PGI® C, C++ & Fortran Compilers & Tools
For Multi-core x64+Accelerators Workstations and Clusters

PGI parallel compilers and tools harness the full power of x64+accelerator systems for science and engineering applications. PGI’s industry leading performance, reliability, native multi-core and OpenMP support, accelerator programming features, and parallel-capable graphical debugging and profiling tools provide a comprehensive HPC programming environment for scientists and engineers. PGI’s support for legacy language and programming features ensures that existing applications will port easily and quickly to the latest-generation multi-core x64+accelerator processor-based systems.

PGCC® C99 and PGCC++® C++ Compilers
Unlike low-end or freely available compilers, PGCC and PGCC++ provide vectorization, inter-procedural analysis, auto-parallelization, native OpenMP 3.1 and OpenACC pragma-based parallel programming for multi-core systems and accelerators. PGCC is an ANSI C99 compiler designed to extract maximum performance from compute-intensive, floating-point array-based applications. PGCC includes VAX/VMS and all K&R extensions and supports the ANSI C99 standard. PGCC++ is fully compatible with the latest ISO/ANSI standards for C++ and is fully GNU compatible. All C++ functions are compatible with Fortran and C functions, so you can compose programs from components written in all three languages. PGCC++ also supports compiling and optimizing CUDA C applications to run on 64-bit and 32-bit x86 targets.

PGFORTRAN F95/03 Compiler
Fortran is still the cornerstone of technical computing. PGI’s standard-compliant Fortran compilers provide the features, quality, and reliability required for developing and maintaining advanced scientific and technical applications. Common IBM, DEC, Sun and Cray extensions and cpp pre-processing help to get existing applications up and running quickly on the latest 64-bit systems. Vectorization, interprocedural analysis, profile feedback and target-specific optimizations for the latest AMD and Intel processors deliver consistently high performance across all x64 systems. PGI Unified Binary™ technology streamlines cross-platform support by enabling a single executable to contain code optimized for both x64 processor families as well as HPC accelerators. Auto-parallelization and OpenMP user-directed parallel programming extensions deliver the full capabilities of today’s multi-processor technical workstations, servers and clusters. PGI Accelerator™ with OpenACC directives and CUDA Fortran extensions simplifies porting to x64+accelerator platforms.

PGDBG® Graphical Parallel Debugger
The PGDBG debugger is a graphical symbolic debugger for single thread, multi-thread, OpenMP and MPI applications. Use PGDBG to control execution and examine the state of a parallel Fortran, C or C++ program. Control and examine threads, OpenMP tasks or MPI processes individually, all at once, or in user-defined sub-groups. Debug MPI processes locally or remotely using a secure ssh connection from Linux, MacOS or Windows, and save the parameters of your debug session for later reuse. Debug 64-bit or 32-bit applications symbolically using source code or with interleaved assembly code and full access to the registers and hardware state of the processor. PGDBG is interoperable with the GNU and Microsoft Visual C++ compilers.

PGPROF® Graphical Parallel Profiler
The PGPROF profiler is an interactive OpenMP thread-parallel, MPI parallel and GPU parallel performance analysis tool. Use PGPROF to quickly determine where execution time is spent and to identify which functions were called and how often. PGPROF supports function, line and assembly level profiling using a uniform time-based sampling mechanism across all supported x64 and x64+accelerator platforms. Hardware performance counter technology is supported on Linux. The PGPROF GUI displays information in intuitive easy-to-use formats and enables browsing of compiler optimization feedback (CCFF) correlated with loop and function source code. Additional capabilities include the ability to quickly analyze MPI Sends, MPI Receives and other MPI communication. Execution time in multi-threaded regions is also readily accessible.
## Multi-core x64+Accelerator Compilers & Tools

### C99, C++ and Fortran 2003 Compilers

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<td>Full 64-bit support on AMD64 and Intel 64 Intel co-processor, AMD APU and NVIDIA GPU support PGI Unified Binary™ technology for AMD64, Intel 64 and HPC accelerators Auto-parallelization OpenMP 3.1 parallelization Vectorization/Optimization directives and pragmas OpenACC directives and pragmas</td>
<td>AMD64 and Intel 64 cross-target optimization Inter-procedural Analysis (IPA) AVX/SSE/SIMD Vectorization Function inlining Profile feedback optimization Invariant code and conditional hoisting</td>
<td>State-of-the-art dependence analysis Nested loop auto-parallelization Nested loop vectorization Loop interchange Loop splitting, unroll &amp; jam Iteration peeling Aligned access optimizations</td>
<td>64-bit and 32-bit targets Debug Fortran, C and C++ Debug parallel OpenMP, MPI and multi-threaded programs Debug locally or across a network Interleaved source and assembly language DBX compatible commands One-touch breakpoint setting Step into, over, out of functions</td>
<td>64-bit and 32 bit x86, and GPU targets Profile Fortran, C and C++ Profile parallel OpenMP, MPI and multi-threaded programs MPI communication profiling Display collective MPI Sends and Receives Hardware counters support</td>
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