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# **fades Documentation**

*Release 4*

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### 1.1 What is fades?

*fades* is a system that automatically handles the virtualenvs in the cases normally found when writing scripts and simple programs, and even helps to administer big projects.



*fades* will automatically create a new virtualenv (or reuse a previous created one), installing the necessary dependencies, and execute your script inside that virtualenv, with the only requirement of executing the script with *fades* and also marking the required dependencies.

*(If you don't have a clue why this is necessary or useful, I'd recommend you to read this small text about [Python and the Management of Dependencies](#) .)*

The first non-option parameter (if any) would be then the child program to execute, and any other parameters after that are passed as is to that child script.

*fades* can also be executed without passing a child script to execute: in this mode it will open a Python interactive interpreter inside the created/reused virtualenv (taking dependencies from `--dependency` or `--requirement` options).

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## 1.2 How to use it?

[resources/video/screensh](#)

Click in the following image to see a video/screencast that shows most of fades features in just 5'...  
...or inspect [these several small GIFs](#) that show each a particular *fades* functionality, but please keep also reading for more detailed information...

### 1.2.1 Yes, please, I want to read

When you write an script, you have to take two special measures:

- need to execute it with *fades* (not *python*)
- need to mark those dependencies

At the moment you execute the script, fades will search a virtualenv with the marked dependencies, if it doesn't exist fades will create it, and execute the script in that environment.

### 1.2.2 How to execute the script with fades?

You can always call your script directly with fades:

```
fades myscript.py
```

However, for you to not forget about fades and to not execute it directly with python, it's better if you put at the beginning of the script the indication for the operating system that it should be executed with fades...

```
#!/usr/bin/fades
```

... and also set the executable bit in the script:

```
chmod +x yourscrip.py
```

### 1.2.3 How to mark the dependencies to be installed?

The procedure to mark a module imported by the script as a *dependency to be installed by fades* is by using a comment.

This comment will normally be in the same line of the import (recommended, less confusing and less error prone in the future), but it also can be in the previous one.

The simplest comment is like:

```
import somemodule # fades
from somepackage import othermodule # fades
```

The *fades* is mandatory, in this examples the repository is PyPI, see [About different repositories](#) below for other examples.

With that comment, *fades* will install automatically in the virtualenv the *somemodule* or *somepackage* from PyPI.

Also, you can indicate a particular version condition, examples:

```
import somemodule # fades == 3
import somemodule # fades >= 2.1
import somemodule # fades >=2.1, <2.8, !=2.6.5
```

Sometimes, the project itself doesn't match the name of the module; in these cases you can specify the project name (optionally, before the version):

```
import bs4 # fades beautifulsoup4
import bs4 # fades beautifulsoup4 == 4.2
```

## 1.2.4 Other ways to specify dependencies

Apart of marking the imports in the source file, there are other ways to tell *fades* which dependencies to install in the `virtualenv`.

One way is through command line, passing the `--dependency` parameter. This option can be specified multiple times (once per dependency), and each time the format is `repository::dependency`. The dependency may have versions specifications, and the repository is optional (defaults to `'pypi'`).

Another way is to specify the dependencies in a text file, one dependency per line, with each line having the format previously described for the `--dependency` parameter. This file is then indicated to *fades* through the `--requirement` parameter. This option can be specified multiple times.

In case of multiple definitions of the same dependency, command line overrides everything else, and requirements file overrides what is specified in the source code.

Finally, you can include package names in the script docstring, after a line where “*fades*” is written, until the end of the docstring; for example:

```
"""Script to do stuff.

It's a very important script.

We need some dependencies to run ok, installed by fades:
    request
    otherpackage
"""
```

## 1.2.5 About different repositories

*fades* supports installing the required dependencies from multiples repositories: besides PyPI, you can specify URLs that can point to projects from GitHub, Launchpad, etc. (basically, everything that is supported by `pip` itself).

When a dependency is specified, *fades* deduces the proper repository. For example, in the following examples *fades* will install requests from the latest revision from PyPI in the first case, and in the second case the latest revision from the project itself from GitHub:

```
-d requests
-d git+https://github.com/kennethreitz/requests.git#egg=requests
```

If you prefer, you can be explicit about which kind of repository *fades* should use, prefixing the dependency with the special token double colon (`::`):

```
-d pypi::requests
-d vcs::git+https://github.com/kennethreitz/requests.git#egg=requests
```

There are two basic repositories: `pypi` which will make *fades* to install the desired dependency from PyPI, and `vcs`, which will make *fades* to treat the dependency as a URL for a version control system site. In the first case, for PyPI, a full range of version comparators can be specified, as usual. For `vcs` repositories, though, the comparison is always exact: if the very same dependency is specified, a *virtualenv* is reused, otherwise a new one will be created and populated.

In both cases (specifying the repository explicitly or implicitly) there is no difference if the dependency is specified in the command line, in a `requirements.txt` file, in the script's docstring, etc. In the case of marking the `import` directly in the script, it slightly different.



When marking the `import` it normally happens that the package itself to be installed has the name of the imported module, and because of that it can only be found in PyPI. So, in the following cases the `pypi` repository is not only deduced, but unavoidable:

```
import requests # fades
from foo import bar # fades
import requests # fades <= 3
```

But if the package is specified (normally needed because it's different than the module name), or if a version control system URL is specified, the same possibilities stated above are available: let *fades* to deduce the proper repository or mark it explicitly:

```
import bs4 # fades beautifulsoup
import bs4 # fades pypi::beautifulsoup
import requests # fades git+https://github.com/kennethreitz/requests.git#egg=requests
import requests # fades vcs::git+https://github.com/kennethreitz/requests.git
↪#egg=requests
```

One last detail about the `vcs` repository: the format to write the URLs is the same (as it's passed without modifications) than what `pip` itself supports (see [pip docs](#) for more details).

## 1.2.6 How to control the virtualenv creation and usage?

You can influence several details of all the virtualenv related process.

The most important detail is which version of Python will be used in the virtualenv. Of course, the corresponding version of Python needs to be installed in your system, but you can control exactly which one to use.

No matter which way you're executing the script (see above), you can pass a `-p` or `--python` argument, indicating the Python version to be used just with the number (2.7), the whole name (`python2.7`) or the whole path (`/usr/bin/python2.7`).

Other detail is the verbosity of *fades* when telling what is doing. By default, *fades* only will use `stderr` to tell if a virtualenv is being created, and to let the user know that is doing an operation that requires an active network connection (e.g. installing a new dependency).

If you call *fades* with `-v` or `--verbose`, it will send all internal debugging lines to `stderr`, which may be very useful if any problem arises. On the other hand if you pass the `-q` or `--quiet` parameter, *fades* will not show anything (unless it has a real problem), so the original script `stderr` is not polluted at all.

Sometimes, you want to run a script provided by one of the dependencies installed into the virtualenv. *fades* supports this via the `-x` (or `--exec` argument). The parameter given to this option needs to be just the executable name; it's an error to use this to execute anything outside the `venv`'s `bin` directory, just don't use this option and pass the executable directly if you want that.

If you want to use IPython shell you need to call *fades* with `-i` or `--ipython` option. This option will add IPython as a dependency to *fades* and it will launch this shell instead of the python one.

You can also use `--system-site-packages` to create a `venv` with access to the system libs.

Finally, no matter how the virtualenv was created, you can always get the base directory of the virtualenv in your system using the `--get-venv-dir` option.

## 1.2.7 How to deal with packages that are upgraded in PyPI

When you tell *fades* to create a virtualenv using one dependency and don't specify a version, it will install the latest one from PyPI.

For example, you do `fades -d foobar` and it installs foobar in version 7. At some point, there is a new version of foobar in PyPI, version 8, but if do `fades -d foobar` it will just reuse previously created virtualenv, with version 7, not downloading the new version and creating a new virtualenv with it!

You can tell fades to do otherwise, just do:

```
fades -d foobar --check-updates
```

... and *fades* will search updates for the package on PyPI, and as it will found version 8, will create a new virtualenv using the latest version.

From this moment on, if you request `fades -d foobar` it will bring the virtualenv with the new version. If you want to get a virtualenv with not-the-latest version for any dependency, just specify the proper versions.

You can even use the `--check-updates` parameter when specifying the package version. Say you call `fades -d foobar==7`, *fades* will install version 7 no matter which one is the latest. But if you do:

```
fades -d foobar==7 --check-updates
```

... it will still use version 7, but will inform you that a new version is available!

### 1.2.8 Under the hood options

For particular use cases you can send specifics arguments to `virtualenv`, `pip` and `python`. using the `--virtuaenv-options`, `--pip-options` and `--python-options` respectively. You have to use that argument for each argument sent.

Examples:

```
fades -d requests --virtualenv-options="--always-copy" --virtualenv-options="--extra-search-tmp"
```

```
fades -d requests --pip-options="--index-url='http://example.com'"
```

```
fades --python-options=-B foo.py
```

### 1.2.9 Setting options using config files

You can also configure fades using `.ini` config files. *fades* will search config files in `/etc/fades/fades.ini`, the path indicated by `xdg` for your system (for example `~/config/fades/fades.ini`) and `.fades.ini`.

So you can have different settings at system, user and project level.

With fades installed you can get your config dir running:

```
python -c "from fades.helpers import get_confdir; print(get_confdir())"
```

The config files are in `.ini` format. (`configparser`) and fades will search for a `[fades]` section.

You have to use the same configurations that in the CLI. The only difference is with the config options with a dash, it has to be replaced with a underscore.:

```
[fades]
ipython=true
verbose=true
python=python3
check_updates=true
dependency=requests;django>=1.8 # separated by semicolon
```

There is a little difference in how fades handle these settings: “dependency”, “pip-options” and “virtualenv-options”. In these cases you have to use a semicolon separated list.

The most important thing is that these options will be merged. So if you configure in `/etc/fades/fades.ini` “dependency=requests” you will have requests in all the virtualenvs created by fades.

## 1.2.10 How to clean up old virtualenvs?

When using *fades* virtual environments are something you should not have to think about. *fades* will do the right thing and create a new virtualenv that matches the required dependencies. There are cases however when you’ll want to do some clean up to remove unnecessary virtual environments from disk.

By running *fades* with the `--rm` argument, *fades* will remove the virtualenv matching the provided UUID if such a virtualenv exists (one easy way to find out the virtualenv’s UUID is calling *fades* with the `--get-venv-dir` option).

Another way to clean up the cache is to remove all venvs that haven’t been used for some time. In order to do this you need to call *fades* with `--clean-unused-venvs`. When *fades* it’s called with this option, it runs in maintain mode, this means that fades will exit after finished this task. All virtualenvs that haven’t been used for more days than the value indicated in param will be removed.

It is recommended to have some automatically way of run this option; ie, add a cron task that perform this command:

```
fades --clean-unused-venvs=42
```

## 1.2.11 Some command line examples

```
fades foo.py --bar
```

Executes `foo.py` under *fades*, passing the `--bar` parameter to the child program, in a virtualenv with the dependencies indicated in the source code.

```
fades -v foo.py
```

Executes `foo.py` under *fades*, showing all the *fades* messages (verbose mode).

```
fades -d dependency1 -d dependency2>3.2 foo.py --bar
```

Executes `foo.py` under *fades* (passing the `--bar` parameter to it), in a virtualenv with the dependencies indicated in the source code and also `dependency1` and `dependency2` (any version > 3.2).

```
fades -d dependency1
```

Executes the Python interactive interpreter in a virtualenv with `dependency1` installed.

```
fades -r requirements.txt
```

Executes the Python interactive interpreter in a virtualenv after installing there all dependencies taken from the `requirements.txt` file.

```
fades -r requirements.txt -r requirements_devel.txt
```

Executes the Python interactive interpreter in a virtualenv after installing there all dependencies taken from files `requirements.txt` and `requirements_devel.txt`.

```
fades -d django -x django-admin.py startproject foo
```

Uses the `django-admin.py` script to start a new project named `foo`, without having to have `django` previously installed.

```
fades --rm 89a2bf83-c280-4918-a78d-c35506efd69d
```

Removes a virtualenv matching the given uuid from disk and cache index.

## 1.2.12 What if Python is updated in my system?

The virtualenvs created by fades depend on the Python version used to create them, considering its major and minor version.

This means that if run fades with a Python version and then run it again with a different Python version, it may need to create a new virtualenv.

Let's see some examples. Let's say you run fades with `python`, which is a symlink in your `/usr/bin/` to `python3.4` (running it directly by hand or because fades is installed to use that Python version).

If you have Python 3.4.2 installed in your system, and it's upgraded to Python 3.4.3, fades will keep reusing the already created virtualenvs, as only the micro version changed, not minor or major.

But if Python 3.5 is installed in your system, and the default `python` is pointed to this new one, fades will start creating all the virtualenvs again, with this new version.

This is a good thing, because you want that the dependencies installed with one specific Python in the virtualenv are kept being used by the same Python version.

However, if you want to avoid this behaviour, be sure to always call fades with the specific Python version (`/usr/bin/python3.4` or `python3.4`, for example), so it won't matter if a new version is available in the system.

## 1.3 How to install it

Several instructions to install `fades` in different platforms.

### 1.3.1 Simplest way

In some systems you can install `fades` directly, no needing to install previously any dependency.

If you are in debian unstable or testing, just do (but probably you will not get the latest version, see below for alternative installation methods):

```
sudo apt-get install fades
```

For Arch linux:

```
yaourt -S fades
```

In systems with Snaps:

```
snap install fades
```

For Mac OS X (and Homebrew):

```
brew install fades
```

Else, keep reading to know how to install the dependencies first, and `fades` in your system next.

### 1.3.2 Dependencies

Besides needing Python 3.3 or greater, fades depends also on the `pkg_resources` package, that comes in with `setuptools`. It's installed almost everywhere, but in any case, you can install it in Ubuntu/Debian with:

```
apt-get install python3-setuptools
```

And on Archlinux with:

```
pacman -S python-setuptools
```

It also depends on `python-xdg` package. This package should be installed on any GNU/Linux OS with a freedesktop.org GUI. However it is an **optional** dependency.

You can install it in Ubuntu/Debian with:

```
apt-get install python3-xdg
```

And on Archlinux with:

```
pacman -S python-xdg
```

Fades also needs the `virtualenv` <<https://virtualenv.pypa.io/en/latest/>> package to support different Python versions for child execution. (see `-python` argument.)

### 1.3.3 For others debian and ubuntu

If you are NOT in debian unstable or testing (if you are, see above for better instructions), you can use this `.deb`.

Download it and install doing:

```
sudo dpkg -i fades-latest.deb
```

### 1.3.4 Using pip if you want

```
pip3 install fades
```

### 1.3.5 Multiplatform tarball

Finally you can always get the multiplatform tarball and install it in the old fashion way:

```
wget http://taniquetil.com.ar/fades/fades-latest.tar.gz
tar -xf fades-latest.tar.gz
cd fades-*
sudo ./setup.py install
```

### 1.3.6 Can I try it without installing it?

Yes! Branch the project and use the executable:

```
git clone https://github.com/PyAr/fades.git
cd fades
bin/fades your_script.py
```

### 1.3.7 What about Windows?

Windows is a platform supported by fades.

However, we don't have a proper Windows installer (a `.exe` or `.msi`), but you can install it using `pip`, or from the tarball, or try it directly from the project. All these options are properly described above.

We *do* want to have a Windows installer. If you can help us in this regard, please contact us. Also we would want a Travis running in Windows so that GitHub runs all the tests in this platform too before landing any code. Thanks!

## 1.4 Get some help, give some feedback

You can ask any question or send any recommendation or request to the [mailing list](#).

Come chat with us on IRC. The `#fades` channel is located at the [Freenode](#) network.

Also, you can open an issue [here](#) (please do if you find any problem!).

Thanks in advance for your time.

## 1.5 How to develop fades itself

Quick guide to get you up and running in fades development.

### 1.5.1 Getting the code

Clone the project:

```
git clone git@github.com:PyAr/fades.git
```

### 1.5.2 Install dependencies

*fades* manages it's own dependencies, so there is nothing extra you need to install.

To try it, just do:

```
bin/fades -V
```

### 1.5.3 How to run the tests

When starting development, at all times, and specially before wrapping up a new branch, you need to be sure that all tests pass ok.

This is very simple, actually, just run:

```
./test
```

That will not only check test cases, but also that the code complies with aesthetic recommendations, and that the README document has a proper format.

If you want to run *one* particular test, just specify it. Example:

```
./test tests.test_main:DepsMergingTestCase.test_two_different
```

## 1.5.4 Development process

Just pick an issue from [the list](#).

Develop, assure `./test` is happy, commit, push, create a pull request, etc.

Please, if you aim for creating a Pull Request with new code (functionality or fixes), include tests for your changes.

Thanks! Enjoy.





## CHAPTER 2

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### Indices and tables

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