



# NOVEMBER 2004

The 24th TOP500 List was introduced during the [Supercomputer Conference](#)(SC2004) in Pittsburgh, PA.

After a close race to the finish line, the DOE/IBM BlueGene/L beta-System was able to claim the No. 1 position on the new TOP500 list with its record Linpack benchmark performance of 70.72 Tflop/s ("teraflops" or trillions of calculations per second). This system, once completed, will be moved to the DOE's Lawrence Livermore National Laboratory in Livermore, Calif.

It is closely followed by the Columbia system built by SGI and installed at the NASA Ames Research Center in Mountain View, Calif. Columbia clocked in at 51.87 Tflop/s. Both systems represent fairly new and exciting technologies, which enabled U.S. manufacturers and research institutions to regain the top spots on the TOP500 list from the Earth Simulator supercomputer, built by NEC and installed in 2002 at the Earth Simulator Center in Yokohama, Japan. The Earth Simulator, with its Linpack benchmark performance of 35.86 Tflop/s, had held the No. 1 position for five consecutive editions of the listing and is now shown as No. 3.

The other positions in the top 10 also showed significant changes, such as the IBM-built MareNostrum cluster installed at the Barcelona Supercomputing Center, at No. 4 with 20.53 Tflop/s. The list also sees the return of the Virginia Tech X-system. This system was often referred to as 'SuperMac' as it is built using Apple's Xserve servers. It had temporarily disappeared from the listing 6 months ago, due to its unavailability during a major hardware upgrade, and is now listed at No. 7 with its new Linpack performance of 12.25 Tflop/s.

## TOP 10 Sites for November 2004

For more information about the sites and systems in the list, click on the links or view the [complete list](#).

Rank	System	Cores	Rmax (GFlop/s)	Rpeak (GFlop/s)	Power (kW)
1	<a href="#">BlueGene/L beta-System</a> - BlueGene/L DD2 beta-System (0.7 GHz PowerPC 440),_IBM <a href="#">IBM/DOE</a> United States	32,768	70,720.00	91,750.00	
2	<a href="#">Columbia</a> - SGI Altix 1.5 GHz, Voltaire Infiniband,_HPE <a href="#">NASA/Ames Research Center/NAS</a> United States	10,160	51,870.00	60,960.00	
3	<a href="#">Earth-Simulator</a> ,_NEC <a href="#">Japan Agency for Marine-Earth Science and Technology</a> Japan	5,120	35,860.00	40,960.00	3,200
4	<a href="#">MareNostrum</a> - eServer BladeCenter JS20 (PowerPC970 2.2 GHz),_Myrinet,_IBM <a href="#">Barcelona Supercomputing Center</a> Spain	3,564	20,530.00	31,363.00	
5	<a href="#">Thunder</a> - Intel Itanium2 Tiger4 1.4GHz - Quadrics,_California Digital Corporation <a href="#">Lawrence Livermore National Laboratory</a> United States	4,096	19,940.00	22,938.00	
6	<a href="#">ASCI Q</a> - AlphaServer SC45, 1.25 GHz,_HPE <a href="#">Los Alamos National Laboratory</a> United States	8,192	13,880.00	20,480.00	

Rank	System	Cores	Rmax (GFlop/s)	Rpeak (GFlop/s)	Power (kW)
7	<b><u>System X</u></b> - 1100 Dual 2.3 GHz Apple XServe/Mellanox Infiniband 4X/Cisco GigE, Self-made Virginia Tech United States	2,200	12,250.00	20,240.00	
8	<u>BlueGene/L DD1 Prototype (0.5GHz PowerPC 440 w/Custom)</u> , IBM/LLNL IBM Rochester United States	8,192	11,680.00	16,384.00	
9	<u>eServer pSeries 655 (1.7 GHz Power4+)</u> , IBM Naval Oceanographic Office - NAVO DSRC United States	2,944	10,310.00	20,019.20	
10	<b><u>Tungsten</u></b> - PowerEdge 1750, P4 Xeon 3.06 GHz, Myrinet, DELL NCSA United States	2,500	9,819.00	15,300.00	