Python for Linux System Adminstration II

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“Pythonic” - Style matters

- Zen of Python (PEP 20)
- Python Style Guide (PEP 8)

Exceptions

EAFP vs LBYL

```
y = 10
try:
    x = y / 0
except ZeroDivisionError, e:
    print e
finally:
    print "done"
```

(NOT)

```
try:
    whatever
except:
    pass
```

os and os.path modules

```
os.environ
os.getcwd
os.chmod
os.chown
os.link
os.mkdir
os.remove
os.rename
```

os.walk()

```
import os
for x in os.walk('.')
    print x
<Output>
('.', ['emptydir'], [ 'chinese-python-
poster.jpg', 'olf_proposal.txt', 'wc.py',
'olf.odp', 'shell.png', 'olf.txt',
'Pil.gif', 'adminscripting.png',
'num_occur.py'])
('./emptydir', [], [])
```

os.path

```
exists
getmtime
isfile
isdir
islink
ismount
samefile
split
```

subprocess and piping

```
from subprocess import *

p = Popen(["ls", "-l"], stdout=PIPE, stderr=PIPE)
out, err = p.communicate()
print out
```

Command line options

`sys.argv`

`optparse`

Testing

Unit test

doctests

logging

(and print)

list comprehensions

Put a list creation operation on one line:

```
list = [1, 2, 3]
newlist = [x*x for x in list]
```

generator expressions

Like list comprehensions, except “lazy” eval
(meaning an entire list won't be created)

```
lines = (x.strip() for x in
                open("my_app.log"))
```

(see yield and full generators)

(also http://www.dabeaz.com/generators/)

Regular expressions

- Not built-in
- import re
- Don't use if not needed – str.startswith(), str.endswith()
- e.g:

```
import re
>>> re.findall("[Ll]en", "len is the Length")
['len', 'Len']
```

Parsing (and writing) .csv files

csv module

- e.g:

```
lines = open(file_name).read().split('\n')
records = [line.split('\t') for line in lines]

or

records = list(csv.reader(open(file_name, “rbU”))
```

ctypes

Use C libraries (even Windows DLL's)

```
>>> from ctypes import *
>>> libc = CDLL("libc.so.6")
>>> libc.printf("hello %s\n", "Python")
hello Python
13
>>> print libc.time(None)
1253757776
```

daemons

```
import daemon
from spam import main_program
with daemon.DaemonContext():
    main_program
```

ssh via paramiko

```
#!/usr/bin/env python
""" test_paramiko.py - tests paramiko library on
localhost connection"""
import paramiko
paramiko.util.log_to_file('paramiko.log')
s = paramiko.SSHClient()
s.load_system_host_keys()
s.connect('localhost', 22, 'testuser', 'password')
stdin, stdout, stderr = s.exec_command('ifconfig')
print stdout.read()
s.close()
```

3 line web server

```
from http.server import HTTPServer,
SimpleHTTPRequestHandler

server = HTTPServer(("",8000),
SimpleHTTPRequestHandler)

server.serve_forever()
```

Tour of the standard library

http://docs.python.org/library/

What we left out

- more string functions
- accessing external environment
- path for imports
- importing your own module
- enumerate
- contexts
- classes
- generators
- decorators
- GUI's
- web apps
- metaprogramming

What about Python 3?

- it's a better language than 2.x
- Unicode strings vs bytes is huge issue
- it's not backward compatible
- it's supported by the developers
- it's the future
- it's not here (for sysadmins) yet (or is it? Arch)

Resources - Books

- *Python for Unix and Linux System Administration*, Noah Gift, Jeremy M. Jones, O'Reilly Media 2008
- *Python Essential Reference*, David Beazley, Addison Wesley 2009
- *Python Cookbook*, Martelli, Ravenscroft & Ascher, O'Reilly Media 2005
- *Pro Python System Administration*, Rytis Sileika, Apress, 2010
- *The Quick Python Book*, 2nd ed, Vern Ceder, Manning 2010 (Python 3 only)

Resources - community

- http://www.python.org, esp. http://wiki.python.org/moin/BeginnersGuide/Programmers
- “Python for system administrators”, James Knowlton, IBM DeveloperWorks, 2007 http://www.ibm.com/developerworks/aix/library/au-python/
- Instant Python, Magnus Hetland, http://www.hetland.org/python/instant-python.php
- Dive into Python, Mark Pilgrim, http://diveintopython.org
- Mailing lists and SIG's - http://www.python.org/community/lists/
- IRC - #python on freenode.net (but be careful ;))
- These slides (as of this afternoon) http://sites.google.com/site/pythonforlinux/
- vceder@gmail.com