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for Intel Platforms and Technologies

Enhancing Open Source Performance on Linux*

“The Intel C++ Compiler for Linux, along with the associated performance tools and libraries, has helped us extract the best performance out of enterprise and scientific applications on IA-32 and Itanium 2-based platforms.”

Barnali Banerjee
Associate Technical Manager
Persistent Systems Pvt. Ltd.

End-to-End Business Integration

Many independent software vendors (ISVs) who design and market sophisticated software solutions need help running their enterprise. In order to manage their complex organizations, these vendors rely on software development, service and support partners to provide software solutions that seamlessly integrate into their existing enterprise applications. This enables them to concentrate their resources on what they do best.

Working together, Persistent Systems and Intel are meeting this need by optimizing Persistent software solutions for the latest Intel® architectures.

Intel® C++ Compiler for best performance

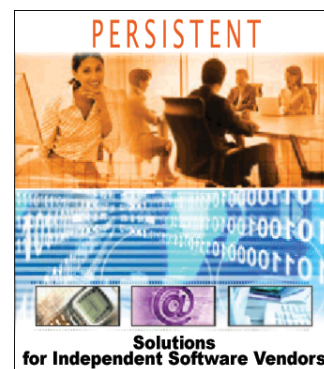
The Intel® C++ Compiler for Linux* helps make software run at top speeds on Intel® Pentium® 4, Intel® Xeon™ and Intel® Itanium® 2 processor-based systems. The Intel C++ Compiler can deliver even more dramatic application performance improvements through the use of advanced compiler optimizations, such as support for Streaming SIMD Extensions 2 (SSE2) and the Intel NetBurst® microarchitecture, and features such as the unique Interprocedural Optimization (IPO) and Profile-Guided Optimization (PGO).

THE APPLICATION

Persistent provides solutions for independent software vendors (ISVs)

Persistent Systems, based in Pune, India, provides end-to-end business integration solutions and support services for some of the world's leading software companies and global corporations.¹ Persistent Systems is a leading technology innovator, as evidenced by its recent CFI-Infosys National IT award for its work on single user identity for Internet directory services and database systems. The Persistent team understands the offshore product development culture, and has installed its software solutions in Asia and the United States.

One of Persistent's many specialized services to enterprises provides the opportunity to gain an early-adopter competitive advantage by migrating applications to Itanium 2-based systems.



THE CHALLENGE

Optimize open-source code

Intel asked Persistent Systems to optimize the performance of the open-source Linux enterprise database MySQL to take advantage of the latest features of the Itanium 2 and Pentium 4 processors.

The engineers began by measuring the time taken by MySQL for an entire Set Query run. The Set Query benchmark includes a number of basic queries used in compute-intensive applications and other typical decision support systems, such as data warehousing and other management information systems (MIS).² The test recorded the time it took to run each query 40 times, and calculated the total time for an entire Set Query run.

THE ANSWER

The Intel C++ Compiler is the solution

The benchmark tested code compiled by the GNU C compiler (gcc) and the Intel C++ Compiler for Linux on Pentium 4 and Itanium 2 processor-based systems.

Because of the versatility of the Intel C++ Compiler, the testers used two different options: the regular 02 compile option, which is enabled with inlining capacity, and the 02 with Interprocedural Optimization (IPO) option. Testers compared these results to the code compiled on GNU C with the 02 option for a baseline comparison, and the 03 option for a best case comparison.

User time measures the quality of the generated code, which is most important for the analysis. The user times show that Intel C++ Compiler-generated MySQL code performs significantly better than its GNU C compiler-generated counterpart on both Pentium 4 and Itanium 2 processor-based systems. When both compilers use the 02 option, the most common optimization level, we see a 16% and 25% performance improvement on Intel compiled code running on Pentium 4 and Itanium 2 processor-based systems, as compared to the performance of GNU C compiled code.

Intel® System Processor ¹	Intel® C++ Compiler Option	GNU C Compiler Option	User Time for Intel® C++ Code (seconds)	User Time for GNU C Code (seconds)	Intel® Compiler Performance Improvement
Pentium® 4	02	02	1034	1236	16%
Pentium® 4	02, IPO	03, fomit	995	1160	14%
Itanium® 2	02	02	771	1030	25%
Itanium® 2	02, IPO	03, fomit	769	1007	24%

“ Persistent’s expertise in data integration technology and in-depth experience with Intel software performance tools on Linux will help ISVs gain business advantage of deploying enterprise solutions on Linux platforms. ”

Hemant Pande
Vice President
Persistent Systems Pvt. Ltd.

With the addition of the Interprocedural Optimization (IPO) option, the Intel compiler produced code that performed 14% better on the Pentium 4 and 24% better on the Itanium 2 processor-based systems than the code compiled by the GNU C compiler with the 03 option.

THE ADVANTAGE

Get the Best from Intel Compilers

The Intel C++ Compiler improved performance of the MySQL code by 14% to 25% on the Pentium 4 and Itanium 2 processor-based servers. This translates to great results that Persistent’s customers can expect for database performance. Persistent can assure its enterprise customers a smooth migration to systems based on the latest, powerful Pentium 4 and Itanium 2 processors.

As enterprise businesses weather the waves of change in the global economy, Intel compiler technology and Persistent data integration solutions are behind them to help keep their computing systems both flexible and reliable.

¹ Persistent Web site 2002 www.persistent.co.in

² University of Massachusetts, Boston.

³ The performance data has been provided by Persistent Systems, Pvt. Ltd. The tests were performed using MySQL version 4.0.3, Intel C++ Compiler 7.1 and the GNU C Compiler 3.1 on the Pentium 4 and 3.2 on the Itanium 2 processor-based servers. The operating system for the Pentium 4 processor-based server was Red Hat Linux® 7.1, and hardware specifications were 1500 MHz, 16 G, and 512 KB memory. The operating system on the Itanium 2 processor-based server was a Red Hat Linux Advanced Server, and the hardware specifications were 900 MHz, 16 G, 8 G memory.

Intel provides both the tools and support to enhance the performance, functionality and efficiency of software applications. Compatible with leading Windows® and Linux® development environments, Intel® Software Development Products are the fastest and easiest way to maximize the latest features of Intel processors. Designed for use in the full development cycle, Intel Software Development Products include Intel Performance Libraries, Intel Compilers (C++ and Fortran, for Windows and Linux), Intel® VTune™ Performance Analyzer and Intel® Threading Tools. Performance depends upon the specific computer systems, components and/or measurement methods used; your results will vary. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing.

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Support.**



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