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# **kubernetes-python-client Documentation**

**Kubernetes**

**Aug 16, 2021**



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Contents:



Python client for the `kubernetes` API.

### 1.1 Installation

From source:

```
git clone --recursive https://github.com/kubernetes-client/python.git
cd python
python setup.py install
```

From PyPI directly:

```
pip install kubernetes
```

### 1.2 Examples

list all pods:

```
from kubernetes import client, config

# Configs can be set in Configuration class directly or using helper utility
config.load_kube_config()

v1 = client.CoreV1Api()
print("Listing pods with their IPs:")
ret = v1.list_pod_for_all_namespaces(watch=False)
for i in ret.items:
    print("%s\t%s\t%s" % (i.status.pod_ip, i.metadata.namespace, i.metadata.name))
```

watch on namespace object:

```
from kubernetes import client, config, watch

# Configs can be set in Configuration class directly or using helper utility
config.load_kube_config()

v1 = client.CoreV1Api()
count = 10
w = watch.Watch()
for event in w.stream(v1.list_namespace, _request_timeout=60):
    print("Event: %s %s" % (event['type'], event['object'].metadata.name))
    count -= 1
    if not count:
        w.stop()

print("Ended.")
```

More examples can be found in [examples](#) folder. To run examples, run this command:

```
python -m examples.example1
```

(replace `example1` with one of the filenames in the `examples` folder)

## 1.3 Documentation

All APIs and Models' documentation can be found at the [Generated client's README file](#)

## 1.4 Compatibility

`client-python` follows [semver](#), so until the major version of `client-python` gets increased, your code will continue to work with explicitly supported versions of Kubernetes clusters.

### 1.4.1 Compatibility matrix of supported client versions

- `client 9.y.z`: Kubernetes 1.12 or below (+-), Kubernetes 1.13 (✓), Kubernetes 1.14 or above (+-)
- `client 10.y.z`: Kubernetes 1.13 or below (+-), Kubernetes 1.14 (✓), Kubernetes 1.14 or above (+-)
- `client 11.y.z`: Kubernetes 1.14 or below (+-), Kubernetes 1.15 (✓), Kubernetes 1.16 or above (+-)
- `client 12.y.z`: Kubernetes 1.15 or below (+-), Kubernetes 1.16 (✓), Kubernetes 1.17 or above (+-)
- `client 17.y.z`: Kubernetes 1.16 or below (+-), Kubernetes 1.17 (✓), Kubernetes 1.18 or above (+-)
- `client 18.y.z`: Kubernetes 1.17 or below (+-), Kubernetes 1.18 (✓), Kubernetes 1.19 or above (+-)

See [here](#) for an explanation of why there is no v13-v16 release.

Key:

- ✓ Exactly the same features / API objects in both `client-python` and the Kubernetes version.
- + `client-python` has features or API objects that may not be present in the Kubernetes cluster, either due to that `client-python` has additional new API, or that the server has removed old API. However, everything they have in



common (i.e., most APIs) will work. Please note that alpha APIs may vanish or change significantly in a single release.

- – The Kubernetes cluster has features the client-python library can't use, either due to the server has additional new API, or that client-python has removed old API. However, everything they share in common (i.e., most APIs) will work.

See the [CHANGELOG](#) for a detailed description of changes between client-python versions.

See [here](#) for an explanation of why there is no v13-v16 release.

Key:

- ✓ Changes in main Kubernetes repo are manually (**should be automated**) published to client-python when they are available.
- No longer maintained; please upgrade.

Kubernetes supports [three minor releases](#) at a time. “Support” means we expect users to be running that version in production, though we may not port fixes back before the latest minor version. For example, when v1.3 comes out, v1.0 will no longer be supported. In consistent with Kubernetes support policy, we expect to support **three GA major releases** (corresponding to three Kubernetes minor releases) at a time.

Note: There would be no maintenance for alpha/beta releases except the latest one.

**Exception to the above support rule:** Since we are running behind on releases, we will support Alpha/Beta releases for a greater number of clients until we catch up with the upstream version.

## 1.5 Homogenizing the Kubernetes Python Client versions

The client releases v12 and before following a versioning schema where the major version was 4 integer positions behind the Kubernetes minor on which the client is based on. For example, v12.0.0 is based on Kubernetes v1.16, v11.0.0 is based on Kubernetes v1.15 and so on.

This created a lot of confusion tracking two different version numbers for each client release. It was decided to homogenize the version scheme starting from the Kubernetes Python client based on Kubernetes v1.17. The versioning scheme of the client from this release would be vY.Z.P where Y and Z are the Kubernetes minor and patch release numbers from Kubernetes v1.Y.Z and P is the client specific patch release numbers to accomodate changes and fixes done specifically to the client. For more details, refer [this issue](#).

## 1.6 Community, Support, Discussion

If you have any problem on using the package or any suggestions, please start with reaching the [Kubernetes clients slack channel](#), or filing an [issue](#) to let us know. You can also reach the maintainers of this project at [SIG API Machinery](#), where this project falls under.

### 1.6.1 Code of Conduct

Participation in the Kubernetes community is governed by the [CNCF Code of Conduct](#).

## 1.7 Troubleshooting

### 1.7.1 SSLError on macOS

If you get an `SSLError`, you likely need to update your version of python. The version that ships with macOS may not be supported.

Install the latest version of python with `brew`:

```
brew install python
```

Once installed, you can query the version of OpenSSL like so:

```
python -c "import ssl; print ssl.OPENSSL_VERSION"
```

You'll need a version with OpenSSL version 1.0.0 or later.

### 1.7.2 Hostname doesn't match

If you get an `ssl.CertificateError` complaining about hostname match, your installed packages does not meet version requirements. Specifically check `ipaddress` and `urllib3` package versions to make sure they met requirements in `requirements.txt` file.

### 1.7.3 Why Exec/Attach calls doesn't work

Starting from 4.0 release, we do not support directly calling `exec` or `attach` calls. you should use `stream` module to call them. so instead of `resp = api.connect_get_namespaced_pod_exec(name, ...)` you should call `resp = stream(api.connect_get_namespaced_pod_exec, name, ...)`

Using `Stream` will overwrite the requests protocol in `core_v1_api.CoreV1Api()` This will cause a failure in non-`exec/attach` calls. If you reuse your api client object, you will need to recreate it between api calls that use `stream` and other api calls.

See more at [exec example](#).

## CHAPTER 2

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### Installation

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At the command line:

```
$ pip install kubernetes
```

Or, if you have virtualenvwrapper installed:

```
$ mkvirtualenv kubernetes  
$ pip install kubernetes
```



The directory `examples` contains a few examples on how to use the client.

### 3.1 Deployments

Here is a simple usage of creating a deployment from a yaml file:

The following example demonstrates how to create, update and delete deployments without the need to read a file from the disk:



## 4.1 kubernetes package

### 4.1.1 Subpackages

kubernetes.client package

#### Subpackages

kubernetes.client.apis package

#### Submodules

kubernetes.client.apis.apis\_api module

kubernetes.client.apis.apps\_api module

kubernetes.client.apis.apps\_v1beta1\_api module

kubernetes.client.apis.authentication\_api module

kubernetes.client.apis.authentication\_v1beta1\_api module

kubernetes.client.apis.authorization\_api module

kubernetes.client.apis.authorization\_v1beta1\_api module

`kubernetes.client.apis.autoscaling_api` module

`kubernetes.client.apis.autoscaling_v1_api` module

`kubernetes.client.apis.batch_api` module

`kubernetes.client.apis.batch_v1_api` module

`kubernetes.client.apis.batch_v2alpha1_api` module

`kubernetes.client.apis.certificates_api` module

`kubernetes.client.apis.certificates_v1alpha1_api` module

`kubernetes.client.apis.core_api` module

`kubernetes.client.apis.core_v1_api` module

`kubernetes.client.apis.extensions_api` module

`kubernetes.client.apis.extensions_v1beta1_api` module

`kubernetes.client.apis.logs_api` module

`kubernetes.client.apis.policy_api` module

`kubernetes.client.apis.policy_v1beta1_api` module

`kubernetes.client.apis.rbac_authorization_api` module

`kubernetes.client.apis.rbac_authorization_v1alpha1_api` module

`kubernetes.client.apis.storage_api` module

`kubernetes.client.apis.storage_v1beta1_api` module

`kubernetes.client.apis.version_api` module

Module contents

`kubernetes.client.models` package

Submodules

`kubernetes.client.models.intstr_int_or_string` module



`kubernetes.client.models.resource_quantity` module

`kubernetes.client.models.runtime_raw_extension` module

`kubernetes.client.models.unversioned_api_group` module

`kubernetes.client.models.unversioned_api_group_list` module

`kubernetes.client.models.unversioned_api_resource` module

`kubernetes.client.models.unversioned_api_resource_list` module

`kubernetes.client.models.unversioned_api_versions` module

`kubernetes.client.models.unversioned_group_version_for_discovery` module

`kubernetes.client.models.unversioned_label_selector` module

`kubernetes.client.models.unversioned_label_selector_requirement` module

`kubernetes.client.models.unversioned_list_meta` module

`kubernetes.client.models.unversioned_server_address_by_client_cidr` module

`kubernetes.client.models.unversioned_status` module

`kubernetes.client.models.unversioned_status_cause` module

`kubernetes.client.models.unversioned_status_details` module

`kubernetes.client.models.unversioned_time` module

`kubernetes.client.models.v1_attached_volume` module

`kubernetes.client.models.v1_aws_elastic_block_store_volume_source` module

`kubernetes.client.models.v1_azure_disk_volume_source` module

`kubernetes.client.models.v1_azure_file_volume_source` module

`kubernetes.client.models.v1_binding` module

`kubernetes.client.models.v1_capabilities` module

`kubernetes.client.models.v1_ceph_fs_volume_source` module

kubernetes.client.models.v1\_cinder\_volume\_source module

kubernetes.client.models.v1\_component\_condition module

kubernetes.client.models.v1\_component\_status module

kubernetes.client.models.v1\_component\_status\_list module

kubernetes.client.models.v1\_config\_map module

kubernetes.client.models.v1\_config\_map\_key\_selector module

kubernetes.client.models.v1\_config\_map\_list module

kubernetes.client.models.v1\_config\_map\_volume\_source module

kubernetes.client.models.v1\_container module

kubernetes.client.models.v1\_container\_image module

kubernetes.client.models.v1\_container\_port module

kubernetes.client.models.v1\_container\_state module

kubernetes.client.models.v1\_container\_state\_running module

kubernetes.client.models.v1\_container\_state\_terminated module

kubernetes.client.models.v1\_container\_state\_waiting module

kubernetes.client.models.v1\_container\_status module

kubernetes.client.models.v1\_cross\_version\_object\_reference module

kubernetes.client.models.v1\_daemon\_endpoint module

kubernetes.client.models.v1\_delete\_options module

kubernetes.client.models.v1\_downward\_api\_volume\_file module

kubernetes.client.models.v1\_downward\_api\_volume\_source module

kubernetes.client.models.v1\_empty\_dir\_volume\_source module

kubernetes.client.models.v1\_endpoint\_address module

kubernetes.client.models.v1\_endpoint\_port module

kubernetes.client.models.v1\_endpoint\_subset module

kubernetes.client.models.v1\_endpoints module

kubernetes.client.models.v1\_endpoints\_list module

kubernetes.client.models.v1\_env\_var module

kubernetes.client.models.v1\_env\_var\_source module

kubernetes.client.models.v1\_event module

kubernetes.client.models.v1\_event\_list module

kubernetes.client.models.v1\_event\_source module

kubernetes.client.models.v1\_exec\_action module

kubernetes.client.models.v1\_fc\_volume\_source module

kubernetes.client.models.v1\_flex\_volume\_source module

kubernetes.client.models.v1\_flocker\_volume\_source module

kubernetes.client.models.v1\_gce\_persistent\_disk\_volume\_source module

kubernetes.client.models.v1\_git\_repo\_volume\_source module

kubernetes.client.models.v1\_glusterfs\_volume\_source module

kubernetes.client.models.v1\_handler module

kubernetes.client.models.v1\_horizontal\_pod\_autoscaler module

kubernetes.client.models.v1\_horizontal\_pod\_autoscaler\_list module

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kubernetes.client.models.v1\_horizontal\_pod\_autoscaler\_status module

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`kubernetes.client.models.v1beta1_subresource_reference` module

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`kubernetes.client.models.v1beta1_token_review_spec` module

`kubernetes.client.models.v1beta1_token_review_status` module

`kubernetes.client.models.v1beta1_user_info` module

`kubernetes.client.models.v2alpha1_cron_job` module

`kubernetes.client.models.v2alpha1_cron_job_list` module

`kubernetes.client.models.v2alpha1_cron_job_spec` module

`kubernetes.client.models.v2alpha1_cron_job_status` module

`kubernetes.client.models.v2alpha1_job` module

`kubernetes.client.models.v2alpha1_job_condition` module

`kubernetes.client.models.v2alpha1_job_list` module

`kubernetes.client.models.v2alpha1_job_spec` module

`kubernetes.client.models.v2alpha1_job_status` module

`kubernetes.client.models.v2alpha1_job_template_spec` module

`kubernetes.client.models.version_info` module

`kubernetes.client.models.versioned_event` module

Module contents

Submodules

`kubernetes.client.api_client` module

`kubernetes.client.configuration` module

`kubernetes.client.rest` module

Module contents

`kubernetes.config` package

Submodules

`kubernetes.config.config_exception` module

`kubernetes.config.incluster_config` module

`kubernetes.config.incluster_config_test` module

`kubernetes.config.kube_config` module

`kubernetes.config.kube_config_test` module

Module contents

`kubernetes.test` package

Submodules

`kubernetes.test.test_apis_api` module

`kubernetes.test.test_apps_api` module

`kubernetes.test.test_apps_v1beta1_api` module

kubernetes.test.test\_authentication\_api module

kubernetes.test.test\_authentication\_v1beta1\_api module

kubernetes.test.test\_authorization\_api module

kubernetes.test.test\_authorization\_v1beta1\_api module

kubernetes.test.test\_autoscaling\_api module

kubernetes.test.test\_autoscaling\_v1\_api module

kubernetes.test.test\_batch\_api module

kubernetes.test.test\_batch\_v1\_api module

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**Module contents**

`kubernetes.watch` package

**Submodules**

`kubernetes.watch.watch` module

`kubernetes.watch.watch_test` module

**Module contents**

#### **4.1.2 Module contents**



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## Contributing Guidelines

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### 5.1 How to become a contributor and submit your own code

#### 5.1.1 Contributor License Agreements

We'd love to accept your patches! Before we can take them, we have to jump a couple of legal hurdles.

Please fill out either the individual or corporate Contributor License Agreement (CLA).

- If you are an individual writing original source code and you're sure you own the intellectual property, then you'll need to sign an [individual CLA](#).
- If you work for a company that wants to allow you to contribute your work, then you'll need to sign a [corporate CLA](#).

Follow either of the two links above to access the appropriate CLA and instructions for how to sign and return it. Once we receive it, we'll be able to accept your pull requests.

### 5.2 Composition of This Repository and Where/How to Contribute

The Kubernetes Python client consists of this main repository (repo) and the base repo, the [python-base](#) repository. The main repository contains mostly files that are generated by the OpenAPI generator from [this OpenAPI spec](#). The base repo is the utility part of the python client and allows developers to create their own kubernetes clients. The base repo is a submodule of the main repo.

#### 5.2.1 Where to Submit Your Patch

The following folders are automatically generated. You will need to submit a patch to the upstream Kubernetes repo [kubernetes](#) or the OpenAPI generator repo [openapi-generator](#).

- [kubernetes/client](#)

- [kubernetes/test](#)
- [kubernetes/docs](#).

In this main repo, the following folders contain developer written codes and the patches should be submitted as pull requests here:

- [kubernetes/e2e\\_test](#)
- [kubernetes/utills](#)
- [examples](#)
- [scripts](#).

The following folders and symbolic links in this main repo are in fact from the base repo. The base repo contains developer written codes only. The patches should be sent to the base repo instead:

- [kubernetes/base](#)
- [kubernetes/config](#)
- [kubernetes/stream](#)
- [kubernetes/watch](#).

### 5.2.2 Contributing A Patch

1. Submit an issue describing your proposed change to the repo in question.
2. The [repo owners](#) will respond to your issue promptly.
3. If your proposed change is accepted, and you haven't already done so, sign a Contributor License Agreement (see details above).
4. Fork the desired repo, develop and test your code changes. Add a test if possible.
5. Submit a pull request.

### 5.2.3 Adding Dependencies

If your patch depends on new packages, add those packages to [requirements.txt](#) and/or [setup.py](#). If these package are for testing only, add those to [test-requirements.txt](#).

### 5.2.4 Commits

Generally we would like to see one commit per pull request. However, if the pull request is reasonably large, the PR can be divided into several commits that make logical sense. The commit message should be clear and indicative of the aim of the fix. Sometimes multiple commits in a single pull request is acceptable if it meets the [Kubernetes pull request guidelines](#).

If you have several commits in a pull request and have been asked to squash your commits, please use `git reset --soft HEAD~N_COMMITS` and commit again to make your PR a single commit.

### 5.2.5 Windows Developers

The symbolic links contained in this repo do not work for Windows operating systems. If you are a Windows developer, please run the [fix](#) inside the [scripts](#) folder or manually copy the content of the [kubernetes/base](#) folder into the [kubernetes](#) folder.

## 5.2.6 Writing Tests

In addition to running the fix yourself and telling us that your fix works, you can demonstrate that your fix really works by using unit tests and end to end tests. Tests are mainly located in three places. You should put your tests into the places that they fit in.

1. **Generated tests** by OpenAPI generator: these tests should pass and do not require modification.
2. **End to end tests**: these are tests that can only be verified with a live kubernetes server.
3. **Base repo tests** in the `base` repo, in which the test files are named `test_*.py`: These tests use the package `Mock` and confirms the functionality of the base repo files.

## 5.2.7 Coding Style

We use an automatic coding style checker by using the `diff` of the `autopep8` output and your code file. To make sure that your code passes the coding style checker, run `autopep8 --in-place --aggressive --aggressive your_code.py` before committing and submitting.

## 5.3 Running Tests Locally

If you write a new end to end (e2e) test, or change behaviors that affect e2e tests, you should set up a local cluster and test them on your machine. The following steps will help you run the unit tests.

1. Acquire a local cluster. `Minikube` is a good choice for Windows and Linux developers. Alternatively if you are on Linux, you can clone the `kubernetes` repo and run `install-etcd.sh` and then `local-up-cluster.sh` to get a local cluster up and running.
2. Run the unit tests. In the root directory of the main repo, run `python -m unittest discover`.
3. Check the test results and make corresponding fixes.

## 5.4 Update the Base Submodule in the Main Repo After Your python-base PR Is Merged

Your contribution to the base repo will not be automatically reflected in the main repo after your PR is merged. Instead, please update the `base` submodule in your fork of the main repo as follows:

```
$ git submodule update --remote
```

You may now add a release note to `CHANGELOG.md` if needed and then commit and push to your fork. You can now send a PR to this main repo to complete your contribution.



## CHAPTER 6

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### Indices and tables

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- `genindex`
- `modindex`
- `search`