

# PyPy Status Talk

(no no, PyPy is not dead)

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based on a PyCon Italia talk by Antonio Cuni



EuroPython

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# Who Am I

- rguillebert on twitter and irc
- PyPy contributor since 2011
- GSoC student on PyPy/Cython
- Worked on Py3k and Numpy support

# PyPy is not dead

- No PyPy status talk at EuroPython 2013
  - ▶ for the first time since 2004!
  - ▶ for no good reason :)
- PyPy is healthy and alive

# What is PyPy?

- RPython toolchain
  - ▶ subset of Python
  - ▶ ideal for writing VMs
  - ▶ JIT & GC for free
- Python interpreter
  - ▶ written in RPython
  - ▶ **FAST**

# PyPy: past two years (1)

- PyPy 2.0 (May 2013)
  - ▶ beta ARM, CFFI, unicode performance
  - ▶ stackless + JIT (eventlet, gevent, ...)
- PyPy 2.1 (July 2013)
  - ▶ stable ARM
  - ▶ py3k (3.2.3), numpy, general improvements, bugfixes
- PyPy 2.2 (November 2013)
  - ▶ incremental GC, faster JSON
  - ▶ more JIT, more py3k
  - ▶ more numpy, numpy C API

# PyPy: past two years (2)

- PyPy 2.3 (May 2014)
  - ▶ Lot of internal refactoring
  - ▶ C API for embedding
    - ★ pypy + uWSGI (thanks to Roberto De Ioris)
  - ▶ the usual, boring, general improvements

# More PyPy-powered languages

- RPython: general framework for dynamic languages
- Topaz: implementing Ruby
  - ▶ most of the language implemented
  - ▶ "definitely faster than MRI"
  - ▶ <https://github.com/topazproject/topaz>
- HippyVM: implementing PHP
  - ▶ ~7x faster than standard PHP
  - ▶ comparable speed as HHVM
  - ▶ <http://hippyvm.com/>

# Fundraising campaign

- py3k: 52'000 \$ of 105'000 \$ (50%)
- numpy: 48'000 \$ of 60'000 \$ (80%)
- STM, 1st call: 25'000 \$
- STM, 2nd call: 3'000 \$ of 80'000 \$ (4%)
- thank to all donors!



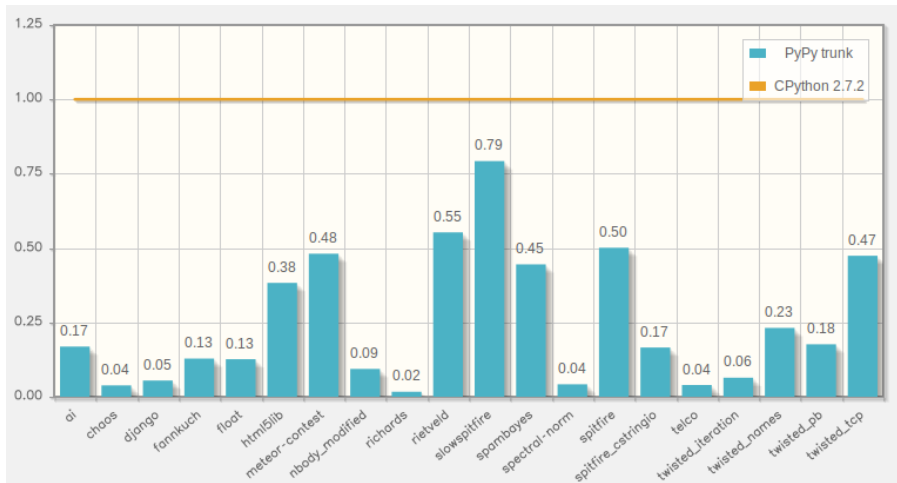
# Commercial support

- We offer commercial support for PyPy
- Consultancy and training
- Performance issues for open- or closed-source programs, porting, improving support in parts of the Python or non-Python interpreters, etc.
- <http://baroquesoftware.com>

# Current status

- Python code: "it just works"
- C code: better than ever!
  - ▶ cpyext: more complete, but still slow
  - ▶ CFFI: the future
  - ▶ Native PyPy C API for embedding
  - ▶ cppy for C++
- Lots of CFFI modules around:
  - ▶ pygame\_cffi, psycopg2cffi, lxml
- numpy: in-progress (more later)

# Speed: 6.5x faster than CPython



# ARM

- Official support since PyPy 2.1
- "it just works"
- ~7.5x faster than CPython on ARM
- thanks to Raspberry-Pi foundation
- distributed as part of Raspbian OS

# numpy

- as usual, in-progress
- 2336 passing tests out of 3265
  - ▶ `http://buildbot.pypy.org/numpy-status/latest.html`
- just try it
- no scipy :-/

- 3.2: stable
- 3.3: branch started, in-progress
- some missing optimizations
  - ▶ getting better

# CFFI

- Python <-> C interfacing done right
  - ▶ existing shared libraries
  - ▶ custom C code
- Inspired by LuaJIT's FFI
- Alternative to C-API, ctypes, Cython, etc.
- Fast on CPython, super-fast on PyPy, Jython support in the future

# The future: STM

- Software Transactional Memory
- Solving the GIL problem
- Without bringing the threads and locks mess
- Preliminary versions of pypy-jit-stm available
- See talk tomorrow



# Contacts, Q&A

- `http://pypy.org`
- `http://morepypy.blogspot.com/`
- `#pypy@freenode.net`
- Any question?