

Daniel Templeton, Grid Architect, and Miha Ahronovitz, the Product Line Manager talk about the new 6.2 release of the Sun Grid Engine software.

1. What is Sun Grid Engine, in a nut shell?

The Sun Grid Engine software is a distributed resource management (DRM) system that intelligently matches workload to available resources according to business policies. The purpose of the Sun Grid Engine software is to enable an organization to get higher utilization, better workload throughput, and higher user productivity from their compute resources. A well configured Sun Grid Engine cluster can achieve resource utilization rates that average above 95% and a several-fold decrease in the time it takes a user to complete his/her work.

2. Who needs Sun Grid Engine? Why?

The Sun Grid Engine software solves the problem of maximizing resource utilization (within limits of business policies) through intelligent distribution of workload across the resources. Anywhere that users' workloads are competing for resources, the Sun Grid Engine software can have a significant impact by resolving resource conflicts and better distributing the load. Typical customer segments include financial services, oil and gas, product development, biotechnology, visual effects and film production, automotive, manufacturing, research, and education.

3. Who are the customers today. Any significant names?

Top high-performance computing sites like Texas Advanced Computer Center (TACC) in the USA and TiTech in Japan are big names with leading edge requirements. A host of financial institutions, from Wall Street to Australia, from the UK to Germany, use the Sun Grid Engine software as a mission-critical part of their daily operations. One of the most striking users of Sun Grid Engine is the Australian visual effects company, Rising Sun Pictures, who is now working on Harry Potter and the Half Blood Prince, X-men Origins: Wolverine, and other major motion pictures for release in 2009.

4. What are the new customer needs that made Sun Grid Engine 6.2 necessary?

The high-performance computing space is blossoming right now. The definition of *big* has gone from tens of teraFLOPS to hundreds of teraFLOPS and is careening towards petaFLOPS. As these new systems push the boundaries of scale, the Sun Grid Engine software has had to grow to keep up. With the 6.2 release, we're now enabling scalability at levels that were previously unthinkable.

Scalability was one of the major driving reasons for the 6.2 release, but we've done more than just enable extreme vertical scalability. With the addition of multi-clustering through Service Domain Manager, we've also enabled lateral scalability. With 6.2 a customer can scale his/her cluster vertically within machines, horizontally through additional machines, and now laterally through additional clusters.

Lateral scalability allows customers to solve a new class of problems that require individual clusters to work independently while continuing to maximize resource utilization by sharing resources among the clusters.

In addition to scalability, the Sun Grid Engine 6.2 software also brings to the table features that enable faster turn-around times, higher user productivity and greater flexibility in how users use the compute cluster.

5. SGE 6.2 has a scalability among the highest on record. How did SGE 6.2 manage to scale up to 63,000 cores? And why?

The why is simple: our customers are already there. With customers like D.E. Shaw, the Texas Advanced Computing Center (TACC), and the Tokyo Institute of Technology, massive scalability is the order of the day. The how is a little more complicated.

We did a tremendous amount of work for 6.2 to ensure that we achieve maximum performance and scalability today and to lay the groundwork for even more impressive scalability tomorrow. Among the significant enhancements are taking the scheduler component from being its own process to being a thread in the qmaster, streamlining the communications protocols, reducing the amount of data traffic generated by resource monitoring, overhauling the utility computing framework, overhauling the interactive and parallel job framework, parallelizing the way the qmaster handles incoming requests, reducing qmaster startup time, optimizing the scheduling algorithm, applying tighter memory management, etc, etc, etc. The net result is unsurpassed scalability that lets our customers run a production compute cluster with sixty-three thousand cores under a single qmaster that processes parallel jobs with tens of thousands of tasks.

6. SGE 6.2 is feature packed. What are some other notable additions?

One big headliner is advance reservation. The idea of advance reservation is to allow users to secure needed resources for a fixed time period. It enables users to coordinate the availability of compute resources with external factors like people, equipment, and/or facility availability.

Another important addition is array task dependencies. Array task dependencies, combined with the job dependencies already offered by the Sun Grid Engine software, enables users to better parallelize their workloads to achieve quicker turn-around time and reduce time to market. Array task dependencies is an important feature for visual effects companies using the Sun Grid Engine software to handle the rendering of animated videos and visual effects. In particular,

One other important new feature for Solaris users is the new support for the Solaris Service Management Framework (SMF) and Sun Service Tags. Both features make for easier management of the Sun Grid Engine 6.2 software when running on machines installed with the Solaris Operating Environment. (Sun Service Tags are also available for Linux.)

7. Where can someone go to get more information?

More information is available at the Sun Grid Engine page on the Sun.com web site at:

<http://www.sun.com/gridware/>

There you'll find lots of great information about Sun Grid Engine, the 6.2 release, and the Grid Engine community. Be sure to check out the links to the Sun Grid Engine blogs, which include blogs from members of the Sun Grid Engine product team, including the product engineers. On those blogs you can find even more information about what you'll get in the new 6.2 release and why you'll want to upgrade.