PLEX

Plex  Conan

How to kill a dragon

Tobias Hieta

Dragon killer, cheese mover and likes to open cans that contains worms

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WTF is Plex?

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The leading media streaming software platform

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WTF is Conan?

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This is a story about love!

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Plex Media Server

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PLEX

60+ dependenc

Boost, zlib, freetype, ffmpeg, bzip, curl, expat, freeima

...

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JavaScript developer ->

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1269 dependencies

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27 targets

Linux (lot of different architectures), Android, iOS, macOS, Windows, FreeBSD

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Compilers …

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Standard libraries

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Many* build systems

*= I think the scientific unit is ‘a fuckton’.

CMake, Auto~~tools~~hell, SCons, Make, Visual Studio, ndk-make, meson, build2, waf and whatever that boost thing is

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They all suck

CMake probably sucks least.

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Compile

PLEX

plex-dependency-builder

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Rebuild the world

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scratchbox2

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Hidden changes

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Frustrated and angry

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(We need)

A new hope

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Individual packages

PLEX

Individual packages

Handle multiple build-systems

PLEX

Individual packages
Handle multiple build-systems

Cross-compile

PLEX

Individual packages
Handle multiple build-systems
Cross-compile

Manage deps and toolchain

PLEX

Individual packages
Handle multiple build-systems
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Manage deps and toolchain

Flexible

PLEX

Individual packages
Handle multiple build-systems
Cross-compile
Manage deps and toolchain
Flexible

Reproducible builds

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Buckaroo won

#shocking

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But...

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Conan really won

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Unified toolchain

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GCC ⚔ Clang

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Single binary
Multiple targets

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A single compiler

to rule them all.

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Cool logo

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16 targets
2 compilers

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Bumps on the road

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PlexConanTool

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```
def source(self):
  tools.download("http://www.libsdl.org/release/SDL2-2.0.tar.gz", "sdl.tar.gz")
  tools.unzip("sdl.tar.gz", ".")
  os.unlink("sdl.tar.gz")

def build(self):
  cmake = CMake(self.settings)
  cmakeflags = "-DSDL_Audio=OFF -DSDL_Video=OFF -DSDL_Render=OFF -DSDL_Power=OFF" \
               "-DSDL_CPUInfo=OFF -DSDL_Threads=OFF -DSDL_Loadso=OFF -DSDL_TImer=OFF -DDIRECTX=OFF -DSDL_SHARED=OFF"
  self.run("cmake %s -DCMAKE_INSTALL_PREFIX=%s -DSDL_Audio=OFF %s %s" % (cmakeflags,
      os.path.join(self.conanfile_directory, "install"),
      os.path.join(self.conanfile_directory, "SDL2-%s" % self.version),
    cmake.command_line))
  self.run("cmake --build . %s" % cmake.build_config)
  self.run("cmake --build . --target install")
```

Initial SDL file - lot of things in there.

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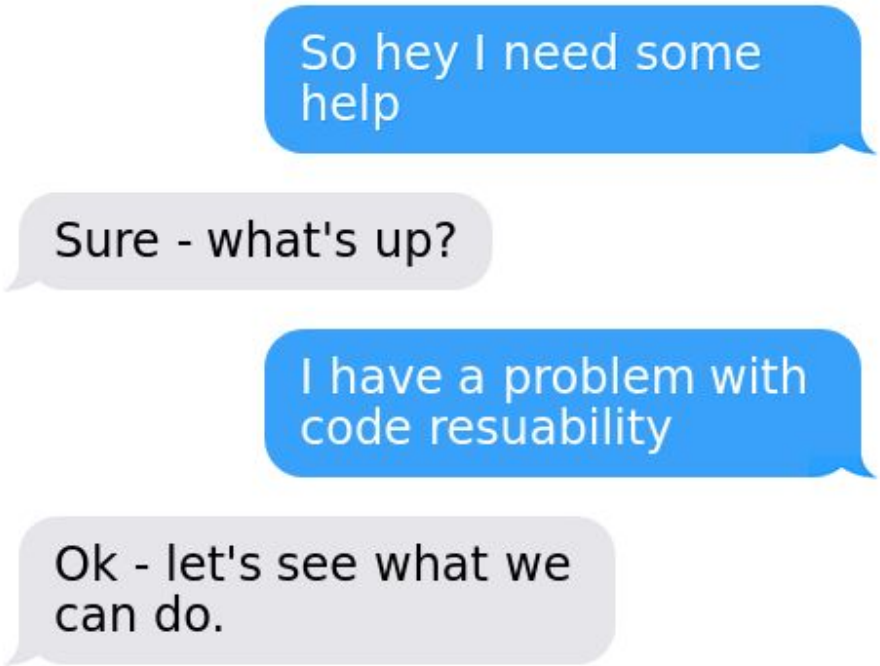
So hey I need some help
Sure - what's up?
I have a problem with code resuability
Ok - let's see what we can do.

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```
requires = "plexconantool/1.0"

def source(self):
  with tools.pythonpath(self):
    import plexconantool
    plexconantool.download(self, "...")

def build(self):
  with tools.pythonpath(self):
    import plexconantool
    cmakeflags = ["-DSDL_Audio=OFF", "-DSDL_Video=OFF", "-DSDL_Render=OFF", "-DSDL_Power=OFF"]
    plexconantool.cmake(self, cmakeflags)
    plexconantool.cmake_build(self)
```

Conan feature for code sharing - much better

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Profiles

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```
CC="clang" CFLAGS="-g -mmacosx-version-min=10.8"\
  conan test_package -s os=macos -s compiler=clang -s arch=x86_64
```

Everything was controlled with env variables.

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Hey - this whole thing with managing compiler flags and settings in the environment is pretty annoying.
Not that bad I think?
Well actually...

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```
[settings]
compiler=clang
compiler.version=5.0
compiler.libcxx=libc++
os=Macos
arch=x86_64
build_type=Release

[env]
CC=clang
CXX=ccache clang++
CFLAGS=-mmacosx-version-min=10.8 -g
```

A profile for macos

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```
conan test_package -pr profiles/macos-x86_64
```

Much easier!

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Build what’s updated

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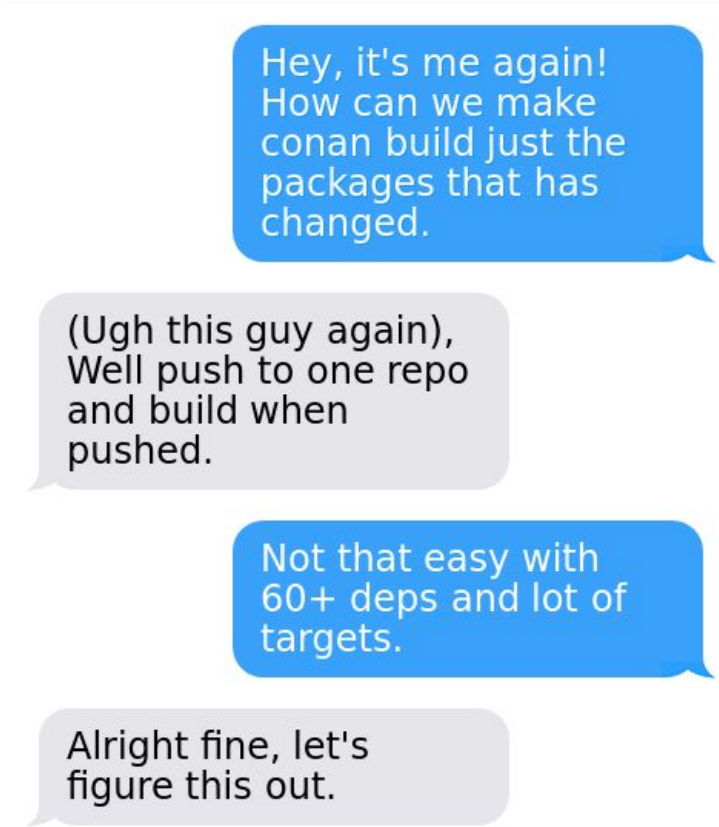
Hey, it's me again! How can we make conan build just the packages that has changed.
(Ugh this guy again), Well push to one repo and build when pushed.
Not that easy with 60+ deps and lot of targets.
Alright fine, let's figure this out.

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```
conan install -pr profile --build=outdated variants/standard
```

build=outdated was added

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```
argtable2/git-79dac1b-4@plex/stable: Package is up to date
breakpad/1.0-9d61e90-2@plex/stable: Package is up to date
bzip2/1.0.6-3@plex/stable: Package is up to date
cotire/1.8.0-391bf6b-0@plex/stable: Package is up to date
zlib/1.2.8-5@plex/stable: Package is up to date
argtable2/git-79dac1b-4@plex/stable: Already installed!
breakpad/1.0-9d61e90-2@plex/stable: Already installed!
bzip2/1.0.6-3@plex/stable: Already installed!
cotire/1.8.0-391bf6b-0@plex/stable: Already installed!
ffmpeg/3.3-8c220a2dd-0@plex/stable: Installing build requirements of: ffmpeg/3.3-8c220a2dd-0@plex/stable
```

Only processing changed packages

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Automation

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Heeey. So outdated is great and all - but how do we know what worked and not?
Seriously? We have other things to do here.
Pretty pleaaaase?
Hello? Please can we do this?
I'll owe you beer!
Ok fine

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```
conan install --build=outdated --json info.json -pr profile variants/standard
```

--json parameter was added

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Now we can parse this

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Reproducible builds

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zlib/1.2.8@plex/stable

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zlib/1.2.8-1@plex/stable

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```
class Bzip2Conan(PlexConanFile):
  name = "bzip2"
  plex_version = "1.0.6"
  plex_revision = 4
```

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PlexConanFile

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Two phase setup

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conan_init.py

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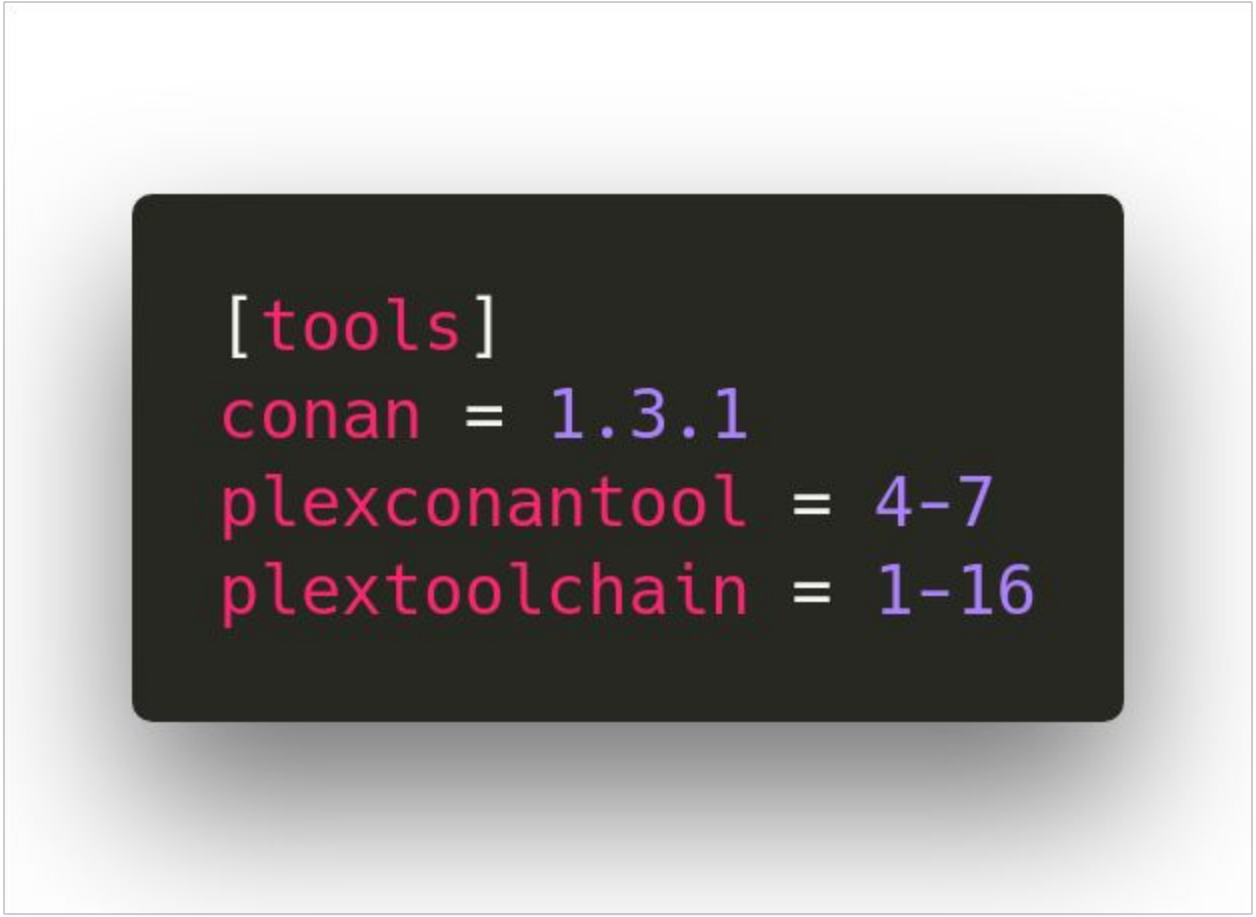

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Consistent environment

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Don’t try this at home

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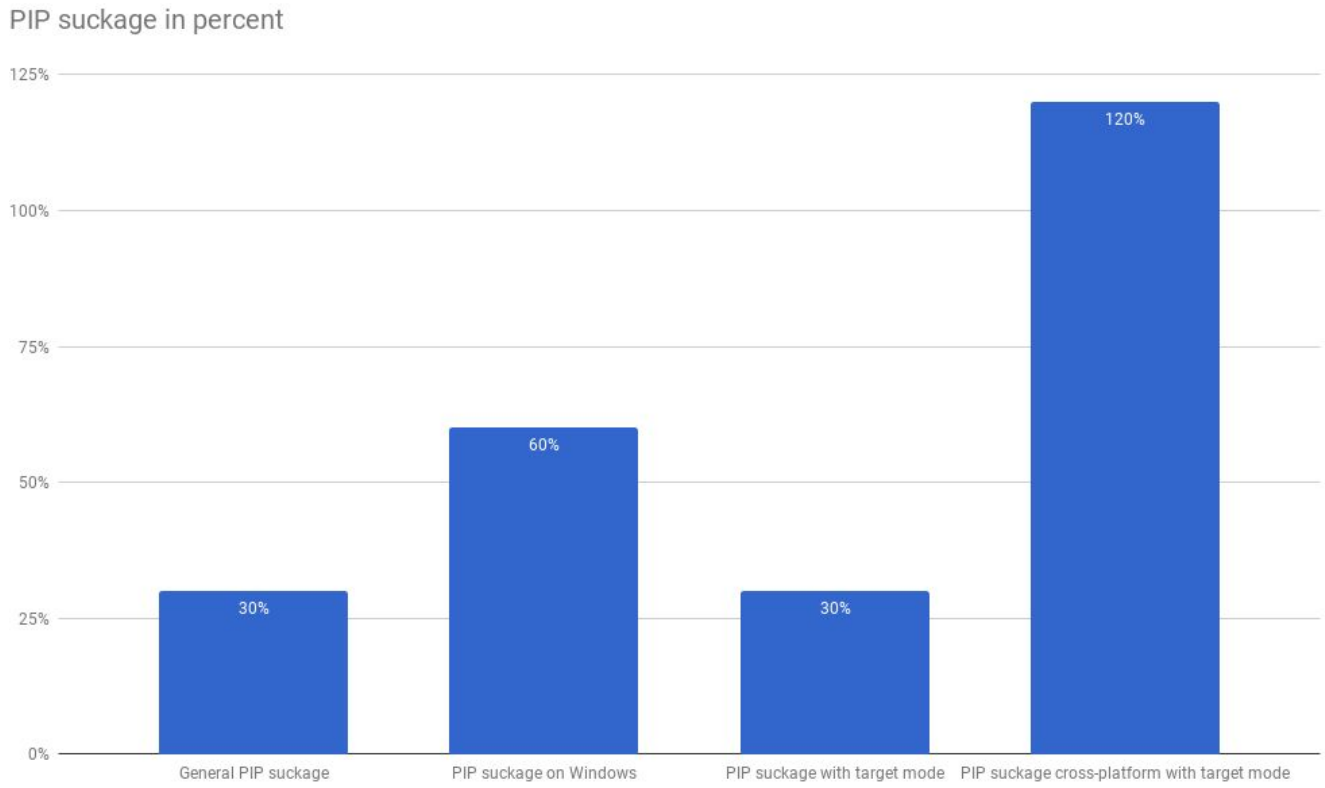
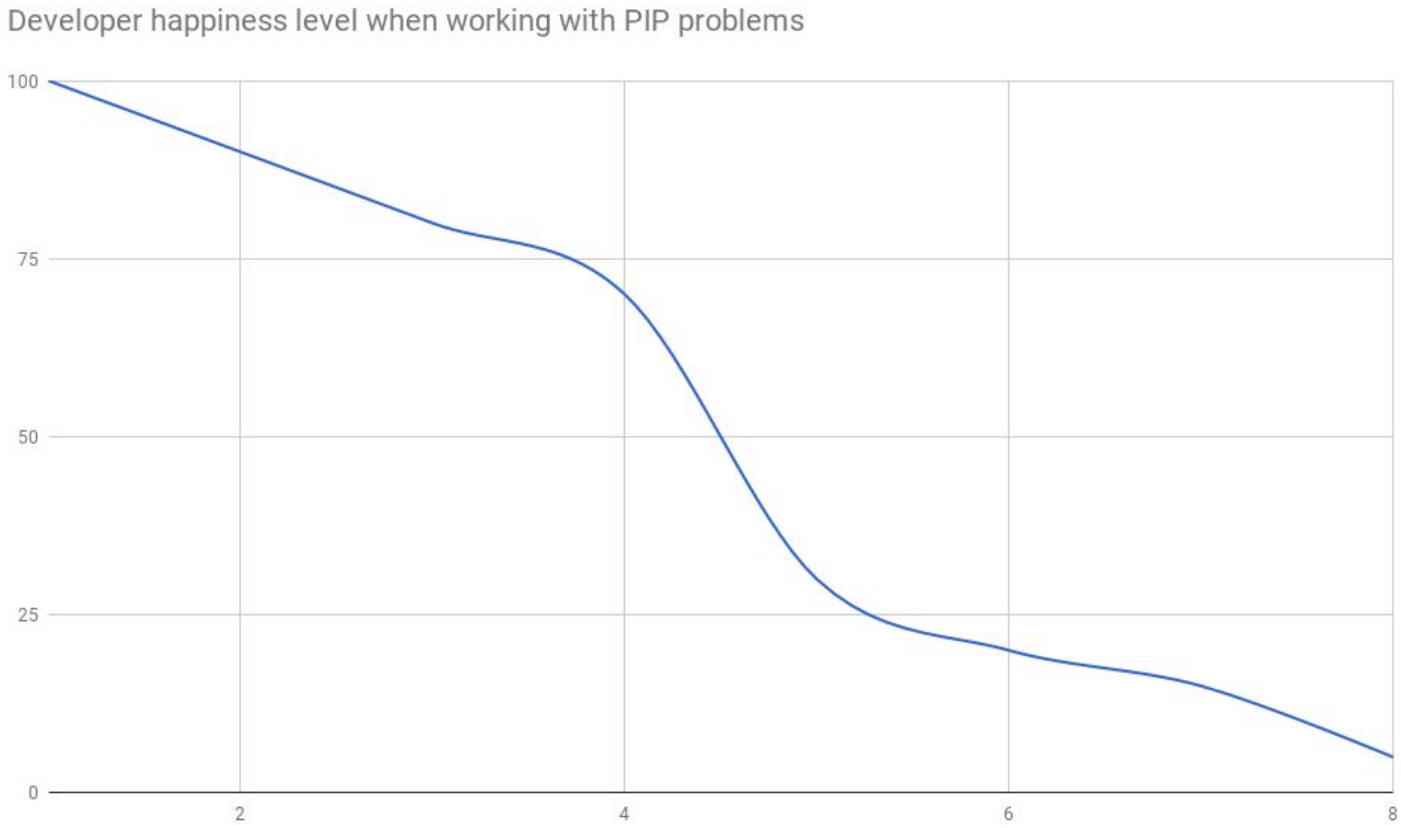

PIP suckage in percent
125%
100%
75%
50%
25%
0%
30%
60%
30%
120%
General PIP suckage
PIP suckage on Windows
PIP suckage with target mode
PIP suckage cross-platform with target mode

PLEX


Developer happiness level when working with PIP problems
100
75
50
25
0
2
4
6
8

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Back on track

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Don’t trust manual revisions

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update_pkg_verison.py

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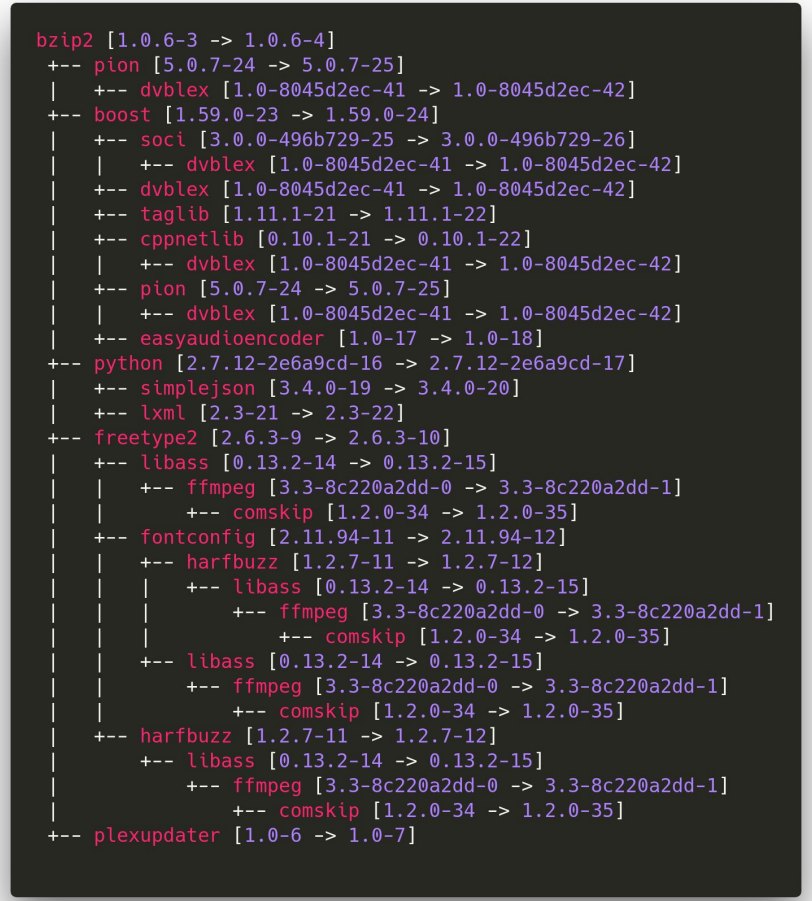
bzip2 [1.0.6-3 -> 1.0.6-4]
+-- pion [5.0.7-24 -> 5.0.7-25]
| +-- dvblex [1.0-8045d2ec-41 -> 1.0-8045d2ec-42]
+-- boost [1.59.0-23 -> 1.59.0-24]
| +-- soci [3.0.0-496b729-25 -> 3.0.0-496b729-26]
| | +-- dvblex [1.0-8045d2ec-41 -> 1.0-8045d2ec-42]
| +-- dvblex [1.0-8045d2ec-41 -> 1.0-8045d2ec-42]
| +-- taglib [1.11.1-21 -> 1.11.1-22]
| +-- cppnetlib [0.10.1-21 -> 0.10.1-22]
| | +-- dvblex [1.0-8045d2ec-41 -> 1.0-8045d2ec-42]
| +-- pion [5.0.7-24 -> 5.0.7-25]
| | +-- dvblex [1.0-8045d2ec-41 -> 1.0-8045d2ec-42]
| +-- easyaudioencoder [1.0-17 -> 1.0-18]
+-- python [2.7.12-2e6a9cd-16 -> 2.7.12-2e6a9cd-17]
| +-- simplejson [3.4.0-19 -> 3.4.0-20]
| +-- lxml [2.3-21 -> 2.3-22]
+-- freetype2 [2.6.3-9 -> 2.6.3-10]
| +-- libass [0.13.2-14 -> 0.13.2-15]
| | +-- ffmpeg [3.3-8c220a2dd-0 -> 3.3-8c220a2dd-1]
| | +-- comskip [1.2.0-34 -> 1.2.0-35]
| +-- fontconfig [2.11.94-11 -> 2.11.94-12]
| | +-- harfbuzz [1.2.7-11 -> 1.2.7-12]
| | | +-- libass [0.13.2-14 -> 0.13.2-15]
| | | +-- ffmpeg [3.3-8c220a2dd-0 -> 3.3-8c220a2dd-1]
| | | +-- comskip [1.2.0-34 -> 1.2.0-35]
| | +-- libass [0.13.2-14 -> 0.13.2-15]
| | +-- ffmpeg [3.3-8c220a2dd-0 -> 3.3-8c220a2dd-1]
| | +-- comskip [1.2.0-34 -> 1.2.0-35]
| +-- harfbuzz [1.2.7-11 -> 1.2.7-12]
| +-- libass [0.13.2-14 -> 0.13.2-15]
| +-- ffmpeg [3.3-8c220a2dd-0 -> 3.3-8c220a2dd-1]
| +-- comskip [1.2.0-34 -> 1.2.0-35]
+-- plexupdater [1.0-6 -> 1.0-7]

PLEX

Blizz

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Thanks!

@tobiashieta

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devstory

PLEX