



Top News from Leading HPC Solution Providers



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As we noted in a few different pieces throughout the week, there has been little change (http://www.hpcwire.com/2014/11/17/curious-standstill-top-500-wont-last-forever/) in the Top 500 supercomputer rankings with Tianhe-2 still maintaining its dramatic edge over other systems. While we expect some new systems

to enter the list in time for the June rundown, the very large machines we heard about this week, most notably those that are part of the CORAL procurements, are a couple of years away.

For anyone who has followed the news of the week, it likely comes as no surprise that the CORAL systems (http://www.hpcwire.com/2014/11/14/coral-signals-new-dawn-exascale-ambitions/) were the top announcements at SC14. This means also that IBM and the future of Power systems for HPC were also a hot topic, as well as what this shift means for NVIDIA's Tesla business unit. While there is quite a bit on that we've shared throughout the week, IBM is back in HPC along, of course, with Lenovo, which according to IDC analysts at this week's briefing on the HPC market (http://www.hpcwire.com/2014/11/18/strange-state-supercomputing-market-2014/), could consume a large portion the Top 500 list in the coming years, possibly usurping HP, which is the dominant server player for HPC systems.

On that note, Lenovo had a strong SC week with announcements that included a new HPC Innovation Center in Stuttgart, Germany where they will work with partners Intel and Mellanox, as well as a 2-socket server offering with Xeon E5-2698A v3 processors that will be made available in the specialty NextScale systems

(http://www.hpcwire.com/2014/11/19/nextscale-nodes-crest-1-teraflops-await-knights-landing/). The company demonstrated their "Petacube" this week at the show, showing how users can condense a petaflop into a densely configured set of two "Knights Landing" powered 42U-tall racks. This was of great interest to those we talked to, in part because of the Knights Landing hook, but there was a new Knight inducted into the community this week.

Intel let loose on more information around the upcoming "Knights Landing" chips, which are expected to emerge in 2015, as well as offered a much more extended sense of the roadmap for increasing floating point performance with the eventual "Knights Hill" codename we first heard this week. For the sake of space, take a gander at this deep dive (http://www.enterprisetech.com/2014/11/17/enterprises-get-xeon-phi-roadmap/) for a sense of how Intel is pushing performance for its coprocessor and future direction.

While Intel remains the unquestionable leader in the CPU space, accelerator adoption via NVIDIA GPUs and Intel Xeon Phi are on a slower but steady growth curve. While we weren't treated to any news about the future of NVIDIA's Maxwell GPUs at the show, the company is still the K80, its next-generation GPU. As reported this week (http://www.enterprisetech.com/2014/11/17/nvidia-doubles-tesla-gpu-accelerators/), "This GPU is different from the GK110B GPU used in the Tesla K40 coprocessor in a few ways, including a doubling of the shared GDDR5 memory and registers in the chip. The GK210 also sports an improved GPU Boost overclocking mechanism that allows for the two GPU chips on the card to squeeze out the maximum performance given the thermal envelope of the systems in which they are tucked and the nature of the workload as it is running."

This development, coupled with NVIDIA's work with IBM in the OpenPower space, which we will see come to fruition in the 2017 timeframe, is set to heat up competition (finally) on the chip front. With Power9, an emerging ARM 64 ecosystem, and plenty of new combinations of other accelerators, including new FPGA and even DSP-fueled low-power processor options, the wait for a more interesting, diverse mix of systems won't be much longer.

There seem to be some shifting winds for a few vendors who have had a presence in supercomputing but now seem keen on moving with more force into the segment. For instance, at the last couple of SC and ISC events, AMD has been more of a "seen but not heard" presence, in part because the din around Intel and NVIDIA has always been heavy. However, this week (http://www.hpcwire.com/2014/11/18/strange-state-supercomputing-market-2014/) we saw a series of announcements that might signal a renewed interest in HPC, powered in part by FastForward 2 research and development funds.

This week the company announced that it would have an unstated stake in the \$32 million overall funds set aside to push the next generation of exascale-class applications. According to AMD, the funds will go toward moving "AMD's APUs based on the open standard heterogeneous system architecture (HAS), as well as future memory systems to power a generation of exascale supercomputers capable of delivering 30-60 times more performance than today's fastest supercomputers."

AMD's FirePro cards were at the heart of the number one Green500 placement, the L-CSC cluster at GSI Helmholtzzentrum in Darmstadt, Germany. AMD helped the center (http://www.hpcwire.com/2014/11/18/green500-2014/) with 5.27 gigaflops per watt on the benchmark across the combination of Intel Ivy Bridge CPUs, AMD FirePro GPUs and some clever software work to push peak efficiency. AMD also partnered with Penguin to demo a new APU cluster based on HAS, which ties the CPU/GPU cores into a shared memory system that Penguin calls... (oh, dear marketing people, are you serious?) the "Jaatikko" (but with umlauts and other Finnish-isms). This system has 10 APU compute nodes that feed from Penguin's Altus (http://www.hpcwire.com/2014/11/18/altus-2014/) supercomputer form at the head and marks a new class of machines from Penguin of the non-NVIDIA variety.

The "seen but not heard" qualifier has applied to Dell to some extent as well over the last couple of years. Despite a few very large installations at TACC and elsewhere, the company is selective about the HPC centers it wants to strike partnerships with. During a (http://www.hpcwire.com/2014/11/18/dell-executives-this-week/) that with Dell executives this week, we were told that while they could easily bid on many more supercomputing sites than they do, their goal is to always learn something new that

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

Along These Lines



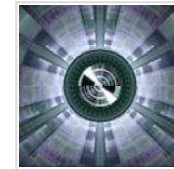
SC13 Wrapup: Supercomputing's Top Themes (http://www.hpcwire.com/2013/11/28/sc13-wrapup-supercomputings-top-themes/)



SC13 in Review: The Week's Top Newsmakers (http://www.hpcwire.com/2013/11/28/sc13-in-review-the-weeks-top-newsmakers/)



This Week in HPC News (http://www.hpcwire.com/2014/02/27/week-hpc-news-6/)



The Strange, Shifting Shape of the Supercomputing Market (http://www.hpcwire.com/2014/11/18/strange-state-supercomputing-market-2014/)

HPC Tweets



can be put into practice across their broad range of platforms. This is especially the case if they can tune new offerings to balance between HPC and hyperscale or large-scale enterprise datacenters.

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As it stands from the most recent Top 500 list, Dell only has a small sliver of the supercomputing pie with installations at 1.8% of the rankings—a total of 9 systems, including the #7 ranked Stampede machine. This might change in lists to come with the introduction of the GPU-accelerated PowerEdge C4130

(http://tci.taborcommunications.com/netapp)



(http://www.dell.com/us/business/p/poweredge-c4130/pd), is the only Intel Xeon E5-2600v3 1U server to offer up to four GPUs/accelerators. Dell says the new machine has "up to 33 percent better GPU/accelerator density than its closest competitors and 400 percent more PCIe GPU/accelerators per processor per rack U than a comparable system." The PowerEdge C4130 can achieve over 7.2 Teraflops on a single 1U server and has a performance/watt ratio of up to 4.17 Gigaflops per watt. In an effort to further add to their HPC portfolio, the company also introduced Dell Storage for HPC with Intel Enterprise Edition for Lustre software (http://en.community.dell.com/dell-blogs/dell4enterprise/b/dell4enterprise/archive/2014/11/17/dell-storage-for-hpc-with-intel-enterprise-edition-for-lustre) (Intel EE for Lustre software).

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Speaking of share on the Top 500, the uptick in sizable systems from Cray is worth pointing out. From the November 2010 list where Cray had 37 systems on the Top 500 to 62 now, there is little doubt the company is pushing forward to eclipse rivals in the lower tiers of the ranks following the large system share from IBM and HP. In addition to announcing a roadmap that is cut with details about their plans for ARM and other architectures (we spoke with Barry Bolding this week, more on that next edition), Cray has found a home at KAUST with one of the new XC40 supercomputers with DataWarp burst buffer and application acceleration technology, in addition to a Sonexion 2000 storage system, a Cray Tiered Adaptive Storage (TAS) system and a Urika-GD graph analytics application.

(http://tci.taborcommunications.com/store)



It's also worth noting the Cray XC40 system at KAUST, named "Shaheen II," will be 25 times more powerful than its current system. It sounds as if they ordered just about everything from the Cray menu—a solid win for Cray in the midst of the buzz around the IBM systems coming that will far exceed the power of Titan and other large-scale Cray systems on the list.

(http://tci.taborcommunications.com/amd)



The storage component of the KAUST deal was an important aspect to that and the "Cori" and "Trinity" systems earlier in the year for Cray. As we noted in our overview of the market following IDC's briefing this week, storage is set to explode over the next couple of years in HPC. Accordingly, DDN's booth was a constant flurry of activity—perhaps more so than any other vendor site we watched over the course of the week. During the show DDN announced their new Exascalr appliance, which, in a single 45 unit rack can provide 4.8 PB of usable storage using 6TB disk drives. DDN says this equates to 100MB/sec sustained scalable per-drive performance, up to 40GB/sec sustained throughput and up to 1.5 million IOPS. The company also is validating its Infinite Memory Engine (IME) across a number of sites as a burst buffer and mode of application acceleration.

(http://tci.taborcommunications.com/sponsor-convey)



Even though this show was lighter on big news items compared to previous years, it's interesting space. In fact, in many ways, HPC seems to be finding itself again in the quest to hit the first generation of pre-exascale systems with Bell's Law (http://en.wikipedia.org/wiki/Bell%27s\_law\_of\_computer\_classes) beginning to take shape, pushing us into a new ten-year cycle. Power and cooling innovations featured prominently at the show, as did storage and network news items that weren't mentioned in the above rundown of some of the main themes.

(http://tci.taborcommunications.com/sponsor-hp-2)



While this has been by no means comprehensive, these were some of the most talked-about items. For more announcements from throughout the week, please take a look at this feed, which gives a rundown of the week.

(http://tci.taborcommunications.com/sponsor-atipa)



It was great seeing so many of you in New Orleans!

(http://tci.taborcommunications.com/sponsor-altair-2)



It was great seeing so many of you in New Orleans!

(http://tci.taborcommunications.com/21812/2014-11-03/69dc5)



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(http://tci.taborcommunications.com/sponsor-intel)



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**Chris Samuel** @chris\_bloke 5m  
Great fun comet hunting with @cafuego at @MBObservatory tonight, observed 2014/q2 - well found Peter!

**Mount Burnett Obsv** 26m  
@MBObservatory  
Observing Comet Lovejoy 2014/Q2, quite a challenge with high cloud but fortunately we have Richard from @BritAstro here to help confirm!  
Retweeted by Chris Samuel  
Expand

**ANSYS, Inc.** @ANSYS\_Inc 1h  
Startup's Wristband Can Track Seizures bit.ly/1zCBG7h  
Show Summary

**Mount Burnett Obsv** 1h  
@MBObservatory  
Daniel Armstrong talking about "Art and Cosmos" showing Percival Lowell's drawings of canals on Mars.

Feature Articles

**A Rare Letter from the Editor**  
(http://www.hpcwire.com/2014/11/22/a-rare-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/2014/11/22/a-rare-letter-editor/)

**NASA Debuts Stunning CO2 Visualization**  
(http://www.hpcwire.com/2014/11/22/nasa-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/2014/11/22/nasa-debuts-stunning-co2-visualization/)

**Intel Etches Future Process for HPC Progress**  
(http://www.hpcwire.com/2014/11/22/intel-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/2014/11/22/intel-etches-future-process-hpc-progress/)

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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

- 2014/11/26/weekly-engineer - Mechanical Packaging - Cray (http://jobs.hpcwire.com/jobdetails.c?id=2012)
- Subsurface Support Manager - Applications and Infrastructure - BHP