Get More Work Done Faster

Harness the power of Sun Grid Engine software, MD Nastran, and SimManager for complex simulations

Highlights

- Perform powerful multidisciplinary engineering simulation and analysis with MD Nastran software in a single, fully-integrated system
- Implement MD Nastran software with Sun™ Grid Engine software and utilize distributed resources to complete more jobs faster
- Manage simulation content and automate intensive computer-aided engineering tasks with SimManager
- Combine Sun Grid Engine software, MD Nastran, and SimManager for better throughput, higher compute capacity utilization, and reduced energy and operating costs.

In today's challenging economy, most companies need to find ways to run simulations, perform intricate business and product analysis, and innovate at less cost. They also require shorter product development cycles and more intelligent what-if scenarios in order to remain competitive.

Toward this end, many organizations are turning to high-performance computing (HPC) to run increasingly complex, compute-intensive calculations in less time. Used by manufacturing and engineering, financial services, energy, life sciences, and education and research organizations alike, HPC provides the power to perform the type of calculations necessary to compete successfully.

MD Nastran and SimManager accelerate and enhance design innovation

MD Nastran, from MSC Software, is a comprehensive multidisciplinary engineering simulation and analysis tool that handles complex, large-scale problems, performing fast and robust system simulations with ease and accuracy. Taking maximum advantage of HPC infrastructure, MD Nastran offers powerful simulation in a single fully-integrated environment that helps to drive efficiency and streamline processes.

Managing content with SimManager software

A wide range of applications and computer-aided engineering (CAE) tools used in complex simulations create an explosion of data and content in multiple formats that often is scattered across various users' desktop machines, shared drives, or servers. Teams can struggle to find and use vital data, and have no means to document and reuse the simulation models and results. SimManager R3 works with MD Nastran to manage simulation content, methods, and processes. SimManager automates manually intensive CAE tasks, accelerates simulation, makes results more reliable, and allows engineers to simulate more in order to develop truly innovative products. Complete audit trails are captured and maintained for every simulation, helping to ensure reliability. Because CAE requires retention of data on the input and applications used to process an analysis, as well as the actual results, SimManager can be a vital part of large-scale simulations and analyses. For this reason, leading companies in automotive, aerospace, shipbuilding, electronics, consumer goods, and other industries utilize SimManager to implement standardization of macros, scripts, session files, and other best practices methods, and automate manually intensive CAE tasks.

Sun Grid Engine tackles compute-intensive workloads

Identifying and using the right compute resources is essential to completing complex CAE analyses and simulations. Analyses must have sufficient resources allocated to a job at the outset, or users run the risk of launching jobs that fail when there are no more compute resources available to support continued processing. With computations that can run for days or weeks, too much valuable time and effort can be lost if a job is initiated without sufficient resources to be able to complete successfully. Alternatively, over-allocating resources wastes valuable compute cycles and prevents other users from completing jobs on the same systems. The

tight integration of Sun™ Grid Engine software with MD Nastran and SimManager software provides a solution that helps organizations meet the challenges of today's economy, accomplishing more with fewer resources, increasing utilization and efficiency, and reducing costs.

Sun Grid Engine software is an effective resource and job management tool that provides policy-based workload management and dynamic provisioning of application workloads. Utilizing distributed resource management software, Sun Grid Engine aggregates compute resources so they can be used more flexibly and efficiently. Pooling federated assets in this manner makes it possible for users to treat distributed systems as a single, powerful, large computational resource. As a result, users no longer need to worry about identifying computing and storage resources in a given compute environment and are free to focus on the engineering matter at hand. Grids can be scaled from a collection of stand-alone systems to supercomputer-class clusters utilizing thousands of processors.

Coordinate resources and complete jobs in less time

Parallelizing jobs allows users to handle massive processing tasks and get work done faster by running pieces of jobs on different systems simultaneously. However, it is imperative that all pieces of the job be completed in the same time frame or risk bottlenecks in job completion. To process jobs effectively, distributed parallel jobs need to be evenly distributed across the cluster to similar types of processors and interconnects, and to machines with sufficient compute and resource capacity, to get the task done.

Distributed processing is a key feature of MD Nastran, but like other CAE applications that require HPC resources, the nature of the processing requirements lends itself well to resource and job management tools such as Sun Grid Engine. The Sun Grid Engine software is adept at managing distributed processing — breaking up a project, identifying adequate compute resources on the network, sending it out to multiple queues, and reassembling the job as it is completed. Integrating Sun Grid Engine with MD Nastran and SimManager makes it possible to divide massive processing jobs into smaller pieces and easily distribute them among different systems within a grid. Large jobs can be completed in less time, helping users get more work done faster.

Use resources more effectively

In taking advantage of grid computing technologies, users ought to be able to simply submit a job. Time can be wasted hunting for systems with the right amount of memory and disk space — if that system information is even available. Without the proper tools, users can under- or over-allocate resources. Users run the risk of having a job fail before completion and wasting weeks of time, or shutting out other users with jobs that could be processed at the same time. Being able to find and reserve the appropriate HPC resources should not be a consideration for users looking to submit jobs. The combination of Sun Grid Engine, MD Nastran, and SimManager helps users to identify and allocate the required resources for job completion, freeing up systems for other jobs or different users. This can make it possible to complete more simulations and analyses — even huge jobs — successfully, without risking failure due to lack of resources.

Learn More

For more information on Sun's HPC solutions, visit sun.com/partners/hpc, mscsoftware.com, or contact your local Sun sales representative.

Reduce costs

Every organization is budget-constrained today. Consequently, there is greater need for smarter, more efficient resources offering massive compute power to complete workloads faster, and tools with the intelligence to utilize these resources efficiently are in great demand. The combination of Sun Grid Engine, MD Nastran, and SimManager software allows users to easily identify, fine-tune, and allocate compute resources evenly across a compute cluster, assured of having the disk space and memory needed for optimal performance and successful job completion.

Running the Sun Grid Engine, MD Nastran, and SimManager software on high-performance, energy-efficient Sun systems, such as Sun servers with chip multithreading technology and other innovations, can result in better throughput, higher compute capacity utilization, and reduced energy and operating costs.

Solve real-world HPC problems with Sun and MSC Software

MSC Software and Sun Microsystems have worked together for over two decades to integrate MSC Software's core CAE solutions, including MD Nastran and SimManager, with Sun systems. The ability of Sun and MSC technology to work together gives users more powerful, high-performance solutions that can help more work get done faster and at less cost.

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