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# **Pulp Smash Documentation**

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**Pulp QE**

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Pulp Smash is a toolkit for writing functional and integration tests for *Pulp*.

Pulp Smash has a presence on the following websites:

- [Documentation](#) is available on ReadTheDocs.
- A [Python package](#) is available on PyPi.
- [Source code](#) and the issue tracker are available on GitHub.

To see a test suite which uses Pulp Smash, see [Pulp 2 Tests](#).

Documentation contents:



# CHAPTER 1

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## Installation

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Location: *Pulp Smash* → *Installation*

There are several different ways to install Python packages, and Pulp Smash supports some of the most common methods. For example, a developer might want to install Pulp Smash in editable mode into a virtualenv:

```
python3 -m venv ~/.venvs/pulp-smash
source env/bin/activate # run `deactivate` to exit environment
pip install --upgrade pip
git clone https://github.com/PulpQE/pulp-smash.git
cd pulp-smash
pip install --editable .[dev]
make all # verify sanity
```

For an explanation of key concepts and more installation strategies, see [Installing Python Modules](#). For an explanation of virtualenvs, see [Virtual Environments and Packages](#).

In addition to the dependencies listed in `setup.py`, install OpenSSH if testing is to be performed against a remote host.<sup>1</sup>

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<sup>1</sup> This hard dependency is a bug. It would be better to require `_an_` SSH implementation, whether provided by OpenSSH, Paramiko, Dropbear, or something else.





Location: *Pulp Smash* → *Configuration*

Pulp Smash needs a configuration file. This configuration file declares certain information about the Pulp application under test.

## 2.1 Interactive Configuration

To interactively create a configuration file, use the CLI:

```
pulp-smash settings create
```

You will be prompted for information like the version of Pulp, API credentials, whether the API is accessible via HTTPS, and so on. It is assumed that both Pulp's CLI client and Pulp's alternate download policies are installed and configured.

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**Note:** For information on how to install and configure Pulp (not Pulp Smash!), see the [Pulp installation](#) documentation.

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## 2.2 Manual Configuration

The interactive configuration tool assumes that all of Pulp's components, such as the webserver and squid, are installed on a single host. If you wish to test a Pulp application whose components are installed on multiple hosts, you must install a custom configuration file.

Pulp Smash's configuration file may reside in one of several locations. The easiest way to deal with this complication is to let Pulp Smash tell you where you should create a configuration file:

```
cat >"$(pulp-smash settings save-path)" <<EOF
...
EOF
pulp-smash settings validate
```

The `save-path` sub-command creates any necessary intermediate directories.

## 2.3 Configuration File Paths

Pulp Smash abides by the [XDG Base Directory Specification](#). When loading a configuration file, Pulp Smash searches for a file named `settings.json`, within a directory named `pulp_smash`, within any of the `$XDG_CONFIG_DIRS`. In practice, this typically means that Pulp Smash loads `~/.config/pulp_smash/settings.json`.

`$XDG_CONFIG_DIRS` is a precedence-ordered list. If multiple configuration files reside on the file system, the first file found is used. Settings are not cascaded.

To search for a file named something other than `settings.json`, set the `PULP_SMASH_CONFIG_FILE` environment variable. It should be a file name, not a path. For example:

```
# Valid. Search paths such as: ~/.config/pulp_smash/alt-settings.json
PULP_SMASH_CONFIG_FILE=alt-settings.json pulp-smash settings load-path

# Invalid. Results are undefined.
PULP_SMASH_CONFIG_FILE=foo/alt-settings.json pulp-smash settings load-path
```

Pulp Smash abides by similar logic when saving a configuration to a file.

## 2.4 Configuration File Syntax

A configuration file is valid if:

- It adheres to the `pulp_smash.config.JSON_CONFIG_SCHEMA` schema.
- Collectively, the hosts fulfill the `pulp_smash.config.P2_REQUIRED_ROLES` or `pulp_smash.config.P3_REQUIRED_ROLES` roles

These checks are executed by `pulp-smash settings validate`.

A single Pulp application may be deployed on just one host or on several hosts. The “pulp” section lets you declare properties of the entire Pulp application. The “hosts” section lets you declare properties of the individual hosts that host Pulp’s components. Here’s a sample configuration file:

```
{
  "pulp": {
    "version": "3",
    "auth": ["admin", "admin"],
    "selinux enabled": false
  },
  "hosts": [
    {
      "hostname": "pulp-1.example.com",
      "roles": {
        "api": {"scheme": "http", "service": "nginx"}
      }
    }
  ]
}
```

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```
    "shell": {}
  }
},
{
  "hostname": "pulp-2.example.com",
  "roles": {
    "pulp resource manager": {},
    "pulp workers": {},
    "redis": {},
    "shell": {}
  }
}
]
```

In this example:

- The first host runs the nginx web server.
- The second host runs all other Pulp services, such as redis.
- Pulp Smash has shell access to both hosts.

The “shell” role deserves special mention. It has an optional “transport” sub-key, e.g. “shell”: {“transport”: “...”}:

- When set to “local,” Pulp Smash will locally execute commands for that host with Python’s built-in subprocess module
- When set to “ssh,” Pulp Smash will execute commands over SSH.
- When omitted, Pulp Smash will guess how to execute commands by comparing the host’s declared hostname against the current host’s hostname. If the two hostnames are identical, Pulp Smash will behave as if “transport” is set to “local.” Otherwise, Pulp Smash will behave as if “transport” is set to “ssh.”

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**Note:** Pulp Smash can access a host via SSH only if the SSH connection can be made without typing a password. Make sure to configure SSH so just running `ssh "$hostname"` will access the host. See `sshd_config(5)`.

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Location: *Pulp Smash* → *About*

Why does Pulp Smash exist? What are its goals, and what does it *not* do?

- *Why Pulp Smash?*
- *Scope and Limitations*
  - *Portability*
  - *Provisioning*
  - *Destructiveness*
- *Contributing*
  - *Learning Pulp Smash*
  - *Code Standards*
  - *Review Process*
  - *Labels*
  - *Creating issues*

### 3.1 Why Pulp Smash?

Pulp Smash exists to make automated functional testing of Pulp easier.

## 3.2 Scope and Limitations

### 3.2.1 Portability

Pulp Smash should be usable in any environment that supports:

- one of the Python versions listed in `.travis.yml`,
- the dependencies listed in `setup.py`,
- a \*nix-like shell,
- the XDG Base Directory Specification,
- and OpenSSH or a compatible clone.

In addition, we recommend that GNU Make or a compatible clone be available.

This level of portability<sup>1</sup> allows Pulp Smash to be accessible<sup>2</sup>.

### 3.2.2 Provisioning

Pulp Smash is not concerned with provisioning systems. Users must bring their own systems.

### 3.2.3 Destructiveness

*Pulp Smash is highly destructive!* You should not use Pulp Smash for testing if you care about the state of the target system. Pulp Smash makes it easy to do the following and more:

- Drop databases.
- Forcefully delete files from the filesystem.
- Stop and start system services.

Pulp Smash treats the system(s) under test as cattle, not pets.<sup>3</sup>

## 3.3 Contributing

Contributions are encouraged. The easiest way to contribute is to submit a pull request on GitHub, but patches are welcome no matter how they arrive.

### 3.3.1 Learning Pulp Smash

Not sure where to start? Consider reading some existing tests in [Pulp 2 Tests](#).

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<sup>1</sup> Portable software cannot make assumptions about its environment. It cannot reference `/etc/pki/tls/certs/ca-bundle.crt` or call `yum`. Instead, it must use standardized mechanisms for interacting with its environment. This separation of concerns should lead to an application with fewer responsibilities. Fewer responsibilities means fewer bugs and more focused developers.

<sup>2</sup> An inaccessible project is a dead project. Labeling a project “open source” and licensing it under a suitable terms does not change that fact. People have better things to do than bang their head against a wall.

<sup>3</sup> The “pets vs cattle” analogy is widely attributed to Bill Baker of Microsoft.

### 3.3.2 Code Standards

Please adhere to the following guidelines:

- Code should be compliant with [PEP-8](#). It is recommended to check for compliance by running `make lint`.
- Pull requests must pass the [Travis CI](#) continuous integration tests. You can locally verify your changes before submitting a pull request by executing `make all`.
- Each commit in a pull request must be atomic and address a single issue. Try asking yourself: “can I revert this commit?” Knowing how to [rewrite history](#) may help. In addition, please take the time to write a [good commit message](#). While not *strictly* necessary, consider: commits are (nearly) immutable, and getting commit messages right makes for a more pleasant review process, better release notes, and easier use of tools like `git log`, `git blame` or `git bisect`.
- The pull request must not raise any other outstanding concerns. For example, do not author a commit that adds a 10MB binary blob without exceedingly good reason. As another example, do not add a test that makes dozens of concurrent requests to a public service such as `docker hub`.

In addition, code should adhere as closely as reasonably possible to the existing style in the code base. A consistent style makes it possible to focus on the substance of code, rather than its form.

### 3.3.3 Review Process

Changes that meet the *code standards* will be reviewed by a Pulp Smash developer and are likely to be merged.

Though commits are accepted as-is, they are frequently accompanied by a follow-up commit in which the reviewer makes a variety of changes, ranging from simple typo corrections and formatting adjustments to whole-sale restructuring of tests. This can take quite a bit of effort and time. If you’d like to make the review process faster and have more assurance your changes are being accepted with little to no modifications, take the time to really make your changes shine: ensure your code is DRY, matches existing formatting conventions, is organized into easy-to-read blocks, has isolated unit test assertions, and so on.

Join the `#pulp` IRC channel on [freenode](#) if you have further questions.

### 3.3.4 Labels

Issues are categorized with [labels](#). Pull requests are categorized with GitHub’s [pull request reviews](#) feature.

The specific meaning of (issue) labels is as follows.

**Issue Type: Bug** This label denotes an issue that describes a specific counter-productive behaviour. For example, an issue entitled “test X contains an incorrect assertion” is a great candidate for this label.

**Issue Type: Discussion** This label denotes an issue that broadly discusses some topic. Feature requests should be given this label. If a discussion results in a specific and concrete plan of action, a new issue should be opened, where that issue outlines a specific solution and has a label of “Issue Type: Plan”.

**Issue Type: Plan** This label denotes an issue that outlines a specific, concrete plan of action for improving Pulp Smash. This may include plans for new utilities or refactors of existing tests or other tools. Open-ended discussions (including feature requests) should go into issues labeled “Issue Type:Discussion.”

**Issue Type: Test Case**

This label indicates that an issue is asking for a test case to be automated. (Issues with this label are a special type of plan.)

**Warning:** This label was kept here for historical reasons. Test cases for Pulp 2 or Pulp 3 should not be filed on Pulp Smash anymore. See: *creating issues*

### 3.3.5 Creating issues

#### 1 - *Pulp Smash Issues*

Issues related to Pulp-Smash itself should be filed on [Pulp Smash issues](#).

#### 2 - *Pulp 2 and Pulp 3 Issues*

As an effort to simplify where issues were tracked, Pulp 2 and Pulp 3 issues are being tracked on [pulp.plan.io](#) for the sake of simplicity.

A new tracker type `Test` was created. Test cases should be related to the parent issue so they can be worked and groomed separately, if applicable.

Select the proper fields to distinguish Pulp versions, and so on.

To illustrate: [test case](#).

**Warning:** On [pulp.plan.io](#) the field *Smash Test* was kept for historical reasons. It should not be used anymore.



Location: *Pulp Smash* → *API Documentation*

This is the Pulp Smash API documentation. It is mostly auto generated from the source code. Beware that Pulp Smash is in a state of flux, and its API is **not stable**. This section of the documentation should be treated as a handy reference for developers, not a gospel.

## 4.1 *pulp\_smash*

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash*

The root of Pulp Smash's namespace.

## 4.2 *pulp\_smash.api*

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.api*

A client for working with Pulp's API.

Working with an API can require repetitive calls to perform actions like check HTTP status codes. In addition, Pulp's API has specific quirks surrounding its handling of href paths and HTTP 202 status codes. This module provides a customizable client that makes it easier to work with the API in a safe and concise manner.

```
class pulp_smash.api.Client (cfg, response_handler=None, request_kwargs=None, pulp_host=None)
```

Bases: object

A convenience object for working with an API.

This class is a wrapper around the `requests.api` module provided by `Requests`. Each of the functions from that module are exposed as methods here, and each of the arguments accepted by `Requests`' functions are also accepted by these methods. The difference between this class and the `Requests` functions lies in its configurable request and response handling mechanisms.

This class is flexible enough that it should be usable with any API, but certain defaults have been set to work well with Pulp.

As an example of basic usage, let's say that you'd like to create a user, then read that user's information back from the server. This is one way to do it:

```
>>> from pulp_smash.api import Client
>>> from pulp_smash.config import get_config
>>> client = Client(get_config())
>>> response = client.post('/pulp/api/v2/users/', {'login': 'Alice'})
>>> response = client.get(response.json()[ '_href' ])
>>> print(response.json())
```

Notice how we never call `response.raise_for_status()`? We don't need to because, by default, `Client` instances do this. Handy!

How does this work? Each `Client` object has a callback function, `response_handler`, that is given a chance to munge each server response. How else might this callback be useful? Well, notice how we call `json()` on each server response? That's kludgy. Let's write our own callback that takes care of this for us:

```
>>> from pulp_smash.api import Client
>>> from pulp_smash.config import get_config
>>> def response_handler(client, response):
...     response.raise_for_status()
...     return response.json()
>>> client = Client(get_config(), response_handler=response_handler)
>>> response = client.post('/pulp/api/v2/users/', {'login': 'Alice'})
>>> response = client.get(response[ '_href' ])
>>> print(response)
```

Pulp Smash ships with several response handlers. In order of increasing complexity, see:

- `pulp_smash.api.echo_handler()`
- `pulp_smash.api.code_handler()`
- `pulp_smash.api.safe_handler()`
- `pulp_smash.api.json_handler()`
- `pulp_smash.api.page_handler()`

As mentioned, this class has configurable request and response handling mechanisms. We've covered response handling mechanisms — let's move on to request handling mechanisms.

When a client is instantiated, a `pulp_smash.config.PulpSmashConfig` must be passed to the constructor, and configuration options are copied from the `PulpSmashConfig` to the client. These options can be overridden on a per-object or per-request basis. Here's an example:

```
>>> from pulp_smash.api import Client
>>> from pulp_smash.config import PulpSmashConfig
>>> cfg = config.PulpSmashConfig(
...     pulp_auth=('username', 'password'),
...     pulp_version='1!0',
...     pulp_selinux_enabled=True,
...     hosts=[
...         config.PulpHost(
...             hostname='example.com',
...             roles={'api': {
...                 'scheme': 'https',
```

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```

...         'verify': '~/Documents/my.crt',
...     })
... )
... ]
... )
>>> client = api.Client(cfg)
>>> client.request_kwargs['url'] == 'https://example.com'
True
>>> client.request_kwargs['verify'] == '~/Documents/my.crt'
True
>>> response = client.get('/index.html') # Use my.crt for SSL verification
>>> response = client.get('/index.html', verify=False) # Disable SSL
>>> response = client.get('/index.html') # Use my.crt for SSL verification
>>> client.request_kwargs['verify'] = None
>>> response = client.get('/index.html') # Do default SSL verification

```

As shown above, an argument that's passed to one of this class' methods is passed to the corresponding Requests method. And an argument that's set in `request_kwargs` is passed to Requests during every call.

The `url` argument is special. When making an HTTP request with Requests, an absolute URL is required. But when making an HTTP request with one of this class' methods, either an absolute or a relative URL may be passed. If a relative URL is passed, it's joined to this class' default URL like so:

```
>>> urljoin(self.request_kwargs['url'], passed_in_url)
```

This allows one to easily use the hrefs returned by Pulp in constructing new requests.

### Parameters

- **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about a Pulp app.
- **response\_handler** – A callback function, invoked after each request is made. Must accept two arguments: a `pulp_smash.config.PulpSmashConfig` object, and a `requests.Response` object. Defaults to `safe_handler()`.
- **request\_kwargs** – A dict of parameters to send with each request. This dict is merged into the default dict of parameters that's sent with each request.
- **pulp\_host** (`pulp_smash.config.PulpHost`) – The host with which to communicate. Defaults to the first host that fulfills the “api” role.

### Supplementary information on writing response handlers.

This class accepts a `pulp_smash.config.PulpSmashConfig` parameter. This object may be accessed via the `_cfg` attribute. This attribute should be used sparingly, as careless accesses can be an easy way to inadvertently create bugs. For example, if given the choice between calling `self._cfg.get_request_kwargs()` or referencing `self.request_kwargs`, reference the latter. To explain why, consider this scenario:

```

>>> from pulp_smash import api, config
>>> client = api.Client(config.get_config())
>>> client.request_kwargs['verify'] == '~/Documents/my.crt'
>>> client.get('https://example.com')

```

The API client has been told to use an SSL certificate for verification. Yet if the client uses `self._cfg.get_requests_kwargs()` when making an HTTP GET call, the SSL certificate won't be used.

If this attribute is so problematic, why does it exist? It exists so that each API client may share context with its response handler. For example, a response handler might need to know which version of Pulp it is communicating

with:

```
>>> def example_handler(client, response):
...     if client._cfg.pulp_version < Version('3'):
...         return pulp_2_procedure(response)
...     else:
...         return pulp_3_procedure(response)
```

However, this same logic could also be implemented by calling `pulp_smash.config.get_config()`:

```
>>> def example_handler(client, response):
...     if config.get_config().pulp_version < Version('3'):
...         return pulp_2_procedure(response)
...     else:
...         return pulp_3_procedure(response)
```

Given this, why lug around a `pulp_smash.config.PulpSmashConfig` object? This is done because it is fundamentally correct for a response handler to learn about its calling API client's state by accessing the calling API client, and it is fundamentally incorrect for a response handler to learn about its calling API client's state by accessing a global cache. To illustrate, consider one possible failure scenario:

1. No settings file exists at any of the default load paths, e.g. `~/.config/pulp_smash/settings.json`.
2. An API client is created by reading a non-default configuration file.
3. The API client makes a request, and a response handler is invoked to handle the response.
4. The response handler needs to learn which version of Pulp is being targeted.
  - If it invokes `pulp_smash.config.get_config()`, no configuration file will be found, and an exception will be raised.
  - If it accesses the calling API client, it will find what it needs.

Letting a response handler access its calling API client prevents incorrect behaviour in other scenarios too, such as when working with multi-threaded code.

### Supplementary information on method signatures.

`requests.post` has the following signature:

```
requests.post(url, data=None, json=None, **kwargs)
```

However, `post()` has a different signature. Why? Pulp supports only JSON for most of its API endpoints, so it makes sense for us to demote `data` to being a regular kwarg and list `json` as the one and only positional argument.

We make `json` a positional argument for `post()`, `put()`, and `patch()`, but not the other methods. Why? Because HTTP OPTIONS, GET, HEAD and DELETE **must not** have bodies. This is stated by the HTTP/1.1 specification, and network intermediaries such as caches are at liberty to drop such bodies.

Why is a sentinel object used in several function signatures? Imagine the following scenario: a user provides a default JSON payload in `self.request_kwargs`, but they want to skip sending that payload for just one request. How can they do that? With `client.post(url, json=None)`.

`delete(url, **kwargs)`  
Send an HTTP DELETE request.

`get(url, **kwargs)`  
Send an HTTP GET request.

**head** (*url*, *\*\*kwargs*)

Send an HTTP HEAD request.

**options** (*url*, *\*\*kwargs*)

Send an HTTP OPTIONS request.

**patch** (*url*, *json=<object object>*, *\*\*kwargs*)

Send an HTTP PATCH request.

**post** (*url*, *json=<object object>*, *\*\*kwargs*)

Send an HTTP POST request.

**put** (*url*, *json=<object object>*, *\*\*kwargs*)

Send an HTTP PUT request.

**request** (*method*, *url*, *\*\*kwargs*)

Send an HTTP request.

Arguments passed directly in to this method override (but do not overwrite!) arguments specified in `self.request_kwargs`.

`pulp_smash.api.code_handler` (*client*, *response*)

Check the response status code, and return the response.

Unlike `safe_handler()`, this method doesn't wait for asynchronous tasks to complete if `response` has an HTTP 202 status code.

**Raises** `requests.exceptions.HTTPError` if the response status code is in the 4XX or 5XX range.

`pulp_smash.api.echo_handler` (*client*, *response*)

Immediately return `response`.

`pulp_smash.api.json_handler` (*client*, *response*)

Like `safe_handler`, but also return a JSON-decoded response body.

Do what `pulp_smash.api.safe_handler()` does. In addition, decode the response body as JSON and return the result.

`pulp_smash.api.page_handler` (*client*, *response*)

Call `json_handler()`, optionally collect results, and return.

Do the following:

1. If `response` has an HTTP No Content (204) `status code`, return `response`.
2. Call `json_handler()`.
3. If the response appears to be paginated, walk through each page of results, and collect them into a single list. Otherwise, do nothing. Return either the list of results or the single decoded response.

**Raises** `ValueError` if the target Pulp application under test is older than version 3 or at least version 4.

`pulp_smash.api.poll_spawned_tasks` (*cfg*, *call\_report*, *pulp\_host=None*)

Recursively wait for spawned tasks to complete. Yield response bodies.

Recursively wait for each of the spawned tasks listed in the given `call_report` to complete. For each task that completes, yield a response body representing that task's final state.

**Parameters**

- `cfg` – A `pulp_smash.config.PulpSmashConfig` object.

- **call\_report** – A dict-like object with a `call report` structure.
- **pulp\_host** – The host to poll. If `None`, a host will automatically be selected by `Client`.

**Returns** A generator yielding task bodies.

**Raises** Same as `poll_task()`.

`pulp_smash.api.poll_task(cfg, href, pulp_host=None)`

Wait for a task and its children to complete. Yield response bodies.

Poll the task at `href`, waiting for the task to complete. When a response is received indicating that the task is complete, yield that response body and recursively poll each child task.

**Parameters**

- **cfg** – A `pulp_smash.config.PulpSmashConfig` object.
- **href** – The path to a task you'd like to monitor recursively.
- **pulp\_host** – The host to poll. If `None`, a host will automatically be selected by `Client`.

**Returns** An generator yielding response bodies.

**Raises** `pulp_smash.exceptions.TaskTimedOutError` – If a task takes too long to complete.

`pulp_smash.api.safe_handler(client, response)`

Check status code, wait for tasks to complete, and check tasks.

Inspect the response's HTTP status code. If the response has an HTTP Accepted status code, inspect the returned call report, wait for each task to complete, and inspect each completed task.

**Raises** `requests.exceptions.HTTPError` if the response status code is in the 4XX or 5XX range.

**Raises**

- `pulp_smash.exceptions.CallReportError` – If the call report contains an error.
- `pulp_smash.exceptions.TaskReportError` – If the task report contains an error.

## 4.3 `pulp_smash.cli`

Location: `Pulp Smash` → `API Documentation` → `pulp_smash.cli`

A client for working with Pulp hosts via their CLI.

**class** `pulp_smash.cli.BaseServiceManager`

Bases: `object`

A base service manager.

Each subclass must implement the abstract methods to provide the service management on a single or multiple hosts.

Subclasses should take advantage of the helper methods offered by this class in order to manage services and check the proper service manager software available on a host.

This base class also offers a context manager to temporarily disable SELinux. It is useful when managing services on hosts running RHEL 6 and earlier, which has SELinux issues when running on Jenkins.

Make sure to call this class `__init__` method on the subclass `__init__` method to ensure the helper methods functionality.

**is\_active** (*services*)

Check whether given services are active.

**Parameters** *services* – A list or tuple of services to check.

**Returns** boolean

**restart** (*services*)

Restart the given services.

**Parameters** *services* – A list or tuple of services to be restarted.

**start** (*services*)

Start the given services.

**Parameters** *services* – A list or tuple of services to be started.

**stop** (*services*)

Stop the given services.

**Parameters** *services* – A list or tuple of services to be stopped.

**class** `pulp_smash.cli.Client` (*cfg*, *response\_handler=None*, *pulp\_host=None*)

Bases: `object`

A convenience object for working with a CLI.

This class provides the ability to execute shell commands on either the local host or a remote host. Here is a typical usage example:

```
>>> from pulp_smash import cli, config
>>> client = cli.Client(config.PulpSmashConfig.load())
>>> response = client.run(('echo', '-n', 'foo'))
>>> response.returncode == 0
True
>>> response.stdout == 'foo'
True
>>> response.stderr == ''
True
```

Smartly chosen defaults make this example concise, but it's also quite flexible. For example, if a single Pulp application is deployed across several hosts, one can choose on which host commands are executed:

```
>>> from pulp_smash import cli, config
>>> cfg = config.PulpSmashConfig.load()
>>> client = cli.Client(cfg, pulp_host=cfg.get_hosts('shell')[0])
>>> response = client.run(('echo', '-n', 'foo'))
```

You can customize how `Client` objects execute commands and handle responses by fiddling with the two public instance attributes:

**machine** A `Plumbum` machine. `run()` delegates all command execution responsibilities to this object.

**response\_handler** A callback function. Each time `machine` executes a command, the result is handed to this callback, and the callback's return value is handed to the user.

If `pulp_host.roles['shell']['transport']` is `'local'` or `'ssh'`, `machine` will be set so that commands run locally or over SSH, respectively. If `pulp_host.roles['shell']['transport']` is

None, the constructor will guess how to set `machine` by comparing the hostname embedded in `pulp_host.hostname` against the current host's hostname. If they match, `machine` is set to execute commands locally; and vice versa.

### Parameters

- **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about the host on which commands will be executed.
- **response\_handler** – A callback function. Defaults to `pulp_smash.cli.code_handler()`.
- **pulp\_host** (`pulp_smash.config.PulpHost`) – A specific host to target. Defaults to the first host with the `pulp cli` role when targeting Pulp 2, and the first host with the `shell` role when targeting Pulp 3. If Pulp 3 gets a CLI, this latter default may change.

### `is_superuser`

Check if the current client is root.

If the current client is in root mode it stores the status as a cache to avoid it to be called again.

This property is named `is_supersuser` to avoid conflict with existing `is_root` function.

### `run` (*args*, *sudo=False*, *\*\*kwargs*)

Run a command and return `self.response_handler(result)`.

This method is a thin wrapper around Plumbum's `BaseCommand.run` method, which is itself a thin wrapper around the standard library's `subprocess.Popen` class. See their documentation for detailed usage instructions. See `pulp_smash.cli.Client` for a usage example.

### Parameters

- **args** – Any arguments to be passed to the process (a tuple).
- **sudo** – If the command should run as superuser (a boolean).
- **kwargs** – Extra named arguments passed to `plumbumBaseCommand.run`.

### `class pulp_smash.cli.CompletedProcess` (*args*, *returncode*, *stdout*, *stderr*)

Bases: `object`

A process that has finished running.

This class is similar to the `subprocess.CompletedProcess` class available in Python 3.5 and above. Significant differences include the following:

- All constructor arguments are required.
- `check_returncode()` returns a custom exception, not `subprocess.CallProcessError`.

All constructor arguments are stored as instance attributes.

### Parameters

- **args** – A string or a sequence. The arguments passed to `pulp_smash.cli.Client.run()`.
- **returncode** – The integer exit code of the executed process. Negative for signals.
- **stdout** – The standard output of the executed process.
- **stderr** – The standard error of the executed process.

### `check_returncode()`

Raise an exception if `returncode` is non-zero.

Raise `pulp_smash.exceptions.CallProcessError` if `returncode` is non-zero.



Why not raise `subprocess.CalledProcessError`? Because `stdout` and `stderr` are not included when `str()` is called on a `CalledProcessError` object. A typical message is:

```
"Command '('ls', 'foo')' returned non-zero exit status 2"
```

This information is valuable. One could still make `subprocess.CalledProcessError` work by overloading `args`:

```
>>> if isinstance(args, (str, bytes)):
...     custom_args = (args, stdout, stderr)
... else:
...     custom_args = tuple(args) + (stdout, stderr)
>>> subprocess.CalledProcessError(args, returncode)
```

But this seems like a hack.

In addition, it's generally good for an application to raise expected exceptions from its own namespace, so as to better abstract away dependencies.

```
class pulp_smash.cli.GlobalServiceManager(cfg)
```

Bases: `pulp_smash.cli.BaseServiceManager`

A service manager that manages services on all Pulp hosts.

Each instance of this class manages a single service. When a method like `start()` is executed, it will start a service on all hosts that are declared as running that service. For example, imagine that the following is executed:

```
>>> from pulp_smash import cli, config
>>> cfg = config.get_config()
>>> svc_mgr = cli.GlobalServiceManager(cfg)
>>> svc_mgr.start(['httpd'])
```

In this case, the service manager will iterate over all hosts in `cfg`. For each host that is declared as fulfilling the `api` role, Apache (`httpd`) will be restarted.

When asked to perform an action, this object may talk to each target host and determines whether it is running as root. If not root, all commands are prefixed with “sudo”. Please ensure that Pulp Smash can either execute commands as root or can successfully execute `sudo`. You may need to edit your `~/.ssh/config` file.

For conceptual information on why both a `pulp_smash.cli.ServiceManager` and a `pulp_smash.cli.GlobalServiceManager` are necessary, see `pulp_smash.config.PulpSmashConfig`.

**Parameters** `cfg` (`pulp_smash.config.PulpSmashConfig`) – Information about the Pulp deployment.

**Raises** `pulp_smash.exceptions.NoKnownServiceManagerError` – If unable to find any service manager on one of the target hosts.

**get\_client** (`pulp_host`, `**kwargs`)

Get an already instantiated client from cache.

**is\_active** (`services`)

Check whether given services are active.

**Parameters** `services` – A list or tuple of services to check.

**Returns** boolean

**restart** (`services`)

Restart the services on every host that has the services.

**Parameters** `services` – An iterable of service names.

**Returns** A dict mapping the affected hosts’ hostnames with a list of `pulp_smash.cli.CompletedProcess` objects.

**start** (`services`)

Start the services on every host that has the services.

**Parameters** `services` – An iterable of service names.

**Returns** A dict mapping the affected hosts’ hostnames with a list of `pulp_smash.cli.CompletedProcess` objects.

**stop** (`services`)

Stop the services on every host that has the services.

**Parameters** `services` – An iterable of service names.

**Returns** A dict mapping the affected hosts’ hostnames with a list of `pulp_smash.cli.CompletedProcess` objects.

**class** `pulp_smash.cli.PackageManager` (`cfg`, `raise_if_unsupported=None`)

Bases: `object`

A package manager on a host.

Each instance of this class represents the package manager on a host. An example may help to clarify this idea:

```
>>> from pulp_smash import cli, config
>>> pkg_mgr = cli.PackageManager(config.get_config())
>>> completed_process = pkg_mgr.install('vim')
>>> completed_process = pkg_mgr.uninstall('vim')
```

In the example above, the `pkg_mgr` object represents the package manager on the host referenced by `pulp_smash.config.get_config()`.

Upon instantiation, a `PackageManager` object talks to its target host and uses simple heuristics to determine which package manager is used. As a result, it’s possible to manage packages on heterogeneous host with homogeneous commands.

Upon instantiation, this object talks to the target host and determines whether it is running as root. If not root, all commands are prefixed with “sudo”. Please ensure that Pulp Smash can either execute commands as root or can successfully execute `sudo`. You may need to edit your `~/.ssh/config` file.

**Parameters**

- `cfg` (`pulp_smash.config.PulpSmashConfig`) – Information about the target host.
- `raise_if_unsupported` (`tuple`) – a tuple of Exception and optional string message to force `raise_if_unsupported` on initialization:

```
pm = PackageManager(cfg, (unittest.SkipTest, 'Test requires yum'))
# will raise and skip if unsupported package manager
```

The optional is calling `pm.raise_if_unsupported` explicitly.

**apply\_erratum** (`erratum`)

Dispatch to proper `_{self.name}_apply_erratum`.

**install** (`*args`)

Install the named packages.

**Return type** `pulp_smash.cli.CompletedProcess`

**name**

Return the name of the Package Manager.

**raise\_if\_unsupported** (*exc, message='Unsupported package manager'*)

Check if the package manager is supported else raise exc.

Use case:

```
pm = PackageManager(cfg)
pm.raise_if_unsupported(unittest.SkipTest, 'Test requires yum/dnf')
# will raise and skip if not yum or dnf
pm.install('foobar')
```

**uninstall** (*\*args*)

Uninstall the named packages.

**Return type** *pulp\_smash.cli.CompletedProcess*

**upgrade** (*\*args*)

Upgrade the named packages.

**Return type** *pulp\_smash.cli.CompletedProcess*

**class** *pulp\_smash.cli.ServiceManager* (*cfg, pulp\_host*)

Bases: *pulp\_smash.cli.BaseServiceManager*

A service manager on a host.

Each instance of this class represents the service manager on a host. An example may help to clarify this idea:

```
>>> from pulp_smash import cli, config
>>> cfg = config.get_config()
>>> pulp_host = cfg.get_services(('api',))[0]
>>> svc_mgr = cli.ServiceManager(cfg, pulp_host)
>>> completed_process_list = svc_mgr.stop(['httpd'])
>>> completed_process_list = svc_mgr.start(['httpd'])
```

In the example above, *svc\_mgr* represents the service manager (such as SysV or systemd) on a host. Upon instantiation, a *ServiceManager* object talks to its target host and uses simple heuristics to determine which service manager is available. As a result, it's possible to manage services on heterogeneous hosts with homogeneous commands.

Upon instantiation, this object talks to the target host and determines whether it is running as root. If not root, all commands are prefixed with “sudo”. Please ensure that Pulp Smash can either execute commands as root or can successfully execute sudo. You may need to edit your `~/.ssh/config` file.

For conceptual information on why both a *pulp\_smash.cli.ServiceManager* and a *pulp\_smash.cli.GlobalServiceManager* are necessary, see *pulp\_smash.config.PulpSmashConfig*.

**Parameters**

- **cfg** (*pulp\_smash.config.PulpSmashConfig*) – Information about a Pulp application.
- **pulp\_host** (*pulp\_smash.config.PulpHost*) – The host to target.

**Raises** *pulp\_smash.exceptions.NoKnownServiceManagerError* – If unable to find any service manager on the target host.

**is\_active** (*services*)

Check whether given services are active.

**Parameters** **services** – A list or tuple of services to check.

**Returns** boolean

**restart** (*services*)

Restart the given services.

**Parameters** **services** – An iterable of service names.

**Returns** An iterable of `pulp_smash.cli.CompletedProcess` objects.

**start** (*services*)

Start the given services.

**Parameters** **services** – An iterable of service names.

**Returns** An iterable of `pulp_smash.cli.CompletedProcess` objects.

**stop** (*services*)

Stop the given services.

**Parameters** **services** – An iterable of service names.

**Returns** An iterable of `pulp_smash.cli.CompletedProcess` objects.

`pulp_smash.cli.code_handler` (*completed\_proc*)

Check the process for a non-zero return code. Return the process.

Check the return code by calling `completed_proc.check_returncode()`. See: `pulp_smash.cli.CompletedProcess.check_returncode()`.

`pulp_smash.cli.echo_handler` (*completed\_proc*)

Immediately return `completed_proc`.

`pulp_smash.cli.is_root` (*cfg*, *pulp\_host=None*)

Tell if we are root on the target host.

**Parameters**

- **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about a Pulp application.
- **pulp\_host** (`pulp_smash.config.PulpHost`) – A specific host to target, instead of the first host with the `pulp cli` role.

**Returns** Either `True` or `False`.

## 4.4 `pulp_smash.config`

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.config*

Tools for managing information about hosts under test.

Pulp Smash needs to know about the Pulp application under test and the hosts that comprise that application. For example, it might need to know which username and password to use when communicating with a Pulp application, or it might need to know which host is hosting the squid service, if any. This module eases the task of managing that information.

`pulp_smash.config.JSON_CONFIG_SCHEMA` = {'anyOf': [{'type': 'object', 'properties': {'pu

The schema for Pulp Smash's configuration file.

`pulp_smash.config.P2_AMQP_SERVICES` = {'qpidd', 'rabbitmq'}

The set of services that can fulfill the `amqp` broker role.

`pulp_smash.config.P2_OPTIONAL_ROLES = {'pulp cli', 'squid'}`  
 Additional roles that can be present in a Pulp 2 application.

`pulp_smash.config.P2_REQUIRED_ROLES = {'amqp broker', 'api', 'mongod', 'pulp celerybeat', 'pulp cli'}`  
 The set of roles that must be present in a functional Pulp 2 application.

`pulp_smash.config.P2_ROLES = {'amqp broker', 'api', 'mongod', 'pulp celerybeat', 'pulp cli'}`  
 The set of all roles that can be present in a Pulp 2 application.

`pulp_smash.config.P3_REQUIRED_ROLES = {'api', 'pulp resource manager', 'pulp workers', 'pulp cli'}`  
 The set of roles that must be present in a functional Pulp 3 application.

**class** `pulp_smash.config.PulpHost` (*hostname, roles*)  
 Bases: tuple

**hostname**  
 Alias for field number 0

**roles**  
 Alias for field number 1

**class** `pulp_smash.config.PulpSmashConfig` (*pulp\_auth, pulp\_version, pulp\_selinux\_enabled, \*, hosts*)  
 Bases: object

Information about a Pulp application.

This object stores information about Pulp application and its constituent hosts. A single Pulp application may have its services spread across several hosts. For example, one host might run Qpid, another might run MongoDB, and so on. Here's how to model a multi-host deployment where Apache runs on one host, and the remaining components run on another host:

```
>>> import requests
>>> from pulp_smash.config import PulpSmashConfig
>>> cfg = PulpSmashConfig(
...     pulp_auth=('username', 'password'),
...     pulp_version='2.12.2',
...     pulp_selinux_enabled=True,
...     hosts=[
...         PulpHost(
...             hostname='pulp1.example.com',
...             roles={'api': {'scheme': 'https'}},
...         ),
...         PulpHost(
...             hostname='pulp.example.com',
...             roles={
...                 'amqp broker': {'service': 'qpidd'},
...                 'mongod': {},
...                 'pulp celerybeat': {},
...                 'pulp resource manager': {},
...                 'pulp workers': {},
...                 'shell': {'transport': 'ssh'},
...             },
...         )
...     ]
... )
```

In the simplest case, all of the services that comprise a Pulp application run on a single host. Here's an example of how this object might model a single-host deployment:

```

>>> import requests
>>> from pulp_smash.config import PulpSmashConfig
>>> cfg = PulpSmashConfig(
...     pulp_auth=('username', 'password'),
...     pulp_version='2.12.2',
...     pulp_selinux_enabled=True,
...     hosts=[
...         PulpHost(
...             hostname='pulp.example.com',
...             roles={
...                 'amqp broker': {'service': 'qpidd'},
...                 'api': {'scheme': 'https'},
...                 'mongod': {},
...                 'pulp cli': {},
...                 'pulp celerybeat': {},
...                 'pulp resource manager': {},
...                 'pulp workers': {},
...                 'shell': {'transport': 'ssh'},
...             },
...         )
...     ]
... )

```

In the simplest case, Pulp Smash’s configuration file resides at `~/.config/pulp_smash/settings.json`. However, there are several ways to alter this path. Pulp Smash obeys the [XDG Base Directory Specification](#). In addition, Pulp Smash responds to the `PULP_SMASH_CONFIG_FILE` environment variable. This variable is a relative path, and it defaults to `settings.json`.

Configuration files contain JSON data structured in a way that resembles what is accepted by this class’s constructor. For exact details on the structure of configuration files, see [pulp\\_smash.config.JSON\\_CONFIG\\_SCHEMA](#).

### Parameters

- **pulp\_auth** – A two-tuple. Credentials to use when communicating with the server. For example: `('username', 'password')`.
- **pulp\_version** – A string, such as `'1.2'` or `'0.8.rc3'`. If you are unsure what to pass, consider passing `'1!0'` (epoch 1, version 0). Must be compatible with the [packaging](#) library’s `packaging.version.Version` class.
- **pulp\_selinux\_enabled** – A boolean. Determines whether selinux tests are enabled.
- **hosts** – A list of the hosts comprising a Pulp application. Each element of the list should be a [pulp\\_smash.config.PulpHost](#) object.

**get\_base\_url** (*pulp\_host=None*)

Generate the base URL for a given `pulp_host`.

**Parameters** **pulp\_host** ([pulp\\_smash.config.PulpHost](#)) – One of the hosts that comprises a Pulp application. Defaults to the first host with the `api` role.

**get\_hosts** (*role*)

Return a list of hosts fulfilling the given role.

**Parameters** **role** – The role to filter the available hosts, see [pulp\\_smash.config.P2\\_ROLES](#) for more information.

**classmethod get\_load\_path** (*xdg\_subdir=None, config\_file=None*)

Return the path to where a configuration file may be loaded from.

Search each of the `$XDG_CONFIG_DIRS` for a file named `$xdg_subdir/$config_file`.

#### Parameters

- **`xdg_subdir`** – A string. The directory to append to each of the `$XDG_CONFIG_DIRS`. Defaults to `'pulp_smash'`.
- **`config_file`** – A string. The name of the settings file. Typically defaults to `'settings.json'`.

**Returns** A string. The path to a configuration file, if one is found.

**Raises** `pulp_smash.exceptions.ConfigFileNotFoundError` – If no configuration file is found.

**`get_requests_kwargs`** (*pulp\_host=None*)

Get kwargs for use by the Requests functions.

This method returns a dict of attributes that can be unpacked and used as kwargs via the `**` operator. For example:

```
>>> cfg = PulpSmashConfig.load()
>>> requests.get(cfg.get_base_url() + '...', **cfg.get_requests_kwargs())
```

This method is useful because client code may not know which attributes should be passed from a `PulpSmashConfig` object to Requests. Consider that the example above could also be written like this:

```
>>> cfg = PulpSmashConfig.load()
>>> requests.get(
...     cfg.get_base_url() + '...',
...     auth=tuple(cfg.pulp_auth),
...     verify=cfg.get_hosts('api')[0].roles['api']['verify'],
... )
```

But this latter approach is more fragile. The user must remember to get a host with api role to check for the verify config, then convert `pulp_auth` config to a tuple, and it will require maintenance if `cfg` gains or loses attributes.

**classmethod `get_save_path`** ()

Return a path to where a configuration file may be saved.

Create parent directories if they don't exist.

**static `get_services`** (*roles*)

Translate role names to init system service names.

Sample usage:

```
>>> from pulp_smash import config
>>> host = config.PulpHost('example.com', {
...     'amqp broker': {'service': 'qpidd'},
...     'pulp celerybeat': {},
... })
>>> services = config.PulpSmashConfig.get_services(host.roles)
>>> services == {'pulp_celerybeat', 'qpidd'}
True
```

**Parameters `roles`** – The `roles` attribute of a `pulp_smash.config.PulpHost`.

**Returns** A set. The services that back the named roles.

**classmethod** `load` (*xdg\_subdir=None, config\_file=None*)

Load a configuration file from disk.

**Parameters**

- **xdg\_subdir** – Passed to `get_load_path()`.
- **config\_file** – Passed to `get_load_path()`.

**Returns** A new `pulp_smash.config.PulpSmashConfig` object. The current object is not modified by this method.

**Return type** `PulpSmashConfig`

`pulp_smash.config.get_config()`

Return a copy of the global `PulpSmashConfig` object.

This method makes use of a cache. If the cache is empty, the configuration file is parsed and the cache is populated. Otherwise, a copy of the cached configuration object is returned.

**Returns** A copy of the global server configuration object.

**Return type** `pulp_smash.config.PulpSmashConfig`

`pulp_smash.config.validate_config(config_dict)`

Validate a config against `pulp_smash.config.JSON_CONFIG_SCHEMA`.

**Parameters** **config\_dict** – A dict, such as one returned by calling `json.load` on a configuration file, or one generated by the user-facing CLI.

**Returns** Nothing.

**Raises** `pulp_smash.exceptions.ConfigValidationError` – If the any validation error is found.

## 4.5 `pulp_smash.constants`

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.constants*

Values usable by multiple test modules.

`pulp_smash.constants.PULP_FIXTURES_BASE_URL = 'https://repos.fedorapeople.org/pulp/pulp/fix'`  
A URL at which generated `pulp fixtures` are hosted.

`pulp_smash.constants.PULP_FIXTURES_KEY_ID = '269d9d98'`

The 32-bit ID of the public key used to sign various fixture files.

To calculate a new key ID, find the public key used by Pulp Fixtures (it should be in the Pulp Fixtures source code repository) and use GnuPG to examine it:

```
$ gpg "$public_key_file"
pub  rsa2048 2016-08-05 [SC]
    6EDF301256480B9B801EBA3D05A5E6DA269D9D98
uid  Pulp QE
sub  rsa2048 2016-08-05 [E]
```

The last 32 bits (8 characters) of the key ID are what Pulp wants — in this example, 269D9D98.



## 4.6 *pulp\_smash.exceptions*

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.exceptions*

Custom exceptions defined by Pulp Smash.

**exception** `pulp_smash.exceptions.BugStatusUnknownError`

Bases: `Exception`

We have encountered a bug whose status is unknown to us.

See *pulp\_smash.selectors* for more information on how bug statuses are used.

**exception** `pulp_smash.exceptions.BugTPRMissingError`

Bases: `Exception`

We have encountered a bug with no “Target Platform Release” field.

See *pulp\_smash.selectors* for more information.

**exception** `pulp_smash.exceptions.CallReportError`

Bases: `Exception`

A call report contains an error.

For more information about pulp’s task handling, see [Synchronous and Asynchronous Calls and Task Management](#).

**exception** `pulp_smash.exceptions.CalledProcessError` (*args\_*, *returncode*, *stdout*, *stderr*, *\*args*, *\*\*kwargs*)

Bases: `Exception`

Indicates a CLI process has a non-zero return code.

See *pulp\_smash.cli.CompletedProcess()* for more information.

**exception** `pulp_smash.exceptions.ConfigFileNotFoundError`

Bases: `Exception`

We cannot find the requested Pulp Smash configuration file.

See *pulp\_smash.config* for more information on how configuration files are handled.

**exception** `pulp_smash.exceptions.ConfigFileSectionNotFoundError`

Bases: `Exception`

We cannot read the requested Pulp Smash configuration file section.

See *pulp\_smash.config* for more information on how configuration files are handled.

**exception** `pulp_smash.exceptions.ConfigValidationError` (*message*, *\*args*, *\*\*kwargs*)

Bases: `Exception`

The configuration file has validation errors.

See *pulp\_smash.config.validate\_config()* for more information on how configuration validation is handled.

**exception** `pulp_smash.exceptions.NoKnownBrokerError`

Bases: `Exception`

We cannot determine the AMQP broker used by a system.

An “AMQP broker” is a tool such as RabbitMQ or Apache Qpid.

**exception** `pulp_smash.exceptions.NoKnownPackageManagerError`

Bases: `Exception`

We cannot determine the package manager used by a system.

A “package manager” is a tool such as `yum` or `dnf`.

**exception** `pulp_smash.exceptions.NoKnownServiceManagerError`

Bases: `Exception`

We cannot determine the service manager used by a system.

A “service manager” is a tool such as `systemctl` or `service`.

**exception** `pulp_smash.exceptions.TaskReportError` (*msg, task, \*args, \*\*kwargs*)

Bases: `Exception`

A task contains an error.

For more information about pulp’s task handling, see [Synchronous and Asynchronous Calls and Task Management](#).

**exception** `pulp_smash.exceptions.TaskTimedOutError`

Bases: `Exception`

We timed out while polling a task and waiting for it to complete.

See `pulp_smash.api.poll_spawned_tasks()` and `pulp_smash.api.poll_task()` for more information on how task polling is handled.

## 4.7 `pulp_smash.pulp2`

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.pulp2*

Tools for Pulp 2 tests.

## 4.8 `pulp_smash.pulp2.constants`

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.pulp2.constants*

Constants for Pulp 2 tests.

`pulp_smash.pulp2.constants.CALL_REPORT_KEYS = frozenset({'result', 'spawned_tasks', 'error`

See: [Call Report](#).

`pulp_smash.pulp2.constants.CONSUMERS_ACTIONS_CONTENT_REGENERATE_APPLICABILITY_PATH = '/pulp`

See: [Content Applicability](#).

`pulp_smash.pulp2.constants.CONSUMERS_CONTENT_APPLICABILITY_PATH = '/pulp/api/v2/consumers/`

See: [Content Applicability](#).

`pulp_smash.pulp2.constants.CONSUMERS_PATH = '/pulp/api/v2/consumers/'`

See: [Consumer APIs](#).

`pulp_smash.pulp2.constants.CONTENT_SOURCES_PATH = '/etc/pulp/content/sources/conf.d'`

See: [Content Sources](#).

`pulp_smash.pulp2.constants.CONTENT_UNITS_PATH = '/pulp/api/v2/content/units/'`

See: [Search for Units](#).

`pulp_smash.pulp2.constants.CONTENT_UPLOAD_PATH = '/pulp/api/v2/content/uploads/'`  
 See: [Creating an Upload Request](#).

`pulp_smash.pulp2.constants.ERROR_KEYS = frozenset({'traceback', '_href', 'exception', 'err`  
 See: [Exception Handling](#).

No href field should be present. See [Issue #1310](#).

`pulp_smash.pulp2.constants.GROUP_CALL_REPORT_KEYS = frozenset({'_href', 'group_id'})`  
 See: [Group Call Report](#).

`pulp_smash.pulp2.constants.LOGIN_KEYS = frozenset({'certificate', 'key'})`  
 See: [User Certificates](#).

`pulp_smash.pulp2.constants.LOGIN_PATH = '/pulp/api/v2/actions/login/'`  
 See: [Authentication](#).

`pulp_smash.pulp2.constants.ORPHANS_PATH = 'pulp/api/v2/content/orphans/'`  
 See: [Orphaned Content](#).

`pulp_smash.pulp2.constants.PLUGIN_TYPES_PATH = '/pulp/api/v2/plugins/types/'`  
 See: [Retrieve All Content Unit Types](#).

`pulp_smash.pulp2.constants.PULP_SERVICES = {'httpd', 'pulp_celerybeat', 'pulp_resource_man`  
 Core Pulp services.

There are services beyond just these that Pulp depends on in order to function correctly. For example, an AMQP broker such as RabbitMQ or Qpid is integral to Pulp's functioning. However, if resetting Pulp (such as in `pulp_smash.pulp2.utils.reset_pulp()`), this is the set of services that should be restarted.

`pulp_smash.pulp2.constants.REPOSITORY_EXPORT_DISTRIBUTOR = 'export_distributor'`  
 A distributor\_type\_id to export a repository.

See: [Export Distributors](#).

`pulp_smash.pulp2.constants.REPOSITORY_GROUP_EXPORT_DISTRIBUTOR = 'group_export_distributor`  
 A distributor\_type\_id to export a repository group.

See: [Export Distributors](#).

`pulp_smash.pulp2.constants.REPOSITORY_GROUP_PATH = '/pulp/api/v2/repo_groups/'`  
 See: [Repository Group APIs](#)

`pulp_smash.pulp2.constants.REPOSITORY_PATH = '/pulp/api/v2/repositories/'`  
 See: [Repository APIs](#).

`pulp_smash.pulp2.constants.TASKS_PATH = '/pulp/api/v2/tasks/'`  
 See: [Tasks APIs](#).

`pulp_smash.pulp2.constants.USER_PATH = '/pulp/api/v2/users/'`  
 See: [User APIs](#).

## 4.9 `pulp_smash.pulp2.utils`

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.pulp2.utils*

Utility functions for Pulp 2 tests.

**class** `pulp_smash.pulp2.utils.BaseAPICrudTestCase` (\*args, \*\*kwargs)

Bases: `unittest.case.TestCase`

A parent class for API CRUD test cases.

`create_body()` and `update_body()` should be overridden by concrete child classes. The bodies of these two methods are encoded to JSON and used as the bodies of HTTP requests for creating and updating a repository, respectively. Be careful to return appropriate data when overriding these methods: the various `test*` methods assume the repository is fairly simple.

Relevant Pulp documentation:

**Create** <http://docs.pulpproject.org/en/latest/dev-guide/integration/rest-api/repo/cud.html#create-a-repository>

**Read** <http://docs.pulpproject.org/en/latest/dev-guide/integration/rest-api/repo/retrieval.html#retrieve-a-single-repository>

**Update** <http://docs.pulpproject.org/en/latest/dev-guide/integration/rest-api/repo/cud.html#update-a-repository>

**Delete** <http://docs.pulpproject.org/en/latest/dev-guide/integration/rest-api/repo/cud.html#delete-a-repository>

**static create\_body()**

Return a dict for creating a repository. Should be overridden.

**Raises** `NotImplementedError` if not implemented by a child class.

**classmethod setUpClass()**

Create, update, read and delete a repository.

**test\_create()**

Assert the created repository has all requested attributes.

Walk through each of the attributes returned by `create_body()` and verify the attribute is present in the repository.

NOTE: Any attribute whose name starts with `importer` or `distributor` is not verified.

**test\_importer\_config()**

Validate the `config` attribute of each importer.

**test\_importer\_type\_id()**

Validate the repo importer's `importer_type_id` attribute.

**test\_number\_importers()**

Assert the repository has one importer.

**test\_read()**

Assert the repo update response has the requested changes.

**test\_status\_codes()**

Assert each response has a correct status code.

**test\_update()**

Assert the repo update response has the requested changes.

**static update\_body()**

Return a dict for updating a repository. Should be overridden.

**Raises** `NotImplementedError` if not implemented by a child class.

**class** `pulp_smash.pulp2.utils.BaseAPITestCase(*args, **kwargs)`

Bases: `unittest.case.TestCase`

A class with behaviour that is of use in many API test cases.

This test case provides set-up and tear-down behaviour that is common to many API test cases.

**Warning:** Avoid using `BaseAPITestCase`. Its design encourages fragile clean-up logic, and it slows down tests by unnecessarily deleting orphans. Try using the `addCleanup` instance method instead, and only delete orphans as needed.

**classmethod `setUpClass()`**

Provide a server config and an iterable of resources to delete.

The following class attributes are created this method:

**cfg** A `pulp_smash.config.PulpSmashConfig` object.

**resources** A set object. If a child class creates some resources that should be deleted when the test is complete, the child class should add that resource’s href to this set.

**classmethod `tearDownClass()`**

Delete all resources named by `resources`.

**class `pulp_smash.pulp2.utils.DuplicateUploadsMixin`**

Bases: `object`

A mixin that adds tests for the “duplicate upload” test cases.

Consider the following procedure:

1. Create a new feed-less repository of any content unit type.
2. Upload a content unit into the repository.
3. Upload the same content unit into the same repository.

The second upload should silently fail for all Pulp releases in the 2.x series. See:

- <https://pulp.plan.io/issues/1406>
- <https://github.com/PulpQE/pulp-smash/issues/81>

This mixin adds tests for this case. Child classes should do the following:

- Create a repository. Content units will be uploaded into this repository.
- Create a class or instance attribute named `upload_import_unit_args`. It should be an iterable whose contents match the signature of `upload_import_unit()`.

**test\_01\_first\_upload()**

Upload a content unit to a repository.

**test\_02\_second\_upload()**

Upload the same content unit to the same repository.

`pulp_smash.pulp2.utils.get_broker(cfg)`

Build an object for managing the target system’s AMQP broker.

Talk to the host named by `cfg` and use simple heuristics to determine which AMQP broker is installed. If Qpid or RabbitMQ appear to be installed, return the name of that service. Otherwise, raise an exception.

**Parameters** `cfg` (`pulp_smash.config.PulpSmashConfig`) – Information about the system on which an AMQP broker exists.

**Returns** A string such as ‘qpid’ or ‘rabbitmq’.

**Raises** `pulp_smash.exceptions.NoKnownBrokerError` – If unable to find any AMQP brokers on the target system.

`pulp_smash.pulp2.utils.get_unit_types()`

Tell which unit types are supported by the target Pulp server.

Each Pulp plugin adds one (or more?) content unit types to Pulp, and each content unit type has a unique identifier. For example, the Python plugin<sup>1</sup> adds the Python content unit type<sup>2</sup>, and Python content units have an ID of `python_package`. This function queries the server and returns those unit type IDs.

**Returns** A set of content unit type IDs. For example: `{'ostree', 'python_package'}`.

`pulp_smash.pulp2.utils.publish_repo(cfg, repo, json=None)`

Publish a repository.

### Parameters

- **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about the Pulp host.
- **repo** – A dict of detailed information about the repository to be published.
- **json** – Data to be encoded as JSON and sent as the request body. Defaults to `{'id': repo['distributors'][0]['id']}`.

**Raises** `ValueError` when `json` is not passed, and `repo` does not have exactly one distributor.

**Returns** The server's response. Call `.json()` on the response to get a call report.

`pulp_smash.pulp2.utils.pulp_admin_login(cfg)`

Execute `pulp-admin login`.

**Parameters** **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about the Pulp server being targeted.

**Returns** The completed process.

**Return type** `pulp_smash.cli.CompletedProcess`

`pulp_smash.pulp2.utils.require_issue_3159(exc)`

Skip tests if Fedora 27 is under test and Pulp #3159 is open.

**Parameters** **exc** – A class to instantiate and raise as an exception. Its constructor must accept one string argument.

`pulp_smash.pulp2.utils.require_issue_3687(exc)`

Skip tests if Fedora 27 is under test and Pulp #3687 is open.

**Parameters** **exc** – A class to instantiate and raise as an exception. Its constructor must accept one string argument.

`pulp_smash.pulp2.utils.require_pulp_2(exc)`

Skip tests if Pulp 2 isn't under test.

**Parameters** **exc** – A class to instantiate and raise as an exception. Its constructor must accept one string argument.

`pulp_smash.pulp2.utils.require_unit_types(required_unit_types, exc)`

Skip tests if one or more unit types aren't supported.

### Parameters

- **required\_unit\_types** – A set of unit types IDs, e.g. `{'ostree'}`.
- **exc** – A class to instantiate and raise as an exception. Its constructor must accept one string argument.

---

<sup>1</sup> [http://docs.pulpproject.org/plugins/pulp\\_python/](http://docs.pulpproject.org/plugins/pulp_python/)

<sup>2</sup> [http://docs.pulpproject.org/plugins/pulp\\_python/reference/python-type.html](http://docs.pulpproject.org/plugins/pulp_python/reference/python-type.html)

`pulp_smash.pulp2.utils.reset_pulp(cfg)`

Stop Pulp, reset its database, remove certain files, and start it.

**Parameters** `cfg` (`pulp_smash.config.PulpSmashConfig`) – Information about the Pulp server being targeted.

**Returns** Nothing.

`pulp_smash.pulp2.utils.reset_squid(cfg)`

Stop Squid, reset its cache directory, and restart it.

**Parameters** `cfg` (`pulp_smash.config.PulpSmashConfig`) – Information about a Pulp host.

**Returns** Nothing.

`pulp_smash.pulp2.utils.search_units(cfg, repo, criteria=None, response_handler=None)`

Find content units in a `repo`.

**Parameters**

- `cfg` (`pulp_smash.config.PulpSmashConfig`) – Information about the Pulp host.
- `repo` – A dict of detailed information about the repository.
- `criteria` – A dict of criteria to pass in the search body. Defaults to an empty dict.
- `response_handler` – The callback function used by `pulp_smash.api.Client` after searching. Defaults to `pulp_smash.api.json_handler()`.

**Returns** Whatever is dictated by `response_handler`.

`pulp_smash.pulp2.utils.sync_repo(cfg, repo)`

Sync a repository.

**Parameters**

- `cfg` (`pulp_smash.config.PulpSmashConfig`) – Information about the Pulp host.
- `repo` – A dict of detailed information about the repository to be synced.

**Returns** The server’s reponse. Call `.json()` on the response to get a call report.

`pulp_smash.pulp2.utils.upload_import_erratum(cfg, erratum, repo)`

Upload an erratum to a Pulp server and import it into a repository.

For most content types, use `upload_import_unit()`.

**Parameters**

- `cfg` (`pulp_smash.config.PulpSmashConfig`) – Information about the Pulp server being targeted.
- `erratum` – A dict, with keys such as “id,” “status,” “issued,” and “references.”
- `repo` – A dict. The repository into which `erratum` be imported.

**Returns** The call report returned when importing the erratum.

`pulp_smash.pulp2.utils.upload_import_unit(cfg, unit, import_params, repo)`

Upload a content unit to a Pulp server and import it into a repository.

This procedure only works for some unit types, such as `rpm` or `python_package`. Others, like `package_group`, require an alternate procedure. The procedure encapsulated by this function is as follows:

1. Create an upload request.
2. Upload the content unit to Pulp, in small chunks.

3. Import the uploaded content unit into a repository.
4. Delete the upload request.

The default set of parameters sent to Pulp during step 3 are:

```
{'unit_key': {}, 'upload_id': '...'}
```

The actual parameters required by Pulp depending on the circumstances, and the parameters sent to Pulp may be customized via the `import_params` argument. For example, if uploading a Python content unit, `import_params` should be the following:

```
{'unit_key': {'filename': '...'}, 'unit_type_id': 'python_package'}
```

This would result in the following upload parameters being used:

```
{
  'unit_key': {'filename': '...'},
  'unit_type_id': 'python_package',
  'upload_id': '...',
}
```

### Parameters

- **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about a Pulp host.
- **unit** – The unit to be uploaded and imported, as a binary blob.
- **import\_params** – A dict of parameters to be merged into the default set of import parameters during step 3.
- **repo** – A dict of information about the target repository.

**Returns** The call report returned when importing the unit.

## 4.10 *pulp\_smash.pulp3*

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.pulp3*

Tools for Pulp 3 tests.

## 4.11 *pulp\_smash.pulp3.constants*

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.pulp3.constants*

Constants for Pulp 3 tests.

## 4.12 *pulp\_smash.pulp3.utils*

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.pulp3.utils*

Utility functions for Pulp 3 tests.



`pulp_smash.pulp3.utils.delete_orphans` (*cfg=None*)

Clean all content units present in pulp.

An orphaned artifact is an artifact that is not in any content units. An orphaned content unit is a content unit that is not in any repository version.

**Parameters** `cfg` (`pulp_smash.config.PulpSmashConfig`) – Information about the Pulp host.

`pulp_smash.pulp3.utils.delete_version` (*repo, version\_href=None*)

Delete a given repository version.

**Parameters**

- **repo** – A dict of information about the repository.
- **version\_href** – The repository version that should be deleted.

**Returns** A tuple. The tasks spawned by Pulp.

`pulp_smash.pulp3.utils.gen_distribution` (*\*\*kwargs*)

Return a semi-random dict for use in creating a Distribution.

`pulp_smash.pulp3.utils.gen_publisher` (*\*\*kwargs*)

Return a semi-random dict for use in creating an Publisher.

`pulp_smash.pulp3.utils.gen_remote` (*url, \*\*kwargs*)

Return a semi-random dict for use in creating a Remote.

**Parameters** `url` – The URL of an external content source.

`pulp_smash.pulp3.utils.gen_repo` (*\*\*kwargs*)

Return a semi-random dict for use in creating a Repository.

`pulp_smash.pulp3.utils.get_added_content` (*repo, version\_href=None*)

Read the added content of a given repository version.

**Parameters**

- **repo** – A dict of information about a repository.
- **version\_href** – The repository version to read. If none, read the latest repository version.

**Returns** A list of information about the content added since the previous repository version.

`pulp_smash.pulp3.utils.get_artifact_paths` (*repo, version\_href=None*)

Return the paths of artifacts present in a given repository version.

**Parameters**

- **repo** – A dict of information about the repository.
- **version\_href** – The repository version to read.

**Returns** A set with the paths of units present in a given repository.

`pulp_smash.pulp3.utils.get_content` (*repo, version\_href=None*)

Read the content units of a given repository.

**Parameters**

- **repo** – A dict of information about the repository.
- **version\_href** – The repository version to read. If none, read the latest repository version.

**Returns** A list of information about the content units present in a given repository version.

`pulp_smash.pulp3.utils.get_content_summary(repo, version_href=None)`

Read the “content summary” of a given repository version.

Repository versions have a “content\_summary” which lists the content types and the number of units of that type present in the repo version.

**Parameters**

- **repo** – A dict of information about the repository.
- **version\_href** – The repository version to read. If none, read the latest repository version.

**Returns** The “content\_summary” of the repo version.

`pulp_smash.pulp3.utils.get_plugins(cfg=None)`

Return the set of plugins installed on the Pulp application.

**Parameters** **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about the Pulp application under test.

**Returns** A set of plugin names, e.g. {'pulpcore', 'pulp\_file'}.

`pulp_smash.pulp3.utils.get_removed_content(repo, version_href=None)`

Read the removed content of a given repository version.

**Parameters**

- **repo** – A dict of information about the repository.
- **version\_href** – The repository version to read. If none, read the latest repository version.

**Returns** A list of information about the content removed since the previous repository version.

`pulp_smash.pulp3.utils.get_versions(repo, params=None)`

Return repository versions, sorted by version ID.

**Parameters**

- **repo** – A dict of information about the repository.
- **params** – Dictionary or bytes to be sent in the query string. Used to filter which versions are returned.

**Returns** A sorted list of dicts of information about repository versions.

`pulp_smash.pulp3.utils.publish(cfg, publisher, repo, version_href=None)`

Publish a repository.

**Parameters**

- **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about the Pulp host.
- **publisher** – A dict of information about the publisher of the repository to be published.
- **repo** – A dict of information about the repository.
- **version\_href** – The repository version to be published.

**Returns** A publication. A dict of information about the just created publication.

`pulp_smash.pulp3.utils.require_pulp_3(exc)`

Raise an exception if Pulp 3 isn’t under test.

If the same exception should be passed each time this method is called, consider using `functools.partial`.

**Parameters** **exc** – A class to instantiate and raise as an exception. Its constructor must accept one string argument.

`pulp_smash.pulp3.utils.require_pulp_plugins` (*required\_plugins, exc*)

Raise an exception if one or more plugins are missing.

If the same exception should be passed each time this method is called, consider using `functools.partial`.

#### Parameters

- **required\_plugins** – A set of plugin names, e.g. {'pulp-file'}.
- **exc** – A class to instantiate and raise as an exception. Its constructor must accept one string argument.

`pulp_smash.pulp3.utils.sync` (*cfg, remote, repo, \*\*kwargs*)

Sync a repository.

#### Parameters

- **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about the Pulp host.
- **remote** – A dict of information about the remote of the repository to be synced.
- **repo** – A dict of information about the repository.
- **kwargs** – Keyword arguments to be merged in to the request data.

**Returns** The server’s response. Call `.json()` on the response to get a call report.

## 4.13 `pulp_smash.pulp_smash_cli`

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.pulp\_smash\_cli*

The entry point for Pulp Smash’s command line interface.

**class** `pulp_smash.pulp_smash_cli.PulpVersionType`

Bases: `click.types.ParamType`

Define the possible values for a Pulp version string.

A Pulp version string is valid if it can be cast to a `packaging.version.Version` object, if it is at least 2, and if it is less than 4.

**convert** (*value, param, ctx*)

Convert a version string to a `Version` object.

**name** = 'Pulp version'

## 4.14 `pulp_smash.selectors`

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.selectors*

Tools for selecting and deselecting tests.

`pulp_smash.selectors.bug_is_fixed` (*bug\_id, pulp\_version*)

Tell the caller whether bug `bug_id` should be tested.

#### Parameters

- **bug\_id** – An integer bug ID, taken from <https://pulp.plan.io>.

- **pulp\_version** – A `packaging.version.Version` object telling the version of the Pulp server we are testing.

**Returns** True if the bug is testable, or False otherwise.

**Raises** `TypeError` if `bug_id` is not an integer.

**Raises** `pulp_smash.exceptions.BugStatusUnknownError` – If the bug has a status Pulp Smash does not recognize.

`pulp_smash.selectors.require` (*ver, exc*)

Optionally skip a test method, based on a version string.

This decorator concisely encapsulates a common pattern for skipping tests. An attribute named `cfg` **must** be accessible from the decorator. It can be used like so:

```
>>> import unittest
>>> from packaging.version import Version
>>> from pulp_smash import config, selectors
>>> class MyTestCase(unittest.TestCase):
...
...     @classmethod
...     def setUpClass(cls):
...         cls.cfg = config.get_config()
...
...     @selectors.require('2.7', unittest.SkipTest)
...     def test_foo(self):
...         self.assertGreaterEqual(self.cfg.pulp_version, Version('2.7'))
```

If the same exception should be passed each time this method is called, consider using `functools.partial`:

```
>>> from functools import partial
>>> from unittest import SkipTest
>>> from pulp_smash.selectors import require
>>> unittest_require = partial(require, exc=SkipTest)
```

### Parameters

- **ver** – A PEP 440 compatible version string.
- **exc** – A class to instantiate and raise as an exception. Its constructor must accept one string argument.

`pulp_smash.selectors.skip_if` (*func, var\_name, result, exc*)

Optionally skip a test method, based on a condition.

This decorator checks to see if `func(getattr(self, var_name))` equals `result`. If so, an exception of type `exc` is raised. Otherwise, nothing happens, and the decorated test method continues as normal. Here's an example of how to use this method:

```
>>> import unittest
>>> from pulp_smash.selectors import skip_if
>>> class MyTestCase(unittest.TestCase):
...
...     @classmethod
...     def setUpClass(cls):
...         cls.my_var = False
...
...     @skip_if(bool, 'my_var', False, unittest.SkipTest)
```

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```

...     def test_01_skips(self):
...         pass
...
...     def test_02_runs(self):
...         type(self).my_var = True
...
...     @skip_if(bool, 'my_var', False, unittest.SkipTest)
...     def test_03_runs(self):
...         pass

```

If the same exception should be passed each time this method is called, consider using `functools.partial`:

```

>>> from functools import partial
>>> from unittest import SkipTest
>>> from pulp_smash.selectors import skip_if
>>> unittest_skip_if = partial(skip_if, exc=SkipTest)

```

### Parameters

- **var\_name** – A valid variable name.
- **result** – A value to compare to `func(getattr(self, var_name))`.
- **exc** – A class to instantiate and raise as an exception. Its constructor must accept one string argument.

## 4.15 *pulp\_smash.utils*

Location: *Pulp Smash* → *API Documentation* → *pulp\_smash.utils*

Utility functions for Pulp tests.

This module may make use of *pulp\_smash.api* and *pulp\_smash.cli*, but the reverse should not be done.

`pulp_smash.utils.fips_is_enabled(cfg, pulp_host=None)`

Return True if the Fips is enabled in server, or False otherwise.

### Parameters

- **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about the system being targeted
- **pulp\_host** – A `:class: pulp_smash.config.PulpHost` to target, instead of the default chosen by `:class: pulp_smash.cli.Client`.

**Returns** True or False

`pulp_smash.utils.fips_is_supported(cfg, pulp_host=None)`

Return True if the server supports Fips, or False otherwise.

### Parameters

- **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about the system being targeted
- **pulp\_host** – A `:class: pulp_smash.config.PulpHost` to target, instead of the default chosen by `:class: pulp_smash.cli.Client`.

**Returns** True or False

`pulp_smash.utils.get_os_release_id(cfg, pulp_host=None)`  
Get ID from `/etc/os-release`.

### Parameters

- **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about the system being targeted.
- **pulp\_host** – A `pulp_smash.config.PulpHost` to target, instead of the default chosen by `pulp_smash.cli.Client`.

**Returns** A string such as “rhel,” “fedora,” or “arch.” (These values come from Red Hat Enterprise Linux, Fedora, and Arch Linux respectively.)

`pulp_smash.utils.get_os_release_version_id(cfg, pulp_host=None)`  
Get `VERSION_ID` from `/etc/os-release`.

### Parameters

- **cfg** (`pulp_smash.config.PulpSmashConfig`) – Information about the system being targeted.
- **pulp\_host** – A `pulp_smash.config.PulpHost` to target, instead of the default chosen by `pulp_smash.cli.Client`.

**Returns** A string such as “7.5” or “27”. (These values come from RHEL 7.5 and Fedora 27, respectively.) Make sure to convert this string to an actual version object if doing version number comparisons. `packaging.version.Version` can be used for this purpose.

`pulp_smash.utils.get_sha256_checksum(url)`  
Return the sha256 checksum of the file at the given URL.

When a URL is encountered for the first time, do the following:

1. Download the file and calculate its sha256 checksum.
2. Cache the URL-checksum pair.
3. Return the checksum.

On subsequent calls, return a cached checksum.

`pulp_smash.utils.http_get(url, **kwargs)`  
Issue a HTTP request to the `url` and return the response content.

This is useful for downloading file contents over HTTP[S].

### Parameters

- **url** – the URL where the content should be get.
- **kwargs** – additional kwargs to be passed to `requests.get`.

**Returns** the response content of a GET request to `url`.

`pulp_smash.utils.uuid4()`  
Return a random UUID4 as a string.

## 4.16 tests

Location: *Pulp Smash* → *API Documentation* → *tests*

Unit tests for Pulp Smash.

This package and its sub-packages contain tests for Pulp Smash. These tests verify that Pulp Smash's internal functions and libraries function correctly.

## 4.17 *tests.test\_api*

Location: *Pulp Smash* → *API Documentation* → *tests.test\_api*

Unit tests for *pulp\_smash.api*.

**class** `tests.test_api.ClientTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Tests for *pulp\_smash.api.Client*.

**classmethod** `setUpClass()`

Assert methods delegate to *pulp\_smash.api.Client.request()*.

All methods on *pulp\_smash.api.Client*, such as *pulp\_smash.api.Client.delete()*, should delegate to *pulp\_smash.api.Client.request()*. Mock out `request` and call the other methods.

**test\_called\_once()**

Assert each method calls `request` exactly once.

**test\_http\_action()**

Assert each method calls `request` with the right HTTP action.

**class** `tests.test_api.ClientTestCase2` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

More tests for *pulp\_smash.api.Client*.

**test\_json\_arg()**

Assert methods with a `json` argument pass on that argument.

**test\_response\_handler()**

Assert `__init__` saves the `response_handler` argument.

The argument should be saved as an instance attribute.

**class** `tests.test_api.CodeHandlerTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Tests for *pulp\_smash.api.code\_handler()*.

**test\_202\_check\_skipped()**

Assert HTTP 202 responses are not treated specially.

**test\_raise\_for\_status()**

Assert `response.raise_for_status()` is called.

**test\_return()**

Assert the passed-in `response` is returned.

**class** `tests.test_api.EchoHandlerTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Tests for *pulp\_smash.api.echo\_handler()*.

**test\_202\_check\_skipped()**

Assert HTTP 202 responses are not treated specially.

**test\_raise\_for\_status()**  
Assert `response.raise_for_status()` is not called.

**test\_return()**  
Assert the passed-in response is returned.

**class** `tests.test_api.JsonHandlerTestCase` (*methodName='runTest'*)  
Bases: `unittest.case.TestCase`

Tests for `pulp_smash.api.json_handler()`.

**test\_202\_check\_run()**  
Assert HTTP 202 responses are treated specially.

**test\_204\_check\_run()**  
Assert HTTP 204 responses are treated specially.

**test\_raise\_for\_status()**  
Assert `response.raise_for_status()` is called.

**test\_return()**  
Assert the JSON-decoded body of response is returned.

**class** `tests.test_api.PageHandlerTestCase` (*methodName='runTest'*)  
Bases: `unittest.case.TestCase`

Tests for `pulp_smash.api.page_handler()`.

**test\_204\_check\_run()**  
Assert HTTP 204 responses are immediately returned.

**test\_is\_a\_page()**  
Assert paginated responses are collected.

**test\_not\_a\_page()**  
Assert non-paginated responses are immediately returned.

**test\_pulp\_2\_error()**  
Assert this handler can't be used with Pulp 2.

**class** `tests.test_api.SafeHandlerTestCase` (*methodName='runTest'*)  
Bases: `unittest.case.TestCase`

Tests for `pulp_smash.api.safe_handler()`.

**test\_202\_check\_run()**  
Assert HTTP 202 responses are treated specially.

**test\_raise\_for\_status()**  
Assert `response.raise_for_status()` is called.

**test\_return()**  
Assert the passed-in response is returned.

## 4.18 *tests.test\_cli*

Location: *Pulp Smash* → *API Documentation* → *tests.test\_cli*

Unit tests for `pulp_smash.cli`.

**class** `tests.test_cli.ClientTestCase` (*methodName='runTest'*)  
Bases: `unittest.case.TestCase`



Tests for `pulp_smash.cli.Client`.

**test\_default\_response\_handler()**

Assert the default response handler checks return codes.

**test\_explicit\_local\_transport()**

Assert it is possible to explicitly ask for a “local” transport.

**test\_explicit\_pulp\_host()**

Assert it is possible to explicitly target a pulp cli PulpHost.

**test\_explicit\_response\_handler()**

Assert it is possible to explicitly set a response handler.

**test\_implicit\_local\_transport()**

Assert it is possible to implicitly ask for a “local” transport.

**test\_implicit\_pulp\_host()**

Assert it is possible to implicitly target a pulp cli PulpHost.

**test\_run()**

Test run commands.

**test\_run\_as\_sudo()**

Test run commands as sudo.

**class tests.test\_cli.CodeHandlerTestCase** (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Tests for `pulp_smash.cli.code_handler()`.

**classmethod setUpClass()**

Call the function under test, and record inputs and outputs.

**test\_check\_returncode()**

Assert `completed_proc.check_returncode()` is not called.

**test\_input\_returned()**

Assert the passed-in `completed_proc` is returned.

**class tests.test\_cli.CompletedProcessTestCase** (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Tests for `pulp_smash.cli.CompletedProcess`.

**setUp()**

Generate kwargs that can be used to instantiate a completed proc.

**test\_can\_eval()**

Assert `__repr__()` can be parsed by `eval()`.

**test\_check\_returncode\_nonzero()**

Call `check_returncode` when returncode is not zero.

**test\_check\_returncode\_zero()**

Call `check_returncode` when returncode is zero.

**test\_init()**

Assert all constructor arguments are saved as instance attrs.

**class tests.test\_cli.EchoHandlerTestCase** (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Tests for `pulp_smash.cli.echo_handler()`.

**classmethod setUpClass()**

Call the function under test, and record inputs and outputs.

**test\_check\_returncode()**

Assert `completed_proc.check_returncode()` is not called.

**test\_input\_returned()**

Assert the passed-in `completed_proc` is returned.

**class** `tests.test_cli.IsRootTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Tests for `pulp_smash.cli.is_root`.

**test\_negative()**

Test what happens when we aren't root on the target host.

**test\_positive()**

Test what happens when we are root on the target host.

**class** `tests.test_cli.PackageManagerTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Tests for `pulp_smash.cli.PackageManager`.

**classmethod setUpClass()**

Set common cfg for all tests.

**test\_apply\_erratum()**

Test apply erratum is called for supported package managers.

**test\_install()**

Test client is called with installation command.

**test\_package\_manager\_name()**

Test the property `name` returns the proper Package Manager.

**test\_raise\_if\_unsupported()**

Test if proper exception raises on `raise_if_unsupported`.

**test\_raise\_no\_known\_package\_manager()**

Test if invalid package manager throws exception.

**test\_uninstall()**

Test client is called with uninstallation command.

**test\_upgrade()**

Test client is called with upgrade command.

## 4.19 `tests.test_config`

Location: *Pulp Smash* → *API Documentation* → *tests.test\_config*

Unit tests for `pulp_smash.config`.

**class** `tests.test_config.GetConfigFileLoadPathTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Test `pulp_smash.config.PulpSmashConfig.get_load_path()`.

**test\_failures()**

Assert the method raises an exception when no config is found.

```

test_success ()
    Assert the method returns a path when a config file is found.

class tests.test_config.GetConfigTestCase (methodName='runTest')
    Bases: unittest.case.TestCase

    Test pulp_smash.config.get_config().

test_cache_empty ()
    A config is loaded from disk if the cache is empty.

test_cache_full ()
    No config is loaded from disk if the cache is populated.

class tests.test_config.GetRequestsKwargsTestCase (methodName='runTest')
    Bases: unittest.case.TestCase

    Test pulp_smash.config.PulpSmashConfig.get_requests_kwargs().

    classmethod setUpClass ()
        Create a mock server config and call the method under test.

test_cfg_auth ()
    Assert that the method does not alter the config's auth.

test_kwargs ()
    Assert that the method returns correct values.

test_kwargs_auth ()
    Assert that the method converts auth to a tuple.

class tests.test_config.HelperMethodsTestCase (methodName='runTest')
    Bases: unittest.case.TestCase

    Test pulp_smash.config.PulpSmashConfig() helper methods.

    setUp ()
        Generate contents for a configuration file.

test_get_hosts ()
    get_hosts returns proper result.

test_get_services ()
    get_services returns proper result.

class tests.test_config.LoadTestCase (methodName='runTest')
    Bases: unittest.case.TestCase

    Test pulp_smash.config.PulpSmashConfig.load().

    do_validate (cfg)
        Validate the attributes of a configuration object.

test_load_config_file ()
    Ensure Pulp Smash can load the config file.

test_load_old_config_file ()
    Ensure Pulp Smash can load the config file.

class tests.test_config.PulpSmashConfigFileTestCase (methodName='runTest')
    Bases: unittest.case.TestCase

    Verify the PULP_SMASH_CONFIG_FILE environment var is respected.

```

**test\_var\_set ()**  
Set the environment variable.

**test\_var\_unset ()**  
Do not set the environment variable.

**class** tests.test\_config.ReprTestCase (*methodName='runTest'*)  
Bases: unittest.case.TestCase  
Test calling repr on a *pulp\_smash.config.PulpSmashConfig*.

**classmethod setUpClass ()**  
Generate attributes and call the method under test.

**test\_can\_eval ()**  
Assert that the result can be parsed by eval.

**test\_is\_sane ()**  
Assert that the result is in an expected set of results.

**class** tests.test\_config.ValidateConfigTestCase (*methodName='runTest'*)  
Bases: unittest.case.TestCase  
Test *pulp\_smash.config.validate\_config()*.

**test\_config\_missing\_roles ()**  
Missing required roles in config raises an exception.

**test\_invalid\_config ()**  
An invalid config raises an exception.

**test\_valid\_config ()**  
A valid config does not raise an exception.

tests.test\_config.pulp\_smash\_config\_load (*config\_str*)  
Load an in-memory configuration file.

**Parameters** *config\_str* – A string. An in-memory configuration file.

**Returns** A *pulp\_smash.config.PulpSmashConfig* object, populated from the configuration file.

## 4.20 tests.test\_pulp2\_utils

Location: *Pulp Smash* → *API Documentation* → *tests.test\_pulp2\_utils*

Unit tests for *pulp\_smash.pulp2\_utils*.

**class** tests.test\_pulp2\_utils.BaseAPITestCaseTestCase (*methodName='runTest'*)  
Bases: unittest.case.TestCase  
Test *pulp\_smash.pulp2\_utils.BaseAPITestCase*.

**classmethod setUpClass ()**  
Define a child class. Call setup and teardown methods on it.

We define a child class in order to avoid altering *pulp\_smash.pulp2\_utils.BaseAPITestCase*. Calling class methods on it would do so.

**test\_set\_up\_class ()**  
Assert method setUpClass creates correct class attributes.

Verify that the method creates attributes named *cfg* and *resources*.

**test\_tear\_down\_class()**

Call method `tearDownClass`, and assert it deletes each resource.

`pulp_smash.api.Client.delete()` should be called once for each resource listed in resources, and once for `pulp_smash.pulp2.constants.ORPHANS_PATH`.

**class** `tests.test_pulp2_utils.GetBrokerTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Test `pulp_smash.pulp2_utils.get_broker()`.

**test\_failure()**

Fail to generate a broker service management object.

Assert that `pulp_smash.exceptions.NoKnownBrokerError` is raised if the function cannot find a broker.

**test\_success()**

Successfully generate a broker service management object.

Assert that:

- `get_broker(...)` returns a string.
- The `cfg` argument is passed to the service object.
- The “qpidd” broker is the preferred broker.

**class** `tests.test_pulp2_utils.PulpAdminLoginTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Test `pulp_smash.pulp2_utils.pulp_admin_login()`.

**test\_run()**

Assert the function executes `cli.Client.run`.

**class** `tests.test_pulp2_utils.SearchUnitsTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Test `pulp_smash.pulp2_utils.search_units()`.

**test\_defaults()**

Verify that default parameters are correctly set.

**class** `tests.test_pulp2_utils.SyncRepoTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Test `pulp_smash.pulp2_utils.sync_repo()`.

**test\_post()**

Assert the function makes an HTTP POST request.

**class** `tests.test_pulp2_utils.UploadImportErratumTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Test `pulp_smash.pulp2_utils.upload_import_erratum()`.

**test\_post()**

Assert the function makes an HTTP POST request.

**class** `tests.test_pulp2_utils.UploadImportUnitTestCase` (*methodName='runTest'*)

Bases: `unittest.case.TestCase`

Test `pulp_smash.pulp2_utils.upload_import_unit()`.

**test\_post ()**  
Assert the function makes an HTTP POST request.

## 4.21 *tests.test\_pulp3\_utils*

Location: *Pulp Smash* → *API Documentation* → *tests.test\_pulp3\_utils*

Unit tests for `pulp_smash.pulp3.utils`.

**class** `tests.test_pulp3_utils.GenTestCase` (*methodName='runTest'*)  
Bases: `unittest.case.TestCase`

Tests the *gen\_* functions.

**test\_gen\_distribution ()**  
Tests the generation of a distribution dict.

**test\_gen\_publisher ()**  
Tests the generation of a publisher dict.

**test\_gen\_remote ()**  
Tests the generation of a remote dict.

**test\_gen\_repo ()**  
Tests the generation of a repository dict.

**test\_sync ()**  
Test HTTP POST request for sync.

## 4.22 *tests.test\_pulp\_smash\_cli*

Location: *Pulp Smash* → *API Documentation* → *tests.test\_pulp\_smash\_cli*

Unit tests for `pulp_smash.pulp_smash_cli`.

**class** `tests.test_pulp_smash_cli.BasePulpSmashCliTestCase` (*methodName='runTest'*)  
Bases: `unittest.case.TestCase`

Base class for all `pulp_smash_cli` tests.

**setUp ()**  
Configure a `CliRunner`.

**class** `tests.test_pulp_smash_cli.MissingSettingsFileMixin`  
Bases: `object`

Test missing settings file.

Classes that inherit from this mixin should provide the `settings_subcommand` attribute set to the settings subcommand to run.

**test\_missing\_settings\_file ()**  
Ensure show outputs proper settings file.

**class** `tests.test_pulp_smash_cli.SettingsCreateTestCase` (*methodName='runTest'*)  
Bases: `tests.test_pulp_smash_cli.BasePulpSmashCliTestCase`

Test `pulp_smash.pulp_smash_cli.settings_create` command.

```

setUp()
    Generate a default expected config dict.

test_create_defaults_and_verify()
    Create settings file with defaults and custom SSL certificate.

test_create_other_values()
    Create settings file with custom values.

test_create_with_defaults()
    Create settings file with default values values.

test_settings_already_exists()
    Create settings file by overriding existing one.

class tests.test_pulp_smash_cli.SettingsLoadPathTestCase (methodName='runTest')
    Bases: tests.test_pulp_smash_cli.BasePulpSmashCliTestCase, tests.test_pulp_smash_cli.MissingSettingsFileMixin
    Test pulp_smash.pulp_smash_cli.settings_load_path command.

    settings_subcommand = 'load-path'

test_settings_load_path()
    Ensure load-path outputs proper settings file path.

class tests.test_pulp_smash_cli.SettingsPathTestCase (methodName='runTest')
    Bases: tests.test_pulp_smash_cli.BasePulpSmashCliTestCase, tests.test_pulp_smash_cli.MissingSettingsFileMixin
    Test pulp_smash.pulp_smash_cli.settings_path command.

    settings_subcommand = 'path'

test_settings_path()
    Ensure path outputs proper settings file path.

class tests.test_pulp_smash_cli.SettingsSavePathTestCase (methodName='runTest')
    Bases: tests.test_pulp_smash_cli.BasePulpSmashCliTestCase
    Test pulp_smash.pulp_smash_cli.settings_save_path command.

test_settings_save_path()
    Ensure save-path outputs proper settings file path.

class tests.test_pulp_smash_cli.SettingsShowTestCase (methodName='runTest')
    Bases: tests.test_pulp_smash_cli.BasePulpSmashCliTestCase, tests.test_pulp_smash_cli.MissingSettingsFileMixin
    Test pulp_smash.pulp_smash_cli.settings_show command.

    settings_subcommand = 'show'

test_settings_show()
    Ensure show outputs proper settings file.

class tests.test_pulp_smash_cli.SettingsValidateTestCase (methodName='runTest')
    Bases: tests.test_pulp_smash_cli.BasePulpSmashCliTestCase, tests.test_pulp_smash_cli.MissingSettingsFileMixin
    Test pulp_smash.pulp_smash_cli.settings_validate command.

    settings_subcommand = 'validate'

```

**test\_invalid\_config()**  
Ensure validate fails on invalid config file schema.

**test\_valid\_config()**  
Ensure validate does not complain about valid settings.

## 4.23 tests.test\_selectors

Location: *Pulp Smash* → *API Documentation* → *tests.test\_selectors*

Unit tests for *pulp\_smash.selectors*.

**class** tests.test\_selectors.**BugIsFixedTestCase** (*methodName='runTest'*)

Bases: unittest.case.TestCase

Test *pulp\_smash.selectors.bug\_is\_fixed()*.

**test\_connection\_error()**  
Make the dependent function raise a connection error.

**test\_testable\_status()**  
Assert the method correctly handles “testable” bug statuses.

**test\_unknown\_status()**  
Assert the method correctly handles an unknown bug status.

**test\_untestable\_status()**  
Assert the method correctly handles “untestable” bug statuses.

**class** tests.test\_selectors.**ConvertTPRTestCase** (*methodName='runTest'*)

Bases: unittest.case.TestCase

Test method *\_convert\_tpr*.

**test\_empty\_version\_string()**  
Assert *version\_string* is converted if it is an empty string.

**test\_invalid\_version\_string()**  
Assert an exception is raised if *version\_string* is invalid.

**test\_valid\_version\_string()**  
Assert *version\_string* is converted if it is valid.

**class** tests.test\_selectors.**GetBugTestCase** (*methodName='runTest'*)

Bases: unittest.case.TestCase

Test method *\_get\_bug*.

**test\_invalid\_bug\_id()**  
Assert an exception is raised if *bug\_id* isn't an integer.

**class** tests.test\_selectors.**GetTPRTestCase** (*methodName='runTest'*)

Bases: unittest.case.TestCase

Test method *\_get\_tpr*.

**test\_failure()**  
Assert the method raises the correct exception no TPR is present.

**test\_success()**  
Assert the method returns the target platform release if present.



```

class tests.test_selectors.SkipIfConditionTestCase (methodName='runTest')
    Bases: unittest.case.TestCase
    Test :meth: pulp_smash.selectors.skip_if.

class DummyTestClass
    Bases: object
    A Dummy Test Class.

    test_should_run()
        skip_if should not skip this method.

    test_should_skip()
        skip_if should skip this method.

test_skip_false()
    Make @skip_if continue without raising an exception.

test_skip_true()
    Make @skip_if raise an exception.

```

## 4.24 *tests.test\_utils*

Location: *Pulp Smash* → *API Documentation* → *tests.test\_utils*

Unit tests for *pulp\_smash.utils*.

```

class tests.test_utils.FipsIsEnabledTestCase (methodName='runTest')
    Bases: unittest.case.TestCase
    Test :func: pulp_smash.utils.fips_is_enabled.

    test_return_false()
        Assert False is returned if the crypto.fips_enabled is not enabled in sysctl.

    test_return_true()
        Assert true is returned if the crypto.fips_enabled is enabled in sysctl.

class tests.test_utils.FipsIsSupportedtestCase (methodName='runTest')
    Bases: unittest.case.TestCase
    Test :func: pulp_smash.utils.fips_is_supported.

    test_return_false()
        Assert false is returned if Called process Error Exception is thrown.

    test_return_true()
        Assert true is returned if the crypto.fips_enabled is supported by sysctl.

class tests.test_utils.GetOsReleaseTestCase (methodName='runTest')
    Bases: unittest.case.TestCase
    Test the get_os_release_* functions.

    These tests are very simple: they just make sure that the string returned by the used pulp_smash.cli.
    Client object is stripped and returned.

    test_get_os_release_id()
        Test pulp_smash.utils.get_os_release_id().

    test_get_os_release_version_id()
        Test pulp_smash.utils.get_os_release_version_id().

```

```
class tests.test_utils.GetSha256ChecksumTestCase (methodName='runTest')
    Bases: unittest.case.TestCase

    Test pulp_smash.utils.get_sha256_checksum().

test_all()
    Call the function three times, with two URLs.

    Call the function with the first URL, the second URL and the first URL again. Verify that:
        

- No download is attempted during the third call.
- The first and second calls return different checksums.
- The first and third calls return identical checksums.

class tests.test_utils.IsRootTestCase (methodName='runTest')
    Bases: unittest.case.TestCase

    Test pulp_smash.cli.is_root.

test_false()
    Assert the method returns False when non-root.

test_true()
    Assert the method returns True when root.

class tests.test_utils.UUID4TestCase (methodName='runTest')
    Bases: unittest.case.TestCase

    Test pulp_smash.utils.uuid4().

test_type()
    Assert the method returns a unicode string.
```

## CHAPTER 5

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### Changelog

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Location: *Pulp Smash* → *Changelog*

Version 1 has not yet been released.



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