Debian and Clang

Sylvestre Ledru – sylvestre@debian.org
Current status:
All C, C++, Objective-C sources are being built with gcc for all supported Debian arches (9) and Kernel (3).
Rebuild of Debian using Clang
Crappy method:

```bash
VERSION=4.7
cd /usr/bin
rm g++-$VERSION gcc-$VERSION cpp-$VERSION
ln -s clang++ g++-$VERSION
ln -s clang gcc-$VERSION
ln -s clang gcc-$VERSION
ln -s clang cpp-$VERSION
cd -
```
Testing the rebuild of the package under amd64.

NOT the performances (build time or execution) nor the execution of the binaries
Full results published: http://clang.debian.net/

Debian Package rebuild
Rebuild of the Debian archive with clang

By Sylvestre Ledru (Debian, IRILL, Scilab Enterprises). February 28th 2012

Presentation

This document presents the result of the rebuild of the Debian archive (the compiler.

clang is now ready to build software for production (either for C, C++ or Obj


Done on the cloud-qa - EC2 (Amazon cloud)
Thanks to Lucas Nussbaum
Rebuild with clang 3.0 - February 28, 2012
15658 packages built : 1381 (8.8 %) failed.

Rebuild with clang 3.1 - June 23, 2012
17710 packages built : 2137 (12.1 %) failed.

Rebuild with clang 3.2 - January 28, 2013
18264 packages built : 2204 (12.1 %) failed.
Why these differences between 3.0 vs 3.1/3.2?
Some information about `-Wall` & `-Werror`:

- `-Wall` enables many warnings
- `-Werror` transforms Warning to Error

```c
int main() {
    unsigned int i = 0;
    return i < 0;
}
```

```bash
$ gcc -Wall -Werror foo.c && echo $?  
0
```

```bash
$ clang -Wall -Werror foo.c && echo $?  
foo.c:3:14: error: comparison of unsigned expression < 0 is always false  
    [-Werror,-Wtautological-compare]  
    return i < 0;  
    ^~  
1 error generated.
```
Unsupported options
50 occurrences

$ gcc -O9 foo.c && echo $?
0

$ clang -O9 foo.c
error: invalid value '9' in '-O9'

Record by libdbi-drivers with -O20 \

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Different default behavior
133 occurrences

```c
int foo(void) {
    return;
}
```

```bash
$ gcc -c noreturn.c; echo $?
0
# -Wall shows it as warning

$ clang -c noreturn.c

noreturn.c:2:2: error: non-void function 'foo' should return a value
[-Wreturn-type]
    return;
   ^

1 error generated.
```
Last rebuild proved that clang is now ready

Remaining problems are upstream

Some work started to report bugs upstream
What next ?
Two goals:

• Test of the quality of the binaries
• Provide tools to the Debian / Ubuntu communities to fix their packages
Publication of a full repository built with clang:

```
deb http://clang.debian.net/repository-2013-04-07/ unstable-clang main
```

```bash
$ echo "deb http://clang.debian.net/repository-2013-04-07/ unstable-clang main" >> /etc/apt/sources.list
$ apt-get update
$ apt-get install coreutils/unstable-clang
$ ls
$ awk
```
http://buildd-clang.debian.net/

Automatic build results of the packages using clang

Connected on the debian mirror (ie: updated packages)
## Debian Clang Package Auto-Building

Buildd reports for amd64 (sid)

### Distributions: [sid]

### Architectures: [amd64]

<table>
<thead>
<tr>
<th>Package</th>
<th>Version</th>
<th>Last change</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>0ad</td>
<td>0.0.13-1</td>
<td>2013-04-15 19:35:42.986454</td>
<td>Needs-Build</td>
</tr>
<tr>
<td>0xffff</td>
<td>0.6~git20130406-1</td>
<td>2013-04-25 09:52:46.800427</td>
<td>Built</td>
</tr>
<tr>
<td>389-admin</td>
<td>1.1.30-1</td>
<td>2013-04-15 16:54:17.54452</td>
<td>Built</td>
</tr>
<tr>
<td>389-adminutil</td>
<td>1.1.15-1</td>
<td>2013-04-10 14:10:40.255492</td>
<td>Built</td>
</tr>
<tr>
<td>389-ds-base</td>
<td>1.3.0.3-1</td>
<td>2013-04-15 16:57:04.652782</td>
<td>Built</td>
</tr>
<tr>
<td>389-dsgw</td>
<td>1.1.9-1</td>
<td>2013-04-15 16:57:47.72331</td>
<td>Failed</td>
</tr>
<tr>
<td>3dchess</td>
<td>0.8.1-17</td>
<td>2013-04-15 16:58:17.217191</td>
<td>Built</td>
</tr>
<tr>
<td>3depict</td>
<td>0.0.10-1</td>
<td>2013-04-15 17:22:53.431718</td>
<td>Needs-Build</td>
</tr>
</tbody>
</table>

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Package(s): golang  Suite: sid

<table>
<thead>
<tr>
<th>Architecture</th>
<th>Version</th>
<th>Status</th>
<th>For</th>
<th>Buildd</th>
<th>State</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>amd64</td>
<td>2:1.0.2-2</td>
<td>Build-Attempted</td>
<td>2h</td>
<td></td>
<td>uncompiled</td>
<td></td>
</tr>
</tbody>
</table>

Tail of log for golang on amd64:

debug/gosym
encoding/csv
encoding/hex
database/sql
image/gif
image/png
os/user
testing
testing/iostest
testing/quick

# os/user
clang: error: argument unused during compilation: `-fno_eliminate-unused-debug-t
make[1]: *** [debian/build.stamp] Error 2
make[1]: Leaving directory `~/PKGBUILDDIR`
make: *** [build-arch] Error 2
Further about Debian & LLVM
Publication of Debian (wheezy, unstable) and Ubuntu (Quantal, Precise, Raring) of Nightly packages of LLVM, Clang, Compiler-rt, Polly & LLDB

http://llvm.org/apt

http://blog.llvm.org/2013/04/llvm-debianubuntu-nightly-packages.html
What next next?
Try a Debian release built with clang with lld + libc++
Thanks!

(For listening
For the software
For this excellent community)