



# SPEC® MPIM2007 Result

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## Intel Corporation

Endeavor (Intel Xeon X5560, 2.80 GHz, DDR3-1333 MHz, SMT off, Turbo on)

SPECmpiM\_peak2007 = Not Run

SPECmpiM\_base2007 = 7.10

MPI2007 license: 13

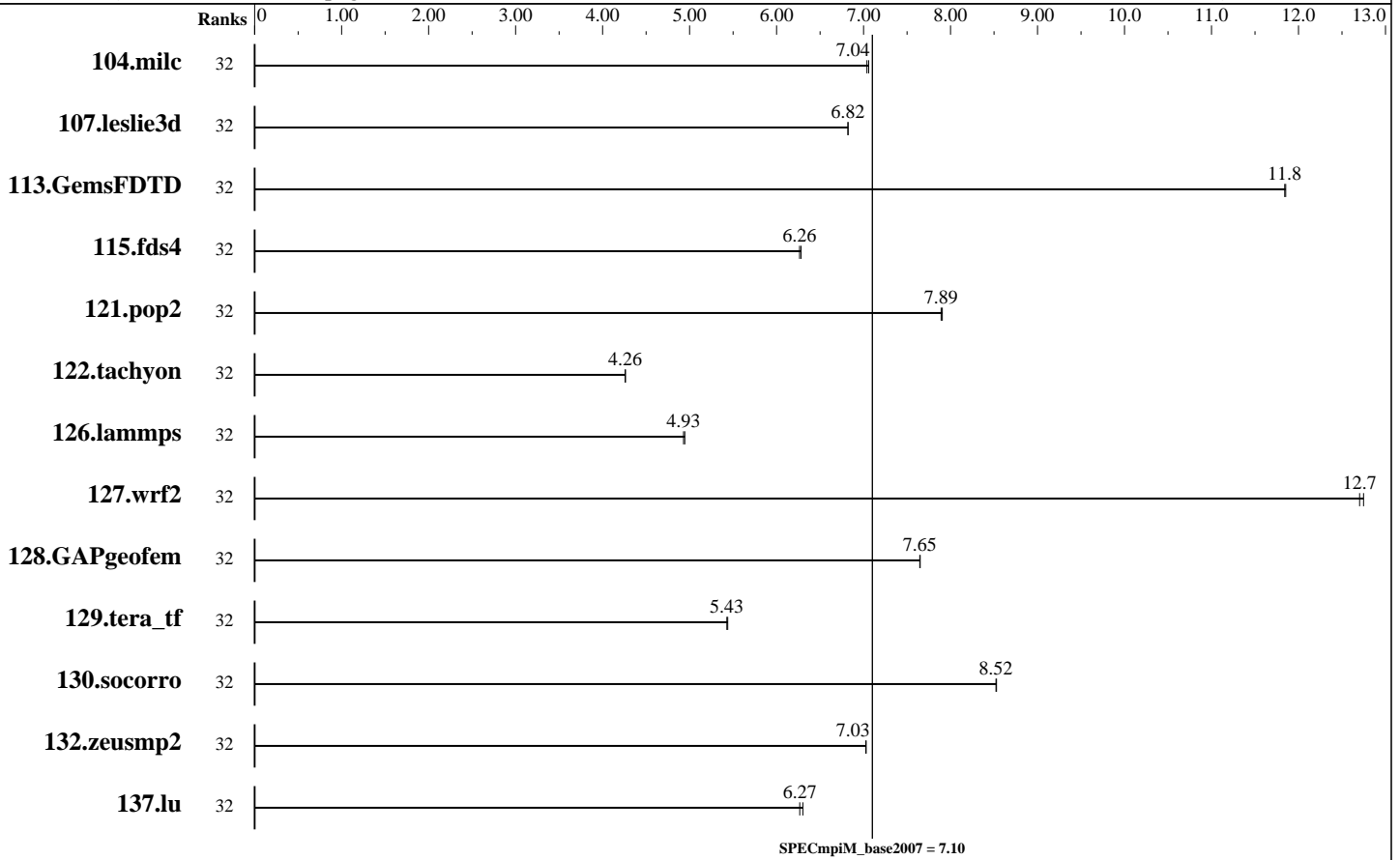
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: Jul-2009

Hardware Availability: Jun-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	32	<u>222</u>	<u>7.04</u>	222	7.06									
107.leslie3d	32	765	6.82	<u>765</u>	<u>6.82</u>									
113.GemsFDTD	32	<u>533</u>	<u>11.8</u>	532	11.9									
115.fds4	32	<u>311</u>	<u>6.26</u>	311	6.28									
121.pop2	32	522	7.91	<u>523</u>	<u>7.89</u>									
122.tachyon	32	<u>657</u>	<u>4.26</u>	656	4.26									
126.lammps	32	<u>591</u>	<u>4.93</u>	589	4.94									
127.wrf2	32	612	12.7	<u>614</u>	<u>12.7</u>									
128.GAPgeofem	32	270	7.65	<u>270</u>	<u>7.65</u>									
129.tera_tf	32	<u>510</u>	<u>5.43</u>	509	5.44									

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	32	<b>448</b>	<b>8.52</b>	448	8.53									
132.zeusmp2	32	441	7.03	<b>442</b>	<b>7.03</b>									
137.lu	32	<b>587</b>	<b>6.27</b>	583	6.30									

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: 4  
Total Chips: 8  
Total Cores: 32  
Total Threads: 32  
Total Memory: 96 GB  
Base Ranks Run: 32  
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: 4  
Uses of the node: compute  
Vendor: Intel  
Model: SR1600UR  
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: 24 GB (RDIMM 6x4-GB DDR3-1333 MHz)  
Disk Subsystem: Seagate 400 GB ST3400755SS  
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 2.6.18-128  
Local File System: Linux/ext2  
Shared File System: Lustre FS  
System State: Multi-User  
Other Software: PBS Pro 8.0

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**Software Availability:** Jun-2009

### Node Description: Endeavor Node

Ports Used: 1  
Interconnect Type: InfiniBand

### Node Description: LFS

#### Hardware

Number of nodes: 8  
Uses of the node: fileserver  
Vendor: Intel  
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: Seagate 250 GB  
Other Hardware: connected to DDN storage (see General Notes)  
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: 46  
Number of Ports: 36  
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

### MPI startup command:

mpirun command was used to start MPI jobs. This command starts an independent ring of mpd daemons, launches an MPI job, and shuts down the mpd ring upon the job termination. The mpirun command automatically detects if an MPI job is submitted in a session allocated using a job scheduler (like PBS Pro). In this case, the mpirun command extracts the host list from the respective environment and uses these nodes automatically.

### BIOS settings:

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

### RAM configuration:

Compute nodes have 1x4-GB RDIMM on each memory channel.

### Network:

Forty six 36-port switches: 18 core switches and 28 leaf switches. Each leaf has one link to each core. Remaining 18 ports on 25 of 28 leafs are used for compute nodes. On the remaining 3 leafs the ports are used for FS nodes and other peripherals.

### Fileserver:

Intel SR1560SF systems connected via IB to DataDirect Networks S2A9900 storage which is: 160 disks, 300GB/disk, 48TB total, 35TB available.

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

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## Base Compiler Invocation (Continued)

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

## 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/results/flags/EM64T\\_Intel111\\_flags.20100413.01.html](http://www.spec.org/mpi2007/results/flags/EM64T_Intel111_flags.20100413.01.html)

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

[http://www.spec.org/mpi2007/results/flags/EM64T\\_Intel111\\_flags.20100413.01.xml](http://www.spec.org/mpi2007/results/flags/EM64T_Intel111_flags.20100413.01.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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