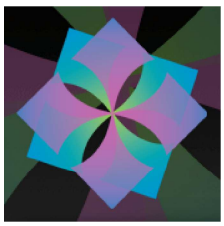


Traditionally, one of the most exciting opening elements of the annual SC event is the announcement of the list of the Top 500 supercomputers on the planet. There are often surprises or at the very least, some notable movements as large systems enter the list, offerin new ways to track architectural and system desig trends.

For each person who just scanned the most rece Top 500 supercomputer list for the end of 2014, there were probably just as many who had to pop over to the June list to make sure they weren't looking at the exact same list. Because, well, with a few exceptions, it hasn't moved much.

Here are a few interesting things to keep in mind, however. First, don't expect Top 500 l stagnation to continue indefinitely. On the same note, however, one might not expect ar major news for the list for the next June incarnation either unless there are international surprises from China or Japan in particular. This is not out of the question by any means especially with major upgrades coming to the chart topping Tianhe-2 machine and other investments set to come online sometime in the next calendar year in Japan from what understand. In fact, the rumor mill in advance of this November's list indicated that there were going to major upgrades already benchmarked on Tianhe-2, which clearly never materialized.

Still, as far as major U.S. based systems, it will be something of a waiting game as the li finds its footing again and the competition heats up. We know of several large systems that will start to appear late next year (hard to say if they will be LINPACK benchmark-ready by next November's list) and into 2016, including the Trinity and Cori supercomputers. Further, as we heard on Friday, some seriously large systems are expected to come online in the 2016-2018 timeframe featuring a GPU-boosted, NVLink connected IBM Power9 architecture with yet another announcement about a similarly sized machine to follow at some point.

Rank	Site	System
1	National Super Computer Center in Guangzhou China	**Tianhe-2 (MilkyWay-2)** - TH-IVB-FEP Cluster, Intel Xeon E5-2692 12C 2.200GHz, TH Express-2, Intel X Phi 31S1P NUDT
2	DOE/SC/Oak Ridge National Laboratory United States	**Titan** - Cray XK7 , Opteron 6274 16C 2.200GHz, C Gemini interconnect, NVIDIA K20x Cray Inc.
3	DOE/NNSA/LLNL United States	**Sequoia** - BlueGene/Q, Power BQC 16C 1.60 GHz Custom IBM
4	RIKEN Advanced Institute for Computational Science (AICS) Japan	K computer, SPARC64 VIIIfx 2.0GHz, Tofu interconn Fujitsu
5	DOE/SC/Argonne National Laboratory United States	**Mira** - BlueGene/Q, Power BQC 16C 1.60GHz, Cus IBM
6	Swiss National Supercomputing Centre (CSCS) Switzerland	**Piz Daint** - Cray XC30, Xeon E5-2670 8C 2.600GH Aries interconnect , NVIDIA K20x Cray Inc.
7	Texas Advanced Computing Center/Univ. of Texas United States	**Stampede** - PowerEdge C8220, Xeon E5-2680 8C 2.700GHz, Infiniband FDR, Intel Xeon Phi SE10P Dell
8	Forschungszentrum Juelich (FZJ) Germany	**JUQUEEN** - BlueGene/Q, Power BQC 16C 1.600GH Custom Interconnect IBM
9	DOE/NNSA/LLNL United States	**Vulcan** - BlueGene/Q, Power BQC 16C 1.600GHz, Custom Interconnect IBM
10	Government United States	Cray XC30, Intel Xeon E5-2697v2 12C 2.7GHz, Arie interconnect Cray Inc.

(http://6lli539m39y3hpkelqsm3c2fg.wpengine.netdna-cdn.com/wp-content/uploads/2014/11/Top500_Top10.png)

Although there isn't a lot of news to drive the mainstream world into its once or a twice year supercomputing interest frenzy, what's actually happening is very subtle but far mo interesting in its own right.

Consider what's happened to the list itself in conjunction with what's occurring on the ground with those who are purchasing large-scale scale systems. They're either claimin that they don't plan on running the Top 500 benchmark at all or even if they do, it means nothing for how they evaluated the procurement of the system. That's not to say the floating point capabilities of the machines aren't important—but as a metric for determin the practical use and potential value of a machine, its importance is diminished.

To be fair, the Top 500 founders are aware of this and in fact, tend to echo the same sentiments about their own beloved benchmark. Dr. Jack Dongarra in conjunction with D Michael Heroux and others are addressing with their evolving HPCG benchmark, which we've discussed at length in the past, but it will be some time before the it has the correctness, culture, and core to boost it to the same prominence of LINPACK.

wire/nsa-releases-new-technology-open-source-community/)
Gidel Unveils Proc10A (http://www.hpcwire.com/off-

Along These Lines

Breaking: Detailed Results from Today's Top 500 Fastest Supercomputers List
(http://www.hpcwire.com/2014/06/23/detailed-results-top-500-fastest-supercomputers-list/)

Breaking: Results in for this Year's Top500 Supercomputer List
(http://www.hpcwire.com/2013/11/18/breaking-results-in-for-this-years-top500-supercomputer-list/)

NICS Tackles Big Science with Beacon
(http://www.hpcwire.com/2014/06/16/nics-tackles-big-science-beacon/)

NVIDIA Kepler Parts Top Green500
(http://www.hpcwire.com/2013/11/22/nvidia-kepler-parts-top-green500/)

HPC Tweets

What does matter is encapsulated perfectly by what the newly announced pre-exascale CORAL systems represent. IBM calls the trend "data centric computing" but as many at the top tier of the list understand is that FLOPS alone aren't going to cut it any longer. Simulations have never been just about increasingly high performance—they're also about data management. In fact, some users we've talked to who run massive scale modeling and simulation applications say that the data created that then must be sorted, managed, and moved accounts for an imbalanced amount of their actual computational resources, hence the need for systems that take this into account in balance with computational horsepower.

To further emphasize these points, consider the list highlights provided by the Top 500 founders:

- Total combined performance of all 500 systems has grown to 309 Pflop/s, compared to 274 Pflop/s in June and 250 Pflop/s one year ago. This increase in installed performance also exhibits a noticeable slowdown in growth compared to the previous long-term trend.
- There are 50 systems with performance greater than 1 petaflop/s on the list, up from 37 six months ago.
- The No. 1 system, Tianhe-2, and the No. 7 system, Stampede, use Intel Xeon Phi processors to speed up their computational rate. The No. 2 system, Titan, and the No. 6 system, Piz Daint, use NVIDIA GPUs to accelerate computation.
- A total of 75 systems on the list are using accelerator/co-processor technology, up from 62 from November 2013. Fifty of these use NVIDIA chips, three use ATI Radeon, and there are now 25 systems with Intel MIC technology (Xeon Phi). Intel continues to provide the processors for the largest share (85.8 percent) of TOP500 systems.
- Ninety-six percent of the systems use processors with six or more cores and 85 percent use eight or more cores.
- HP has the lead in systems with 179 (36 percent) compared to IBM with 153 systems (30 percent). HP had 182 systems (36.4 percent) six months ago, and IBM had 176 systems (35.2 percent) six months ago. In the system category, Cray remains third with 62 systems (12.4 percent).

There will be a detailed presentation on the Top 500 results tomorrow–we're looking forward to bringing you the highlights from that, as well as more in-depth analysis following the slides presented and perspectives from the Top 500 team.

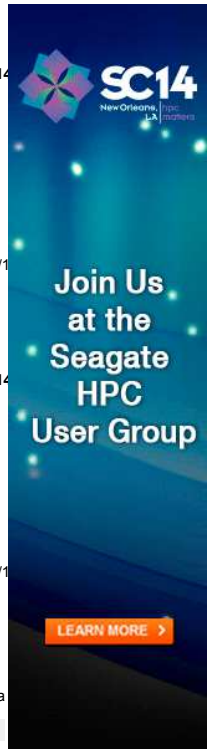
Feature Articles

A Rare Letter from the Editor (http://www.hpcwire.com/2014 letter-editor/)
In the five years I've been here, one would be hard pressed to find a letter from the editor, especially one that uses the dreaded personal Read more… (http://www.hpcwire.com/2014/11/27/rare-letter-editor/)

NASA Debuts Stunning CO2 Visualization (http://www.hpcwire.com/2014 debuts-stunning-co2-visualization/)
In keeping with the SC spirit of HPC matters, we wanted to share another amazing example of supercomputing in action. Last week, NASA officials Read more… (http://www.hpcwire.com/2014/1 debuts-stunning-co2-visualization/)

Intel Etches Future Process for HPC Progress (http://www.hpcwire.com/2014 etches-future-process-hpc-progress/)
"This market, this industry, is poised for a fairly fundamental transformation," Raj Hazra, Vice President and General Manager of Intel's High Read more… (http://www.hpcwire.com/2014/1 etches-future-process-hpc-progress/)

Read more HPCwire Features… (http://www.hpcwire.com/ca



Short Takes

Weekly Twitter Roundup (http://www.hpcwire.com/2014/11/26/weekly-twitter-roundup-16/)
Here at *HPCwire,* we want to help keep the HPC community as up-to-date as possible on some of the most captivating news items that were Read more… (http://www.hpcwire.com/2014/11/26/weekly-twitter-roundup-16/)

HPC Job Bank

Hardware Engineer - Mechanical Packaging - Cray (http://jobs.hpcwire.com/jobdetails.cfm?jid=2012)

Subsurface Support Manager- Applications and Infrastructure - BHP