Blue Collar Computing: Overcoming High Performance Computing Barriers

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ISA High Performance Computing

The two major barriers for companies wanting to use High Performance Computing (HPC) to solve complex problems are the cost of implementation and the difficulty of installing, maintaining, programming and using HPC systems.

While there is no question that multiprocessor parallel programming is very difficult (and getting more difficult with each leap forward made by hardware), it no longer needs to remain a barrier for companies who want to make use of these technologies.

No, we are not publishing "The Idiot's Guide to HPC", nor have I learned of any top secret government programs that successfully implement knowledge transfer. There are, however, resources available for manufacturers with challenging questions or simulations which could improve their processes. We will look at one approach in this article, with others to follow in future blog entries.

The Ohio Supercomputer Center is located in Columbus, OH and provides the networking backbone for all Ohio Public schools and supercomputing facilities for Ohio Higher Education. They are a state funded organization which also includes researchers and programmers.

So what does the Ohio State public school computer infrastructure have to do with your manufacturing plant? The OSC has also built and is actively growing a program called "Blue Collar Computing." This program allows industry to work with the OSC resources and utilizes their hardware and software for a fee. Since they are a state funded organization, businesses within Ohio get a discounted price, but the service is open and available to all.

There are a variety of services available to companies which can help give a business the leg up and over the barriers of cost and difficulty. Since they are providing services on a computing as utility basis, they are especially well suited for companies that have one time or infrequent problems they need to solve. A company can either bring in code they have purchased or written themselves and buy CPU cycles on the OSC hardware, or experts at the OSC can work with businesses on a project basis to develop new software which will then run on the OSC hardware. This solves some of the problems of learning curve, but even the COTS applications can be confusing and overwhelming to new users. With an understanding of this problem, the HPC community at large is moving toward building web portals, or easy to use desktop clients designed for a much more user friendly interface. OSC is no exception to this and are working with local industry consortia to find the general case problems that can be distilled into easy to use web based applications that use the power of Supercomputing on the backend to speed up processing. One example of this is a weld-simulation tool which is currently in production; they

are also in the process of developing a material mix calculation tool for the polymer industry and a plant floor optimization simulation tool.

Not sure if parallel computing, clusters or HPC even makes sense for your business? The experts at OSC can work with you to analyze your problems, your code and even do test development and performance analysis before you make the commitment to investment. They have actively worked with industry in this way to bring their expert knowledge to the IT staff of businesses, leap frogging the decision making process for the businesses.

OSC is not the only state owned supercomputing center to work with industry, there are centers in other states currently engaged with industry. We will highlight the successes of these other centers in future blog entries, along with the recent partnership of national supercomputing centers with industry, for example through the DOE's INCITE program.

Have a hard problem that you think would make a great application? Have concerns or excitement about government and industry partnerships? Questions about HPC? Comment and let us know what you think.

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