Upgrade Python to latest version (3.10) on Ubuntu Linux

*by **Rehan Haider**, Sun 29 August 2021* **Category**: Snippets

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Linux systems come with Python install by default, but, they are usually not the latest. Python also cannot be updated by a typical `apt upgrade` command as well.

To check the version of Python installed on your system run

```
python3 --version
```

> ***`python`*** *keyword is used for Python 2.x versions which has been deprecated*

In this guide we will

1. Update Python to the latest version
2. Fix pip & other Python related issues
3. While doing the above two, ensure your Ubuntu which is heavily dependent on Python does not break

Updating Python to the latest version

Ubuntu's default repositories do not contain the latest version of Python, but an open source repository named `deadsnakes` does.

> ***Python3.10 is not officially available on Ubuntu 20.04, ensure you backup your system before upgrading.***

Step 1: Check if Python3.10 is available for install

```
sudo add-apt-repository ppa:deadsnakes/ppa
sudo apt update
```

Check if Python 3.10 is available by running

```
apt list | grep python3.10
```

This will produce the below result, if you see python3.10 it means you can install it

```
apt list | grep python3.10

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

idle-python3.10/focal 3.10.0-1+focal1 all
libpython3.10-dbg/focal 3.10.0-1+focal1 amd64
libpython3.10-dev/focal 3.10.0-1+focal1 amd64
libpython3.10-minimal/focal 3.10.0-1+focal1 amd64
libpython3.10-stdlib/focal 3.10.0-1+focal1 amd64
libpython3.10-testsuite/focal 3.10.0-1+focal1 all
libpython3.10/focal 3.10.0-1+focal1 amd64
libqgispython3.10.4/focal 3.10.4+dfsg-1ubuntu2 amd64
python3.10-dbg/focal 3.10.0-1+focal1 amd64
python3.10-dev/focal 3.10.0-1+focal1 amd64
python3.10-distutils/focal 3.10.0-1+focal1 all
python3.10-doc/focal 3.10.0~a7-1+focal2 all
python3.10-examples/focal 3.10.0-1+focal1 all
python3.10-full/focal 3.10.0-1+focal1 amd64
python3.10-gdbm-dbg/focal 3.10.0-1+focal1 amd64
python3.10-gdbm/focal 3.10.0-1+focal1 amd64
python3.10-lib2to3/focal 3.10.0-1+focal1 all
python3.10-minimal/focal 3.10.0-1+focal1 amd64
python3.10-tk-dbg/focal 3.10.0-1+focal1 amd64
python3.10-tk/focal 3.10.0-1+focal1 amd64
python3.10-venv/focal 3.10.0-1+focal1 amd64
python3.10/focal 3.10.0-1+focal1 amd64
```

Step 2: Install Python 3.10

Now you can install Python 3.10 by running

```
sudo apt install python3.10
```

Now though Python 3.10 is installed, if you check the version of your python by running `python3 --version` you will still see an older version. This is because you have two versions of Python installed and you need to choose Python 3.10 as the default.

Step 3: Set Python 3.10 as default

> ***Steps beyond here are tested on Ubuntu 20.04 in VM & WSL2, but are experimental , proceed at your own risk.***

Changing the default alternatives for Python will break your Gnome terminal. To avoid this, you need to edit the `gnome-terminal` configuration file.

Open the terminal and run:

```
sudo nano /usr/bin/gnome-terminal
```

In first line, change `#!/usr/bin/python3` to `#!/usr/bin/python3.8` . Press `Ctrl +X` followed by `enter` to save and exit.

Then save and close the file.

Next, update the default Python by adding both versions to an alternatives by running the below

```
sudo update-alternatives --install /usr/bin/python3 python3 /usr/bin/python3.9 1
sudo update-alternatives --install /usr/bin/python3 python3 /usr/bin/python3.10 2
```

Now run

```
sudo update-alternatives --config python3
```

rresponding to Python3.10 (if not selected by default).

```
sudo update-alternatives --config python3
There are 3 choices for the alternative python3 (providing /usr/bin/python3).

  Selection    Path                Priority   Status
------------------------------------------------------------
  0            /usr/bin/python3.8    2         auto mode
  1            /usr/bin/python3.10   1         manual mode
  2            /usr/bin/python3.8    2         manual mode
* 3            /usr/bin/python3.9    1         manual mode

Press <enter> to keep the current choice[*], or type selection number: 1
update-alternatives: using /usr/bin/python3.10 to provide /usr/bin/python3 (python3) in manual mode
```

Now run `python3 --version` again and you should see the latest Python as the output.

Fix pip and disutils errors

Installing the new version of Python will break `pip` as the `distutils` for Python3.10 is not installed yet.

Fix Python3-apt

Running `pip` in terminal will not work, as the current pip is not compatible with Python3.10 and python3-apt will be broken, that will generate an error like

```
Traceback (most recent call last):
    File "/usr/lib/command-not-found", line 28, in <module>
        from CommandNotFound import CommandNotFound
    File "/usr/lib/python3/dist-packages/CommandNotFound/CommandNotFound.py", line 19, in <module>
        from CommandNotFound.db.db import SqliteDatabase
    File "/usr/lib/python3/dist-packages/CommandNotFound/db/db.py", line 5, in <module>
        import apt_pkg ModuleNotFoundError: No module named 'apt_pkg'
```


To fix this first remove the current version of python3-apt by running

```
sudo apt remove --purge python3-apt
```

Then do some cleanup

```
sudo apt autoclean
```

DO NOT RUN `sudo apt autoremove` as it will remove several packages that are required. This may break your system if you're using GUI, if you're on WSL2 you can proceed.

`-apt` by running

```
sudo apt install python3-apt
```

Install pip & distutils

Running `pip` will still throw an error `pip: command not found`. We need to install the latest version of pip compatible with Python 3.10.

Also, if try to manually install the latest version of pip, it will throw an error like


```
ImportError: cannot import name 'sysconfig' from 'distutils'
(/usr/lib/python3.10/distutils/__init__.py)
```

Or you might also see an error stating `No module named 'distutils.util'`. This is because the `distutils` module is not installed yet, to install run the below command

```
sudo apt install python3.10-distutils
```

Now you can install `pip` by running

```
curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py
sudo python3.10 get-pip.py
```

> *If you get an error like* ***`bash: curl: command not found`*** *then you need to install curl first by running* ***`sudo apt install curl`***

Now you can run `pip` and you should see the output of `pip --version`

Fix pip-env errors when using venv

When you try to create a new virtual environment using `python -m venv env`, you may into the following error.

```
Error: Command '['/path/to/env/bin/python3', '-Im', 'ensurepip', '--upgrade', '--default-pip']' returned non-zero exit status 1
```

You can fix this by reinstalling venv by running

```
sudo apt install python3.10-venv
```

All should be done now. It is complicated, but this is how you update Python to latest version.

Extra

nstalled, you can avoid typing out `python3` by running

```
echo "alias py=/usr/bin/python3" >> ~/.zshrc
echo "alias python=/usr/bin/python3" >> ~/.zshrc
```

Now you can run your files with `py` or `python` .

Need Help? Open a discussion thread on GitHub.

#python #ubuntu

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