

TECH BRIEF:

hyperSPARC AND MULTIPROCESSING PERFORMANCE

With a dual- or quad-CPU hyper-SPARC upgrade, Sun SPARCstation™ 10 and SPARCstation 20 users are now able to take advantage of a powerful trend in desktop computing-multiprocessing. Now cost-effectively available to every end-user, multiprocessing takes advantage of today's sophisticated operating systems like SunSoft's Solaris™ 1.1, 1.1.1B, 2.3, and 2.4, as well as the increasing number of multi-threaded applications coming to market. This is especially true for machines that are heavily loaded (i.e. running multiple processes) or running multi-threaded applications.

Multi-threading represents the latest development in high-performance software technology as applications are optimized for powerful multiprocessing environments such as Solaris and hyperSPARC. These applications are written so that they can be split into multiple "threads" and assigned to multiple processors in parallel. The results of these separated sub-tasks are then reassembled to produce a final, single result. Multi-threaded applications literally allow a single task to run almost as many times faster as the number of processors available to it. An example of such an application is ORACLE 7™ Release 7.1, Oracle's relational database engine, which under Solaris 2.3 or 2.4 will break into multiple threads in order to utilize all available processors.

A common misconception is that multiple processors will make all your applications run that much faster; that is, a quad-processor upgrade would automatically run your application four

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times faster. Applications that have not yet been written (or re-written) to run as multiple processes, such as multi-threaded applications, will not realize this performance gain. However, this does not prevent users without multi-threaded applications from reaping the benefits of multiprocessing. If a machine is heavily utilized with multiple processes that run concurrently, advanced operating systems such as Solaris will assign different processes to available processors, even in the absence of multi-threading. This will not allow a single application to run many times faster, but it can allow multiple applications to run many times faster than they would on a single processor machine. Running one application multiple times, as in a batch environment, is an exten-

sion of this principle. Each instance of the applications started is assigned to run on the most idle processor. This is highly successful in environments where a single machine must service multiple users.

It is important that each processor has adequate resources (memory, disk space, etc...) in order to function at its maximum rate. Multiprocessing is only efficient as long as there is no contention for resources that create other bottlenecks in the system. With enough RAM to load multiple copies of compute-intensive applications, high-bandwidth I/O, and the right CPUs in the system, there is much that multiprocessing has to offer SPARC users.



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