Full Stack on Wine

Create a Win-Win between
Wine and thousands of Win32 open source projects

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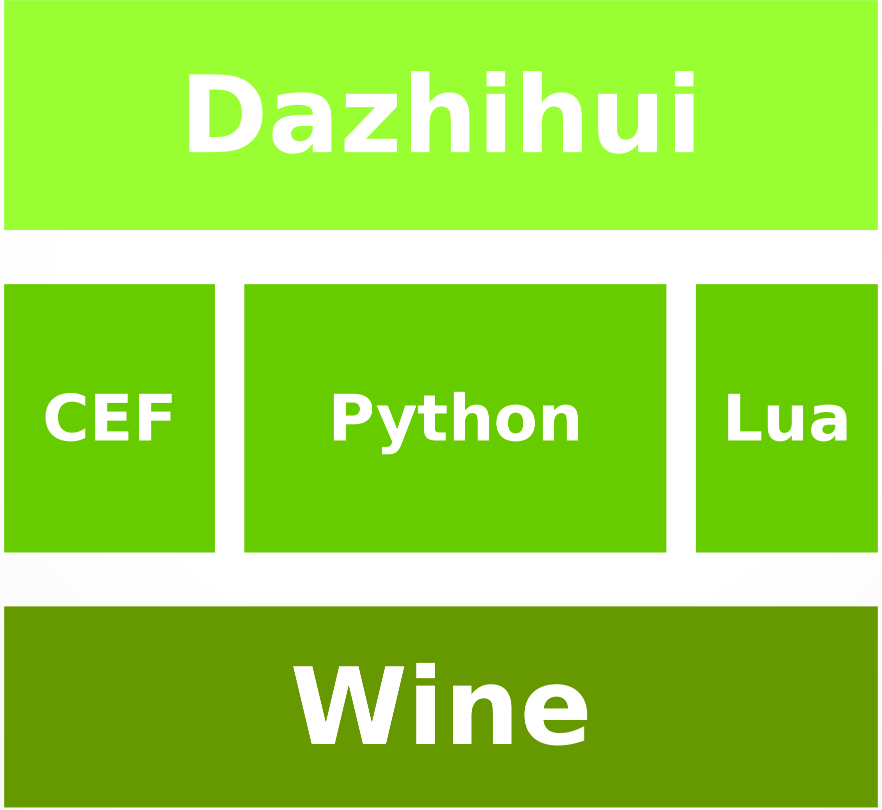
Survey

- Chromium Browser
- Chromium Embed Framework (CEF)
- Python
- Lua
- Dazhihui Financial Security Software

Kownledge – Popularity of software

Closed / Mixed source productions	Open source third party libraries
Long Tail	Famous

Story – Hacking experience on Dazhihui



Dazhihui

CEF

Python

Lua

Wine

Knowledge – Cost of Debugging

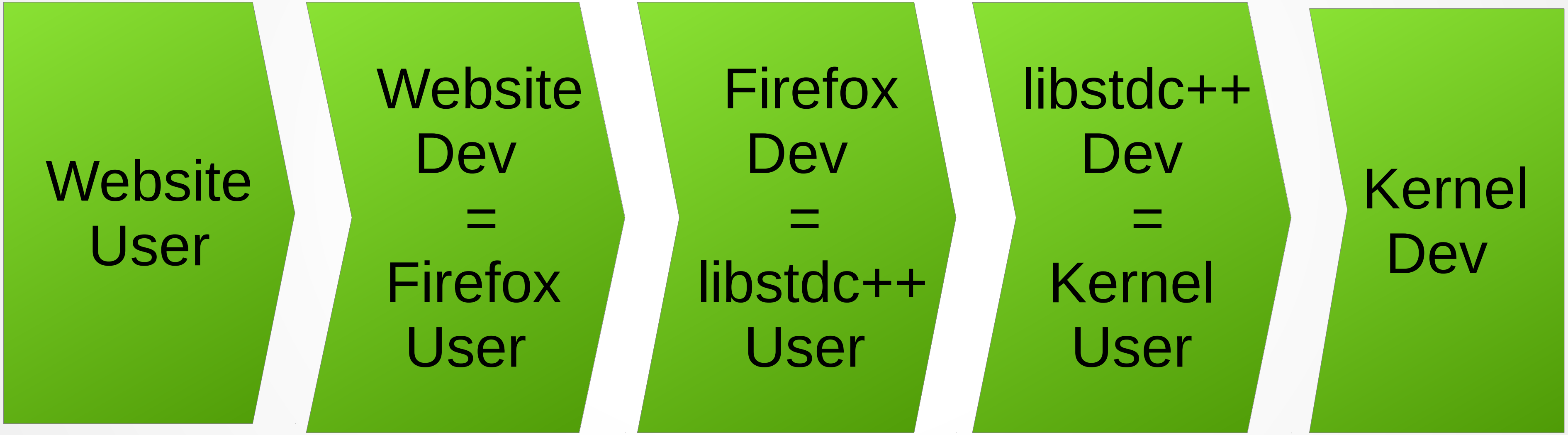
Mixed source production as a combined blackbox	Open source projects as independent components
Expensive	Relative Non-expensive

Question – Nightmare of QA

How could we make sure Dazhihui is compatible with Wine if we are even not sure how compatible is CEF / Python / Lua on Wine?

This makes me thinking...

Normal User / Dev knows two domains



Website User

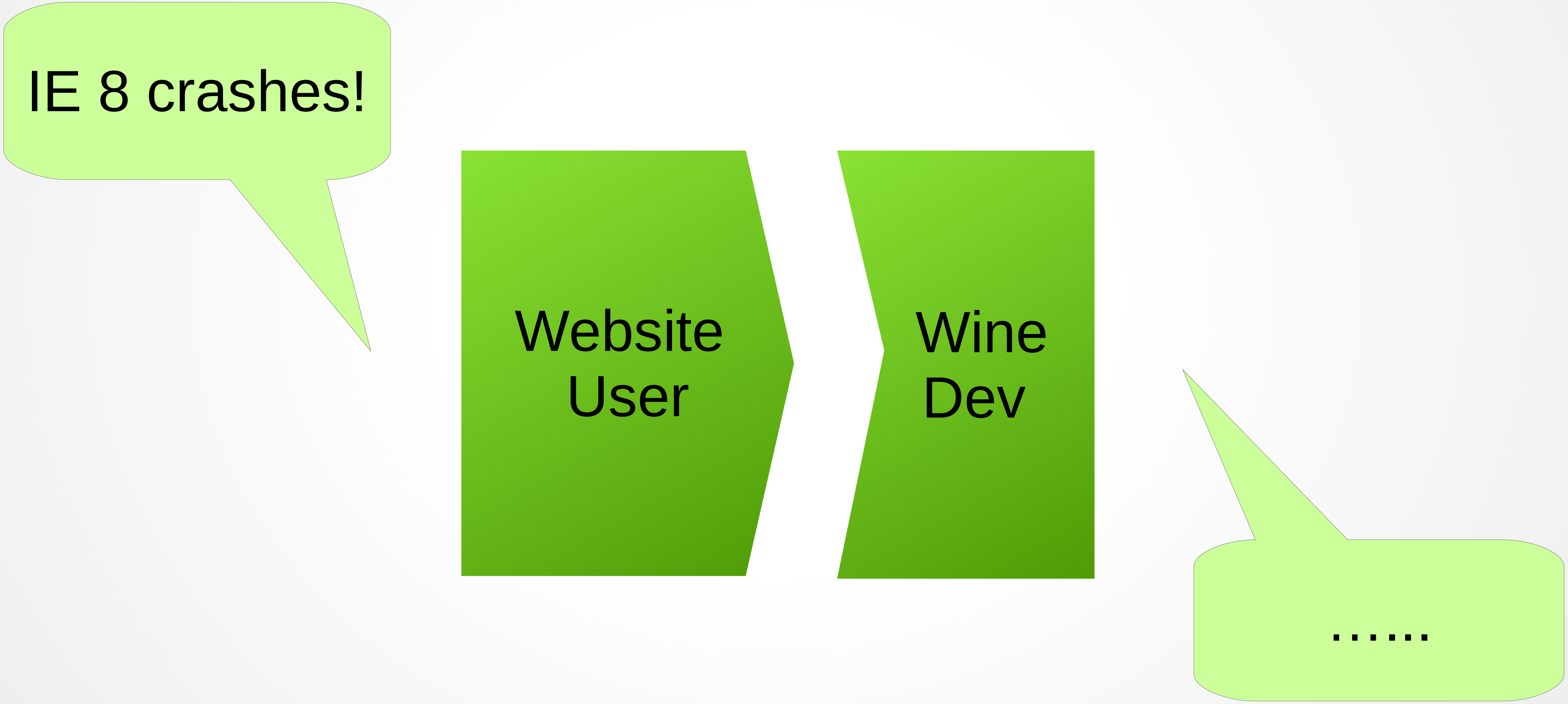
Website Dev = Firefox User

Firefox Dev = libstdc++ User

libstdc++ Dev = Kernel User

Kernel Dev

Wine User / Dev knows everything...



IE 8 crashes!

Website User

Wine Dev

…….

Structure of Dev / User community

Normal software commuities: layer by layer

Wine communites: missing middle layers

Story – Nightmare of upgrading Valve Steam and Tencent QQ

- Chromium v44.0.2378.0 introduced a new feature …
- CEF v3.2357.1273 Inherit the new feature from Chromium …
- Valve Steam (steamwebhelper) upgrades its bundled CEF …
- Bomb!

Question – How to fix the nightmare of upgrading?
Good doctor vs Great doctor

Good doctor treats the disease after a patient sicks

Great doctor prevents the disease before the patient sicks

– Chinese Folk Tale

Good doctors survive
Great doctors starve

– WineConf2015

Summary - Our goals

- Save our Dev from blackbox debugging
- Save our QA from nightmare
- Fill the gap between end user and low level dev
- Catch bug before application update

Solution – Full Stack on Wine

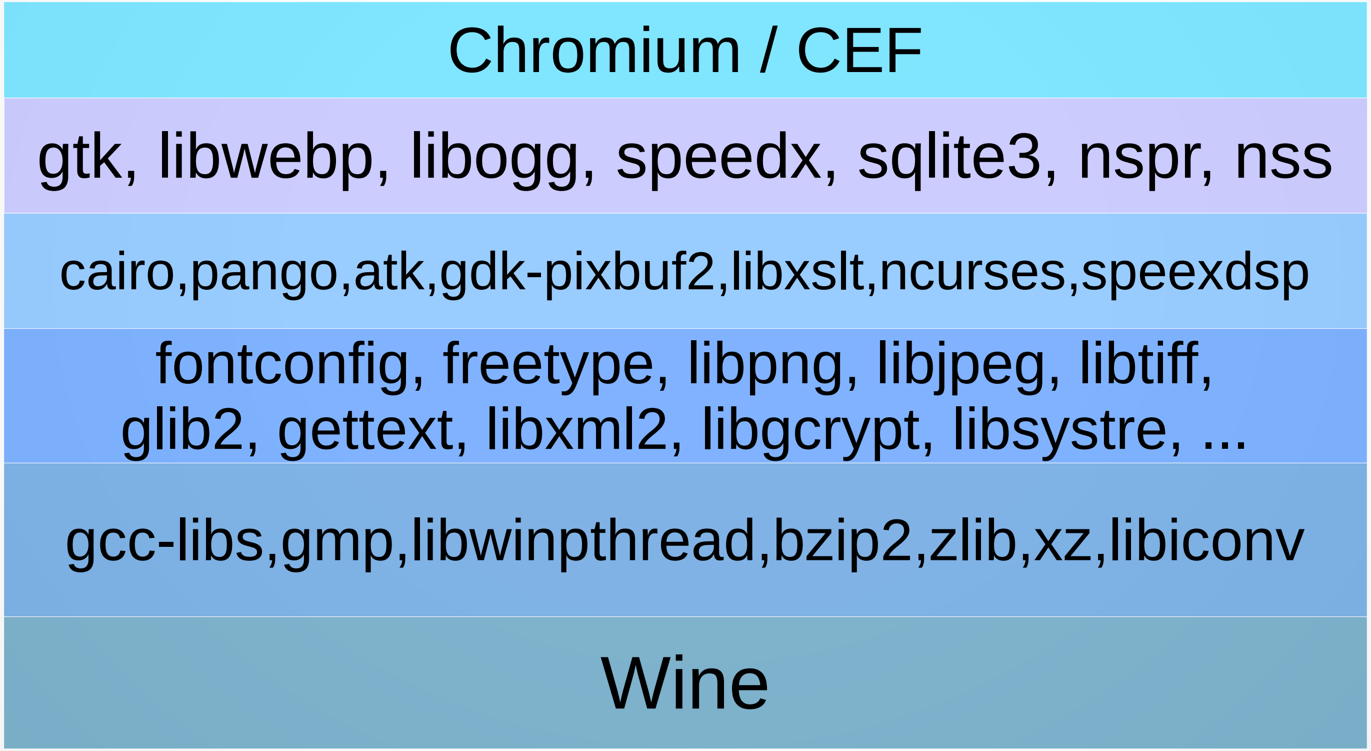
FOR OUR PARTNERS

- Create a centralized Win32 compiling and deployment platform base on Wine.
- Combine Valgrind with Wine as addional value to Win32 developers.

FOR WINE

- Improve the compatibility of Win32 open source libraries on top of Wine, layer by layer.
- Coodinate release plan with famous Win32 open source projects.

What is a 'stack'?



Chromium / CEF

gtk, libwebp, libogg, speedx, sqlite3, nspr, nss

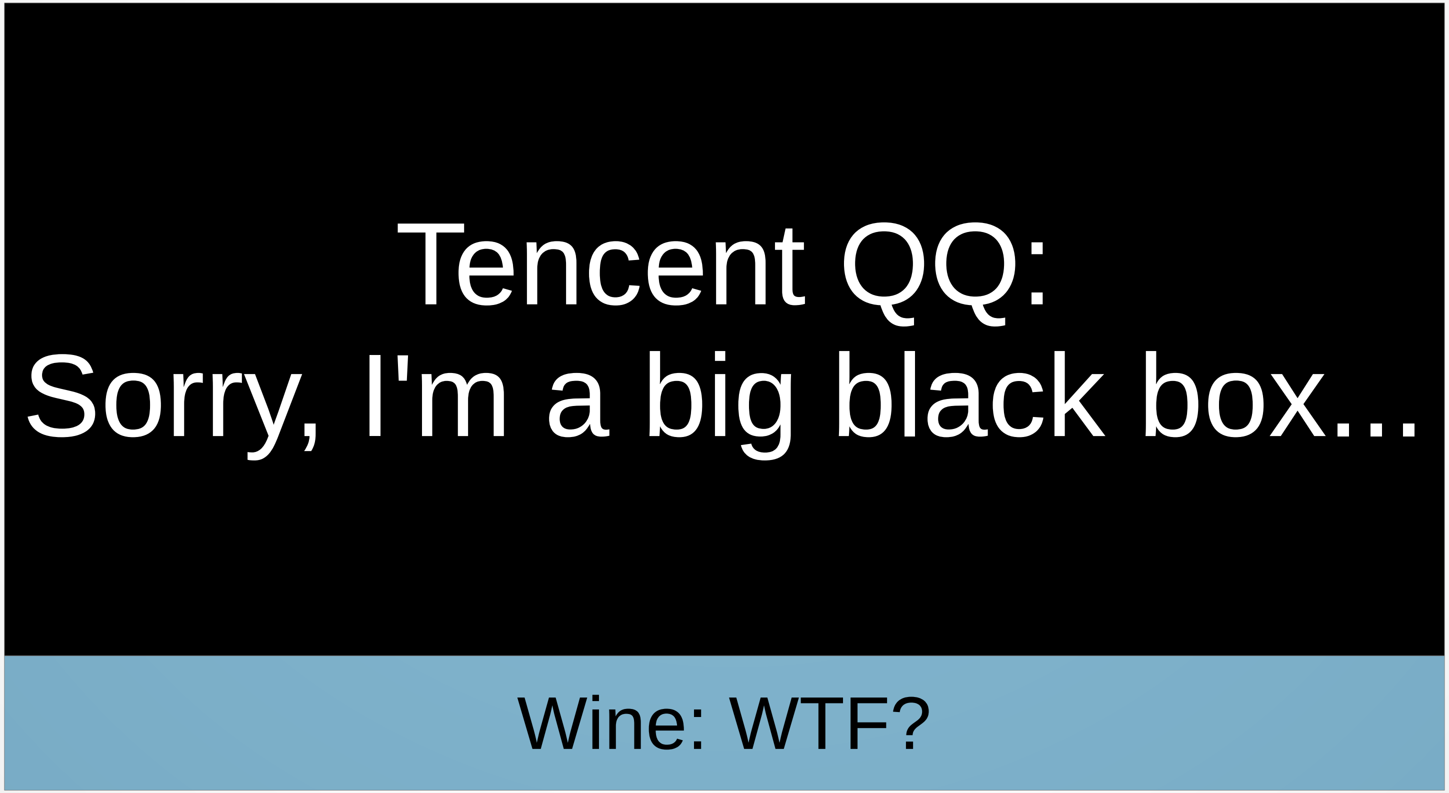
cairo,pango,atk,gdk-pixbuf2,libxslt,ncurses,speexdsp

fontconfig, freetype, libpng, libjpeg, libtiff, glib2, gettext, libxml2, libgcrypt, libsystre, ...

gcc-libs,gmp,libwinpthread,bzip2,zlib,xz,libiconv

Wine

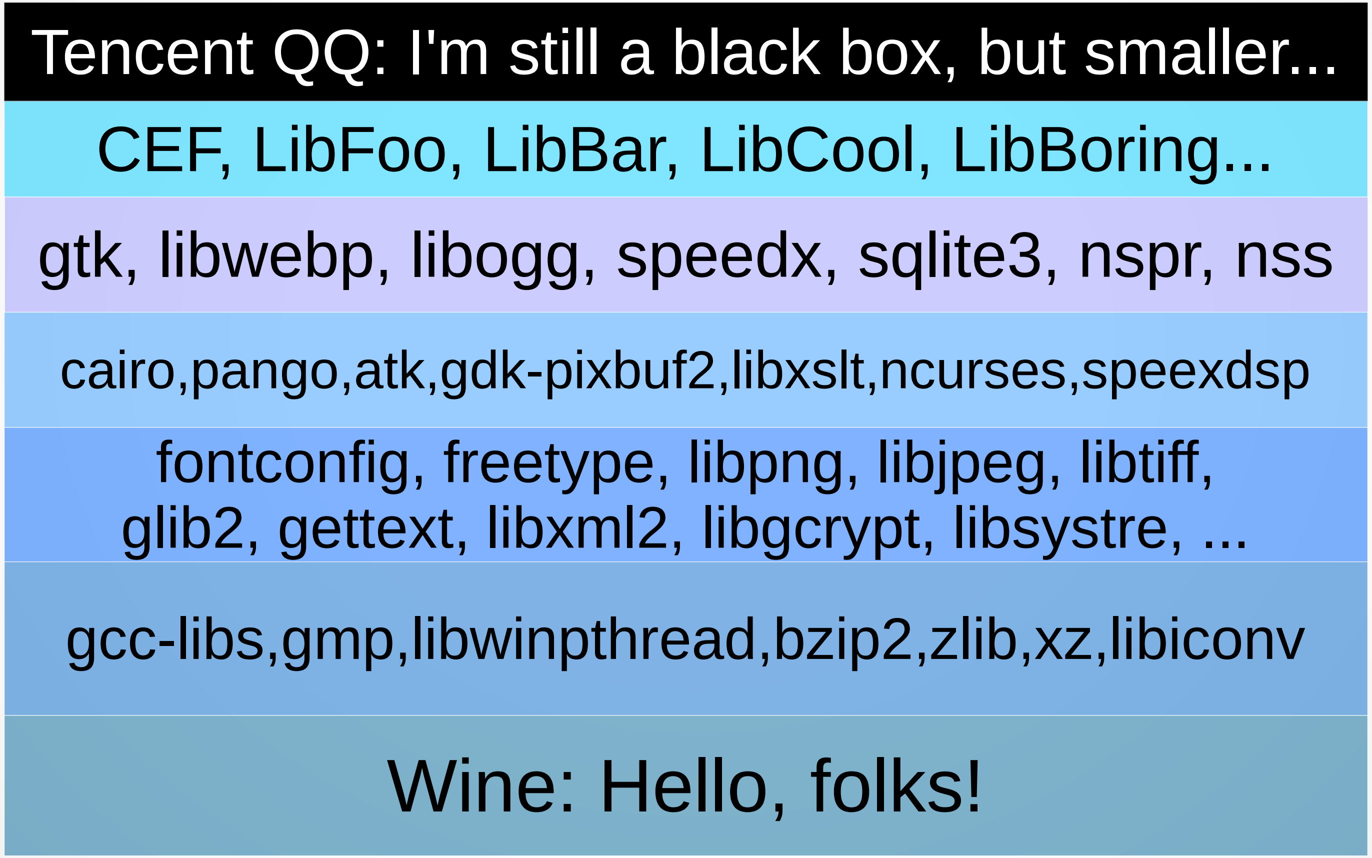
What we did before...



Tencent QQ:
Sorry, I'm a big black box...

Wine: WTF?

What we hope in the future...



Tencent QQ: I'm still a black box, but smaller...

CEF, LibFoo, LibBar, LibCool, LibBoring...

gtk, libwebp, libogg, speedx, sqlite3, nspr, nss

cairo,pango,atk,gdk-pixbuf2,libxslt,ncurses,speexdsp

fontconfig, freetype, libpng, libjpeg, libtiff,
glib2, gettext, libxml2, libgcrypt, libsystre, ...

gcc-libs,gmp,libwinpthread,bzip2,zlib,xz,libiconv

Wine: Hello, folks!

Step by Step, Layer by Layer

- Step One (relative harder)
  - Manually test or run testsuite on Wine, fix test failures.

- Step Two (relative easier)
  - Continuous Integration Testing platform based on Wine

Introduce MSYS2

- Derivative of Cygwin
- Replacement of MSYS
- Pacman
- POSIX build environment: msys2_shell
- Win32 build environment: mingw32_shell / mingw64_shell
- 300+ MSYS2 packages, 700+ MinGW packages
- MSYS2 = a Win32 distribution, Full Stack on Windows
- Wine + MSYS2 = Full Stack on Wine

Work on Wine + Cygwin / MSYS2

- Several months of work
- Fixed 30+ bugs, patches in Wine and Wine Staging
- Reported 5 upstream bugs, one is detected by Valgrind
- Strong support from Cygwin Devs / MSYS2 Devs / XZ Devs
- Impossible without Wine Staging

Status of Wine + Cygwin / MSYS2

- Almost work out of box (Wine Staging 1.7.51)
  - Export STAGING_WRITECOPY=1
- Manual testing
  - gcc / clang / gdb / strace / coreutils / binutils / make / git / autoconf / xz ...
- Integration testing
  - xz: 100% pass (9/9)
  - libpng: 100% pass (40/40)
  - gettext: 93.8% pass (361/385)

Wine + MSYS2 as Win32 compiling platform

- Latest Wine Staging + several local hacks:
  - GCC (MSYS2) 4.9.2, 8+ hours, 3 stagings
  - Qt (MinGW) 4.8.7, 20+ hours, 200+M source code
  - 300+ MSYS2 packages
  - 50+ MINGW packages
    - Boost, Binutils, Cairo, ffmpeg, Inkscape, Gimp, Qt, QtCreator, SQLite3, Tor, WineD3D, Wget, WxWidgets, etc
  - All above done by self-compiled MSYS2 runtime using Wine MSYS2

Next plan

- Build a centralized continuous compiling and continuous deployment platform based on Wine
  - Drone CI / Travis CI / Buildbot / Jenkins
- Invite Win32 open source developers
- Integrate Valgrind
- Work with Win32 partner projects to fix Wine failures

Why maintain a centralized build service?

- Self controllable environment
  - Kernel, libc, filesystem, wine, etc
- Quick bug fix
- Build connections with open source win32 developers, build a developers' community
- Required by next next plan

Future Dream (next next plan)

- Plan A
  - Provide commercial service to Windows software vendors
- Plan B
  - Provide commercial techinical support to mainstream CI vendors
    - Travis CI, Appveyor CI, Drone CI, Circle CI, Snap CI, etc

Advantage, Disadvantage

- We are good at
  - Unlimited parallel builds, License free
  - Save hardware resource
    - Wine + Docker vs Windows inside VM
  - Valgrind
- We can't guarentee
  - Zero false positive

Theory - the more the better

- Dream
  - Convince Top 1000 open source win32 projects to use our solution
  - Build a Wine/Win32 developer community like a Linux distribution

Real world cases

- LibreOffice (FOSDEM 2013)
- Firefox
- Git for Windows
- Bitcoin
- llvm
- Search in github: filename:.travis.yml wine

Summary – Our plan

- Continuous Compiling / Deployment service
- Valgrind support
- Fix test failures, layer by layer, expect a long term job
- Always welcome new contributors...
- Seek for business chance

Call for help – contribute time

- Contribute time
  - Upstream existent wine staging patches
  - Continue improve remain hacks
  - Test Win32 open source libraries / applications
  - Fix Wine bugs
  - Improve Valgrind symbol support
  - Improve WineDBG / GDB symbol support

Call for help – contribute connections

- Do you have connenctions to:
  - GCC, Clang, GDB, Git, etc
  - Python, Perl, PHP, Lua, OpenJDK, Rust, Go, Node.js, etc
  - CEF, NSIS, etc
  - Cocos2dx, Godot, Minetest, Blender, OpenRA, MonoGame, etc
  - LibreOffice, Firefox, Gimp, Inkscape, etc
- Please invite them to join us
  - Investigate chance to Win-Win
  - Co-mentor future GSoC projects

Call for help – contribute ideas

- Any combination similar to Wine + Valgrind
  - Useful for Win32 application developers
  - Available only on unix
  - Possible case: LibFuzzer, Klee, Reverse Debugging, etc

Proposal
Build consensus focus on Win32 open source software

- Top to Bottom
  - Steam folks and QQ folks
    - Could we co-work on CEF?
    - Binary scanning tool to discover common used open source libraries?
- Bottom to Top
  - Cocos2dx
    - What games are developed by cocos2dx?

Proposal
Coordinate release plan with our partner project

- Wine side: Milestone / Stable Release
  - Could each of 'Fixed all gcc/clang/gdb/git test failures' suggest a milestone?
  - Could 'Fixed all Chromium 39 / CEF 3.2 test failures' suggest a stable release?
- Partner side: wait for Wine!
  - Could we ask CEF / cocos2dx / etc reserve a reasonable time for Wine community to test their software before final release?

QA & Open Discussion

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Thank You!