

LINUX DEVELOPMENT TOOLS STRATEGIES

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SGI intends to release a suite of high performance compilers for C, C++, and Fortran 90/95. The intention is for them to be made available under the standard GNU Public License. This offering is intended to complement the offering from Red Hat for the Itanium (64-bit) chipset from Intel.

SGI has historically demonstrated an ability to produce the best in high-performance compiler technology. It is our intention to perpetuate this legacy by bringing this expertise to bear in the Linux environment, as well as working closely with the Open Source development community, to deliver our Pro64 suite of high performance compilers for 64-bit Linux.

We will also be delivering performance analysis technology on 64-bit Linux. This work in progress is discussed in some detail below. This discussion is limited to low level tools, i.e. compilers, debuggers, and performance analysis tools.

IA-64 Linux

Note: SGI is continuing its long-standing commitment to active cooperation with the Open Source community. The assembler and linker, as well as the front end for the C and C++ compiler are the Cygnus/Red Hat offerings. The Fortran offering will use the front end previously using on the MIPSpro FORTRAN compiler offerings.

Pro64 C, C++

These will support the LP64 little-endian model, and are fully Gnu gcc and g++ compatible to the source, command line and ABI level.

To maximize familiarity and ease of use, we have worked particularly closely with the Open Source community in developing these two compilers. Working with the gcc and g++ gatekeepers, we extracted the front-end code from the source tree and implemented it as a discreet piece of code. This is the front-end we are using for the Pro64 offering.

The near-term approach SGI is taking with Linux will be focused on working with the Open Source community to the greatest extent possible, while looking for opportunities to provide SGI value-added products and layers. These value-adds will be provided as adjuncts to standard Linux distributions.

The long-term vision is to establish SGI as the definitive resource high performance Linux software development. The first step in executing on this vision is the delivery of our Pro64 Compiler Suite, which will be offered as complementary to the GNU 64-bit offering for the Cygnus division of Red Hat, Inc.

Pro64 Compiler Suite

The compiler suite will consist of offerings for C, C++ and Fortran 90/95. The compilers will be released to the Open Source under a standard GPL licensing scheme. The beta release is scheduled for 2QCY2000 and contains:

*Complete C, C++, Fortran 90 optimizing compilers
Fortran runtime libraries
Vector math library
OpenMP support library
Man pages
Assign command*

Pthread based OpenMP support will trail the beta release by approximately six months.

Pro64 Fortran

The Fortran offering will be fully compatible with MIPSpro Fortran 90/95. The front-end will be the same as what is currently used in the Irix MIPSpro Fortran compiler.

We will be furnishing Fortran runtimes:

- libfortran
- libffio

and the ability to read/write big-endian data. Pthread based OpenMP support will also be available in the initial release.

Optimization Highlights

The following are some highlight of optimizations that will form a part of the initial product release:

- Loop Nest Optimization
- Global Optimization
- Interprocedural Optimization
- Software Pipelining
- Predication and HyperBlocks

These compilers will be hosted natively on IA-64/Linux, with a heavy focus on floating point operations. There are currently no plans to provide a cross-compile environment.

IA-64 Tools

The intention is to provide a complete, scalable toolset, whether from SGI or a third party. The exact nature of this offering has not yet been determined, but some key strategic decisions have been made as to direction and I can share those with you.

Performance Analysis

It has always been our intention to leverage our existing technical strengths, augmenting them with the wealth of expertise made available through the Open Source community. One of the key areas where SGI feels we can make a difference is in performance analysis tools.

SGI has had a robust suite of performance analysis technology called SpeedShop available on its Irix platform for some time. The exact nature of the Linux implementation has not yet been defined but will undoubtedly consist, in large measure, of bring SpeedShop like performance experiments and functionality over to Linux.

The delivery mechanism for this has not yet been determined.

Availability

Compilers

Beta	Est. 2QCY2000
FCS	Est. 4QCY2000