TECH BRIEF:

MULTIPROCESSING SYMMETRY

Many people are under the impression that in order to run multiple processors in their SS600, SS10, or SS20 they must use Solaris 2.x. Further, while some people do understand that you can run SunOS 4.1.3 with multiple processors, they think only one CPU will be utilized. Both of these assumptions are incorrect. Full multiprocessing functionality is in SunOS 4.1.3 and beyond. In fact the multiprocessing in 4.1.3 works quite well with most applications.

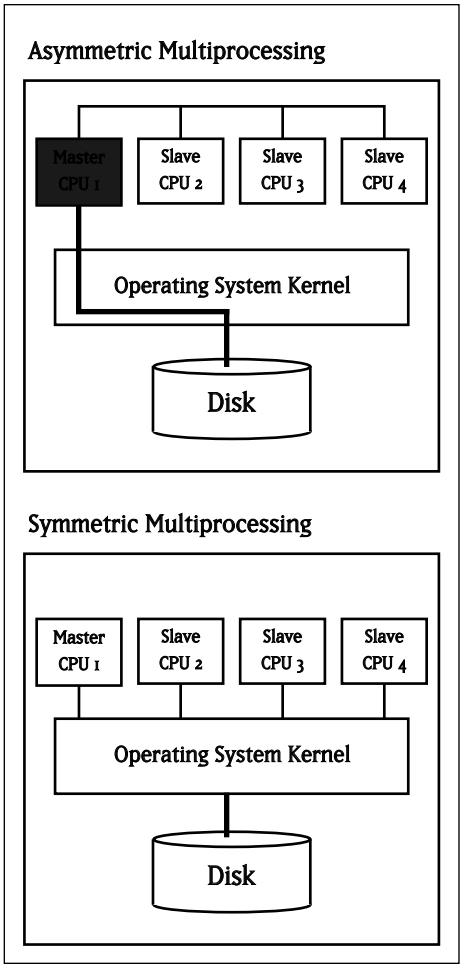
The real difference between 4.1.3 (Solaris 1) and Solaris 2 is the asymmetric vs. symmetric multiprocessing implementation in the kernel of the operating system. SunOS 4.1.3 is asymmetric multiprocessing, allowing only one CPU at a time to have full access to the operating system kernel, or core. Things such as disk I/O and communications with other peripherals will require that a process can enter the kernel and execute its code, creating the restriction that only one I/O operation can be utilizing the kernel at a time.

Asymmetric multiprocessing design does allow several compute tasks to run in parallel. Each CPU can run a compute-intensive application almost as many times faster as the number of CPUs available to it. I/O intensive applications do not, however, realize the same performance gain. Only one processor can perform I/O operations at a time.

With symmetric multiprocessing all CPUs have equal access to the operating system kernel and each can simultaneously and independently perform compute and/or I/O intensive operations assuming they are not contending for the same device. This keeps the operating system from becoming a bottleneck to the system.

While symmetric multiprocessing will most likely be faster for multiple I/O intensive jobs running concurrently on one system it is not true that this benefits everyone. A job that is very compute intensive and does very little I/O will perform equally under SunOS 4.1.3 and Solaris 2 if run concurrently on multiple processors.

Be aware that you do *not* need to update your OS to Solaris 2 to run multiple hyperSPARCs and take advantage of multiprocessing performance benefits. Depending on how you utilize your machine, Sun OS 4.1.3 may offer the same performance levels as a migrator to 2.x, with considerably less system porting headaches.



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