PlayStation3 Gravity Grid – Radiocápsula RCP/CPR [1]

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Calificación:

The Sony PlayStation 3 has a number of unique features that make it particularly suited for scientific computation. First, the PS3 is an open platform, which essentially means that one can run a different system software on it, for example PowerPC Linux. Next, it has a revolutionary processor called the Cell processor which was developed by Sony, IBM and Toshiba. This processor has a main CPU (called the PPU) and several (six for the PS3) special compute engines (called SPUs) available for raw computation. Moreover, each SPU performs vector operations, which implies that they can compute on multiple data, in a single step. Finally, its incredibly low cost make it very attractive as a scientific computing node i.e. part of a cluster. In fact, its highly plausible that the raw computing power per dollar that the PS3 offers, is significantly higher than anything else on the market today! Thanks to a very generous, partial donation by Sony, we have a sixteen PS3 cluster in our department, which we call PS3 Gravity Grid. Check out some pictures of the cluster here: 1) the PS3's arrive; 2) the rack arrives; 3) front view of the cluster; 4) side view of the cluster. We are using "stock" PS3s for this cluster, with no hardware modifications. They are networked together using an inexpensive netgear gigabit switch. For Linux installation, there are several guides available on the internet. For YDL Linux, consider using the guide by Terrasoft Solutions. For Fedora 8, I found this guide particularly useful. For deploying a parallel job on this cluster, we use a code that implements a standard domain decomposition approach, based on message-passing (MPI). There are more details

available on our code below. For compiling, we use GCC and also IBM's XL compilers for the Cell, that are available as part of IBM's Cell SDK. The MPI distribution that we are using is the recently released, OpenMPI distribution for PowerPC Linux. Questions? Feel free to contact Gaurav Khanna about this research and the PS3 Gravity Grid. People Core Faculty Dana Fine, UMassD Math, MA Robert Fisher, UMassD Physics, MA J. P. Hsu, UMassD Physics, MA Jae-Hun Jung, UMassD Math, MA Gaurav Khanna, UMassD Physics, MA

Links
[1] https://www.cienciapr.org/en/external-news/playstation3-gravity-grid-radiocapsula-rcpcpr