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[How to Build Your Own Supercomputer Using A Rack Of PlayStation 3s](#)

Gaurav Khanna is one of the first scientists to use the PS3s for research

The brand-new PlayStation 3 from Sony is surely one of the best recipes for having fun. If the average user would enjoy setting off into a difficult mission with Solid Snake in the Metal Gear series or smashing some alien creatures in the Alien versus Predator, some true tech geeks would put gaming consoles to new and amazing use. Astrophysics scientist Gaurav Khanna is one of the latter kind of console users. Such tech geeks would hardly enjoy going on a killing spree in a virtual world, so he used his PS3 device in order to build its own supercomputer. In order to increase the computing power, Khanna hooked 16 PlayStation 3 units in a single cluster. He managed to achieve a whole computing system that provides as much computing power as a 400-node supercomputer. "The challenge these days with supercomputing facilities is that there is a lot of demand for them. So even if I submitted a job that would be expected to take about an hour, it could actually take two days to get started because the queues are so long," Khanna said. "The PS3 cluster is all mine and was very low cost to set up, which makes it really attractive," he continued. The cluster set-up is referred to as "the gravity grid" and is used to simulate the activity of very large black holes in the Physics Department at the University of Massachusetts. His research is focused on estimating the properties of gravity waves that are generated upon the collision of two black holes. Khanna's research is based on Einstein's theory of relativity and is comprised of theoretical aspects only. Setting up a supercomputer out of PlayStation devices required some serious tweaking. First of all, the simulation software can only run on Linux platforms, so Khanna had to load the PS3 consoles with Linux distributions. "Linux can turn any system into a general-purpose computer, but for it to work for me I have to run my own code on it for astrophysics applications. The hard part of the job was to make sure my own calculations could run fast on the platform, which meant I had to optimize the written code so it could utilize the new features of the system," he said. The PlayStation 3 devices are special and powerful computing systems, as they come rigged with IBM's Cell processor that takes care of processing the high-end gaming functions. The Cell chips are built on IBM's 65-nanometer SOI (Silicon-Over-Insulator) process. The Cell is extremely different from all the conventional CPUs on the market. It is built of a powerful, 64-bit dual-threaded PowerPC core, as well as eight proprietary 'Synergistic Processing Elements' (SPEs) - eight highly specialized mini-computers on the same die. The scientist has not performed any modifications to the PS3 hardware. They have just been networked together via a regular Gigabit Ethernet switch. "Overall, a single PS3 performs better than the highest-end desktops available and compares to as many as 25 nodes of an IBM Blue Gene supercomputer," Khanna concluded.