
 - If it's a collection, construct a list by calling this method for each individual item in the collection. Then serialize **that** and return it.

Parameters

- **model** – The model or model list
- **to_string** – True to generate a JSON string, False to generate a dictionary
- **schema_name** – Name of schema to use for serializing. If None, will be
- **by inspecting model** (*determined*) –
- ****kwargs** – Additional parameters to be passed to the Schema. Note that the 'many' parameter will be set correctly automatically.

Returns A serialized model representation

classmethod `serialize_command` (*command*, *to_string=True*, ***kwargs*)

Convert a command model into serialized form

Parameters

- **command** – The command object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of command

classmethod `serialize_event` (*event*, *to_string=True*, ***kwargs*)

Convert a logging config model into serialized form

Parameters

- **event** – The event object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of event

classmethod `serialize_garden` (*garden*, *to_string=True*, ***kwargs*)

Convert an garden model into serialized form

Parameters

- **garden** – The garden object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary

- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of garden

classmethod `serialize_instance` (*instance*, *to_string=True*, ***kwargs*)

Convert an instance model into serialized form

Parameters

- **instance** – The instance object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of instance

classmethod `serialize_job` (*job*, *to_string=True*, ***kwargs*)

Convert a job model into serialized form.

Parameters

- **job** – The job object(s) to be serialized.
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the schema (e.g. many=True)

Returns Serialize representation of job.

classmethod `serialize_job_for_import` (*job*, *to_string=True*, ***kwargs*)

Convert a Job object into serialized form expected by the import endpoint.

The fields that an existing Job would have that a new Job should not (e.g. 'id') are removed by the schema.

Parameters

- **job** – The Job to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the schema (e.g. many=True)

Returns Serialized representation of the Job

classmethod `serialize_job_ids` (*job_id_list*, *to_string=True*, ***kwargs*)

Convert a list of IDS into serialized form expected by the export endpoint.

Parameters

- **job_id_list** – The list of Job id(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the schema (e.g. many=True)

Returns Serialized representation of the job IDs

classmethod `serialize_logging_config` (*logging_config*, *to_string=True*, ***kwargs*)

Convert a logging config model into serialize form

Parameters

- **logging_config** – The logging config object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of logging config

classmethod `serialize_operation` (*operation*, *to_string=True*, ***kwargs*)

Convert an operation model into serialized form

Parameters

- **operation** – The operation object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of operation

classmethod `serialize_parameter` (*parameter*, *to_string=True*, ***kwargs*)

Convert a parameter model into serialized form

Parameters

- **parameter** – The parameter object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of parameter

classmethod `serialize_patch` (*patch*, *to_string=True*, ***kwargs*)

Convert a patch model into serialized form

Parameters

- **patch** – The patch object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of patch

classmethod `serialize_principal` (*principal*, *to_string=True*, ***kwargs*)

Convert a principal model into serialized form

Parameters

- **principal** – The principal object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation

classmethod `serialize_queue` (*queue*, *to_string=True*, ***kwargs*)

Convert a queue model into serialized form

Parameters

- **queue** – The queue object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of queue

classmethod `serialize_refresh_token` (*refresh_token*, *to_string=True*, ***kwargs*)

Convert a role model into serialized form

Parameters

- **refresh_token** – The token object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation

classmethod serialize_request (*request*, *to_string=True*, ***kwargs*)

Convert a request model into serialized form

Parameters

- **request** – The request object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of request

classmethod serialize_request_file (*request_file*, *to_string=True*, ***kwargs*)

Convert a request file model into serialized form

Parameters

- **request_file** – The request file object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of request file

classmethod serialize_resolvable (*resolvable*, *to_string=True*, ***kwargs*)

Convert a resolvable model into serialized form

Parameters

- **resolvable** – The resolvable object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of runner

classmethod serialize_role (*role*, *to_string=True*, ***kwargs*)

Convert a role model into serialized form

Parameters

- **role** – The role object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation

classmethod serialize_runner (*runner*, *to_string=True*, ***kwargs*)

Convert a runner model into serialized form

Parameters

- **runner** – The runner object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of runner

classmethod `serialize_system` (*system*, *to_string=True*, *include_commands=True*, ***kwargs*)
Convert a system model into serialized form

Parameters

- **system** – The system object(s) to be serialized
- **to_string** – True to generate a JSON-formatted string, False to generate a dictionary
- **include_commands** – True if the system’s command list should be included
- ****kwargs** – Additional parameters to be passed to the Schema (e.g. many=True)

Returns Serialized representation of system

3.1.15 brewtils.schemas module

```
class brewtils.schemas.SystemSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.InstanceSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.CommandSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.ParameterSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.RequestSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.RequestTemplateSchema
    opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.RequestFileSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.FileSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.FileChunkSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.FileStatusSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.PatchSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
```

opts = <marshmallow.schema.SchemaOpts object>

unwrap_envelope (*data*, *many*)

Helper function for parsing the different patch formats.

This exists because previously multiple patches serialized like:

```
{
  "operations": [
    {"operation": "replace", ...},
    {"operation": "replace", ...}
    ...
  ]
}
```

But we also wanted to be able to handle a simple list:

```
[
  {"operation": "replace", ...},
  {"operation": "replace", ...}
  ...
]
```

Patches are now (as of v3) serialized as the latter. Prior to v3 they were serialized as the former.

class brewtils.schemas.LoggingConfigSchema (*strict=True*, ***kwargs*)

Bases: brewtils.schemas.BaseSchema

opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.EventSchema (*strict=True*, ***kwargs*)

Bases: brewtils.schemas.BaseSchema

opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.QueueSchema (*strict=True*, ***kwargs*)

Bases: brewtils.schemas.BaseSchema

opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.PrincipalSchema (*strict=True*, ***kwargs*)

Bases: brewtils.schemas.BaseSchema

opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.LegacyRoleSchema (*strict=True*, ***kwargs*)

Bases: brewtils.schemas.BaseSchema

opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.RefreshTokenSchema (*strict=True*, ***kwargs*)

Bases: brewtils.schemas.BaseSchema

opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.JobSchema (*strict=True*, ***kwargs*)

Bases: brewtils.schemas.BaseSchema

opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.JobExportSchema (**args*, ***kwargs*)

Bases: *brewtils.schemas.JobSchema*

make_object (*data*)

```

    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.JobExportInputSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.JobExportListSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.DateTriggerSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.IntervalTriggerSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.CronTriggerSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.FileTriggerSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.GardenSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.OperationSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.UserSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.UserCreateSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.UserListSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.RoleSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>
class brewtils.schemas.RoleAssignmentSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema
    opts = <marshmallow.schema.SchemaOpts object>

```

```
class brewtils.schemas.RoleAssignmentDomainSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema

    opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.GardenDomainIdentifierSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema

    opts = <marshmallow.schema.SchemaOpts object>

class brewtils.schemas.SystemDomainIdentifierSchema (strict=True, **kwargs)
    Bases: brewtils.schemas.BaseSchema

    opts = <marshmallow.schema.SchemaOpts object>
```

3.1.16 brewtils.specification module

3.1.17 brewtils.stoppable_thread module

```
class brewtils.stoppable_thread.StoppableThread (**kwargs)
    Bases: threading.Thread

    Thread class with a stop() method. The thread itself has to check regularly for the stopped() condition.

    stop ()
        Sets the stop event

    stopped ()
        Determines if stop has been called yet.

    wait (timeout=None)
        Delegate wait call to threading.Event
```

3.1.18 Module contents

```
brewtils.client (_wrapped=None, bg_name=None, bg_version=None)
    Class decorator that marks a class as a beer-garden Client
```

Using this decorator is no longer strictly necessary. It was previously required in order to mark a class as being a Beer-garden Client, and contained most of the logic that currently resides in the `parse_client` function. However, that's no longer the case and this currently exists mainly for back-compatibility reasons.

Applying this decorator to a client class does have the nice effect of preventing linters from complaining if any special attributes are used. So that's something.

Those special attributes are below. Note that these are just placeholders until the actual values are populated when the client instance is assigned to a Plugin:

- `_bg_name`: an optional system name
- `_bg_version`: an optional system version
- `_bg_commands`: holds all registered commands
- `_current_request`: Reference to the currently executing request

Parameters

- **`_wrapped`** – The class to decorate. This is handled as a positional argument and shouldn't be explicitly set.

- **bg_name** – Optional plugin name
- **bg_version** – Optional plugin version

Returns The decorated class

```
brewtils.command(_wrapped=None, description=None, parameters=None, command_type='ACTION',
                  output_type='STRING', schema=None, form=None, template=None,
                  icon_name=None, hidden=False, metadata=None)
```

Decorator for specifying Command details

For example:

```
@command(output_type='JSON')
def echo_json(self, message):
    return message
```

Parameters

- **_wrapped** – The function to decorate. This is handled as a positional argument and shouldn't be explicitly set.
- **description** – The command description. If not given the first line of the method docstring will be used.
- **parameters** – A list of Command parameters. It's recommended to use @parameter decorators to declare Parameters instead of declaring them here, but it is allowed. Any Parameters given here will be merged with Parameters sourced from decorators and inferred from the method signature.
- **command_type** – The command type. Valid options are Command.COMMAND_TYPES.
- **output_type** – The output type. Valid options are Command.OUTPUT_TYPES.
- **schema** – A custom schema definition.
- **form** – A custom form definition.
- **template** – A custom template definition.
- **icon_name** – The icon name. Should be either a FontAwesome or a Glyphicon name.
- **hidden** – Flag controlling whether the command is visible on the user interface.
- **metadata** – Free-form dictionary

Returns The decorated function

```
brewtils.parameter(_wrapped=None, key=None, type=None, multi=None, display_name=None,
                   optional=None, default=None, description=None, choices=None, parameters=None,
                   nullable=None, maximum=None, minimum=None, regex=None,
                   form_input_type=None, type_info=None, is_kwarg=None, model=None)
```

Decorator for specifying Parameter details

For example:

```
@parameter(
    key="message",
    description="Message to echo",
    optional=True,
    type="String",
```

(continues on next page)

(continued from previous page)

```
        default="Hello, World!",
    )
    def echo(self, message):
        return message
```

Parameters

- **_wrapped** – The function to decorate. This is handled as a positional argument and shouldn't be explicitly set.
- **key** – String specifying the parameter identifier. If the decorated object is a method the key must match an argument name.
- **type** – String indicating the type to use for this parameter.
- **multi** – Boolean indicating if this parameter is a multi. See documentation for discussion of what this means.
- **display_name** – String that will be displayed as a label in the user interface.
- **optional** – Boolean indicating if this parameter must be specified.
- **default** – The value this parameter will be assigned if not overridden when creating a request.
- **description** – An additional string that will be displayed in the user interface.
- **choices** – List or dictionary specifying allowed values. See documentation for more information.
- **parameters** – Any nested parameters. See also: the 'model' argument.
- **nullable** – Boolean indicating if this parameter is allowed to be null.
- **maximum** – Integer indicating the maximum value of the parameter.
- **minimum** – Integer indicating the minimum value of the parameter.
- **regex** – String describing a regular expression constraint on the parameter.
- **form_input_type** – Specify the form input field type (e.g. `textarea`). Only used for string fields.
- **type_info** – Type-specific information. Mostly reserved for future use.
- **is_kwarg** – Boolean indicating if this parameter is meant to be part of the decorated function's kwargs. Only applies when the decorated object is a method.
- **model** – Class to be used as a model for this parameter. Must be a Python type object, not an instance.

Returns The decorated function

`brewtils.system(_wrapped=None, bg_name=None, bg_version=None)`

Class decorator that marks a class as a beer-garden Client

Using this decorator is no longer strictly necessary. It was previously required in order to mark a class as being a Beer-garden Client, and contained most of the logic that currently resides in the `parse_client` function. However, that's no longer the case and this currently exists mainly for back-compatibility reasons.

Applying this decorator to a client class does have the nice effect of preventing linters from complaining if any special attributes are used. So that's something.

Those special attributes are below. Note that these are just placeholders until the actual values are populated when the client instance is assigned to a Plugin:

- `_bg_name`: an optional system name
- `_bg_version`: an optional system version
- `_bg_commands`: holds all registered commands
- `_current_request`: Reference to the currently executing request

Parameters

- **`_wrapped`** – The class to decorate. This is handled as a positional argument and shouldn't be explicitly set.
- **`bg_name`** – Optional plugin name
- **`bg_version`** – Optional plugin version

Returns The decorated class

```
class brewtils.Plugin (client=None, system=None, logger=None, **kwargs)
```

Bases: `object`

A Beer-garden Plugin

This class represents a Beer-garden Plugin - a continuously-running process that can receive and process Requests.

To work, a Plugin needs a Client instance - an instance of a class defining which Requests this plugin can accept and process. The easiest way to define a `Client` is by annotating a class with the `@system` decorator.

A Plugin needs certain pieces of information in order to function correctly. These can be grouped into two high-level categories: identifying information and connection information.

Identifying information is how Beer-garden differentiates this Plugin from all other Plugins. If you already have fully-defined System model you can pass that directly to the Plugin (`system=my_system`). However, normally it's simpler to pass the pieces directly:

- `name` (required)
- `version` (required)
- `instance_name` (required, but defaults to "default")
- `namespace`
- `description`
- `icon_name`
- `metadata`
- `display_name`

Connection information tells the Plugin how to communicate with Beer-garden. The most important of these is the `bg_host` (to tell the plugin where to find the Beer-garden you want to connect to):

- `bg_host`
- `bg_port`
- `bg_url_prefix`
- `ssl_enabled`

- `ca_cert`
- `ca_verify`
- `client_cert`

An example plugin might look like this:

```
Plugin(  
    name="Test",  
    version="1.0.0",  
    instance_name="default",  
    namespace="test_plugins",  
    description="A Test",  
    bg_host="localhost",  
)
```

Plugins use `Yapconf` for configuration loading, which means that values can be discovered from sources other than direct argument passing. Config can be passed as command line arguments:

```
python my_plugin.py --bg-host localhost
```

Values can also be specified as environment variables with a “BG_” prefix:

```
BG_HOST=localhost python my_plugin.py
```

Plugins service requests using a `concurrent.futures.ThreadPoolExecutor`. The maximum number of threads available is controlled by the `max_concurrent` argument.

Warning: Normally the processing of each Request occurs in a distinct thread context. If you need to access shared state please be careful to use appropriate concurrency mechanisms.

Warning: The default value for `max_concurrent` is 5, but setting it to 1 is allowed. This means that a Plugin will essentially be single-threaded, but realize this means that if the Plugin invokes a Command on itself in the course of processing a Request then the Plugin **will** deadlock!

Parameters

- **client** – Instance of a class annotated with `@system`.
- **bg_host** (*str*) – Beer-garden hostname
- **bg_port** (*int*) – Beer-garden port
- **bg_url_prefix** (*str*) – URL path that will be used as a prefix when communicating with Beer-garden. Useful if Beer-garden is running on a URL other than `/`.
- **ssl_enabled** (*bool*) – Whether to use SSL for Beer-garden communication
- **ca_cert** (*str*) – Path to certificate file containing the certificate of the authority that issued the Beer-garden server certificate
- **ca_verify** (*bool*) – Whether to verify Beer-garden server certificate
- **client_cert** (*str*) – Path to client certificate to use when communicating with Beer-garden
- **api_version** (*int*) – Beer-garden API version to use

- **client_timeout** (*int*) – Max time to wait for Beer-garden server response
- **username** (*str*) – Username for Beer-garden authentication
- **password** (*str*) – Password for Beer-garden authentication
- **access_token** (*str*) – Access token for Beer-garden authentication
- **refresh_token** (*str*) – Refresh token for Beer-garden authentication
- **system** (*brewtils.models.System*) – A Beer-garden System definition. Incompatible with name, version, description, display_name, icon_name, max_instances, and meta-data parameters.
- **name** (*str*) – System name
- **version** (*str*) – System version
- **description** (*str*) – System description
- **display_name** (*str*) – System display name
- **icon_name** (*str*) – System icon name
- **max_instances** (*int*) – System maximum instances
- **metadata** (*dict*) – System metadata
- **instance_name** (*str*) – Instance name
- **namespace** (*str*) – Namespace name
- **logger** (*logging.Logger*) – Logger that will be used by the Plugin. Passing a logger will prevent the Plugin from performing any additional logging configuration.
- **worker_shutdown_timeout** (*int*) – Time to wait during shutdown to finish processing
- **max_concurrent** (*int*) – Maximum number of requests to process concurrently
- **max_attempts** (*int*) – Number of times to attempt updating of a Request before giving up. Negative numbers are interpreted as no maximum.
- **max_timeout** (*int*) – Maximum amount of time to wait between Request update attempts. Negative numbers are interpreted as no maximum.
- **starting_timeout** (*int*) – Initial time to wait between Request update attempts. Will double on subsequent attempts until reaching max_timeout.
- **mq_max_attempts** (*int*) – Number of times to attempt reconnection to message queue before giving up. Negative numbers are interpreted as no maximum.
- **mq_max_timeout** (*int*) – Maximum amount of time to wait between message queue reconnect attempts. Negative numbers are interpreted as no maximum.
- **mq_starting_timeout** (*int*) – Initial time to wait between message queue reconnect attempts. Will double on subsequent attempts until reaching mq_max_timeout.
- **working_directory** (*str*) – Path to a preferred working directory. Only used when working with bytes parameters.

bg_host

Deprecated since version 3.0: bg_host is now in `_config(plugin._config.bg_host)`

Provided for backward-comptibility

bg_port

Deprecated since version 3.0: bg_port is now in _config (plugin._config.bg_port)

Provided for backward-comptibility

bg_url_prefix

Deprecated since version 3.0: bg_url_prefix is now in _config (plugin._config.bg_url_prefix)

Provided for backward-comptibility

bm_client

Deprecated since version 3.0: bm_client attribute has been renamed to _ez_client.

Provided for backward-comptibility

ca_cert

Deprecated since version 3.0: ca_cert is now in _config (plugin._config.ca_cert)

Provided for backward-comptibility

ca_verify

Deprecated since version 3.0: ca_verify is now in _config (plugin._config.ca_verify)

Provided for backward-comptibility

client

client_cert

Deprecated since version 3.0: client_cert is now in _config (plugin._config.client_cert)

Provided for backward-comptibility

connection_parameters

Deprecated since version 3.0: connection_parameters has been removed. Please use _config

Provided for backward-comptibility

instance

instance_name

Deprecated since version 3.0: instance_name is now in _config (plugin._config.instance_name)

Provided for backward-comptibility

logger

Deprecated since version 3.0: logger attribute has been renamed to _logger.

Provided for backward-comptibility

max_attempts

Deprecated since version 3.0: max_attempts is now in _config (plugin._config.max_attempts)

Provided for backward-comptibility

max_concurrent

Deprecated since version 3.0: max_concurrent is now in _config (plugin._config.max_concurrent)

Provided for backward-comptibility

max_timeout

Deprecated since version 3.0: max_timeout is now in _config (plugin._config.max_timeout)

Provided for backward-comptibility

metadata

Deprecated since version 3.0: metadata is now part of the `system` attribute (`plugin.system.metadata`)

Provided for backward-comptibility

run()

shutdown_event

Deprecated since version 3.0: `shutdown_event` attribute has been renamed to `_shutdown_event`.

Provided for backward-comptibility

ssl_enabled

Deprecated since version 3.0: `ssl_enabled` is now in `_config` (`plugin._config.ssl_enabled`)

Provided for backward-comptibility

starting_timeout

Deprecated since version 3.0: `starting_timeout` is now in `_config` (`plugin._config.starting_timeout`)

Provided for backward-comptibility

system

unique_name

class `brewtils.EasyClient(*args, **kwargs)`

Bases: `object`

Client for simplified communication with Beergarden

This class is intended to be a middle ground between the `RestClient` and `SystemClient`. It provides a ‘cleaner’ interface to some common Beergarden operations than is exposed by the lower-level `RestClient`. On the other hand, the `SystemClient` is much better for generating Beergarden Requests.

Parameters

- **bg_host** (*str*) – Beer-garden hostname
- **bg_port** (*int*) – Beer-garden port
- **bg_url_prefix** (*str*) – URL path that will be used as a prefix when communicating with Beer-garden. Useful if Beer-garden is running on a URL other than ‘/’.
- **ssl_enabled** (*bool*) – Whether to use SSL for Beer-garden communication
- **ca_cert** (*str*) – Path to certificate file containing the certificate of the authority that issued the Beer-garden server certificate
- **ca_verify** (*bool*) – Whether to verify Beer-garden server certificate
- **client_cert** (*str*) – Path to client certificate to use when communicating with Beer-garden
- **api_version** (*int*) – Beer-garden API version to use
- **client_timeout** (*int*) – Max time to wait for Beer-garden server response
- **username** (*str*) – Username for Beer-garden authentication
- **password** (*str*) – Password for Beer-garden authentication
- **access_token** (*str*) – Access token for Beer-garden authentication

- **refresh_token** (*str*) – Refresh token for Beer-garden authentication

can_connect (***kwargs*)

Determine if the Beergarden server is responding.

Parameters ****kwargs** – Keyword arguments passed to the underlying Requests method

Returns A bool indicating if the connection attempt was successful. Will return False only if a `ConnectionError` is raised during the attempt. Any other exception will be re-raised.

Raises `requests.exceptions.RequestException` – The connection attempt resulted in an exception that indicates something other than a basic connection error. For example, an error with certificate verification.

clear_all_queues ()

Cancel and remove all Requests in all queues

Returns True if the clear was successful

Return type bool

clear_queue (*queue_name*)

Cancel and remove all Requests from a message queue

Parameters **queue_name** (*str*) – The name of the queue to clear

Returns True if the clear was successful

Return type bool

create_garden (*garden*)

Create a new Garden

Parameters **garden** (*Garden*) – The Garden to create

Returns The newly-created Garden

Return type *Garden*

create_job (*job*)

Create a new Job

Parameters **job** (*Job*) – New Job definition

Returns The newly-created Job

Return type *Job*

create_request (*request, **kwargs*)

Create a new Request

Parameters

- **request** – New request definition
- ****kwargs** – Extra request parameters

Keyword Arguments

- **blocking** (*bool*) – Wait for request to complete before returning
- **timeout** (*int*) – Maximum seconds to wait for completion

Returns The newly-created Request

Return type *Request*

create_system (*system*)

Create a new System

Parameters **system** (*System*) – The System to create

Returns The newly-created system

Return type *System*

delete_chunked_file (*file_id*)

Delete a given file on the Beer Garden server.

Parameters **file_id** – The beer garden-assigned file id.

Returns The API response

download_bytes (*file_id*)

Download bytes

Parameters **file_id** – Id of bytes to download

Returns The bytes data

download_chunked_file (*file_id*)

Download a chunked file from the Beer Garden server.

Parameters **file_id** – The beer garden-assigned file id.

Returns A file object

download_file (*file_id, path*)

Download a file

Parameters

- **file_id** – The File id.
- **path** – Location for downloaded file

Returns Path to downloaded file

execute_job (*job_id, reset_interval=False*)

Execute a Job

Parameters

- **job_id** (*str*) – The Job ID
- **reset_interval** (*bool*) – Restarts the job's interval time to now if the job's trigger is an interval

Returns The returned request

Return type *Request*

export_jobs (*job_id_list=None*)

Export jobs from an optional job ID list.

If *job_id_list* is None or empty, definitions for all jobs are returned.

Parameters **job_id_list** – A list of job IDS, optional

Returns A list of job definitions

find_jobs (***kwargs*)

Find Jobs using keyword arguments as search parameters

Parameters ****kwargs** – Search parameters

Returns List of Jobs matching the search parameters

Return type List[*Job*]

find_requests (***kwargs*)

Find Requests using keyword arguments as search parameters

Parameters ****kwargs** – Search parameters

Returns List of Systems matching the search parameters

Return type List[*Request*]

find_systems (***kwargs*)

Find Systems using keyword arguments as search parameters

Parameters ****kwargs** – Search parameters

Returns List of Systems matching the search parameters

Return type List[*System*]

find_unique_request (***kwargs*)

Find a unique request

Note: If ‘id’ is a given keyword argument then all other parameters will be ignored.

Parameters ****kwargs** – Search parameters

Returns The Request if found, None otherwise

Return type *Request*, None

Raises *FetchError* – More than one matching Request was found

find_unique_system (***kwargs*)

Find a unique system

Note: If ‘id’ is a given keyword argument then all other parameters will be ignored.

Parameters ****kwargs** – Search parameters

Returns The System if found, None otherwise

Return type *System*, None

Raises *FetchError* – More than one matching System was found

forward (*operation*, ***kwargs*)

Forwards an Operation

Parameters

- **operation** – The Operation to be forwarded
- ****kwargs** – Keyword arguments to pass to Requests session call

Returns The API response

get_config ()

Get configuration

Returns Configuration dictionary

Return type dict

get_garden (*garden_name*)

Get a Garden

Parameters **garden_name** – Name of garden to retrieve

Returns The Garden

get_gardens ()

Get all Gardens.

Returns A list of all the Gardens

get_instance (*instance_id*)

Get an Instance

Parameters **instance_id** – The Id

Returns The Instance

get_instance_status (*instance_id*)

Get an Instance's status

Parameters **instance_id** – The Id

Returns The Instance's status

get_logging_config (*system_name=None, local=False*)

Get a logging configuration

Note that the *system_name* is not relevant and is only provided for backward-compatibility.

Parameters **system_name** (*str*) – UNUSED

Returns The configuration object

Return type dict

get_queues ()

Retrieve all queue information

Returns List of all Queues

Return type List[[*Queue*](#)]

get_request (*request_id*)

Get a Request

Parameters **request_id** – The Id

Returns The Request

get_system (*system_id*)

Get a Garden

Parameters **system_id** – The Id

Returns The System

get_user (*user_identifier*)

Find a user

Parameters **user_identifier** (*str*) – User ID or username

Returns The User

Return type *Principal*

get_version (***kwargs*)

Get Bartender, Brew-view, and API version information

Parameters ****kwargs** – Extra parameters

Returns Response object with version information in the body

Return type dict

import_jobs (*job_list*)

Import job definitions from a list of Jobs.

Parameters **job_list** – A list of jobs to import

Returns A list of the job IDs created

initialize_instance (*instance_id, runner_id=None*)

Start an Instance

Parameters

- **instance_id** (*str*) – The Instance ID
- **runner_id** (*str*) – The PluginRunner ID, if any

Returns The updated Instance

Return type *Instance*

instance_heartbeat (*instance_id*)

Send an Instance heartbeat

Parameters **instance_id** (*str*) – The Instance ID

Returns True if the heartbeat was successful

Return type bool

pause_job (*job_id*)

Pause a Job

Parameters **job_id** (*str*) – The Job ID

Returns The updated Job

Return type *Job*

publish_event (**args, **kwargs*)

Publish a new event

Parameters

- ***args** – If a positional argument is given it's assumed to be an Event and will be used
- ****kwargs** – Will be used to construct a new Event to publish if no Event is given in the positional arguments

Keyword Arguments **_publishers** (*Optional[List[str]]*) – List of publisher names. If given the Event will only be published to the specified publishers. Otherwise all publishers known to Beergarden will be used.

Returns True if the publish was successful

Return type bool

remove_garden (*garden_name*)

Remove a unique Garden

Parameters **garden_name** (*String*) – Name of Garden to remove

Returns True if removal was successful

Return type bool

Raises `NotFoundError` – Couldn't find a Garden matching given name

remove_instance (*instance_id*)

Remove an Instance

Parameters **instance_id** (*str*) – The Instance ID

Returns True if the remove was successful

Return type bool

remove_job (*job_id*)

Remove a unique Job

Parameters **job_id** (*str*) – The Job ID

Returns True if removal was successful

Return type bool

Raises `DeleteError` – Couldn't remove Job

remove_system (***kwargs*)

Remove a unique System

Parameters ****kwargs** – Search parameters

Returns True if removal was successful

Return type bool

Raises `FetchError` – Couldn't find a System matching given parameters

rescan ()

Rescan local plugin directory

Returns True if rescan was successful

Return type bool

resume_job (*job_id*)

Resume a Job

Parameters **job_id** (*str*) – The Job ID

Returns The updated Job

Return type *Job*

update_garden (*garden*)

update_instance (*instance_id*, ***kwargs*)

Update an Instance status

Parameters **instance_id** (*str*) – The Instance ID

Keyword Arguments

- **new_status** (*str*) – The new status

- **metadata** (*dict*) – Will be added to existing instance metadata

Returns The updated Instance

Return type *Instance*

update_instance_status (*instance_id*, *new_status*)

Get an Instance's status

Parameters

- **instance_id** (*str*) – The Instance ID
- **new_status** (*str*) – The new status

Returns The updated Instance

Return type *Instance*

update_request (*request_id*, *status=None*, *output=None*, *error_class=None*)

Update a Request

Parameters

- **request_id** (*str*) – The Request ID
- **status** (*Optional[str]*) – New Request status
- **output** (*Optional[str]*) – New Request output
- **error_class** (*Optional[str]*) – New Request error class

Returns The updated response

Return type *Response*

update_system (*system_id*, *new_commands=None*, ***kwargs*)

Update a System

Parameters

- **system_id** (*str*) – The System ID
- **new_commands** (*Optional[List[Command]]*) – New System commands

Keyword Arguments

- **add_instance** (*Instance*) – An Instance to append
- **metadata** (*dict*) – New System metadata
- **description** (*str*) – New System description
- **display_name** (*str*) – New System display name
- **icon_name** (*str*) – New System icon name
- **template** (*str*) – New System template

Returns The updated system

Return type *System*

upload_bytes (*data*)

Upload a file

Parameters **data** – The bytes to upload

Returns The bytes Resolvable

upload_chunked_file (*file_to_upload, desired_filename=None, file_params=None*)

Upload a given file to the Beer Garden server.

Parameters

- **file_to_upload** – Can either be an open file descriptor or a path.
- **desired_filename** – The desired filename, if none is provided it
- **use the basename of the file_to_upload** (*will*) –
- **file_params** – The metadata surrounding the file. Valid Keys: See brewtils File model

Returns A BG file ID.

upload_file (*path*)

Upload a file

Parameters **path** – Path to file

Returns The file Resolvable

who_am_i ()

Find user using the current set of credentials

Returns The User

Return type *Principal*

class brewtils.**SystemClient** (*args, **kwargs)

Bases: object

High-level client for generating requests for a Beer-garden System.

SystemClient creation: This class is intended to be the main way to create Beer-garden requests. Create an instance with Beer-garden connection information and a system name:

```
client = SystemClient(
    system_name='example_system',
    system_namespace='default',
    bg_host="host",
    bg_port=2337,
)
```

Note: Passing an empty string as the system_namespace parameter will evaluate to the local garden's default namespace.

Pass additional keyword arguments for more granularity:

version_constraint: Allows specifying a particular system version. Can be a version literal ('1.0.0') or the special value 'latest.' Using 'latest' will allow the SystemClient to retry a request if it fails due to a missing system (see Creating Requests).

default_instance: The instance name to use when creating a request if no other instance name is specified. Since each request must be addressed to a specific instance this is a convenience to prevent needing to specify the instance for each request.

always_update: If True the SystemClient will always attempt to reload the system definition before making a request. This is useful to ensure Requests are always made against the latest version of the system. If not set the System definition will be loaded when making the first request and will only be reloaded if a Request fails.

Loading the System: The System definition is lazily loaded, so nothing happens until the first attempt to send a Request. At that point the SystemClient will query Beer-garden to get a system definition that matches

the `system_name` and `version_constraint`. If no matching System can be found a `FetchError` will be raised. If `always_update` was set to `True` this will happen before making each request, not only the first.

Making a Request: The standard way to create and send requests is by calling object attributes:

```
request = client.example_command(param_1='example_param')
```

In the normal case this will block until the request completes. Request completion is determined by periodically polling Beer-garden to check the Request status. The time between polling requests starts at 0.5s and doubles each time the request has still not completed, up to `max_delay`. If a timeout was specified and the Request has not completed within that time a `ConnectionTimeoutError` will be raised.

It is also possible to create the `SystemClient` in non-blocking mode by specifying `blocking=False`. In this case the request creation will immediately return a `Future` and will spawn a separate thread to poll for Request completion. The `max_concurrent` parameter is used to control the maximum threads available for polling.

```
# Create a SystemClient with blocking=False
client = SystemClient(
    system_name='example_system',
    system_namespace='default',
    bg_host="localhost",
    bg_port=2337,
    blocking=False,
)

# Create and send 5 requests without waiting for request completion
futures = [client.example_command(param_1=number) for number in range(5)]

# Now wait on all requests to complete
concurrent.futures.wait(futures)
```

If the request creation process fails (e.g. the command failed validation) and `version_constraint` is 'latest' then the `SystemClient` will check to see if a newer version is available, and if so it will attempt to make the request on that version. This is so users of the `SystemClient` that don't necessarily care about the target system version don't need to be restarted every time the target system is updated.

It's also possible to control what happens when a Request results in an `ERROR`. If the `raise_on_error` parameter is set to `False` (the default) then Requests that are not successful simply result in a Request with a status of `ERROR`, and it is the plugin developer's responsibility to check for this case. However, if `raise_on_error` is set to `True` then this will result in a `RequestFailedError` being raised. This will happen regardless of the value of the `blocking` flag.

Tweaking Beer-garden Request Parameters: There are several parameters that control how beer-garden routes / processes a request. To denote these as intended for Beer-garden itself (rather than a parameter to be passed to the Plugin) prepend a leading underscore to the argument name.

Sending to another instance:

```
request = client.example_command(
    _instance_name="instance_2", param_1="example_param"
)
```

Request with a comment:

```
request = client.example_command(
    _comment="I'm a beer-garden comment!", param_1="example_param"
)
```

Without the leading underscore the arguments would be treated the same as “param_1” - another parameter to be passed to the plugin.

Request that raises:

```
client = SystemClient(
    system_name="foo",
    system_namespace='default',
    bg_host="localhost",
    bg_port=2337,
)

try:
    client.command_that_errors(_raise_on_error=True)
except RequestFailedError:
    print("I could have just ignored this")
```

Parameters

- **system_name** (*str*) – Name of the System to make Requests on
- **system_namespace** (*str*) – Namespace of the System to make Requests on
- **version_constraint** (*str*) – System version to make Requests on. Can be specific ('1.0.0') or 'latest'.
- **default_instance** (*str*) – Name of the Instance to make Requests on
- **always_update** (*bool*) – Whether to check if a newer version of the System exists before making each Request. Only relevant if `version_constraint='latest'`
- **timeout** (*int*) – Seconds to wait for a request to complete. 'None' means wait forever.
- **max_delay** (*int*) – Maximum number of seconds to wait between status checks for a created request
- **blocking** (*bool*) – Flag indicating whether creation will block until the Request is complete or return a Future that will complete when the Request does
- **max_concurrent** (*int*) – Maximum number of concurrent requests allowed. Only has an effect when `blocking=False`.
- **raise_on_error** (*bool*) – Flag controlling whether created Requests that complete with an ERROR state should raise an exception
- **bg_host** (*str*) – Beer-garden hostname
- **bg_port** (*int*) – Beer-garden port
- **bg_url_prefix** (*str*) – URL path that will be used as a prefix when communicating with Beer-garden. Useful if Beer-garden is running on a URL other than '/'.
- **ssl_enabled** (*bool*) – Whether to use SSL for Beer-garden communication
- **ca_cert** (*str*) – Path to certificate file containing the certificate of the authority that issued the Beer-garden server certificate
- **ca_verify** (*bool*) – Whether to verify Beer-garden server certificate
- **client_cert** (*str*) – Path to client certificate to use when communicating with Beer-garden
- **api_version** (*int*) – Beer-garden API version to use
- **client_timeout** (*int*) – Max time to wait for Beer-garden server response

- **username** (*str*) – Username for Beer-garden authentication
- **password** (*str*) – Password for Beer-garden authentication
- **access_token** (*str*) – Access token for Beer-garden authentication
- **refresh_token** (*str*) – Refresh token for Beer-garden authentication

bg_default_instance

bg_system

create_bg_request (*command_name*, ***kwargs*)

Create a callable that will execute a Beer-garden request when called.

Normally you interact with the SystemClient by accessing attributes, but there could be certain cases where you want to create a request without sending it.

Example:

```
client = SystemClient(host, port, 'system', blocking=False)

# Create two callables - one with a parameter and one without
uncreated_requests = [
    client.create_bg_request('command_1', arg_1='Hi!'),
    client.create_bg_request('command_2'),
]

# Calling creates and sends the request
# The result of each is a future because blocking=False on the SystemClient
futures = [req() for req in uncreated_requests]

# Wait for all the futures to complete
concurrent.futures.wait(futures)
```

Parameters

- **command_name** (*str*) – Name of the Command to send
- **kwargs** (*dict*) – Will be passed as parameters when creating the Request

Returns Partial that will create and execute a Beer-garden request when called

Raises `AttributeError` – System does not have a Command with the given `command_name`

load_bg_system ()

Query beer-garden for a System definition

This method will make the query to beer-garden for a System matching the name and version constraints specified during SystemClient instance creation.

If this method completes successfully the SystemClient will be ready to create and send Requests.

Returns None

Raises `FetchError` – Unable to find a matching System

send_bg_request (**args*, ***kwargs*)

Actually create a Request and send it to Beer-garden

Note: This method is intended for advanced use only, mainly cases where you’re using the SystemClient without a predefined System. It assumes that everything needed to construct the request is being passed in kwargs. If this doesn’t sound like what you want you should check out `create_bg_request`.

Parameters

- **args** (*list*) – Unused. Passing positional parameters indicates a bug
- **kwargs** (*dict*) – All necessary request parameters, including Beer-garden internal parameters

Returns A completed Request object blocking=False: A future that will be completed when the Request does

Return type blocking=True

Raises `ValidationError` – Request creation failed validation on the server

`brewtils.get_easy_client(**kwargs)`

Easy way to get an EasyClient

The benefit to this method over creating an EasyClient directly is that this method will also search the environment for parameters. Kwargs passed to this method will take priority, however.

Parameters ****kwargs** – Options for configuring the EasyClient

Returns The configured client

Return type `brewtils.rest.easy_client.EasyClient`

`brewtils.get_argument_parser()`

Get an ArgumentParser pre-populated with Brewtils arguments

This is helpful if you’re expecting additional command line arguments to a plugin startup script.

This enables doing something like:

```
def main():
    parser = get_argument_parser()
    parser.add_argument('positional_arg')

    parsed_args = parser.parse_args(sys.argv[1:])

    # Now you can use the extra argument
    client = MyClient(parsed_args.positional_arg)

    # But you'll need to be careful when using the 'normal' Brewtils
    # configuration loading methods:

    # Option 1: Tell Brewtils about your customized parser
    connection = get_connection_info(cli_args=sys.argv[1:],
                                     argument_parser=parser)

    # Option 2: Use the parsed CLI as a dictionary
    connection = get_connection_info(**vars(parsed_args))

    # Now specify connection kwargs like normal
    plugin = RemotePlugin(client, name=...
                          **connection)
```

IMPORTANT: Note that in both cases the returned `connection` object **will not** contain your new value. Both options just prevent normal CLI parsing from failing on the unknown argument.

Returns Argument parser with Brewtils arguments loaded

Return type `ArgumentParser`

`brewtils.get_connection_info(cli_args=None, argument_parser=None, **kwargs)`

Wrapper around `load_config` that returns only connection parameters

Parameters

- **cli_args** (*list, optional*) – List of command line arguments for configuration loading
- **argument_parser** (*ArgumentParser, optional*) – Argument parser to use when parsing `cli_args`. Supplying this allows adding additional arguments prior to loading the configuration. This can be useful if your startup script takes additional arguments.
- ****kwargs** – Additional configuration overrides

Returns Parameters needed to make a connection to Beergarden

Return type `dict`

`brewtils.load_config(cli_args=True, environment=True, argument_parser=None, bootstrap=False, **kwargs)`

Load configuration using Yapconf

Configuration will be loaded from these sources, with earlier sources having higher priority:

1. `**kwargs` passed to this method
2. Command line arguments (if `cli_args` argument is not `False`)
3. **Environment variables using the BG_ prefix** (if `environment` argument is not `False`)
4. Default values in the brewtils specification

Parameters

- **cli_args** (*Union[bool, list], optional*) – Specifies whether command line should be used as a configuration source - `True`: Argparse will use the standard `sys.argv[1:]` - `False`: Command line arguments will be ignored when loading configuration - List of strings: Will be parsed as CLI args (instead of using `sys.argv`)
- **environment** (*bool*) – Specifies whether environment variables (with the `BG_` prefix) should be used when loading configuration
- **argument_parser** (*ArgumentParser, optional, deprecated*) – Argument parser to use when parsing `cli_args`. Supplying this allows adding additional arguments prior to loading the configuration. This can be useful if your startup script takes additional arguments. See `get_argument_parser` for additional information.
- ****kwargs** – Additional configuration overrides

Returns The resolved configuration object

Return type `box.Box`

`brewtils.configure_logging(raw_config, namespace=None, system_name=None, system_version=None, instance_name=None)`

Load and enable a logging configuration from Beergarden

WARNING: This method will modify the current logging configuration.

The configuration will be template substituted using the keyword arguments passed to this function. For example, a handler like this:

```
handlers:
  file:
    backupCount: 5
    class: "logging.handlers.RotatingFileHandler"
    encoding: utf8
    formatter: default
    level: INFO
    maxBytes: 10485760
    filename: "$system_name.log"
```

Will result in logging to a file with the same name as the given `system_name`.

This will also ensure that directories exist for any file-based handlers. Default behavior for the Python logging module is to not create directories that do not already exist, which would dramatically lower the utility of templating.

Parameters

- **raw_config** – Configuration to apply
- **namespace** – Used for configuration templating
- **system_name** – Used for configuration templating
- **system_version** – Used for configuration templating
- **instance_name** – Used for configuration templating

Returns None

`brewtils.normalize_url_prefix(url_prefix)`

Enforce a consistent URL representation

The normalized prefix will begin and end with `'/'`. If there is no prefix the normalized form will be `'/'`.

Examples

INPUT	NORMALIZED
None	<code>'/'</code>
<code>''</code>	<code>'/'</code>
<code>'/'</code>	<code>'/'</code>
<code>'example'</code>	<code>'/example/'</code>
<code>'/example'</code>	<code>'/example/'</code>
<code>'example/'</code>	<code>'/example/'</code>
<code>'/example/'</code>	<code>'/example/'</code>

Parameters `url_prefix` (*str*) – The prefix

Returns The normalized prefix

Return type `str`

Contributions are welcome, and they are greatly appreciated! Every little bit helps, and credit will always be given. You can contribute in many ways:

4.1 Types of Contributions

4.1.1 Report Bugs

Report bugs at <https://github.com/beer-garden/brewtils/issues>.

If you are reporting a bug, please include:

- Your operating system name and version.
- Any details about your local setup that might be helpful in troubleshooting.
- Detailed steps to reproduce the bug.

4.1.2 Fix Bugs

Look through the GitHub issues for bugs. Anything tagged with “bug” and “help wanted” is open to whoever wants to implement it.

4.1.3 Implement Features

Look through the GitHub issues for features. Anything tagged with “enhancement” and “help wanted” is open to whoever wants to implement it.

4.1.4 Write Documentation

Brewtils could always use more documentation, whether as part of the official Brewtils docs, in docstrings, or even on the web in blog posts, articles, and such.

4.1.5 Submit Feedback

The best way to send feedback is to file an issue at <https://github.com/beer-garden/brewtils/issues>.

If you are proposing a feature:

- Explain in detail how it would work.
- Keep the scope as narrow as possible, to make it easier to implement.
- Remember that this is a volunteer-driven project, and that contributions are welcome :)

4.2 Get Started!

Ready to contribute? Here's how to set up `brewtils` for local development.

1. Fork the `brewtils` repo on GitHub.
2. Clone your fork locally:

```
$ git clone git@github.com:your_name_here/brewtils.git
```

3. Install your local copy into a virtualenv. Assuming you have `virtualenvwrapper` installed, this is how you set up your fork for local development:

```
$ mkvirtualenv brewtils
$ cd brewtils/
$ python setup.py develop
```

4. Create a branch for local development:

```
$ git checkout -b name-of-your-bugfix-or-feature
```

Now you can make your changes locally.

5. When you're done making changes, check that your changes pass `flake8` and the tests:

```
$ flake8 brewtils test
$ pytest test
```

To get `flake8` and `pytest`, just `pip` install them into your virtualenv.

6. Commit your changes and push your branch to GitHub:

```
$ git add .
$ git commit -m "Your detailed description of your changes."
$ git push origin name-of-your-bugfix-or-feature
```

7. Submit a pull request through the GitHub website.

4.3 Pull Request Guidelines

Before you submit a pull request, check that it meets these guidelines:

1. The pull request should include tests.
2. If the pull request adds functionality, the docs should be updated. Put your new functionality into a function with a docstring, and add the feature to the list in README.rst.
3. The pull request should work for Python 2.7 and 3.6+. Check <https://github.com/beer-garden/brewtils/pulls> and make sure that the tests pass for all supported Python versions.

4.4 Tips

To run a subset of tests:

```
$ pytest test/models_test.py::TestSystem::test_instance_names
```


5.1 Development Leads

- Logan Asher Jones <loganasherjones@gmail.com>
- Matt Patrick

5.2 Contributors

None yet. Why not be the first?

6.1 3.12.0

6.1.1 3/21/2022

6.1.2 Other Changes

- Added new internal event types: `USER_UPDATED` and `USERS_IMPORTED`.

6.2 3.11.0

6.2.1 2/9/2022

6.2.2 New Features

- `get_gardens` (list of all Gardens) and `update_garden` (apply a new definition to an existing Garden) added to easy client

6.2.3 Other Changes

- Permission field added to `UserSchema`.

6.3 3.10.0

1/4/2022

6.3.1 Bug Fixes

- `Bytes` and `Base64` parameter types can now be defined as optional.
- `RestClient` no longer requires `username` and `password` when using certificates.

6.4 3.9.0

12/8/21

6.4.1 New Features

- `EasyClient` `execute_job` method now supports resetting the run interval for jobs with an interval trigger.

6.5 3.8.0

11/18/21

6.5.1 New Features

- `EasyClient` now has an `execute_job` method for doing ad-hoc executions of a scheduled job.
- `Request` now has a `status_updated_at` field representing when the last status changed occurred.

6.5.2 Other Changes

- Misc additions related to future support of authentication / authorization in Beer Garden.

6.6 3.7.1

10/15/21

6.6.1 Bug Fixes

- Pinned troublesome dependency `wrapt` to version that's known to not be a problem

6.6.2 Other Changes

- Misc additions related to future support of authentication / authorization in Beer Garden.

6.7 3.6.0

9/22/21

6.7.1 Bug Fixes

- Fixed issues related to interacting with beer-garden urls containing unicode characters (Issue #339 / PR #344)

6.7.2 New Features

- Added `export_jobs` and `import_jobs` to EasyClient (Issue #353 / PR #337)
- Added `create_garden` and `remove_garden` to EasyClient (Issue #348 / PR #350)

6.7.3 Other Changes

- Added schemas for use in future authorization related features (Issue #345 / PR #347)

6.8 3.5.0

8/18/21

6.8.1 New Features

- Can now specify proxy parameters when creating RestClients

6.9 3.4.0

6/24/21

6.9.1 Bug Fixes

- Changed duplicate event enum value (Issue #932 / PR #330)
- Better handling of non-json error responses (Issue #1033 / PR #324)
- No longer ignoring `max_attempts`, `max_timeout`, and `starting_timeout` values (Issue #1028 / PR #323)
- A plugin Client instance can now be reused (Issue #1014 / PR #321)
- Charset in content-type header no longer breaks URL-based display resource loading (Issue #1010 / PR #319)
- URL-based template resolution respects connection configuration (Issue #1009 / PR #318)
- System attributes (like description) can now be cleared (Issue #1002 / PR #317)

6.9.2 New Features

- Jobs now have a timeout field (Issue #1046 / PR #329)
- Added `bg_system` and `bg_default_instance` properties to SystemClient (Issue #279 / PR #273)
- Forwarding REST calls now support `blocking` and `timeout` parameters (Issue #895 / PR #325)

- Added support for lambdas as a Choices source (Issue #1004 / PR #322)
- Bytes-type parameters are now supported (Issue #991 / PR #316)
- Systems can now have UI templates (Issue #997 / PR #315)
- Commands now have a metadata field (Issue #358 / PR #314)

6.9.3 Other Changes

- Removed support for pika versions below 1.0 (Issue #651 / PR #328)
- SystemClient now has a `__str__` method (Issue #76 / PR #327)
- Dropped official support for Python 3.5 (Issue #1043 / PR #326)
- Added INVALID Request status (PR #325)

6.10 3.3.0

4/23/21

6.10.1 Bug Fixes

- Better error messages for incorrect parameter definitions (Issue #986 / PR #309)
- Fixed a case where reusing a parameter model could break (Issue #987 / PR #310)

6.10.2 New Features

- Support for scheduled job modification (Issue #294 / PR #308)

6.11 3.2.1

4/16/21

6.11.1 Bug Fixes

- Nullable multi parameters with a model no longer set a problematic default (Issue #769, #983 / PR #305)
- End date is now set correctly for cron-type jobs (Issue #963 / PR #306)
- Order of parameters in the UI now matches the order of decorators (Issue #267, #981 / PR #304)

6.11.2 Other Changes

- More type hints for SystemClient and EasyClient methods (Issue #957 / PR #303)

6.12 3.2.0

4/1/21

6.12.1 New Features

- SystemClient with no parameters will default to the current plugin (Issue #780 / PR #293)
- Added methods to RestClient and EasyClient for using the /api/v1/forward API (PR #301)
- New and improved decorators module (Issue #777 / PR #290)

6.12.2 Other Changes

- The @system decorator has been renamed to @client (Issue #927 / PR #297)
- @parameters (plural, with an “s”) is now deprecated (Issue #924, PR #299)
- Easier to specify logger name when creating a StoppableThread (Issue #874 / PR #291)

6.13 3.1.0

2/5/21

6.13.1 Bug Fixes

- SystemClient parameter resolution no longer always fails if no system is assigned (Issue #859 / PR #289)
- Added positional arguments back-compatibility for EasyClient and SystemClient creation (Issue #836 / PR #286)
- Fixed regression relating to old decorator deprecations (Issue #835 / PR #285)

6.13.2 Other Changes

- Added ‘hidden’ field to Request ile model (Issue #414 / PR #288)
- Added ‘job’ and ‘request’ fields to File model (Issue #833 / PR #284)

6.14 3.0.2

Date: 1/11/21

6.14.1 Bug Fixes

- SystemClient no longer disallows creating a Request for a System without a namespace (Issue #827 / PR #281)
- Logs are now written correctly when a Plugin encounters an uncaught exception after initialization (Issue #787 / PR #276)

- Plugin registration will now behave as expected when the list of plugin Commands is empty (Issue #806 / PR #277)

6.14.2 New Features

- Added a Rescan method to the EasyClient (Issue #815 / PR #278)

6.14.3 Other Changes

- The decorators `command_registrar`, `register`, and `plugin_param` are officially deprecated (Issue #825 / PR #280)

6.15 3.0.1

Date: 12/15/20

6.15.1 New Features

- Added `client_key` parameter to support separate key and cert files (beer-garden#785)
- Better `SystemClient` error message if a positional parameter is used (beer-garden#775)
- Plugins will now work when connected to a v2 Beer Garden (beer-garden#751)
- Support for file-type parameters (beer-garden#368)

6.15.2 Bug Fixes

- Using nested models when defining Parameters now works correctly (beer-garden#354)

6.15.3 Other Changes

- Plugins now register a SIGTERM handler for shutdown consistency (beer-garden/#745)

6.16 3.0.0

Date: 11/10/20

Note: This is a major upgrade with several breaking changes. Please see the [Upgrade Guide](#) for all changes.

6.16.1 New Features

- Plugins now automatically load configuration from CLI and environment variables
- Logging configuration is loaded automatically when Plugins are created
- No longer need to pass connection information to System/Easy/Rest Clients
- Parameter choices definition can be a non-list iterable (beer-garden/#512)

- It's now easier to specify an alternate parent when making a request (beer-garden/#336)
- SchemaParser can now directly serialize dicts and Boxes (#239)

6.16.2 Bug Fixes

- EasyClient.get_instance_status is deprecated but now actually returns the instance status

6.16.3 Other Changes

- Plugins are now multi-threaded by default (#47)
- Better error messages when using SystemClient with raise_on_error=True (beer-garden/#689)
- Various deprecated names have been removed
- Can now defer setting a Plugin client
- EasyClient.get_version returns actual version information instead of Response object
- Using a pika version <1 is deprecated

6.17 2.4.15

Date: 10/13/20

6.17.1 Bug Fixes

- Fixing command invocation error when request has no parameters (beer-garden/#351)

6.18 2.4.14

Date: 1/30/20

6.18.1 Bug Fixes

- Better error handling if a request exceeds 16MB size limit (beer-garden/#308)

6.19 2.4.13

Date: 1/13/20

6.19.1 Bug Fixes

- Requests republished to rabbit are now persistent (beer-garden/#397)

6.20 2.4.12

Date: 1/10/20

6.20.1 Other Changes

- Reverting a log message level that was incorrectly set to INFO

6.21 2.4.11

Date: 12/9/19

6.21.1 Other Changes

- Plugins always attempt to notify Beer-garden when terminating (beer-garden/#376)

6.22 2.4.10

Date: 11/12/19

6.22.1 Bug Fixes

- Plugins can now survive a rabbitmq broker restart (beer-garden/#353, beer-garden/#359)

6.23 2.4.9

Date: 10/30/19

6.23.1 Bug Fixes

- Fixed issue with callbacks in RequestConsumer when using Pika v1 (beer-garden/#328)

6.24 2.4.8

Date: 9/5/19

6.24.1 New Features

- Better control over how specific error types are logged (beer-garden/#285)

6.24.2 Bug Fixes

- Decorators now work with non-JSON resources loaded from a URL (beer-garden/#310)

6.25 2.4.7

Date: 6/27/19

6.25.1 New Features

- Can now specify a name and version in the `system` decorator (beer-garden/#290)

6.25.2 Bug Fixes

- SystemClient now correctly handles versions with suffixes (beer-garden/#283)

6.25.3 Other Changes

- Added compatability with Pika v1 (#130)

6.26 2.4.6

Date: 4/19/19

6.26.1 Bug Fixes

- Using new pika heartbeat instead of `heartbeat_interval` (#118)
- `@parameters` now accepts any iterable, not just lists (beer-garden/#237)

6.26.2 Other Changes

- Support for new header-style authentication token (#122)
- Added `EasyClient.get_instance`, deprecated `get_instance_status` (beer-garden/#231)
- Parameters with `is_kwarg` on command without `**kwargs` will raise (beer-garden/#216)

6.27 2.4.5

Date: 2/14/19

6.27.1 Bug Fixes

- Fixed a warning occuring with newer versions of Marshmallow (#111)

6.27.2 Other Changes

- Adding EasyClient to __all__ (beer-garden/#233)

6.28 2.4.4

Date: 1/7/19

6.28.1 Bug Fixes

- RabbitMQ connections now deal with blocked connections (beer-garden/#203)
- Plugin will use url_prefix kwarg if bg_url_prefix not given (beer-garden/#186)
- Always respecting parameter choices definition changes (beer-garden/#58)

6.29 2.4.3

Date: 11/16/18

6.29.1 New Features

- Added instance retrieve and delete methods to clients (#91)

6.29.2 Bug Fixes

- Logging API now respects all connection parameters (#94)

6.30 2.4.2

Date: 10/7/18

6.30.1 New Features

- Ability to specify a timeout for Beergarden communication (beer-garden/#87)
- `parameters` decorator for cleaner command definitions (beer-garden/#82)

6.30.2 Bug Fixes

- Fixed error when republishing a message to RabbitMQ (beer-garden/#88)

6.31 2.4.1

Date: 09/11/18

6.31.1 Other Changes

- Changed Plugin warning type so it won't be displayed by default

6.32 2.4.0

Date: 09/5/18

6.32.1 New Features

- Added job scheduling capability (beer-garden/#10)
- Added support for authentication / users (beer-garden/#35)
- Plugins will load log level from the environment (bartender/#4)
- RestClient now exposes `base_url` (#58)
- SystemClient can wait for a request to complete instead of polling (#54)
- Allowing custom argument parser when loading configuration (#67)
- Support for TLS connections to RabbitMQ (#74)
- Warning for future change to plugin `max_concurrent` default value (#79)
- Added methods `get_config` to RestClient, `can_connect` to EasyClient

6.32.2 Other Changes

- Renamed PluginBase to Plugin (old name is aliased)

6.33 2.3.7

Date: 07/11/18

6.33.1 New Features

- Current request can be accessed using `self._current_request` (beer-garden/#78)

6.33.2 Bug Fixes

- Updating import problem from lark-parser #61
- Pinning setup.py versions to prevent future breaks

6.34 2.3.6

Date: 06/06/18

6.34.1 Other Changes

- Added *has_parent* to request model

6.35 2.3.5

Date: 4/17/18

6.35.1 Bug Fixes

- Using *simplejson* package to fix JSON parsing issue in Python 3.4 & 3.5 (#48, #49)

6.36 2.3.4

Date: 4/5/18

6.36.1 New Features

- Python 3.4 is now supported (#43)
- Now using *Yapconf* for configuration parsing (#34)
- Parameter types can now be specified as native Python types (#29)
- Added flag to raise an exception if a request created with *SystemClient* completes with an 'ERROR' status (#28)

6.36.2 Other Changes

- All exceptions now inherit from *BrewtilsException* (#45)
- Removed references to *Brewmaster* exception classes (#44)
- Requests with JSON *command_type* are smarter about formatting exceptions (#27)
- Decorators, *RemotePlugin*, and *SystemClient* can now be imported directly from the *brewtils* package

6.37 2.3.3

Date: 3/20/18

6.37.1 Bug Fixes

- Fixed bug where request updating could retry forever (#39)

6.38 2.3.2

Date: 3/7/18

6.38.1 Bug Fixes

- Fixed issue with multi-instance remote plugins failing to initialize (#35)

6.39 2.3.1

Date: 2/22/18

6.39.1 New Features

- Added `description` keyword argument to `@command` decorator

6.40 2.3.0

Date: 1/26/18

6.40.1 New Features

- Added methods for interacting with the Queue API to `RestClient` and `EasyClient`
- Clients and Plugins can now be configured to skip server certificate verification when making HTTPS requests
- Timestamps now have true millisecond precision on platforms that support it
- Added `form_input_type` to `Parameter` model
- Plugins can now be stopped correctly by calling their `_stop` method
- Added Event model

6.40.2 Bug Fixes

- Plugins now additionally look for `ca_cert` and `client_cert` in `BG_CA_CERT` and `BG_CLIENT_CERT`

6.40.3 Other Changes

- Better data integrity by only allowing certain Request status transitions

6.41 2.2.1

Date: 1/11/18

6.41.1 Bug Fixes

- Nested requests that reference a different beer-garden no longer fail

6.42 2.2.0

Date: 10/23/17

6.42.1 New Features

- Command descriptions can now be changed without updating the System version
- Standardized Remote Plugin logging configuration
- Added domain-specific language for dynamic choices configuration
- Added `metadata` field to Instance model

6.42.2 Bug Fixes

- Removed some default values from model `__init__` functions
- System descriptors (description, display name, icon name, metadata) now always updated during startup
- Requests with output type 'JSON' will now have JSON error messages

6.42.3 Other changes

- Added license file

6.43 2.1.1

Date: 8/25/17

6.43.1 New Features

- Added `updated_at` field to Request model
- `SystemClient` now allows specifying a `client_cert`
- `RestClient` now reuses the same session for subsequent connections
- `SystemClient` can now make non-blocking requests
- `RestClient` and `EasyClient` now support PATCHing a System

6.43.2 Deprecations / Removals

- `multithreaded` argument to `PluginBase` has been superseded by `max_concurrent`
- These decorators are now deprecated - `@command_registrar`, instead use `@system - @plugin_param`, instead use `@parameter - @register`, instead use `@command`
- These classes are now deprecated - `BrewmasterSchemaParser`, instead use `SchemaParser` - `BrewmasterRestClient`, instead use `RestClient` - `BrewmasterEasyClient`, instead use `EasyClient` - `BrewmasterSystemClient`, instead use `SystemClient`

6.43.3 Bug Fixes

- Reworked message processing to remove the possibility of a failed request being stuck in `IN_PROGRESS`
- Correctly handle custom form definitions with a top-level array
- Smarter reconnect logic when the RabbitMQ connection fails

6.43.4 Other changes

- Removed dependency on `pyopenssl` so there's need to compile any Python extensions
- Request processing now occurs inside of a `ThreadPoolExecutor` thread
- Better serialization handling for epoch fields

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