

## Top500 Supercomputers: IBM continues to forge ahead

The headlines announcing the two last installments of the Top500 List of Supercomputers had already read "[Big Big Blue](#)" and "[IBM dashes ahead](#)." This time around IBM again did not disappoint: Almost half the systems in the 27th Top500 List of Supercomputers presented yesterday on the occasion of the opening of the conference [International Supercomputer 2006](#) in Dresden come from IBM. With now 243 systems IBM has truly consolidated the substantial lead it has enjoyed since the last list issued in November 2005 (219 systems at the time). The runner-up is HP with 154 systems (down from 169), followed by Dell (22), Cray (16) and SGI (12).

When overall computing power is taken as a measure IBM's dominance, at 54 percent, emerges even more clearly. 25 Blue Gene systems in all were able to make the ranking, with the eServer Blue Gene solution located at Lawrence Livermore Labs with its 131,072 processors and a maximum performance of 280.6 teraflop/s still far and away the lone contender for the top spot. It is followed by its smaller Blue Gene colleague at the IBM Thomas J. Watson Research Center, which sports a peak Linpack performance of 91.2 teraflop/s. The No.3-ranking system is also one supplied by IBM, an eServer 575 system equipped with 12,208 Power5 processors that with a peak performance of 75.8 teraflop/s was able to pull unambiguously ahead of NASA's Columbia, whose 10,160 Itanium-2 processors in its SGI Altix were able to achieve 51.9 teraflop/s on the Linpack benchmark.

The fastest European, a NovaScale 5160 system with 8,704 Itanium-2 processors based at the French Commissariat à l'Energie Atomique, came in fifth. With its benchmark best of 42.9 teraflop/s it barely manages to outperform its German challenger, the system stationed at the Forschungszentrum Jülich [Research Center Jülich; FZJ], whose peak performance is put at 37.3 teraflops/s. In between those two, two others managed to squeeze in, however: the Dell-Xeon cluster of the Sandia National Labs and the Opteron system of the Tokyo Institute of Technology, the latter equipped with otherwise unavailable Sun Fire X4600 8-processor boards. The Japanese system's 38.3 teraflop/s were calculated prior to the installation of its ClearSpeed coprocessor cards, which are said to boost its performance considerably. The fastest European system of the previous list, the PowerPC processor-equipped Spanish MareNostrum system in Barcelona -- which is [described in detail](#) in a [heise open](#) article -- was with its 27.9 teraflop/s relegated to rank No.11.

With its eighth place the Blue Gene system of the FZJ is the first German contender to make it into the Top 10 since the Top500 List began to be compiled 13 years ago. Even so Germany as a whole has continued to lose ground; with only 17 systems on the current list the country has dropped to mid-table among nations -- five years ago the Top500 List had featured 60 systems from Germany, thereby at the time making the country the undisputed No.2 behind the United States. Meanwhile the UK (35), Japan (29) and the People's Republic of China (28) have all three overtaken the Federal Republic. With regard to processors it is the Xeon/Pentium 4 that features most

prominently in the new list (265 systems). However, when compared with the previous list (285 systems equipped with Intel processors), the company's lead is seen to have shrunk somewhat; its Itanium processors appear to be in decline among the most powerful supercomputer systems (37 as opposed to 46). On the other hand Opteron processors, which are now found in 80 of the Top500 systems -- up from 55 in the previous list --, look to have gained ground. What is striking among Xeon and Opteron supercomputers is how many of them feature blades: 204 supercomputers of the Top500 List were put together using blades.

At 2.79 petaflop/s overall the total computing power of the supercomputers on the current Top500 List has grown by 21 percent when compared with the previous list. For all that, the upward trend in supercomputing performance seems to have weakened somewhat: In the six-month periods up to now increases of 30 percent or more had been the rule. (*Robert W. Smith*) / ([jk/c't](#))