SGI® Performance Suite

Extending High Performance Technical Computing for Large Scale Servers and Clusters
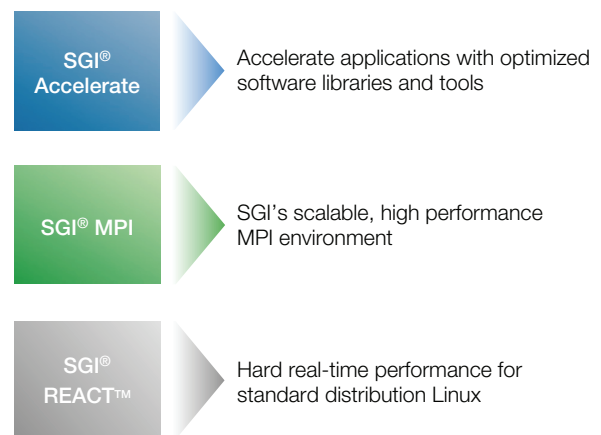
Overview

SGI Performance Suite takes Linux® performance software to the next level. While hardware and processor technology continue to scale, managing software performance has become increasingly complex. SGI continues to extend technical computing performance for large scale servers and clusters.

SGI Performance Suite is designed to accelerate the performance of SGI® UV™, SGI® ICE™, and SGI® Rackable® servers. Some examples of the numerous benefits of the tools in SGI Performance Suite include:

- The SGI Message Passing Toolkit MPI library helped SGI ICE achieve world record performance in the Standard Performance Evaluation Corporation's (SPEC) MPI2007 benchmark tests for high performance technical computing. The benchmarks measure performance on real-world applications in a variety of fields including computational fluid dynamics, electromagnetism, geophysics, ray tracing and hydrodynamics.

- SGI MPI PerfBoost scaled the 111 million cell ANSYS FLUENT 12.0 benchmark to 4092 cores without re-compilation or re-linking with SGI MPI libraries.

- NumaTools data placement tool helped SGI UV achieve the top x86-64 STREAM result.

Key Features and Benefits

SGI Performance Suite provides application acceleration components for software developers and end-users. SGI Accelerate, SGI MPI and SGI REACT contain libraries and tools that enable software developers to develop, profile, and tune applications for faster performance. End users benefit from running their applications with the runtime acceleration tools supplied in SGI Accelerate and SGI MPI.

SGI® Accelerate	Accelerate applications with optimized software libraries and tools
SGI® MPI	SGI's scalable, high performance MPI environment
SGI® REACT™	Hard real-time performance for standard distribution Linux

SGI Accelerate – Optimizes Application Performance

SGI Accelerate helps accelerate application performance, through tools that tune applications at runtime without recompiling and libraries that optimize performance with specialized algorithms.

- **Cpusets**, which optimize CPU and memory utilization, and **NumaTools** data placement tools.

- **Linkless Flexible File I/O (FFIO)** helps to improve runtime I/O performance for I/O intensive applications without re-linking, additional coding or re-tooling of the software logic.

- **Performance Co-Pilot (pcp-sgi)** is a tool for monitoring and managing system performance.

- **Libgru development kit** provides direct access to the SGI UV Global Reference Unit (GRU), which executes certain instructions in parallel – offloading this work from the CPU and allowing it to run other jobs.

- **SGISolve fast sparse solvers** improve performance for mathematical operations on matrices.

SGI MPI – High Performance MPI Environment

SGI MPI contains complementary tools enabling application acceleration, with SGI MPT as the core MPI performance engine.

SGI MPI includes:

- **SGI Message Passing Toolkit** (MPI-2.2, MPI-3.0)

- **Perfcatcher** MPI profiling tool

- Easy launch with **Array Services** and **Secure Array Services**

- Accurate shared memory measurement

- **SHMEM** message passing API

- **XPMEM** cross process memory mapping

- **SGI MPI PerfBoost**, which accelerates Platform MPI, Intel MPI, Open MPI and MPICH applications. SGI has seen up to 70% performance boosts for certain applications.

- **Checkpoint-Restart** gives job management control to MPI applications, by allowing the user to stop a job and restart it from the checkpoint later.

- **MPInside** MPI profiling and performance analysis tool provides finer-grained metrics for analyzing MPI communications.

- **MPIPlace** Profile guided placement tool for MPI applications on clusters scaling to thousands of cores. Uses profile data from MPInside.

SGI REACT – Hard Real-time Performance

SGI REACT is the only hard real-time performance solution for standard Linux distributions, where no special custom kernels are required. SGI has successfully achieved a real-time latency guarantee of 30 μsec for 2-128 core systems.

SGI REACT includes:

- **SGI REACT** library for Linux hard real-time performance

- **SGI Linux Trace** debugger for real-time applications

- **REACT Configuration** Tools optimize resource usage for time critical applications

- **Frame Rate Scheduler** manages frame-based applications performance

- **SGI-shield** runtime anti-jitter capability

- **User level interrupt** generates software interrupts

- **External interrupt driver** generates hardware interrupts

SGI Performance Suite – System Requirements

Systems	SGI UV, SGI ICE X, SGI Rackable
Operating Systems	Red Hat Enterprise Linux 6 SUSE Linux Enterprise Server 11

How to Buy

Contact SGI Sales at http://www.sgi.com/sales/askarep.html

About SGI

SGI, the trusted leader in high performance computing (HPC), is focused on helping customers solve their most demanding business and technology challenges by delivering technical computing, Big Data analytics, cloud computing, and petascale storage solutions that accelerate time to discovery, innovation, and profitability.

For more information please contact an SGI sales representative at 1-800-800-7441 or visit www.sgi.com/contactus.

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