



# SPEC<sup>®</sup> MPIL2007 Result

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## Intel Corporation

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

SPECmpiL\_peak2007 = Not Run

SPECmpiL\_base2007 = 22.1

MPI2007 license: 13

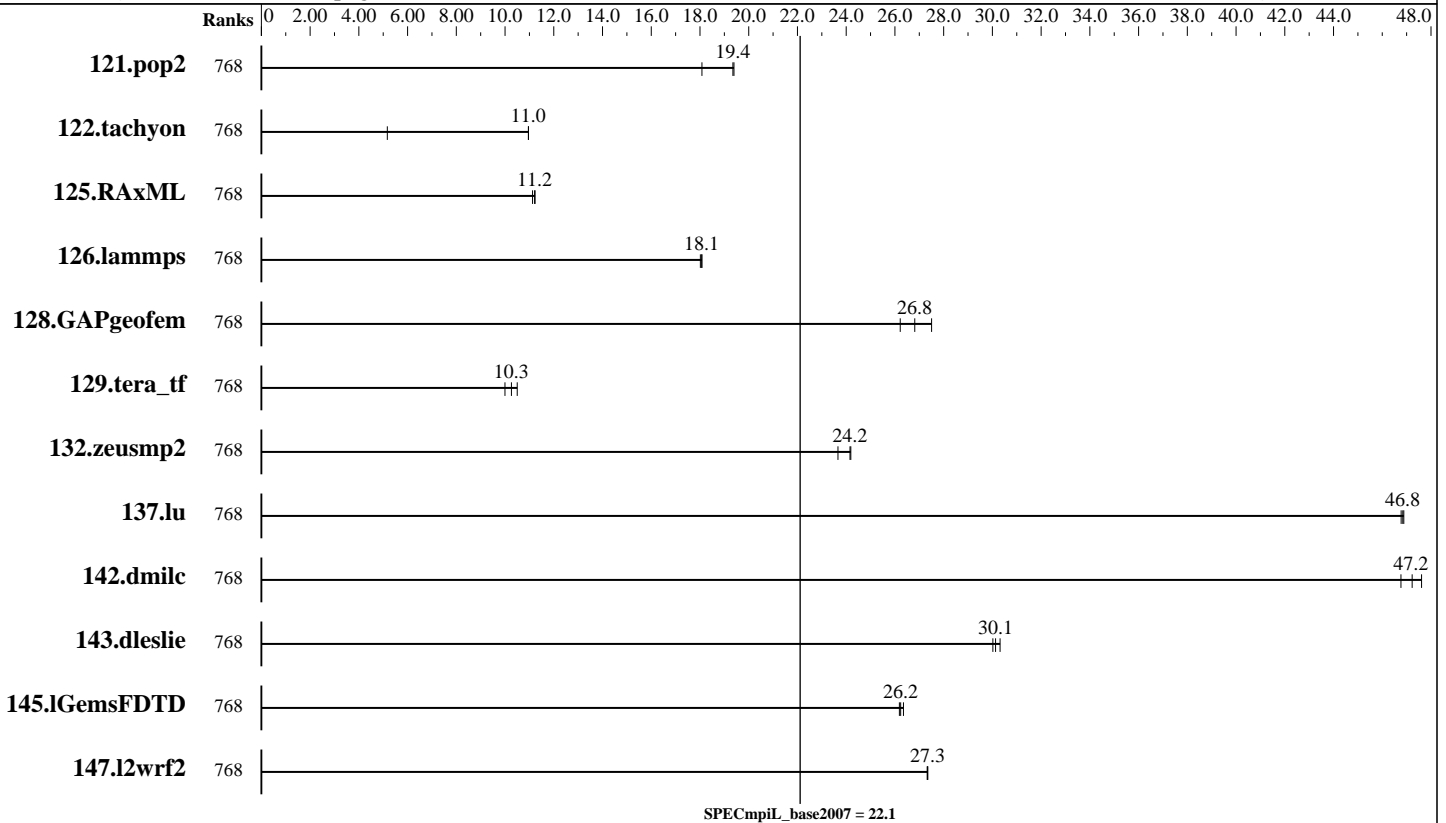
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: Sep-2010

Hardware Availability: Mar-2010

Software Availability: Nov-2010



## Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	768	215	18.1	<u>201</u>	<u>19.4</u>	201	19.4							
122.tachyon	768	376	5.17	<u>177</u>	<u>11.0</u>	177	11.0							
125.RAxML	768	262	11.1	<u>260</u>	<u>11.2</u>	260	11.2							
126.lammps	768	136	18.1	136	18.0	<u>136</u>	<u>18.1</u>							
128.GAPgeofem	768	<u>221</u>	<u>26.8</u>	216	27.5	226	26.2							
129.tera_tf	768	<u>107</u>	<u>10.3</u>	110	10.0	105	10.5							
132.zeusmp2	768	87.6	24.2	89.6	23.7	<u>87.8</u>	<u>24.2</u>							
137.lu	768	<u>89.7</u>	<u>46.8</u>	89.8	46.8	89.6	46.9							
142.dmilc	768	77.4	47.6	78.8	46.8	<u>78.0</u>	<u>47.2</u>							
143.dleslie	768	<u>103</u>	<u>30.1</u>	103	30.0	102	30.3							
145.lGemsFDTD	768	167	26.3	168	26.2	<u>168</u>	<u>26.2</u>							
147.l2wrf2	768	300	27.3	300	27.3	<u>300</u>	<u>27.3</u>							

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: NFS  
 Total Compute Nodes: 64  
 Total Chips: 128  
 Total Cores: 768  
 Total Threads: 1536  
 Total Memory: 1536 GB  
 Base Ranks Run: 768  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

### Software Summary

C Compiler: Intel C++ Compiler 12.0.0.072 for Linux  
 C++ Compiler: Intel C++ Compiler 12.0.0.072 for Linux  
 Fortran Compiler: Intel Fortran Compiler 12.0.0.072 for Linux  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: Intel MPI Library 4.0.1.005 for Linux  
 Other MPI Info: None  
 Pre-processors: No  
 Other Software: None

## Node Description: Endeavor Node

### Hardware

Number of nodes: 64  
 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: 2  
 CPU Characteristics: Intel Turbo Boost Technology disabled, 6.4 GT/s QPI, Hyper-Threading enabled  
 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: NFS

Hardware		Software	
Number of nodes:	1	Adapter:	Intel 82563GB Dual-Port Gigabit Ethernet Controller
Uses of the node:	fileserver	Adapter Driver:	e1000e
Vendor:	Intel	Adapter Firmware:	N/A
Model:	S7000FC4UR	Operating System:	RedHat EL 5 Update 4
CPU Name:	Intel Xeon CPU	Local File System:	None
CPU(s) orderable:	1-4 chips	Shared File System:	NFS
Chips enabled:	4	System State:	Multi-User
Cores enabled:	16	Other Software:	None
Cores per chip:	4		
Threads per core:	2		
CPU Characteristics:	--		
CPU MHz:	2926		
Primary Cache:	32 KB I + 32 KB D on chip per core		
Secondary Cache:	8 MB I+D on chip per chip, 4 MB shared / 2 cores		
L3 Cache:	None		
Other Cache:	None		
Memory:	64 GB		
Disk Subsystem:	8 disks, 500GB/disk, 2.7TB total		
Other Hardware:	None		
Adapter:	Intel 82563GB 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	
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:

mpiexec.hydra command was used to start MPI jobs. To start a job by this command, the daemons are not required to be run beforehand.

BIOS settings:

Intel Hyper-Threading Technology (SMT): Enabled (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>



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## 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

## 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).

Tested with SPEC MPI2007 v2.0.  
Report generated on Tue Jul 22 13:41:27 2014 by SPEC MPI2007 PS/PDF formatter v1463.  
Originally published on 6 October 2010.