CPython
Constricting the Great Ape

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Introduction

A new Python port

Python on Plan 9 has been rout with compromises.

This talk

- Brief history of Python ports to Plan 9
- A new version of Python
- APE updates
- Mercurial temperament

History

2002 - Python 2.2+

A native Plan 9 port that emulated some POSIX calls, yet os.platform == 'plan9'.
— Russ Cox

2008-2009 - Python 2.5.1

A more current 386 version of Python that uses APE for basic interfaces. Offers more coherent integration for typical POSIX-based Python scripts and useful for running early versions of Hg. Depends on APE versions of OpenSSL for libssl and libcrypto.
— Felipe Bichued & Federico G. Benavento

2013 - Python 2.7.5+

Updated CPython port for 386 and amd64. Based on POSIX implementation to ease script integration with other platforms.
- Requires updated versions of APE libraries: ap, bsd, and auth, mp, and sec.
- No third-party library dependencies.
- Supports most recent versions of Hg directly from the source.
- New TLS/SSL module.
- Includes plan9 module with bind(2) and rfork(2).

Why build a new version of Python?

Purpose

New amd64, and arm, ports of Plan 9 required a new version of Python.
Heavily used cross-platform software, Hg, really needs to leverage features only found in Python 2.6 and above, e.g., $GOROOT/lib/codereview/codereview.py.

Compatibility

POSIX features are heavily used, but we needed something that doesn't pull in a slew of third-party libraries that don't get maintained (e.g., openssl).

Requirements

- Leverage APE for a base POSIX module.
- Support current Python 2.7+ source tree.
- Integrate Hg C modules for performance.

APE updates

Purpose

Integrate Plan 9's libsec in order to support the native TLS/SSL and eliminate our dependency on out-of-date OpenSSL ports. This required building the following native Plan 9 libraries for APE use:
- /sys/src/ape/lib/auth
- /sys/src/ape/lib/bio
- /sys/src/ape/lib/mp
- /sys/src/ape/lib/sec

Compatibility

These libraries are *drop-in* builds of the native Plan 9 versions. The only changes are in the mkfiles to reference the /sys/src/lib(mp|sec) source and missing header files.

Requirements
- Access to Plan 9-native TLS/SSL.
- Provide base for new _hashlibsec and _p9ssl Python modules.

Something to tame, or constrict, the APE.

APE updates, continued

Outdated POSIX API
    What was APE targeting?

Compatibility
    We've started to modernize APE to be closer to 1003.1–2001 and beyond.

Requirements
    • 9atom versions of /sys/src/ape/lib, /sys/include/ape, and $arch/include/ape.
    • Updated socket calls in /sys/src/ape/lib/bsd.
    • Additional modifications to functions across the ape/(9|ap|bsd) tree.

Mercurial

The end goal

In order to pull other source repositories, we need Hg.

Compatibility

The prior Python 2.5.x ports used the Python modules instead of linking in the higher performance C modules. These C modules are rather stable and easy to link into python directly.

Requirements

- Source for cpyton and hg both located in /sys/src/cmd.
- Custom Plan 9 module
- Additional modifications to functions across the ape/(9|ap|bsd) tree.
- Use lnfs if not hosted on fossil.

```
% cat cpython-src.proto
sys    - sys sys
     src         - sys sys
       cmd       - sys sys
                 cpython       - sys sys
                       +       - sys sys

% cat cpython-amd64.proto
amd64 - sys sys
      bin        - sys sys
       python - sys sys
      include   - sys sys
        python2.7      - sys sys
              +        - sys sys
      lib        - sys sys
        python2.7      - sys sys
              +        - sys sys
lib    - sys sys
       mercurial       - sys sys
         +        - sys sys
rc     - sys sys
       bin        - sys sys
        hg        - sys sys
        mercurial       - sys sys
               +        - sys sys
sys    - sys sys
       lib        - sys sys
        python2.7      - sys sys
              +        - sys sys
       man        - sys sys
        1         - sys sys
               python - sys sys

% cat hg-src.proto
sys    - sys sys
     src         - sys sys
       cmd       - sys sys
                 hg      - sys sys
                       +        - sys sys
```

```
% cat cpython-386.proto
386    - sys sys
       bin        - sys sys
        python - sys sys
       include   - sys sys
         python2.7      - sys sys
               +        - sys sys
       lib        - sys sys
         python2.7      - sys sys
               +        - sys sys
lib    - sys sys
       mercurial       - sys sys
         +        - sys sys
rc     - sys sys
       bin        - sys sys
        hg        - sys sys
        mercurial       - sys sys
               +        - sys sys
sys    - sys sys
       lib        - sys sys
         python2.7      - sys sys
               +        - sys sys
       man        - sys sys
        1         - sys sys
               python - sys sys
```

CPython proto files

```
[ui]
username=Jeff Sickel <jas@corpus-callosum.com>

[extensions]
graphlog=
patchbomb=
mq=
rebase=
factotum=

[diff]
#nodates=1

[hostfingerprints]
bitbucket.org=24:9c:45:8b:9c:aa:ba:55:4e:01:6d:58:ff:e4:28:7d:2a:14:ae:3b
inferno-os.googlecode.com=24:eb:8b:2c:ef:a3:d5:f9:ee:63:01:3f:3a:c9:7e:c5:ce:9c:a6:60
code.google.com=39:dc:17:9f:c4:dc:67:32:e2:02:5a:b9:c4:18:d7:9d:4e:1c:6e:94
code.google.com=c8:e4:8c:62:9b:0c:45:f8:c0:03:a1:c6:10:f2:38:4f:b0:ad:53:3b
code.google.com=76:9a:5d:41:30:bd:48:c6:93:56:16:1d:e7:c3:89:ff:62:60:ca:f3
code.google.com=54:a7:34:39:1b:2a:ec:b8:92:68:dc:3a:3e:fe:2b:d3:91:ed:23:1f
code.google.com=c7:9d:1d:b2:a0:5a:3d:98:63:2c:1c:44:f2:13:c1:10:96:76:ba:fb
code.google.com=67:1b:98:92:48:86:ff:e1:c5:02:44:c5:9f:f3:96:78:08:f5:0a:45

[smtp]
host = smtp.server.com
tls = starttls
username = jas

[email]
method = smtp
```

$home/lib/hgrc

Summary

CPython
   Continuing on in the twenty-first century, just not going to 3.x.

Source
   https://bitbucket.org/jas/cpython
   http://selenic.com/hg

Images
   Titanoboa, the snake that would beat King Kong's ass
        http://www.bizarbin.com/extinct-creatures/