

## Quick Take

### Highlights of ISC 2017 Conference

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#### HIGHLIGHTS

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ISC 2017 was held last week in Frankfurt, drawing 3,253 HPC developers, users, scientists, and engineers from 60 countries, according to conference officials. The attendance represented a 5.2 percent increase compared to last year's event. The ISC Conference turned 32 this year, making it the world's oldest HPC community forum and Europe's largest HPC exhibition. This year, ISC17 hosted a total of 148 exhibitors consisting of 100 vendors, 46 research entities, and 2 media organizations from 26 countries.

At the conference there were a number of major themes prevalent throughout that included:

- The growing anticipation for exascale computers in 2021 and beyond.
- The rise of deep learning both as a rapidly emerging technology and as a way to augment traditional HPC-base modeling and simulation.
- The slowdown in the growth of new top computers in Top 500 HPC list.

#### ANALYST OPINION

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For those who were unable to attend all of the sessions at ISC, or indeed, to even make the trip to Frankfurt, Hyperion Research offer the following insights, presented in no particular order, gathered over the week-long event:

- ARM seems to have stronger momentum in the European HPC development community than anywhere else in the world. Europe is pushing for a European HPC processor design. Some European HPC experts anticipate the arrival of ARM-based systems on the Top 500 list in the near future. Major sticking points for ARM are the lack of a mature HPC software ecosystem (that will take time) and licensing fees that can be formidable hurdles for some buyers, especially SMEs.
- There was a belief that all of the technology needed to get to Exascale is either already available or is expected to be available when needed. The last real exascale hurdle, keeping total system power consumption near the 20-30 MW level per system, is considered by many to be manageable by the anticipated exascale arrival times, 2020-21 for peak and 2023-24 for sustained performance. Although some early Exascale system installations may require more power.
- AI and deep learning was on everyone's mind this year.
  - In many cases the promissory systems are years ahead of the delivery systems.

- Deep learning is now widely considered to be not just a standalone research direction, but one that can be used to offer significant performance improvements when used in concert with traditional HPC modeling and simulation applications as well as with HPDA applications.
- A number of HPC vendors are looking to offer not only deep learning specific hardware, but are also planning to offer deep learning as a service to a growing number of potential new deep learning customers.
- Deep learning advocates, noting that many deep learning applications will require only 16 bit precision, have coined the term "AI-exascale systems" as those that can achieve exascale performance on deep learning training runs and to differentiate them from traditional 64-bit scientific computing exascale systems.
- Despite widespread recognition that deep learning today is mostly limited to social media/Internet mega-companies that already have enough data to permit early exploration of DL, such as Google Facebook, and Baidu, there was no significant presence of these users at the conference. We expect these names to show up at future ISC conference.
- China's visibility as a player in the global HPC development community is greatest at the top end of the Top 500 list. We expect Chinese vendors to undertake major initiatives in the next few years to expand beyond China into other important HPC markets, first Europe (as Lenovo is already doing) and then the United States.
- ISC confirmed that liquid cooling is becoming more popular, and not only for the largest HPC systems. New approaches are making liquid cooling possible for data centers that weren't built with liquid cooling in mind.
- Japan is taking the lead in building energy efficient HPCs. The top four systems in the Green500 are all newly installed Japanese systems with the new TSUBAME 3.0, a modified HPE ICE XA system installed at the Tokyo Institute of Technology, achieving 14.1 Gflops/watt during its 1.998-petaflop Linpack performance run. Indeed, Japan had a total of six systems in the Green500 top ten.
- Strong performance on the Green500 is built on the use of GPUS, as shown by the top 13 systems on the latest Green500 are all equipped with NVIDIA P100 hardware.

Finally, there was an overall lack of product announcements from major HPC players at the conference. This may be due a combination of factors that include: delayed product cycles, the slowdown of technology advancement in HPCs due to increasing Moore's law constraints, the rising cost of developing and marketing HPCs at the leading edge, the increasing customer preference to hold onto their HPCs longer to wring out the most technical and financial benefit possible, and in some cases the pause before the storm of upcoming 100+ Pflops systems expected in the next two years.

## About Hyperion Research, LLC

Hyperion Research, consisting of the former IDC High Performance Computing (HPC) analyst team, provides HPC information, analysis, and recommendations based on technology and market trends. Research includes market sizing and forecasting, share tracking, segmentation, technology and related trend analysis, and both user & vendor analysis for multi-user technical server technology used for HPC and HPDA (high performance data analysis). We provide thought leadership and practical guidance for users, vendors and other members of the HPC community by focusing on key market and technology trends across government, industry, commerce, and academia.

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