OSNAP: Python App Deployment using Embedded Python

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main.py

```
1
2  print('hello world')
3
```

Give your Python application to regular users

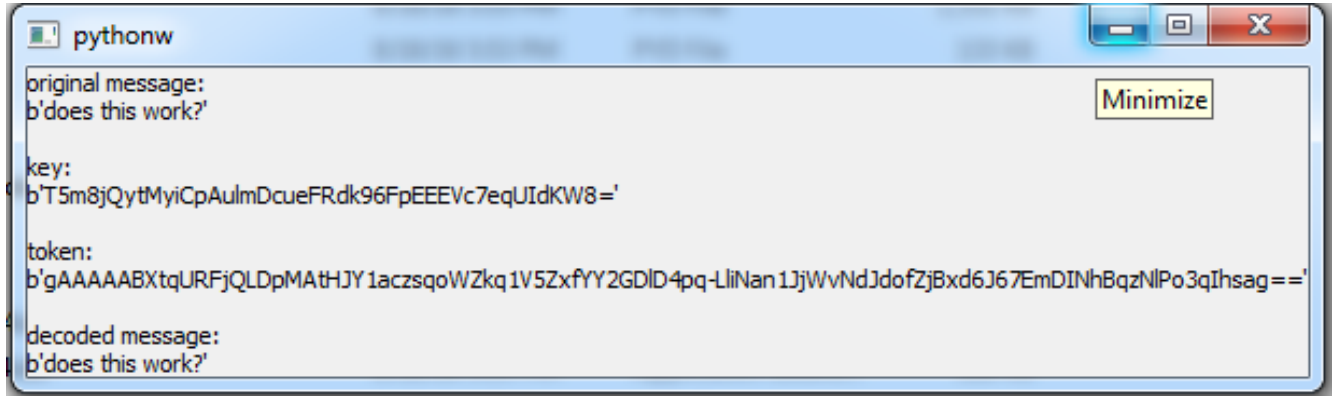
http://manicallydepressedmoderatelyfunny.blogspot.com/2015/01/halo-5-beta-livedierepeat.html

- My Particular Requirements
  - Does not rely on an existing Python environment
  - Works with essentially all Python code and packages
  - Looks like a native application to the OS (e.g. .exe, .app)
  - Creates a regular installer
  - Windows and OSX/MacOS
- Existing Tools
  - cx_freeze
  - py2exe
  - py2app
  - briefcase
  - pyinstaller
  - pynsist

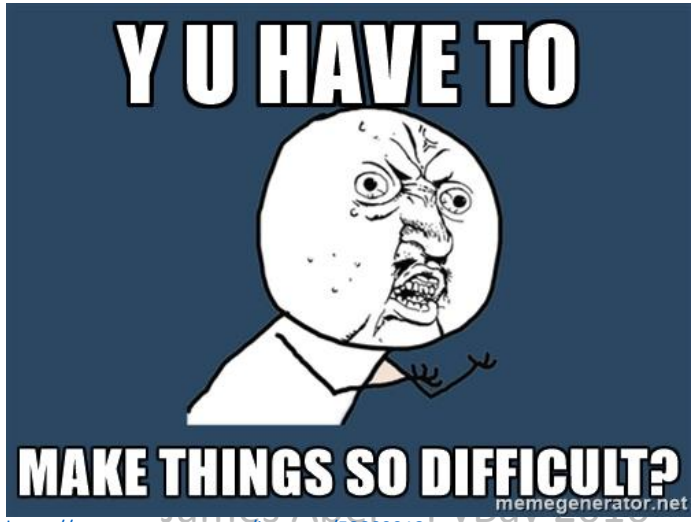
27 lines (17 sloc) | 530 Bytes

```
1
2  import sys
3
4  from PyQt5.QtWidgets import QApplication, QLabel
5
6  import cryptography.fernet
7
8
9  def run():
10
11     app = QApplication(sys.argv)
12
13     m = b'does this work?'
14     s = 'original message:\n' + str(m) + '\n\n'
15
16     k = cryptography.fernet.Fernet.generate_key()
17     fernet = cryptography.fernet.Fernet(k)
18     t = fernet.encrypt(m)
19     d = fernet.decrypt(t)
20     s += 'key:\n' + str(k) + '\n\n'
21     s += 'token:\n' + str(t) + '\n\n'
22     s += 'decoded message:\n' + str(d)
23
24     window = QLabel(s)
25     window.show()
26
27     app.exec_()
```

Minimal But Effective Test Case

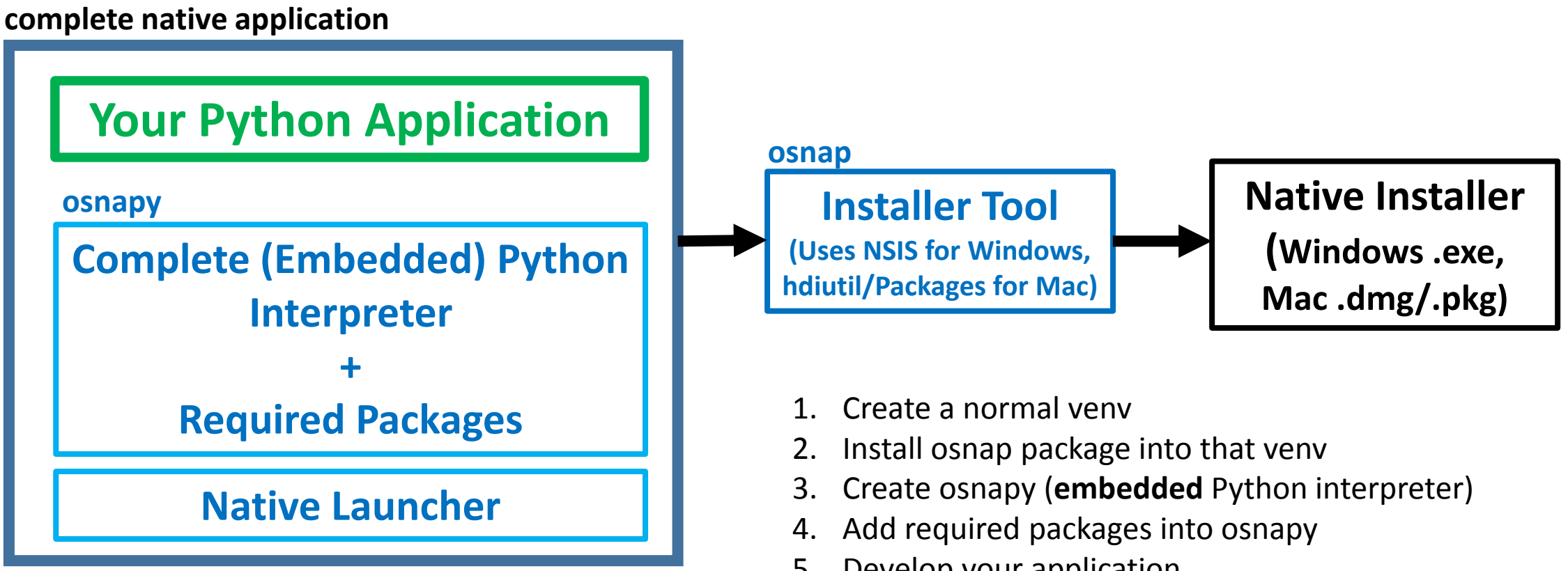


```
c:\temp>testcase.exe

Traceback (most recent call last):

  File "testcase.py", line 26, in <module>

  File "c:\James\Projects\cryptographybugtestcase\core\crypto.py", line 17, in encrypt

  File "c:\python34\lib\site-packages\cryptography\fernet.py", line 51, in encrypt

  File "c:\python34\lib\site-packages\cryptography\fernet.py", line 61, in
_encrypt_from_parts

  File "c:\python34\lib\site-packages\cryptography\hazmat\primitives\ciphers\base.py",
line 43, in encryptor

  File "c:\python34\lib\site-packages\cryptography\hazmat\backends\multibackend.py",
line 57, in create_symmetric_encryption_ctx

cryptography.exceptions.UnsupportedAlgorithm: cipher AES in CBC mode is not supported
by this backend.
```



https://memegenerator.net/instance/58809918

OSNAP:
Overly Simplistic Native Applications tool for Python



1. Create a normal venv
2. Install osnap package into that venv
3. Create osnapy (**embedded** Python interpreter)
4. Add required packages into osnapy
5. Develop your application
6. Create and deploy installer

OSNAP is simplistic …

- Leverages ***embedded*** Python builds for Windows and OSX
  - Python is “embedded” into the launcher
- Not too complex
  - Native Launchers – 82 lines of ***Python*** (not C) code
    - Both Windows and Mac
  - osnapy (independent Python interpreter w/packages) – 80 lines of code
  - Installers - ~300 total lines of code (both Windows and Mac)
- Installer (what’s shipped) is kind of big. Test case:
  - 87 MB on Windows
  - 132 MB on Mac

(Note: I’m not trying to replace the existing freezing/app creation tools. They are mature and often work quite well. Merely offer an alternative for cases that have additional requirements.)

Get OSNAP

- Looking for users and/or collaborators
- Tools/Scripts and Example Code available at: https://github.com/jamesabel/osnap

- Thank You
  - Thomas Kluyver (pynsist)
  - Glyph

- Contact
  - j@abel.co
  - abel.co

BACKUP

Why is it “overly simplistic”?

- The installer (what you ship to users) is kind of big – even for the small test case:
  - 132 MB for OS X
  - 87 MB for Windows
  - Just for reference, iTunes installers are:
    - 242 MB for OS X (our example app is 55% of that)
    - 122 MB for Windows (our example app is 71% of that)
  - With care our installer size should be able to be reduced
- Also it’s simplistic since our launcher is also written in Python
  - Created with py2exe and py2app
  - Is a simple native program that just executes main

Using embedded Python

- The idea is to have a complete and separate Python interpreter that we can use to run our app against (to make sure it works) and to bundle into the installer.
- Windows embedded zip is in the standard Python install page for 3.5
- egenix pyrun for Mac
- Doesn't have pip – have to get get-pip.py and install it

The launcher

- Written in Python (to keep it easy to write)
- Use py2exe (Windows) and py2app (Mac) to create the native apps
- Just does a `osnapy/bin/python main.py`
- See test_example