



Compiler flags

Darryl Gove

Compiler Performance Engineering

darryl.gove@sun.com

Sun Studio 12

- IDE (based on NetBeans.org)
- Compilers
 - > C/C++/Fortran
- Debugger
 - > dbx
- Performance Analyzer
- Thread Analyzer
- Solaris and Linux
- SPARC and x86/64

CoolTools

- Free download from
 - > <http://cooltools.sunsource.net/>
- Developer
 - > ATS, BIT, Discover, SPOT, corestat
- Deployer
 - > cooltuner, coolstack

Optimisation flags

- No optimisation flags = no optimisation
- `-O` = good degree of optimisation
- `-fast` = aggressive optimisation

Target architecture

- General
 - > `-xtarget=generic`
- Needed to exploit features
 - > `-xtarget=sparcfmaf -fma=fused`
 - > `-xarch=sse2 -xvector=simd`
- Flags evaluated from left to right

Debug flags

- **-g** for C/Fortran
- **-g0** for C++
 - > **-g** disables front-end inlining in C++
- Changes code at low optimisation
 - > Tail call optimisation
- Allows attribution of time to lines of source

32-bit or 64-bit

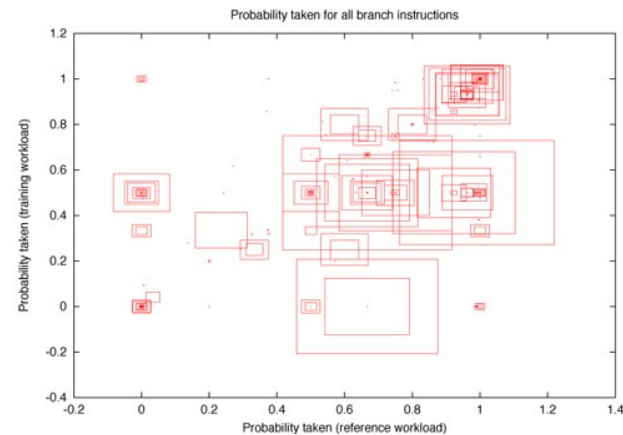
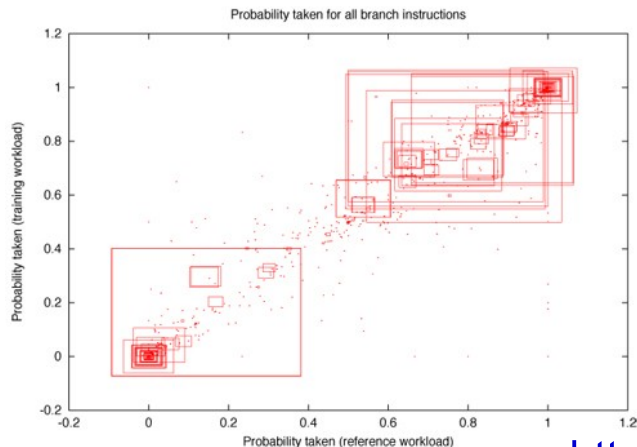
- Compiler flags: `-m32` | `-m64`
- 64-bit:
 - > Larger address space
 - > Pointers and longs 64-bits
 - > Larger memory footprint
 - > Lower performance
- EMT64
 - > Better ABI
 - > More registers
 - > Higher performance

Inlining

- Inlining
 - > Within file **-xO4**
 - > Across files **-xipo**
- Avoid cost of calling routine
- Expose further performance opportunities

Profile feedback

- Two compile passes (complicates build)
- Good for “branchy” code
- Helps inlining decisions
- Profile feedback
 - > `-xprofile=[collect:|use:]`



<http://developers.sun.com/solaris/articles/coverage.html> 9

Aliasing

- Compiler has to assume pointers alias
 - > Unless it can prove otherwise
 - > Or it is told to assume otherwise
- Specify degree of aliasing
 - > **-xalias_level=<level>**
- Specify pointers passed into functions don't alias
 - > **-xrestrict**
- Restrict qualify pointers
 - > **int * restrict p**

Resources

- Developer portal
 - > <http://developers.sun.com/>
- Forums
 - > <http://forum.java.sun.com/index.jspa?tab=devtools>



Compiler flags

Darryl Gove

darryl.gove@sun.com

<http://blogs.sun.com/d/>

