The care and feeding of large snakes

Rob Reid

NRAO (Charlottesville)

May 14, 2010
Python is a beautiful and elegant language.
It’s easy to learn...
...but makes some uneasy.
I will present some python and matplotlib performance facts.
Unpeeling the onion that is CASA.

XML

*_cmpt._*

"casa" (C++ classes)

casacore
Unpeeling the onion that is CASA.
Unpeeling the onion that is CASA.

users

python

"casa" (C++ classes)

casacore

XML

*_cmpt._*
Unpeeling the onion that is CASA.

users (incl. contributors)

python

XML

*_cmpt._*

"casa" (C++ classes)

casacore
Added benefits

Examples:
http://www.mrao.cam.ac.uk/~bn204/alma/casata.html
http://www.cv.nrao.edu/~rreid/casa/scripts/
Thin vs. thick layers

The snake ate my program.
Thin vs. thick layers

Rob Reid (NRAO)
Thin vs. thick layers

The snake ate my program.
Thin vs. thick layers

The snake ate my program.
The snake ate my program.
matplotlib *can* keep up with qwt

im.plotweights (C++ in Imager.cc) had to be taken out because of bitrot. I slapped together a rough replacement with matplotlib, and compared it to plotms using g19_d2usb.ms:

<table>
<thead>
<tr>
<th>im.plotweights</th>
<th>plotms</th>
<th>plotwts.py</th>
</tr>
</thead>
<tbody>
<tr>
<td>C++, pgplot?</td>
<td>C++, qwt</td>
<td>tb.query, pl.ioff, scipy.sqrt</td>
</tr>
<tr>
<td>?? (segfaulted)</td>
<td>60s</td>
<td>27s</td>
</tr>
<tr>
<td>optional gridding</td>
<td>no gridding</td>
<td>no gridding</td>
</tr>
<tr>
<td></td>
<td>but tons of other options</td>
<td>write your own options</td>
</tr>
<tr>
<td></td>
<td>(flagging?)</td>
<td></td>
</tr>
</tbody>
</table>
Python 3

- All living script languages change.

PyPy? (A JIT compiler that aims for C-ish speed)

- Successor to psyco (which only supports 32 bit systems).
- Achieved numpy compatibility in April.
- “Drop-in” replacement for cPython if modules are compiled for it as required.