More than batteries included: NeuroDebian

Michael Hanke and Yaroslav O. Halchenko

Debian Developers, University of Magdeburg, Dartmouth College

EuroScipy 2011, Python in Neuroscience satellite, Paris

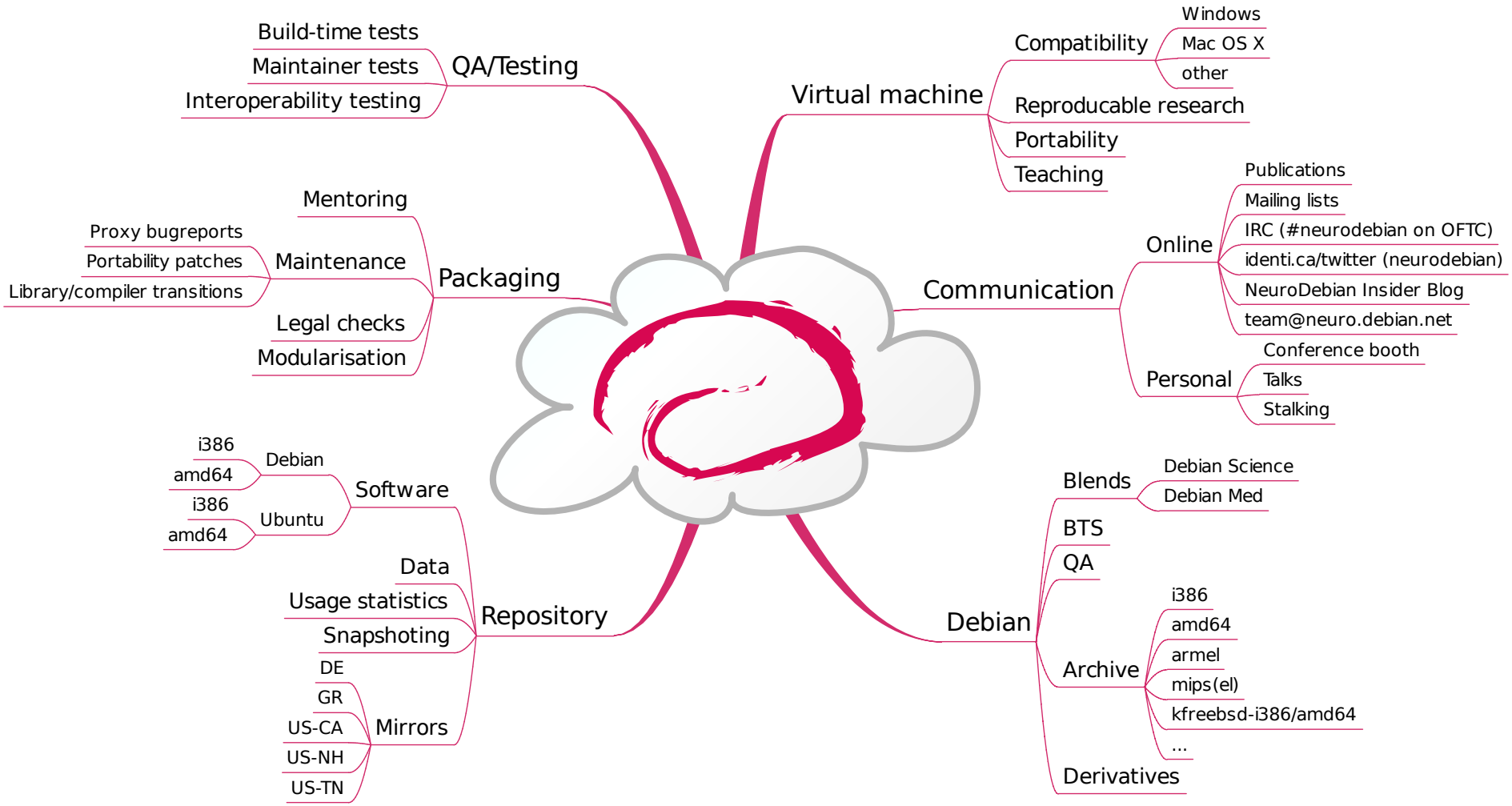
Audience check

Who has heard of NeuroDebian before?

Who is using Debian, Ubuntu or some other derived operating system?

Who is a developer?

What is NeuroDebian?



Research platform: Issues

Problem

- Complex heterogeneous analysis software suites
- Complicated, non-standard, or non-existing installation and update procedures (mostly, but not limited to non-Python)
- Limited, non-uniform set of "supported platforms"
- Typical users have little technical background

`http://neuro.debian.net`

Research platform: NeuroDebian

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Solution

- Integrate **all** relevant software in a common environment
- Make manual maintenance tasks trivial, or superfluous

$\longrightarrow$ Bring everything into Debian

`http://neuro.debian.net`

What does that mean?

```
sudo apt-get install python-nipype python-nipy fsl afni
```

GNU/Linux for sure

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Neuroscience runs on GNU/Linux

Michael Hanke[1, 2, 3*] and Yaroslav O. Halchenko[1, 2]

[1] Center for Cognitive Neuroscience, Dartmouth College, USA
[2] Department of Psychological and Brain Sciences, Dartmouth College, USA
[3] Department of Experimental Psychology, Otto-von-Guericke-University, Germany

In response to a recent grant application for a software development project, we received some reviewer comments that questioned the prevalence of GNU/Linux systems as a computing platform in neuroscience. Moreover, a concern was raised that virtualization is not a feasible solution to overcome limitations of any particular platform or to provide a convenient multiplatform working environment. We were surprised by these comments, because they are in contrast to what we experience daily while working with software developers worldwide to integrate neuroscience software into the NeuroDebian project.

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Why debian for Python in Neuroscience?

Most versatile, most comprehensive Python distribution?

```
% apt-cache dump|grep '^Package: python-'|cut -d'-' -f2,2|sort|uniq|wc -l
1137
```

From the release notes Debian 6.0 (squeeze)

Debian GNU/Linux 6.0 is the first GNU/Linux distribution release ever to offer comprehensive support for magnetic resonance imaging (MRI) based neuroimaging research.

People that get things done

- "Do-ocracy" instead of steering (commercial) entity
- Python modules/apps teams, Debian Science, Debian Med, ...
- Vast archive of maintained software (≈30000 binary packages)
- Origin of most active GNU/Linux distributions (63%; distrowatch.org)

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http://www.debian.org

How does software benefit from Debian?

- Extended reach
  - one stable release, two rolling "release" flavors
  - ≈130 derivative distributions (distrowatch.org)

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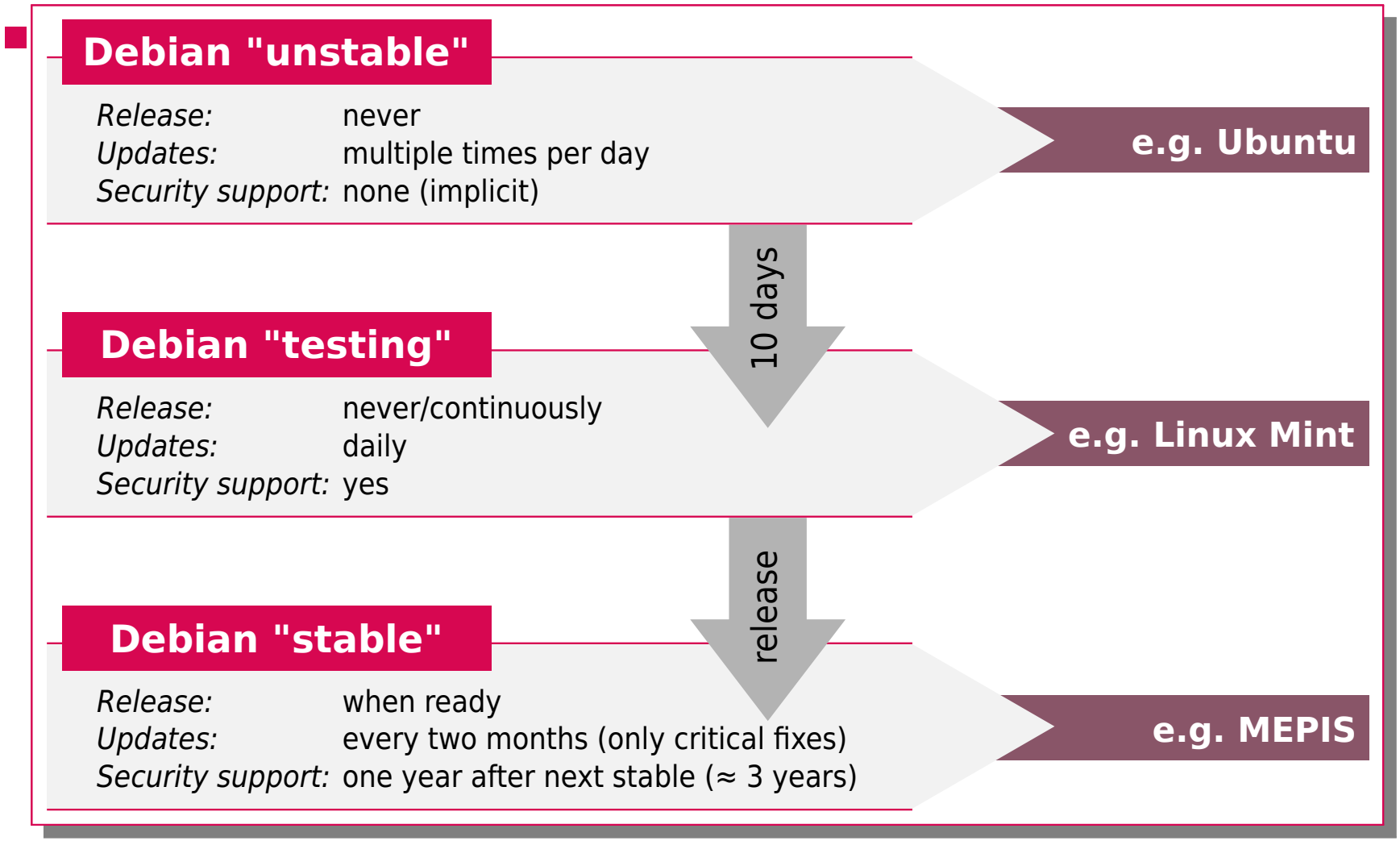


How does software benefit from Debian?

- Extended reach
  - one stable release, two rolling "release" flavors
  - ≈130 derivative distributions (distrowatch.org)
- Mutual awareness
  - Explicitly documented dependencies
  - Synchronized transitions
- Less maintenance work through modularity
  - 3rd-party software in dedicated packages maintained by someone else
- Continuous integration testing
  - 13 hardware architectures
  - Three kernels
  - Continuous automated testing for
    - Build success
    - Clean installation/de-installation, Availability of dependencies
    - Policy compliance
    - Package conflicts

But I only care about Ubuntu!

No, you don't!

- Most software we care about comes (almost) 1:1 from Debian (SciPy, VTK, ITK, ...)
- No LTS for neuroscience (NumPy only since 10.04)

Go Debian!

- Developers: Get it right in Debian, have it work in Debian/Ubuntu/Mint/aptosid/Mepis/... (at no additional cost)
- Users: Stable release with 3-4 years support for all software
- Scientists: Want your research tool to be found and used? Include it in the largest software archive in the world.

Stop the blurb: What do you have?

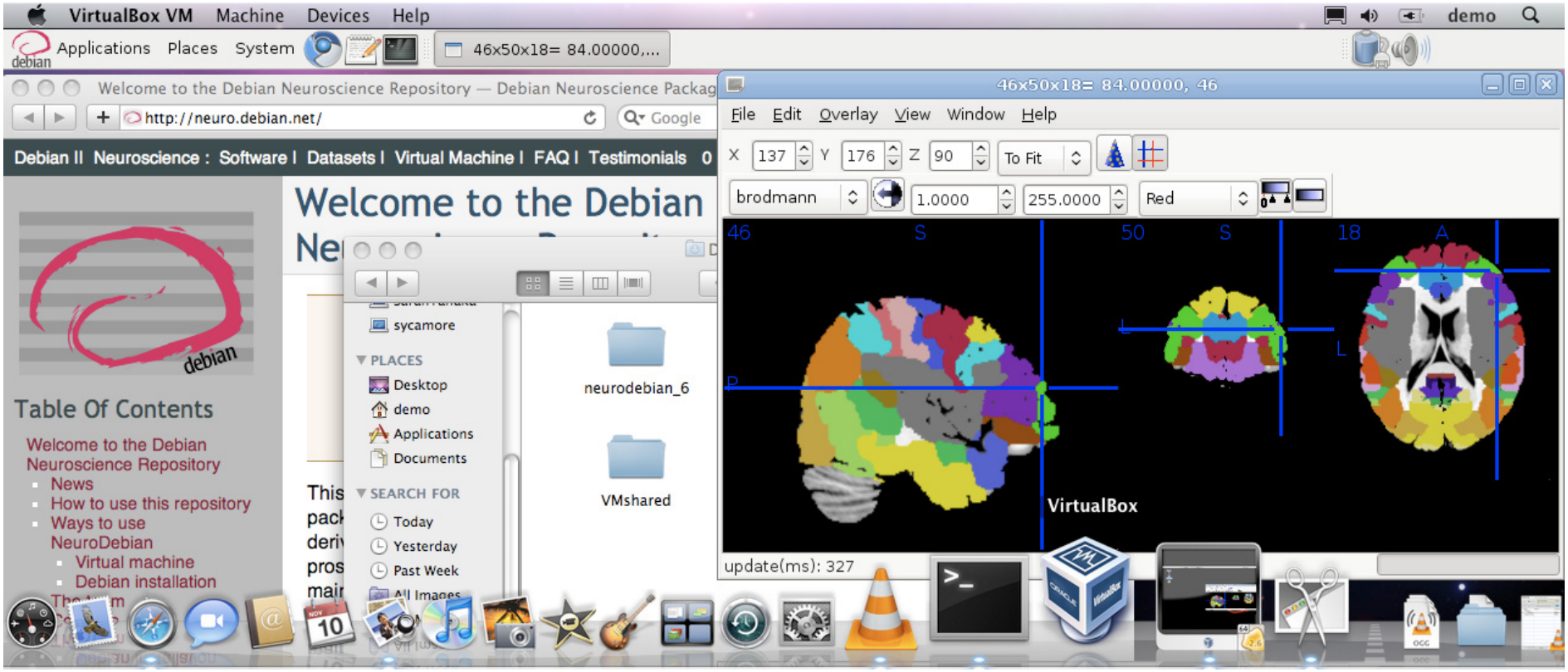
http://tagcrowd.com

And more ...


nibabel
enable
uncertainties
ninix-aya
gnuradio
petsc4py
openopt
rpy2
nipype
biggles
rpy
plplot
fiat
getfem++
chaco
ferari
brian
pyentropy
pyfits
dockbarx
model-builder
scitools
libvigraimpex
gnudatalanguage
guiqwt
pytools
openmeeg
mmass
dballe
pyqwt5
babel
spyder
biopython
swiginac
fonttools
nipy
wsjt
ipython
pygtk
networkx
slicer
pymca
pyevolve
panflute
pymvpa
numpy
necpp
pyepl
snowballz
dicompyler
childsplay
eficas
magics++
cmor
whiteboard
nulog
gauss
gdal
scipy
csa
singularity
fofix-dfsg
pygrace
mypaint
shogun
stimfit
pygame
mayavi2
matplotlib
pywavelets
psychopy
pytango
yade
astk
gvb
mlpy
cfflib
sphinx
pydicom
syfi
scikit-learn
pebl
joblib
pytrainer
grass
castle-combat
pysparse
connectomeviewer
nitime
veusz
tpclient-pywx
dolfin
gamera
gastables
viper
visual
instant
mdp
pytables
h5py
epigrass
vitables
pdb2pqr
pynifti
pyqwt3d
symeig
trilinos

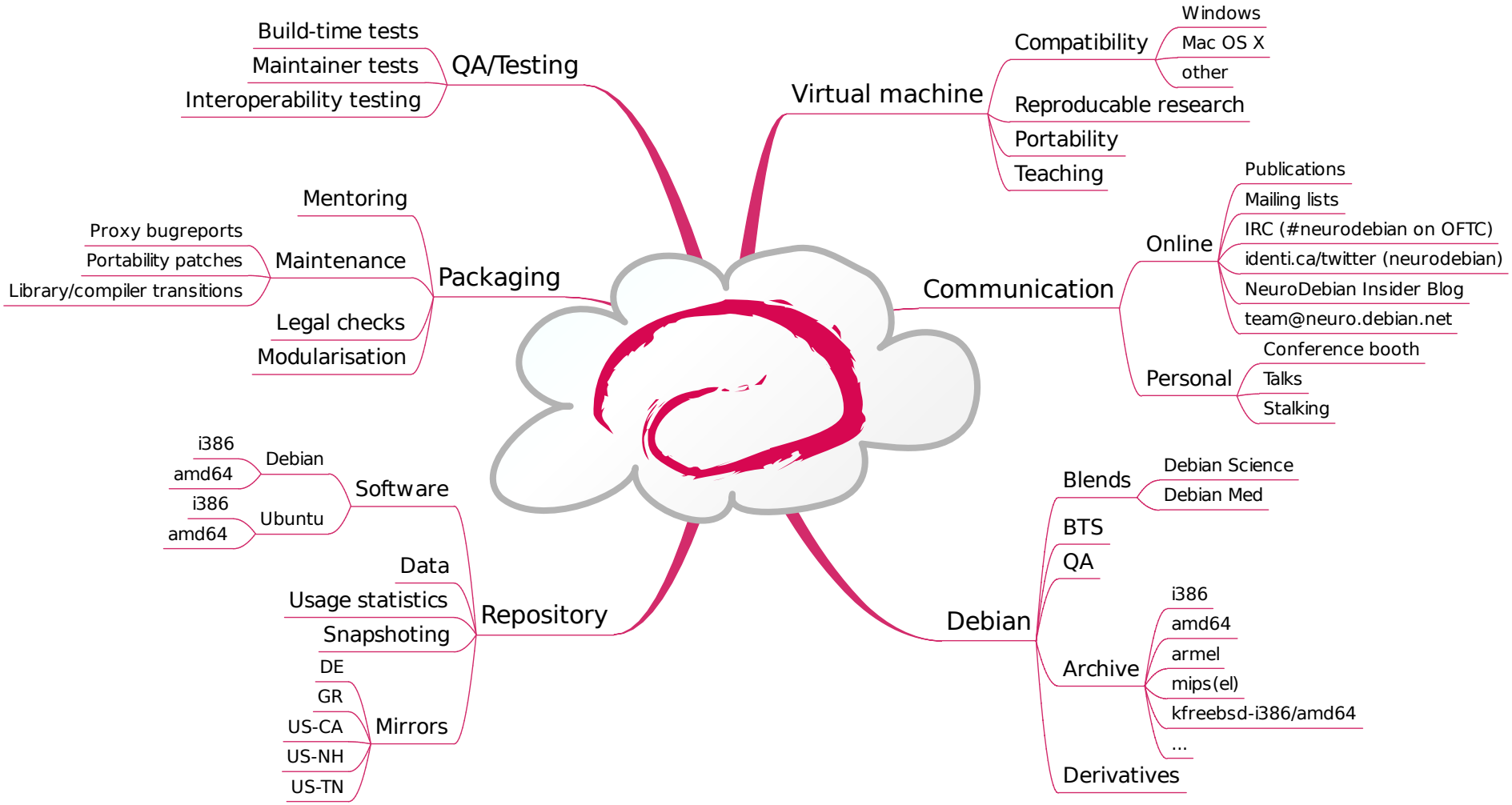
But, but my true love is a fruit and I'm married to monster!

- NeuroDebian virtual machine (32/64bit, multi-core)
- Most convenient solution for Mac OS X, Windows
- Base image with setup wizzard, fully functional within minutes
- Great for teaching, workshops, development, analysis



`http://neuro.debian.net/vm.html`

What is NeuroDebian?



For whom is NeuroDebian?

You want to ...

- have **readily usable** software at your fingertips
- have the **latest developments** of research software
- use a **rock-solid** operating system
- **try something new**, without investing much time
- offer **students** a fully functional "take-away" research environment
- **escape limitations** of an institutional computing environment
- **waste less time** maintaining computers
- have **your own software** easily available for other's to use
- **develop neuroscience software** without worrying about dependencies
- **efficiently collaborate** with other researchers
- **help** make NeuroDebian more robust, and/or **built on top** of it

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`http://neuro.debian.net`

Get involved!

- Find and evaluate software
- Report bugs, send patches
- Support: Mailing list, IRC (`http://neuro.debian.net/#contacts`)
- Post on the NeuroDebian blog
- Help (co-)maintain a package
- Package your own software
- Send us tests
- Spread the word

WE NEED HELP!

http://openhatch.org/+projects/NeuroDebian

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Debian Community

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Stefan Pollmann

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Michael Hanke
mih@debian.org
http://mih.voxindeserto.de