

Supercomputing not just for geeks

Seattle Post Intelligencer

Last updated August 9, 2007 6:29 p.m. PT

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Once the exclusive domain of a handful of well-funded companies, supercomputing is increasingly becoming accessible, scalable and affordable to companies of all sizes, budgets and needs. As of last week, the same technological marvel that first enabled a machine to triumph over humanity's greatest chess player can now be had from the same company that has become the dominant name in desktop computing.

At the recent International Supercomputing Conference in Dresden, Germany, Microsoft announced its rollout of high performance computing for an amazing out-of-the-box price of \$50,000 -- a fraction of its cost decades ago. Although it is a late-entry player in the market, Microsoft's vision is that an emerging market of smaller companies will soon see the need and benefits of supercomputing, or high-performance computing.

What does supercomputing for the masses mean?

Developments mark a supercomputing milestone that could result in enormous mainstream benefits including revitalization of the ailing manufacturing sector.

Researchers, academics and engineers from smaller organizations will be able to tap into vastly increased computing power to test hypotheses, prototype products, cut production costs and design better processes for anything from assembly lines to document tracking. The consequence will be a full-spectrum surge of innovation and scientific advancement.

Long before Microsoft's announcement, HPC was already moving beyond its traditional functions in meteorology and astrophysics. The Pringles factory takes advantage of supercomputing aerodynamic analysis to improve the way potato chips fly off the assembly line. Supercomputing simulations have reduced the amount of money that Goodyear has spent on physical tire prototypes from 40 percent to 15 percent. Meanwhile, golf club manufacturer Ping is using supercomputing to simulate and test new designs.

The engineers behind these applications know that supercomputers are fast becoming the best way to perform that quintessential American task: Make it better and make it faster. Supercomputers can help create new markets, new opportunities and new jobs in the U.S. Simulation makes choosing between alternative processing methods far easier. Better analysis and documentation of capabilities helps with efficiency. Improved factory and workflow layouts increase productivity. All those factors can dramatically

improve a company's bottom line and increase its competitive edge in the global marketplace and will play an increasingly crucial role in maintaining the competitiveness of U.S. industry.

Admittedly, many Rust Belt companies aren't well positioned to dive into the supercomputing revolution on their own. That's why such programs as the Blue Collar Computing Initiative are helping small and medium-size businesses adopt supercomputing tools.

With more computing horsepower for design simulations, engineers can be bolder and more inventive in their ideas, while avoiding the endless repetition of trial-and-error prototypes. The freedom to branch out from proven, safe solutions will be vital for exciting breakthroughs in the next decades.

Congress is now considering legislation that would expand the successful Blue Collar Computing Initiative and help reduce the risk to companies willing to take a leap into the technological future. Ohio's Sen. George Voinovich and Rep. Tim Ryan are leading a bipartisan effort to make high performance computing resources more widely available to small businesses and manufacturers. Anyone concerned about the United States' ever-rising trade deficit and shrinking manufacturing base should give this legislation serious consideration.

This effort would pave the way for new supercomputing centers to be created across the country. These centers would assist small businesses in finding areas where supercomputing could help them stay competitive, as well as develop software specifically designed to meet the needs of small businesses. Sad to say, without a serious push into new technologies such as supercomputing, the U.S. is likely to see continued erosion in our industrial sector. Supercomputing will help us compete through brains, not brawn. It will also help revitalize the nation's leadership in the critical areas of computational science, engineering and product design. Without smart intervention now, we'll be left lagging as other countries leapfrog ahead using affordable, powerful computing to increase their efficiency and maximize the impact of innovative thinking.

Just as the ATM has replaced the bank teller, desktop supercomputing simulations will begin replacing physical testing labs and transforming old-fashioned heavy industry into light, adaptable and efficient businesses for the future.

The democratization of supercomputing is happening, is U.S. enterprise ready?

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