
pydocket Documentation

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Note: Pydocker is in alpha and under active development.

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This goal of **pydocker** is to make it seamless to work on a docker container on your laptop like you would with your normal environment. This means it handles passing all of your credentials (SSH key, Google, etc) and mounting a directory of your choosing from the host machine to the container, and sets up port forwarding so that you can still use notebooks. It supports local images, Google Container Repository, or anywhere docker can pull from.

1.1 Get Started

(Note: These instructions currently OSX specifix because of brew but does work on other OSes.)

Before you install the library there are some minimal environment setup steps.

1.1.1 Docker setup

Install and start Docker:

```
brew cask install docker
open /Applications/Docker.app
```

Build Example Image

Dockerfile

```
FROM google/cloud-sdk:slim
RUN pip install jupyterlab notebook pandas
RUN /bin/echo -e '#!/bin/bash\njupyter notebook --notebook-dir="/" --ip=0.0.0.0 --\n↪allow-root --NotebookApp.token=""' > /usr/bin/notebook && \
    chmod +x /usr/bin/notebook && \
    /bin/echo -e '#!/bin/bash\njupyter lab --notebook-dir="/" --ip=0.0.0.0 --allow-\n↪root --NotebookApp.token=""' > /usr/bin/lab && \
    chmod +x /usr/bin/lab
WORKDIR /current
CMD notebook
```

This Dockerfile uses the current directory as the workspace, and will look for all files there and the build command, `docker build -t notebook -f Dockerfile .`, will create a local docker image called **Notebook**, which

uses the *google/cloud-sdk* as a base image. The Dockerfile also then makes a couple of small scripts to make it easier to launch notebooks or jupyterlab.

1.1.2 Install pydocker

```
pip install sq-pydocker
```

Setup ssh for pydocker

```
pydocker init
```

This will copy your ssh keys, and create a new config based on your main square config, but modified because of running in a docker container. This only needs to be run the first time.

1.1.3 Using pydocker

```
Usage: pydocker [OPTIONS] COMMAND [ARGS]...

Options:
  -v, --verbose          Show this message and exit.
  --help                  Show this message and exit.

Commands:
  agent
  init
  launch
  remove
  remove-all
  status
  stop
  stop-all
```

Start ssh-agent container

If you need to have the ability to ssh into machines you can start an ssh-agent in a container with:

```
pydocker agent
```

This will add keys copied with the `init` command without passwords automatically, or print the command you need to run to add password protected keys. This `ssh-agent` container will then be connected to all other containers, so you don't need to keep entering your key password. The makes it more secure by not storing any credentials in the Image. This container can be restarted when needed, if you run `pydocker agent` it will delete the container, and make a new one.

Launch

```
Options:
  -i, --image TEXT      Docker image
  -n, --name TEXT       container name
```

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```

-d, --working-dir TEXT  host directory to mount
-p, --port INTEGER      Host port to be connected to container port 8888
-l, --no-logs           disable streaming of container logs
--gcloud / --no-gcloud  include gcloud credentials
-c, --command TEXT      command which is passed to container
-r, --rm                enable auto-removal of the container on daemon side
                        when the container's process exits
--help                  Show this message and exit.

```

This command launches the notebook (which we built above) and forwards internal port 8888 to the laptops port 9000 and creates a container named test. In addition the host's current folder `.` is mounted in the **working_dir** folder. This gives the container access to the host filesystem. After running the command you can go to `localhost:9000` in your browser.

```
pydocker launch --image notebook --name test --working-dir . --port 9000 --no-gcloud
```

Remote images also work:

```
pydocker launch --image jupyter/minimal-notebook:latest --name example --working-dir .
↪ --port 9000 --no-gcloud
```

Will pull the remote image down first. You can still do `docker pull IMAGE` and pydocker will use the already downloaded image.

Google Cloud Setup (optional)

This is only required if you are going to be using Google Cloud. If you already have gcloud installed, update by running `gcloud components update`. If you have not setup Google Cloud already, begin by installing Google Cloud.

1. Download the (archive)(<https://cloud.google.com/sdk/docs/quickstart-mac-os-x>) and unpack it (only do the "Before you begin" section).
2. Navigate to the folder containing `google-cloud-sdk` and run

```
./google-cloud-sdk/install.sh
```

3. Set your gcloud account and project.

```
gcloud auth login
gcloud config set account ${USER}@DOMAIN.com
gcloud config set project YOUR_PROJECT
gcloud auth application-default login
```

4. Now generate your ssh credentials by running:

```
gcloud compute ssh --zone "us-central1-a" "RUNNING_VM"
```

Status Server

```
pydocker status
```

This will open a status server which will show a page with information about all local containers. This includes a link to click into any with open port forwarding.

pydocker pydocker

Image	Container	State	Status	Port
jupyter/minimal-notebook	example2	running	Up 41 seconds	9005
jupyter/minimal-notebook	example	exited	Exited (0) 36 seconds ago	
ssh-agent	ssh-agent	running	Up 2 days	

Fig. 1: Container Status

Remove Containers

```
pydocker remove-all
pydocker remove CONTAINER_NAME
```

This delete all running containers, or just the one selected.

Stop Containers

```
pydocker stop-all
pydocker stop CONTAINER_NAME
```

This stop all running containers, or just the one selected.

1.2 API Reference

These are the APIs provided by Pydocker.

1.2.1 ssh

`pydocker.ssh.add_keys()`

Tries to add ssh keys found in `~/ssh/cloud_keys`, will prompt with required command if there is a password.

`pydocker.ssh.build_ssh()`

Build the ssh-agent image

`pydocker.ssh.params()`

Generates dictionary containing parameters to run ssh-agent

Returns Dictionary containing parameters to run ssh-agent

Return type dict

`pydocker.ssh.shutdown()`

shutdown ssh-agent

```
pydocker.ssh.start()
```

Starts a container running an ssh-agent. This also will remove an existing container and replace it if run again.

1.2.2 utils

```
class pydocker.utils.LocalContainer(image, name, working_dir, port, logs=True, com-
                                     mand='jupyter notebook -ip=0.0.0.0 -allow-root -
                                     NotebookApp.token="", rm=False, **kwargs)
```

Bases: object

```
gcloud()
```

```
run()
```

```
stream_logs()
```

```
pydocker.utils.bash(command, environment="")
```

```
pydocker.utils.delete_container(name=None)
```

```
pydocker.utils.setup_machine()
```

Setup laptop for first use. This includes creating ssh config, and making a copy of credentials.

```
pydocker.utils.start_ssh()
```

```
pydocker.utils.stop_container(name=None)
```

1.2.3 status

```
pydocker.status.index()
```

```
pydocker.status.start_server()
```


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