



# SPEC<sup>®</sup> MPIL2007 Result

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## Intel Corporation

Endeavor (Intel Xeon X5670, 2.93 GHz,  
DDR3-1333 MHz, SMT off, Turbo off)

SPECmpiL\_peak2007 = Not Run

SPECmpiL\_base2007 = 33.1

MPI2007 license: 13

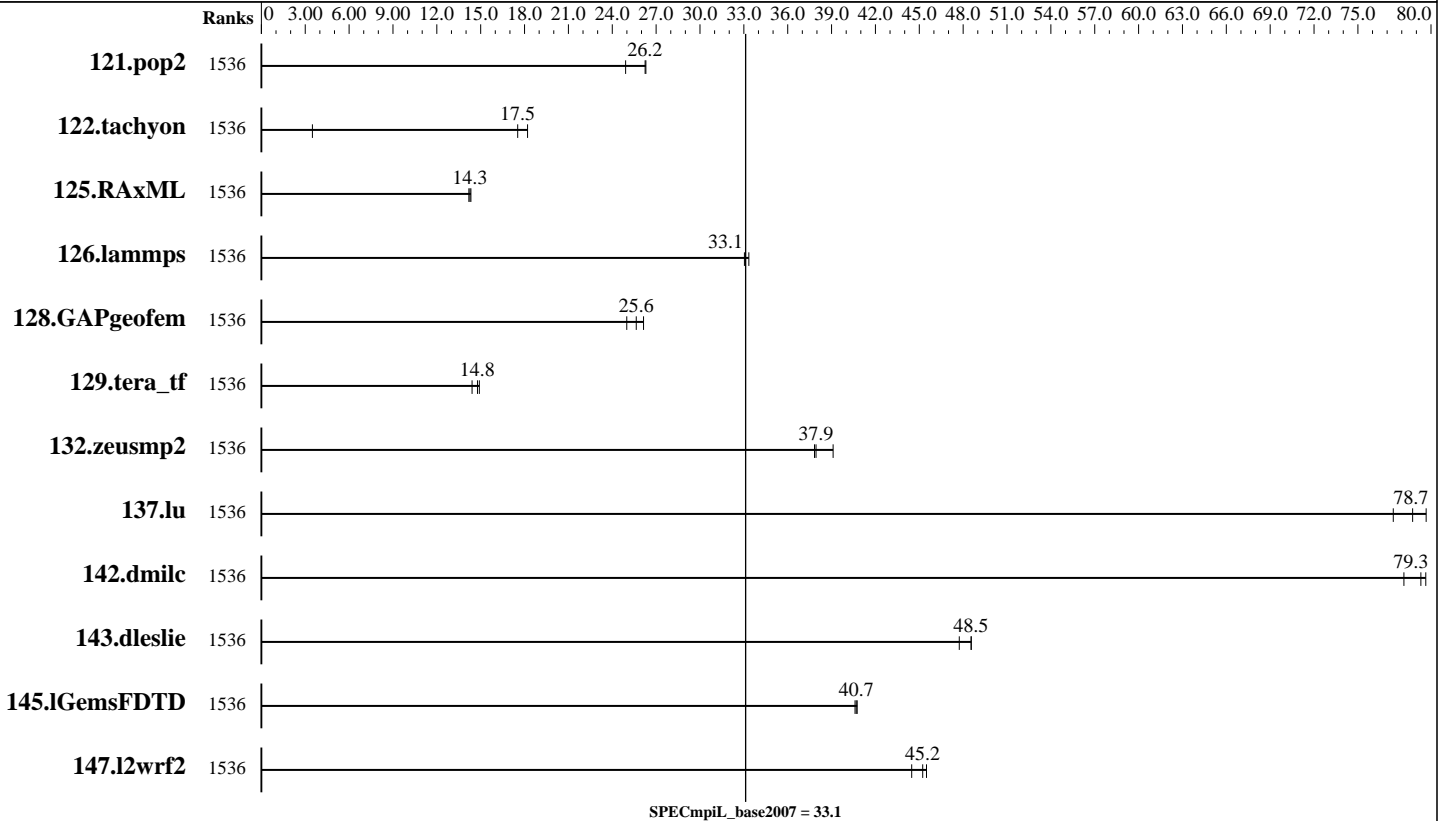
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: Mar-2010

Hardware Availability: Mar-2010

Software Availability: Feb-2010



## Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	1536	156	24.9	<b>148</b>	<b>26.2</b>	148	26.3							
122.tachyon	1536	557	3.49	107	18.2	<b>111</b>	<b>17.5</b>							
125.RAxML	1536	206	14.2	204	14.3	<b>205</b>	<b>14.3</b>							
126.lammps	1536	<b>74.3</b>	<b>33.1</b>	74.4	33.0	73.7	33.3							
128.GAPgeofem	1536	<b>231</b>	<b>25.6</b>	237	25.0	227	26.1							
129.tera_tf	1536	73.7	14.9	76.3	14.4	<b>74.4</b>	<b>14.8</b>							
132.zeusmp2	1536	54.2	39.1	56.0	37.8	<b>55.9</b>	<b>37.9</b>							
137.lu	1536	54.3	77.4	52.7	79.7	<b>53.4</b>	<b>78.7</b>							
142.dmilc	1536	46.3	79.6	<b>46.5</b>	<b>79.3</b>	47.1	78.1							
143.dleslie	1536	63.8	48.6	64.9	47.7	<b>63.9</b>	<b>48.5</b>							
145.lGemsFDTD	1536	<b>108</b>	<b>40.7</b>	109	40.6	108	40.8							
147.l2wrf2	1536	180	45.5	<b>181</b>	<b>45.2</b>	184	44.5							

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

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http://www.spec.org/



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### Hardware Summary

Type of System: Homogeneous  
 Compute Node: Endeavor Node  
 Interconnects: IB Switch  
 Gigabit Ethernet  
 File Server Node: HOME  
 Total Compute Nodes: 128  
 Total Chips: 256  
 Total Cores: 1536  
 Total Threads: 1536  
 Total Memory: 3 TB  
 Base Ranks Run: 1536  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

### Software Summary

C Compiler: Intel C++ Compiler 11.1.064 for Linux  
 C++ Compiler: Intel C++ Compiler 11.1.064 for Linux  
 Fortran Compiler: Intel Fortran Compiler 11.1.064 for Linux  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: MVAPICH 1.1  
 Other MPI Info: None  
 Pre-processors: No  
 Other Software: None

## Node Description: Endeavor Node

### Hardware

Number of nodes: 128  
 Uses of the node: compute  
 Vendor: Intel  
 Model: SR1600UR  
 CPU Name: Intel Xeon X5670  
 CPU(s) orderable: 1-2 chips  
 Chips enabled: 2  
 Cores enabled: 12  
 Cores per chip: 6  
 Threads per core: 1  
 CPU Characteristics: Intel Turbo Boost Technology disabled, 6.4 GT/s QPI, Hyper-Threading disabled  
 CPU MHz: 2934  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 12 MB I+D on chip per chip, 12 MB shared / 6 cores  
 Other Cache: None  
 Memory: 24 GB (RDIMM 6x4-GB DDR3-1333 MHz)  
 Disk Subsystem: Seagate 400 GB ST3400755SS  
 Other Hardware: None  
 Adapter: Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller  
 Number of Adapters: 1  
 Slot Type: PCI-Express x8  
 Data Rate: 1Gbps Ethernet  
 Ports Used: 2  
 Interconnect Type: Ethernet  
 Adapter: Mellanox MHQH29-XTC  
 Number of Adapters: 1  
 Slot Type: PCIe x8 Gen2  
 Data Rate: InfiniBand 4x QDR  
 Ports Used: 1  
 Interconnect Type: InfiniBand

### Software

Adapter: Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller  
 Adapter Driver: e1000  
 Adapter Firmware: None  
 Adapter: Mellanox MHQH29-XTC  
 Adapter Driver: OFED 1.4.2  
 Adapter Firmware: 2.7.000  
 Operating System: Red Hat EL 5.4, kernel 2.6.18-164  
 Local File System: Linux/ext2  
 Shared File System: NFS  
 System State: Multi-User  
 Other Software: PBS Pro 10.1



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### Node Description: HOME

Hardware		Software	
Number of nodes:	1	Adapter:	Intel 82546GB Dual-Port Gigabit Ethernet Controller
Uses of the node:	fileserver	Adapter Driver:	e1000
Vendor:	Intel	Adapter Firmware:	N/A
Model:	SSR212CC	Operating System:	RedHat EL 4 Update 4
CPU Name:	Intel Xeon CPU	Local File System:	None
CPU(s) orderable:	2 chips	Shared File System:	NFS
Chips enabled:	2	System State:	Multi-User
Cores enabled:	2	Other Software:	None
Cores per chip:	1		
Threads per core:	1		
CPU Characteristics:	--		
CPU MHz:	2800		
Primary Cache:	12 KB I + 16 KB D on chip per chip		
Secondary Cache:	1 MB I+D on chip per chip		
L3 Cache:	None		
Other Cache:	None		
Memory:	6 GB		
Disk Subsystem:	10 disks, 320GB/disk, 2.6TB total		
Other Hardware:	None		
Adapter:	Intel 82546GB Dual-Port Gigabit Ethernet Controller		
Number of Adapters:	1		
Slot Type:	PCI-Express x8		
Data Rate:	1Gbps Ethernet		
Ports Used:	1		
Interconnect Type:	Ethernet		

### Interconnect Description: IB Switch

Hardware		Software	
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		



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## Interconnect Description: Gigabit Ethernet

Hardware		Software
Vendor:	Force10 Networks	
Model:	Force10 S50, Force10 C300	
Switch Model:	Force10 S50, Force10 C300	
Number of Switches:	15	
Number of Ports:	48	
Data Rate:	1Gbps Ethernet, 10Gbps Ethernet	
Firmware:	8.2.1.0	
Topology:	Fat tree	
Primary Use:	Cluster File System	

## Submit Notes

The config file option 'submit' was used.

## General Notes

MPI startup command:

mpirun command was used to start MPI jobs.

BIOS settings:

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

Intel Turbo Boost Technology (Turbo) : Disabled (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.

Job placement:

Each MPI job was assigned to a topologically compact set of nodes, i.e. the minimal needed number of leaf switches was used for each job: 1 switch for 96/192 ranks, 2 switches for 384 ranks, 4 switches for 768 ranks, 8 switches for 1536 ranks.

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

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

## Base Compiler Invocation

C benchmarks:

mpicc

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## Base Compiler Invocation (Continued)

C++ benchmarks:

126.lammps: mpicxx

Fortran benchmarks:

mpif90

Benchmarks using both Fortran and C:

mpicc mpif90

## Base Portability Flags

121.pop2: -DSPEC\_MPI\_CASE\_FLAG  
126.lammps: -DMPICH\_IGNORE\_CXX\_SEEK

## 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.20120720.html](http://www.spec.org/mpi2007/flags/EM64T_Intel111_flags.20120720.html)

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

[http://www.spec.org/mpi2007/flags/EM64T\\_Intel111\\_flags.20120720.xml](http://www.spec.org/mpi2007/flags/EM64T_Intel111_flags.20120720.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).

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