



Why Does the Air Force Want Thousands of PlayStations?

Clusters of High-Performance Gaming Consoles Can Serve as Supercomputers

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Guess what's on the U.S. Air Force's wish list this holiday season.

Sony's popular PlayStation 3 gaming console. Thousands of them.

The Air Force Research Laboratory in Rome, N.Y., recently issued a [request for proposal](#) indicating its intention to purchase 2,200 PlayStation 3 (PS3) consoles.

But the military researchers don't plan to play "[Call of Duty: Modern Warfare 2](#)" or any of the [season's other blockbuster games](#). They plan to string the consoles together into a massive supercomputer and study how well they can enhance the military's high-performance computing systems.

PS3s Offer High Performance at a Good Price

"The PS3s offer some outstanding performance for the price," said Richard Linderman, senior scientist for advanced computing architectures at the Air Force Research Laboratory. "It's an opportunity to leverage the large gaming market and get those kinds of cost efficiencies which are more along the lines of high-performance computing."

What makes the PlayStation so interesting to Linderman and his bargain-hunting colleagues is the PS3's mega-powerful Cell processor, which was created jointly by IBM, Sony and Toshiba.

According to a document accompanying the Air Force RFP, a server configured with two 3.2GHz cell processors can cost up to \$8,000, while two Sony PS3s cost just a fraction of that price at about \$600.

The two cell processors are about 33 percent more powerful than the PS3s, but the document went on to say that the PS3s are still more cost-effective.

Researchers Across the Country Harness Power of PlayStation 3

In May 2008, the Air Force acquired 336 PlayStation 3 consoles, loaded them on to large metal bread racks and linked them together in its first experimental cluster.

Once the researchers configured the hardware, they installed the Linux operating system on them, turning the gaming consoles into a military-grade supercomputer.

Linderman said they've found the cluster's performance to be "excellent."

"It's not marketing hype," he added.

Linderman said their first PS3 cluster was used in applications such as high-definition video processing and "neuromorphic" computing, which mimics the way the human brain perceives and processes images and information. When the new cluster of 2,200 PS3 consoles arrive in the next month or so, he said they will likely be used for similar projects.

But the Air Force researchers aren't the only ones to harness the power of the PlayStation consoles. From coast to coast, academic and military computer scientists are stringing the consoles together in various projects.

PS3 Cluster Research Includes Aircraft Monitoring and Fincial Risk Assessment

David Bader, a professor and executive director of high performance computing at the Georgia Institute of Technology, has been involved in a number of projects involving PlayStation clusters.

When the PlayStation launched in 2006, he said, its processor far surpassed those of its generation.

"Sony wanted a processor that they could use inside a game box that would be able to render the games but also incorporate real-world physics, emotion and really new aspects to game playing," Bader said.

The same chip that enabled high-octane game play also powered Toshiba's high-end HD TVs and technology created by IBM for oil and gas exploration.

At Georgia Tech, Bader has researched the possibility of using PS3 clusters in aircraft monitoring and financial risk assessment.

One project proposed using PlayStation 3 consoles on board commercial airplanes, he said. Consoles would not only provide in-flight entertainment for each passenger, but also serve as sensors around the aircraft that would alert the pilot to potential problems and failures.

Astrophysicists at the [University of Massachusetts at Dartmouth](#) are using a cluster of PS3 consoles to research gravitational waves and black holes.

And even the [U.S. Immigration and Customs Enforcement agency's Cyber Crimes Center](#) has used linked PS3s to solve Internet crimes.

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