Lua

and

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debian

Roadmap

- Debian: an opportunity for Lua
- Packaging Lua
- Packaging Lua batteries
- It's not all a bed of roses

Who am I?

- Daily job: researcher in CS @ Inria
  - completely unrelated topics (type theory, interactive provers, Coq, …)
- I love developing software!
  - and I used Lua for some of my projects
- I support free software
  - Debian developer since 2006
- I read lua-l, but I don't post very often

What is Debian?

- A project that builds a free OS
- A long tradition in assembling components
    - QA: written policies, automatic checks, ...
- An opportunity for Lua:
    - Debian is popular with many derivatives
    - It supports "exotic" architectures
    - It is huge (30K packages, 17K match "^lib")
    - It is tested (compilation & installation time)

The beginning

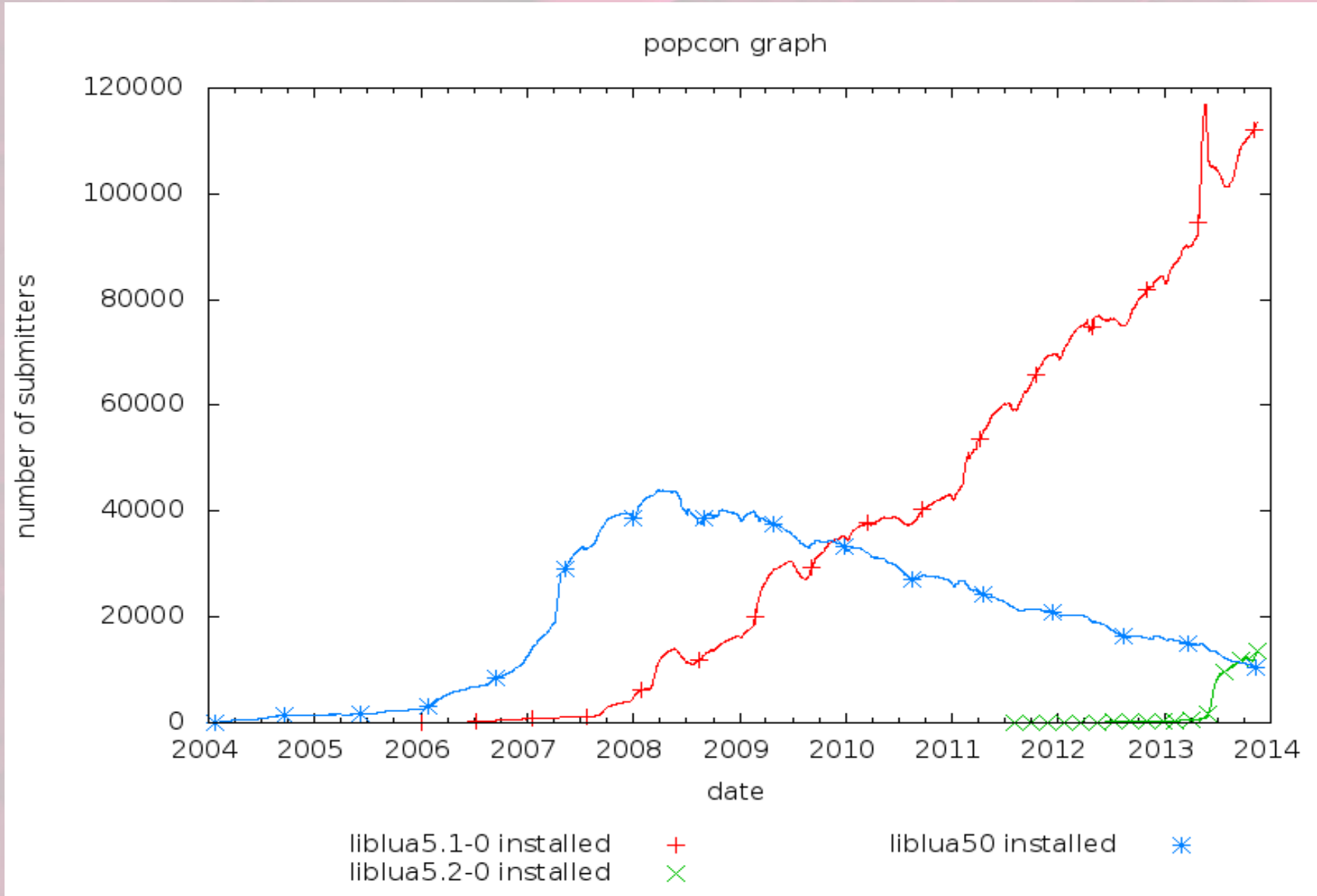lua40 (4.0-1) unstable; urgency=low

  * Initial Release.
  * Added support for shared libraries

-- Daniel Silverstone <dsilvers@debian.org> Mon, 11 Feb 2002

Where are we now?

popcon graph

liblua5.1-0 installed +   liblua50 installed ✳
liblua5.2-0 installed ✕

Which packages depend on Lua 5.1

aegisub	geany-plugin-lua	libtolua++5.1-dev	pax-britannica
apache2-bin	genometools	libwreport2	pdns-backend-lua
aqualung	gimp-gluas	lighttpd-mod-cml	pepper
asc	gnuplot-x11	**love**	**postgresql-9.3-pllua**
asterisk-modules	grafx2	lsyncd	premake
awesome	gringo	lua-augeas	**prosody**
bam	hedgewars	**luakit**	python-lua
blobby	highlight	megaglest	qcontrol
boswars	httest	monotone	radare-common
btanks	ibus-pinyin	mpv	ruby-luabridge
celestia-gnome	instead	mudlet	simgrid
conky-std	kamailio-lua-modules	**mysql-proxy**	syncmaildir
crawl	kyototycoon	nbibtex	tagua
crossfire-client	libapache2-modsecurity	netpanzer	texworks-scripting-lua
crtmpserver	libcegui-mk2-0.7.6	**nginx-extras**	tokyotyrant
deets	libcsound64-6.0	notion	trafficserver
devilspie2	libdballe5	ocropus	ulatencyd
diod	libedje1	opendkim	uwsgi-plugin-lua5.1
ekeyd	libeiskaltdcpp2.2	orthanc	vim
elinks	libgv-lua		weechat-plugins
ember	libhighlight-perl		widelands
fceux	libplplot-lua		xavante
fillets-ng	libquvi7		xmoto
freepops	libtaoframework-lua5.1-cil		
freespace2	libtokyotyrant3		
funguloids			

"Embedders" are not cool with the Security Team

- There are more packages using Lua!

- But they embed it :-/

  - Luatex (lua, lpeg, lfs...)

  - Wesnoth

  - ...

How Lua is packaged

- lua5.1 – statically linked interpreter

- liblua5.1-0 – shared library

- liblua5.1-dev – .h, .pc, .a, .so

  - link the Lua runtime (dynamically or statically)

  - .pc file name (lua.pc or lua5.1.pc)

- liblua5.1-0-dbg – debugging symbols

  - for bug reports with readable stack trace

How Lua libraries are packaged
dh-lua: one tool to rule them all

- .c files compiled with the same flags
    - CFLAGS=-g -O2 -fstack-protector --param=ssp-buffer-size=4 -Wformat -Werror=format-security
    - LDFLAGS=-Wl,-z,relro
- .a and .so
- .pc file systematically generated
    - gcc -static a.c `pkg-config --cflags --libs --static lua5.1 lua5.1-expat`
- .h files automatically generated if absent
    - int luaopen_foo (lua_State *L);
- Tests run using the interpreter, a dynamically linked app and a statically linked app at build time (soon installation time)
- Standard names: lua-foo (runtime), lua-foo-dev (doc + .pc + .h + .a...)
- Agnostic .lua files are "shared" between 5.1 and 5.2
- Luajit only packages (FFI) on their way

Example: lua-expat

```
lua-expat$ cat debian/lua5.1.dh-lua.conf

### things relative to the C library part
CLIB_CFLAGS= -I src/ $(shell pkg-config expat --cflags)
CLIB_LDFLAGS= $(shell pkg-config expat --libs)
CLIB_OBJS= src/lxplib.lo

### things relative to the lua library part
LUA_HEADER=src/lxplib.h
LUA_SOURCES=src/lxp/lom.lua
LUA_SOURCES_MANGLER=sed 's?^src/??'
LUA_MODNAME=lxp
LUA_TEST=tests/test.lua; tests/test-lom.lua

### this part is relative to pkg-config
PKG_URL=http://matthewwild.co.uk/projects/luaexpat/
```

Example: lua-expat

```
$ dpkg -I lua-expat_1.2.0-6_amd64.deb

 Package: lua-expat
 Architecture: amd64
 Maintainer: Enrico Tassi <gareuselesinge@debian.org>
 Provides: lua5.1-expat, lua5.2-expat
 Homepage: http://matthewwild.co.uk/projects/luaexpat/
 Description: libexpat bindings for the Lua language
  This package contains the bindings for the expat library.
 Lua-Versions: 5.1 5.2

$ dpkg -I lua-expat-dev_1.2.0-6_amd64.deb

 Package: lua-expat-dev
 Depends: lua-expat (= 1.2.0-6)
 Provides: lua5.1-expat-dev, lua5.2-expat-dev
 Description: libexpat development files for the Lua language
  This package contains the development files of the libexpat Lua
bindings,
  useful to create a statically linked binary (like a C application or a
  standalone Lua interpreter).
  Documentation is also shipped within this package.
 Lua-Versions: 5.1 5.2
```

Example: lua-expat

```
$ dpkg -c lua-expat_1.2.0-6_amd64.deb | cut -d / -f 3-

usr/share/doc/lua-expat/changelog.Debian.gz
usr/share/doc/lua-expat/copyright

usr/share/lua/5.1/lxp/lom.lua
usr/share/lua/5.2/lxp/
usr/lib/x86_64-linux-gnu/liblua5.1-expat.so.0.0.0
usr/lib/x86_64-linux-gnu/liblua5.2-expat.so.0.0.0

usr/share/lua/5.2/lxp/lom.lua
   -> ../../5.1/lxp/lom.lua

usr/lib/x86_64-linux-gnu/lua/5.1/lxp.so
   -> ../../liblua5.1-expat.so.0.0.0
usr/lib/x86_64-linux-gnu/lua/5.2/lxp.so
   -> ../../liblua5.2-expat.so.0.0.0

usr/lib/x86_64-linux-gnu/liblua5.1-expat.so.0
   -> liblua5.1-expat.so.0.0.0
usr/lib/x86_64-linux-gnu/liblua5.2-expat.so.0
   -> liblua5.2-expat.so.0.0.0
```

Example: lua-expat-dev

```
$ dpkg -c lua-expat-dev_1.2.0-6_amd64.deb | cut -d / -f 3-

usr/include/lua5.1/lxplib.h
usr/include/lua5.2/lxplib.h

usr/share/doc/lua-expat-dev/changelog.Debian.gz
usr/share/doc/lua-expat-dev/copyright
usr/share/doc/lua-expat-dev/us/lom.html
usr/share/doc/lua-expat-dev/us/index.html
…

usr/lib/x86_64-linux-gnu/liblua5.1-expat.a
usr/lib/x86_64-linux-gnu/liblua5.2-expat.a

usr/lib/x86_64-linux-gnu/pkgconfig/lua5.2-expat.pc
usr/lib/x86_64-linux-gnu/pkgconfig/lua5.1-expat.pc

usr/lib/x86_64-linux-gnu/liblua5.1-expat.so
  -> liblua5.1-expat.so.0.0.0
usr/lib/x86_64-linux-gnu/liblua5.2-expat.so
  -> liblua5.2-expat.so.0.0.0
```
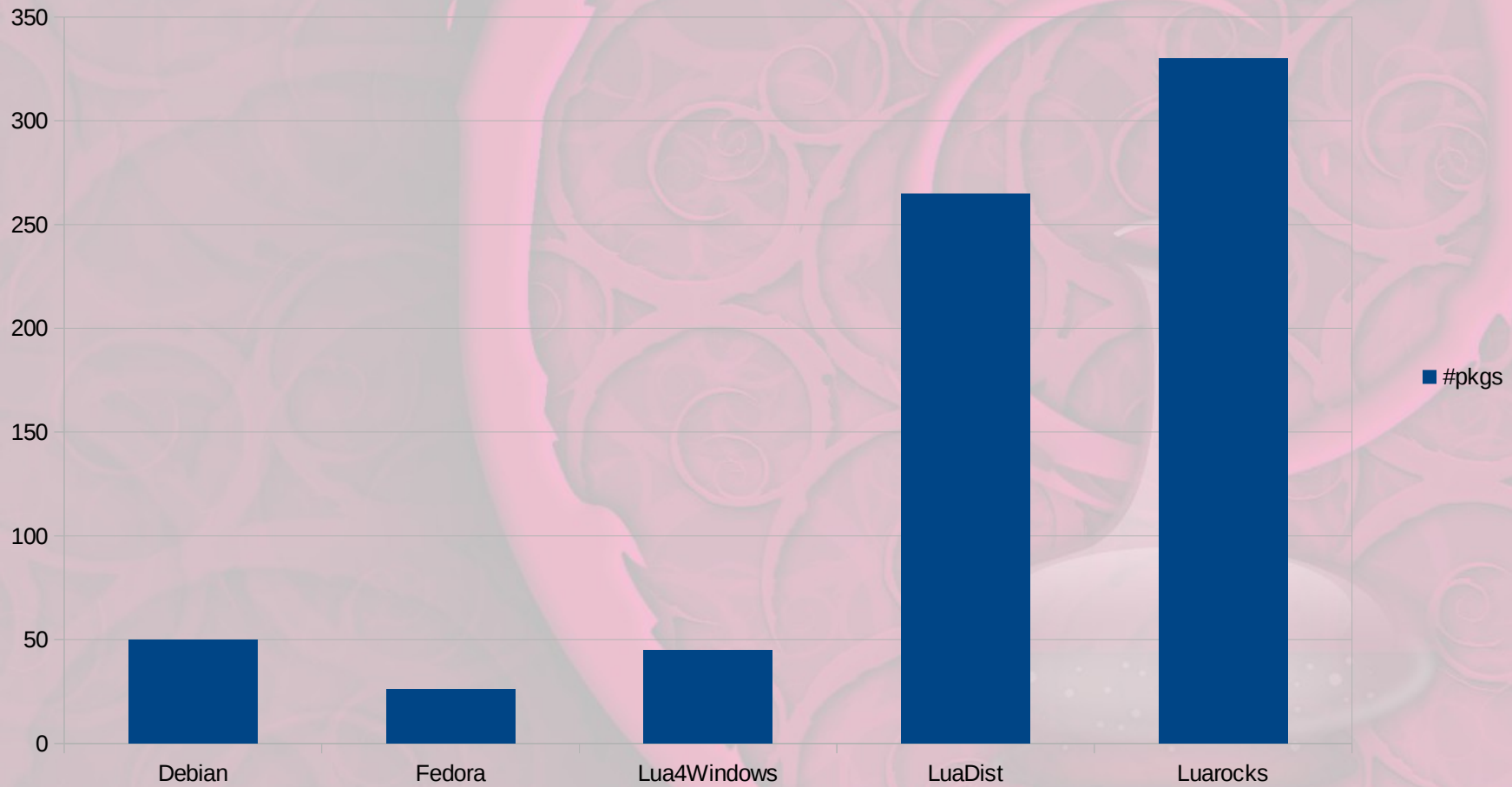
What is usr/lib/x86_64-linux-gnu/ ?

- Arch dependent libraries stay inside arch dependent paths

- This lets you co-install lua-expat for amd64 and armel for example

- Two common use cases:

  - Cross compilation
  - Run i386 software on amd64

Batteries – Q.A. & Standardization: failures

- Debian wheezy & Lua 5.2: no internet!

    1. Lua 5.2 released 16 Dec 2011
    2. Debian freeze 30 Jun 2012 (released 4 Apr 2013)
        - ~40% of packages work with 5.2
        - Some ported by myself, some by upstreams but not released in time. Eg: lfs, expat, …
    3. Luasocket 3.0-rc1 14 Jun 2013

- Lpeg 0.12: no "regression" discovery!

    1. Adds sanity check (empty loops)
    2. luajson has lunit based test suite (Debian has luaunit)
    3. No automatic testing, bug discovered/fixed 7 months later

Proposal: Lua Platform

- Set of batteries blessed by the Lua authority
  - Not all of them, nor only the ones I like
- Maintained by the community
  - No single point of failure
  - Still developed by their authors
- Available in all Lua distributions

It is all about sharing effort!

That's all folks

Thanks for your attention!

References:
* Lua packaging project: http://alioth.debian.org/projects/pkg-lua/
* Lua packaging policy: http://pkg-lua.alioth.debian.org/policy.html
* Incomplete list of Lua packages:
  http://anonscm.debian.org/gitweb/?p=pkg-lua/pkg-lua.git;a=blob;f=mrconfig
* Installation count: http://popcon.debian.org/
* The best software distribution (of course): http://www.debian.org/

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