



# SPEC<sup>®</sup> MPIM2007 Result

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## Intel Corporation

Endeavor (Intel Xeon X5560, 2.80 GHz, SMT off, Turbo on)

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 23.3

MPI2007 license: 13

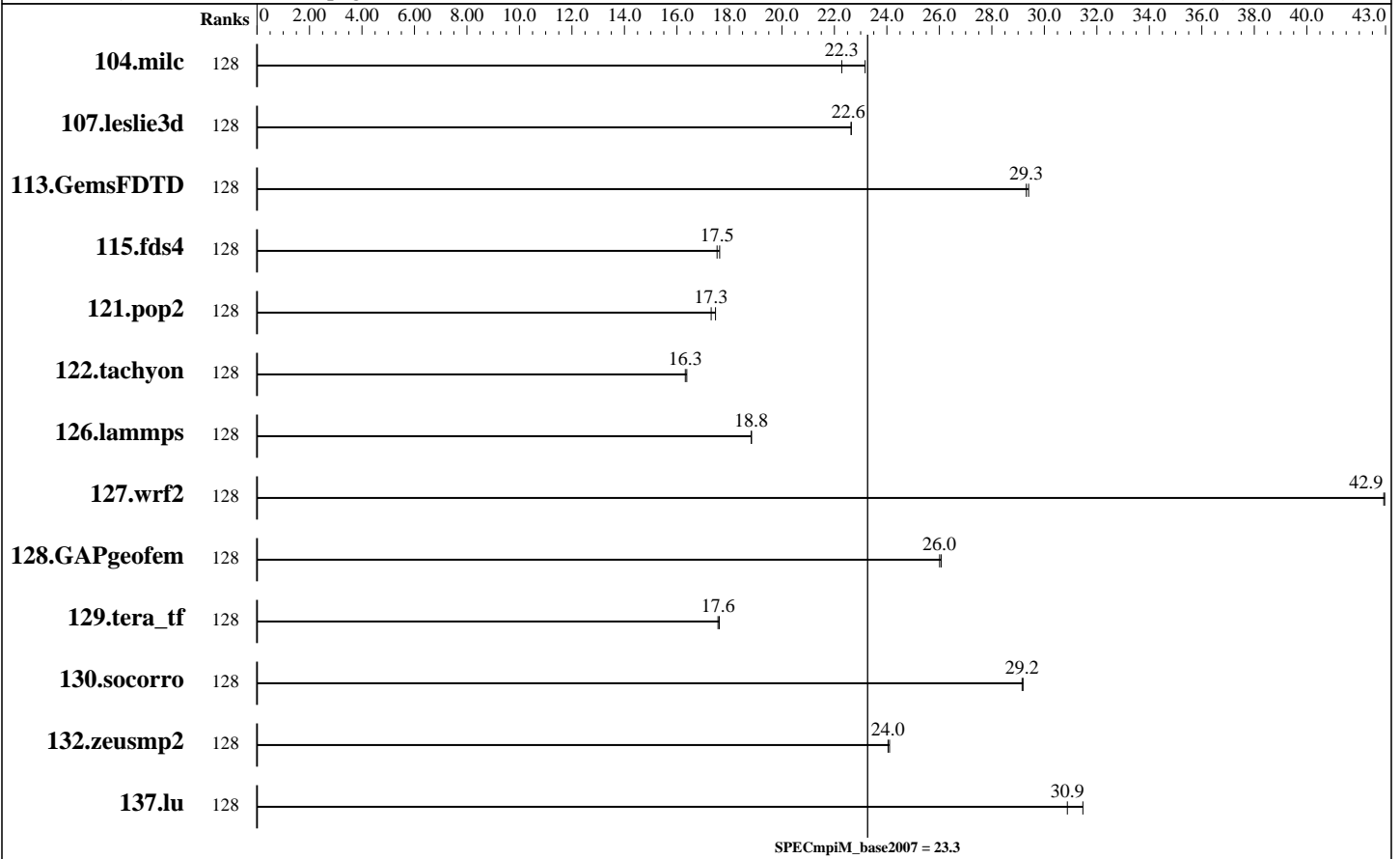
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: Feb-2009

Hardware Availability: Mar-2009

Software Availability: Jun-2009



## Results Table

Benchmark	Base								Peak					
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
104.milc	128	<u>70.2</u>	<u>22.3</u>	67.5	23.2									
107.leslie3d	128	231	22.6	<u>231</u>	<u>22.6</u>									
113.GemsFDTD	128	<u>215</u>	<u>29.3</u>	215	29.4									
115.fds4	128	111	17.6	<u>111</u>	<u>17.5</u>									
121.pop2	128	236	17.5	<u>239</u>	<u>17.3</u>									
122.tachyon	128	<u>171</u>	<u>16.3</u>	171	16.4									
126.lammps	128	155	18.8	<u>155</u>	<u>18.8</u>									
127.wrf2	128	<u>182</u>	<u>42.9</u>	181	43.0									
128.GAPgeofem	128	<u>79.4</u>	<u>26.0</u>	79.2	26.1									
129.tera_tf	128	<u>158</u>	<u>17.6</u>	157	17.6									

Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.



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## Results Table (Continued)

Benchmark	Base						Peak							
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
130.socorro	128	<u>131</u>	<u>29.2</u>	131	29.2									
132.zeusmp2	128	<u>129</u>	<u>24.0</u>	129	24.1									
137.lu	128	<u>119</u>	<u>30.9</u>	117	31.5									

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### Hardware Summary

Type of System: Homogeneous  
 Compute Node: Endeavor Node  
 Interconnect: IB Switch  
 File Server Node: LFS  
 Total Compute Nodes: 16  
 Total Chips: 32  
 Total Cores: 128  
 Total Threads: 128  
 Total Memory: 288 GB  
 Base Ranks Run: 128  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

### Software Summary

C Compiler: Intel C++ Compiler 11.1 for Linux  
 C++ Compiler: Intel C++ Compiler 11.1 for Linux  
 Fortran Compiler: Intel Fortran Compiler 11.1 for Linux  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: Intel MPI Library 3.2 for Linux  
 Other MPI Info: None  
 Pre-processors: No  
 Other Software: Intel MPI Library 3.2 for Linux Multi-Purpose Daemon (MPD)

## Node Description: Endeavor Node

### Hardware

Number of nodes: 16  
 Uses of the node: compute  
 Vendor: Intel  
 Model: Supermicro X8DTN+  
 CPU Name: Intel Xeon X5560  
 CPU(s) orderable: 1-2 chips  
 Chips enabled: 2  
 Cores enabled: 8  
 Cores per chip: 4  
 Threads per core: 1  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.2 GHz, 6.4 GT/s QPI, Hyper-Threading disabled  
 CPU MHz: 2800  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 8 MB I+D on chip per chip, 8 MB shared / 4 cores  
 Other Cache: None  
 Memory: 18 GB (RDIMM 6x2-GB, 6x1-GB DDR3-1066 MHz)  
 Disk Subsystem: Seagate 500 GB ST3500320NS  
 Other Hardware: None  
 Adapter: Mellanox MHQH29-XTC  
 Number of Adapters: 1  
 Slot Type: PCIe x8 Gen2  
 Data Rate: InfiniBand 4x QDR

### Software

Adapter: Mellanox MHQH29-XTC  
 Adapter Driver: OFED 1.3.1  
 Adapter Firmware: 2.5.9  
 Operating System: Red Hat EL 5.2, kernel 2.6.18-53  
 Local File System: Linux/ext2  
 Shared File System: Lustre FS  
 System State: Multi-User  
 Other Software: PBS Pro 8.0

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### Node Description: Endeavor Node

Ports Used: 1  
Interconnect Type: InfiniBand

### Node Description: LFS

#### Hardware

Number of nodes: 8  
Uses of the node: fileserver  
Vendor: DataDirect Networks  
Model: SR1560SF  
CPU Name: Intel Xeon E5462  
CPU(s) orderable: 1-2 chips  
Chips enabled: 2  
Cores enabled: 8  
Cores per chip: 4  
Threads per core: 1  
CPU Characteristics: 1600 MHz FSB  
CPU MHz: 2800  
Primary Cache: 32 KB I + 32 KB D on chip per core  
Secondary Cache: 12 MB I+D on chip per chip, 6 MB shared / 2 cores  
L3 Cache: None  
Other Cache: None  
Memory: 16 GB DDR2 16x1-GB 667 MHz  
Disk Subsystem: 160 disks, 300GB/disk, 48TB total, 35TB available  
Other Hardware: None  
Adapter: Mellanox MHGH28-XTC  
Number of Adapters: 1  
Slot Type: PCIe x8 Gen2  
Data Rate: InfiniBand 4x DDR  
Ports Used: 1  
Interconnect Type: InfiniBand

#### Software

Adapter: Mellanox MHGH28-XTC  
Adapter Driver: OFED 1.3.1  
Adapter Firmware: 2.5.0  
Operating System: Red Hat EL 5.2  
Local File System: None  
Shared File System: Lustre FS  
System State: Multi-User  
Other Software: None

### Interconnect Description: IB Switch

#### Hardware

Vendor: Mellanox  
Model: Mellanox MTS3600Q-1UNC  
Switch Model: Mellanox MTS3600Q-1UNC  
Number of Switches: 9  
Number of Ports: 324  
Data Rate: InfiniBand 4x QDR  
Firmware: 7.1.000  
Topology: Fat tree  
Primary Use: MPI traffic, FS traffic

#### Software



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## Submit Notes

The config file option 'submit' was used.

## General Notes

BIOS settings notes:

Intel Hyper-Threading Technology (SMT): Disabled (default is Enabled)

Intel Turbo Boost Technology (Turbo) : Enabled (default is Enabled)

RAM configuration notes: compute nodes have

1x2-GB and 1x1-GB RDIMM on each memory channel,

2-GB RDIMM is closer to the CPU.

Network notes: nine 36-port switches, 3 core switches and 6 leaf switches.

Each leaf has 6 links to each core. Remaining 18 ports on 5 of 6 leaves are used for compute nodes. On the sixth leaf 8 ports are used for FS nodes, remaining 10 ports are open.

PBS Pro was used for job submission. It has no impact on performance.

Can be found at: <http://www.altair.com>

Lustre File System 1.6.6 was used. Download from:

<http://www.sun.com/software/products/lustre>

## Base Compiler Invocation

C benchmarks:

mpiicc

C++ benchmarks:

126.lammps: mpiicpc

Fortran benchmarks:

mpiifort

Benchmarks using both Fortran and C:

mpiicc mpiifort

## Base Portability Flags

121.pop2: -DSPEC\_MPI\_CASE\_FLAG

126.lammps: -DMPICH\_IGNORE\_CXX\_SEEK

127.wrf2: -DSPEC\_MPI\_CASE\_FLAG -DSPEC\_MPI\_LINUX



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## Base Optimization Flags

C benchmarks:

-O3 -xSSE4.2 -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xSSE4.2 -no-prec-div

Fortran benchmarks:

-O3 -xSSE4.2 -no-prec-div

Benchmarks using both Fortran and C:

-O3 -xSSE4.2 -no-prec-div

The flags file that was used to format this result can be browsed at

[http://www.spec.org/mpi2007/flags/EM64T\\_Intel111\\_flags.html](http://www.spec.org/mpi2007/flags/EM64T_Intel111_flags.html)

You can also download the XML flags source by saving the following link:

[http://www.spec.org/mpi2007/flags/EM64T\\_Intel111\\_flags.xml](http://www.spec.org/mpi2007/flags/EM64T_Intel111_flags.xml)

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For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC MPI2007 v1.1.

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