

What's it like to unbox a supercomputer? Surprisingly, just like unboxing a normal PC

By Sebastian Anthony on August 1, 2014 at 1:37 pm

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I don't know about you, but unboxing new gadgets gets me pretty excited. For me, it's knowing that soon — very soon now, after I cut through the bubble wrap or peel back the protective plastic — the device will burst into life for the very first time. If I'm honest, it actually makes me feel like Frankenstein breathing life into his monster for the first time — especially when I unbox a bunch of components and build them into a new PC. What, then, must it feel like to unbox a brand new petascale supercomputer?

Recently, the Pawsey Supercomputing Centre in Australia received a new Cray XC30 supercomputer, dubbed Magnus2. Remarkably, unboxing an XC30 is basically just like unboxing a new computer — just on a much larger scale. As you can see in the photos above and below, the Pawsey engineers basically just cracked open a bunch of crates, wired them up, and voila: a supercomputer with more than 35,000 Xeon cores and peak performance of around 1 petaflop. Cray has previously said that the XC30, with its Aries interconnect, is **technically capable of scaling to 100 petaflops or more.**



Wheeling the XC30 supercomputer into place



The Cray XC30 is designed with “serial” cooling in mind, with fans blowing from the left and exhausting on the right.

[ITNews](#), the Australian website that took the photos, notes that each of the seven cabinets that make up Magnus2 weighs in at 1.4 tonnes (3,100 lbs). This is mostly due to the incredible density of the [Cray XC30](#), which crams up to 384 CPUs into a single cabinet. Cray lists the max performance of each XC30 cabinet as 99 teraflops — so I’m not actually sure how Pawsey managed to squeeze 1 petaflop out of seven cabinets. Cray does make Nvidia Tesla daughter cards for the XC30, but [the literature on the IVEC/Pawsey website](#) only mentions Xeon CPUs.



University of Arizona, peeling the shrink wrap off an El Gato supercomputer cabinet



Plugging in El Gato

It's a similar story over at the University of Arizona, which recently unboxed its **El Gato supercomputer**. We're not quite sure who built El Gato (it was probably IBM), but it appears to be a custom build using IBM's **x86 iDataPlex** servers and Nvidia Tesla K20 accelerators. Like the Pawsey supercomputer, El Gato came fully built (and shrink wrapped), and just had to be plugged in. With peak performance of 145 teraflops, El Gato is one of the fastest supercomputers located at a US university, rather than a dedicated research facility like ORNL or LLNL.

Not all supercomputer installations are as plug-and-play as Magnus2 or El Gato, though. In the time-lapse video below you can see engineers at the DoE's Oak Ridge National Laboratory (ORNL) manually **upgrading the Jaguar supercomputer to become the Titan supercomputer**. At the time, Titan was the fastest supercomputer in the world, with 560,640 Intel Xeon and Nvidia Tesla cores pumping out about 17 petaflops. The **Chinese Tianhe-2** has since taken the lead, though.

So, there you go: That's what it's like to unbox a supercomputer. For the most part, it's just like buying a new PC from Dell — but on a much larger scale. Unless of course you opt for upgrading an existing supercomputer, in which case it's much like opening up your own PC and changing some components — but multiply that process by 100, 1000, or 10000 times, depending on the size of the installation. In both cases, wiring everything up takes a bit of work, but it's usually the *making sure everything actually works* that takes the most time, with lots of operating system and software diagnostics required.

And now, of course, you should read our story about [the history of supercomputers](#) — and, perhaps more importantly, the [future \(and difficulty\) of deploying exascale supercomputers](#).