



# SPEC<sup>®</sup> MPIL2007 Result

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## Intel Corporation

Endeavor (Intel Xeon E5-2697 v3, 2.60 GHz,  
DDR4-2133 MHz, SMT on, Turbo off)

SPECmpiL\_peak2007 = Not Run

SPECmpiL\_base2007 = 33.5

MPI2007 license: 13

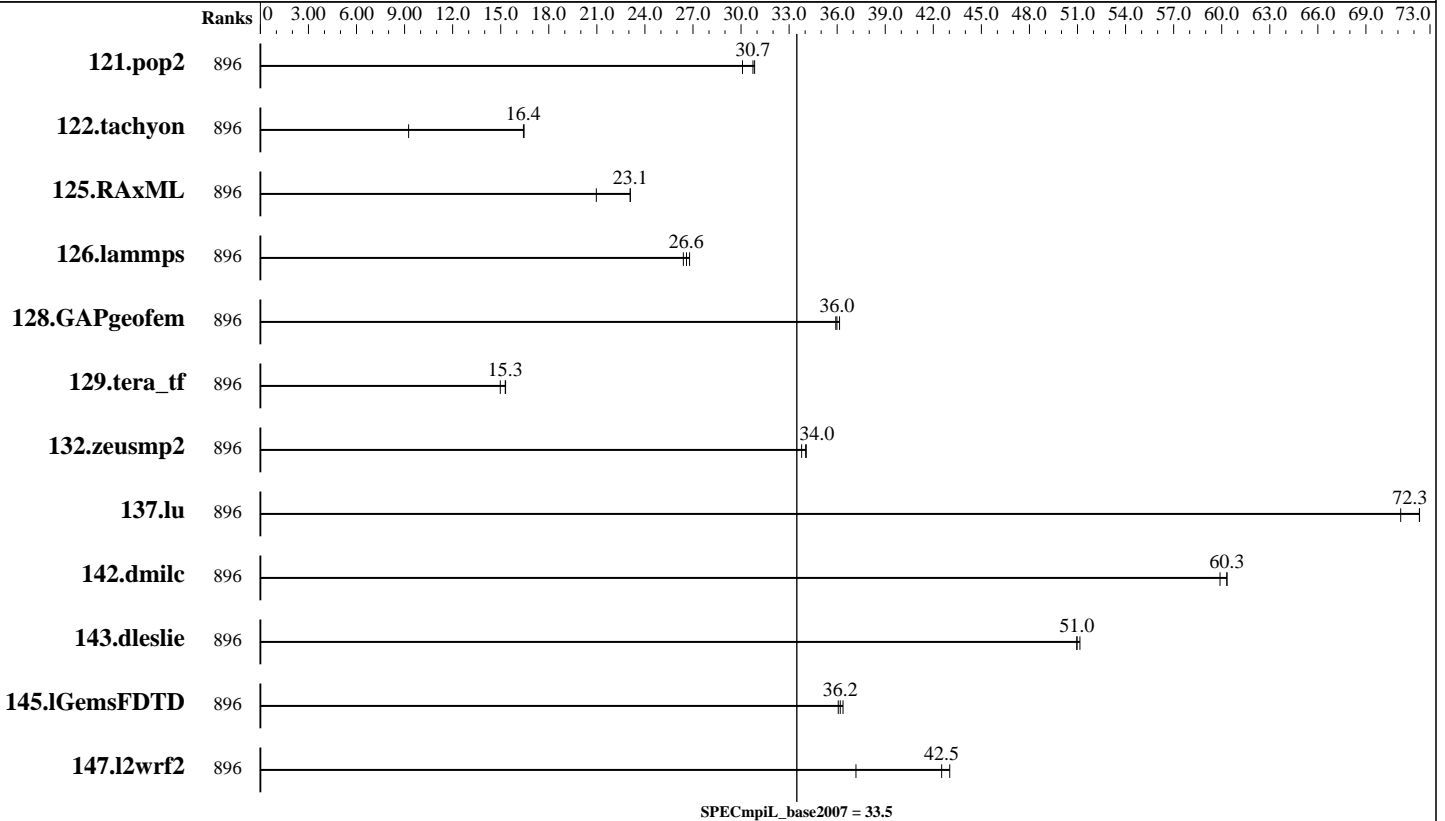
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: Aug-2014

Hardware Availability: Sep-2014

Software Availability: May-2014



## Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	896	129	30.1	<b><u>127</u></b>	<b><u>30.7</u></b>	126	30.8							
122.tachyon	896	210	9.25	<b><u>118</u></b>	<b><u>16.4</u></b>	118	16.5							
125.RAxML	896	139	21.0	<b><u>126</u></b>	<b><u>23.1</u></b>	126	23.1							
126.lammps	896	91.8	26.8	93.2	26.4	<b><u>92.5</u></b>	<b><u>26.6</u></b>							
128.GAPgeofem	896	164	36.1	<b><u>165</u></b>	<b><u>36.0</u></b>	165	35.9							
129.tera_tf	896	<b><u>71.9</u></b>	<b><u>15.3</u></b>	71.8	15.3	73.4	15.0							
132.zeusmp2	896	62.2	34.1	62.8	33.8	<b><u>62.3</u></b>	<b><u>34.0</u></b>							
137.lu	896	<b><u>58.1</u></b>	<b><u>72.3</u></b>	58.1	72.3	59.0	71.2							
142.dmilc	896	61.1	60.3	61.5	59.9	<b><u>61.1</u></b>	<b><u>60.3</u></b>							
143.dleslie	896	60.8	51.0	60.6	51.2	<b><u>60.8</u></b>	<b><u>51.0</u></b>							
145.lGemsFDTD	896	<b><u>122</u></b>	<b><u>36.2</u></b>	121	36.4	122	36.1							
147.l2wrf2	896	191	43.0	<b><u>193</u></b>	<b><u>42.5</u></b>	221	37.2							

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

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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: 32  
 Total Chips: 64  
 Total Cores: 896  
 Total Threads: 1792  
 Total Memory: 2 TB  
 Base Ranks Run: 896  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

### Software Summary

C Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422  
 C++ Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422  
 Fortran Compiler: Intel Fortran Composer XE 2013 for Linux, Version 14.0.3.174 Build 20140422  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: Intel MPI Library 4.1.3.049 for Linux  
 Other MPI Info: None  
 Pre-processors: No  
 Other Software: None

## Node Description: Endeavor Node

### Hardware

Number of nodes: 32  
 Uses of the node: compute  
 Vendor: Intel  
 Model: R2208WTTYC1  
 CPU Name: Intel Xeon E5-2697 v3  
 CPU(s) orderable: 1-2 chips  
 Chips enabled: 2  
 Cores enabled: 28  
 Cores per chip: 14  
 Threads per core: 2  
 CPU Characteristics: Intel Turbo Boost Technology disabled, 9.6 GT/s QPI, Hyper-Threading enabled  
 CPU MHz: 2600  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 35 MB I+D on chip per chip, 35 MB shared / 14 cores  
 Other Cache: None  
 Memory: 64 GB (8 x 8 GB 2Rx4 PC4-17000R-15, ECC)  
 Disk Subsystem: ATA INTEL SSDSA2BZ20, SSDSC2BB80  
 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 MCX353A-FCAT ConnectX-3  
 Number of Adapters: 1  
 Slot Type: PCIe x8 Gen3  
 Data Rate: InfiniBand 4x FDR  
 Ports Used: 1  
 Interconnect Type: InfiniBand

### Software

Adapter: Intel (ESB2) 82575EB Dual-Port Gigabit Ethernet Controller  
 Adapter Driver: e1000  
 Adapter Firmware: None  
 Adapter: Mellanox MCX353A-FCAT ConnectX-3  
 Adapter Driver: OFED 3.5-2-MIC-rc1  
 Adapter Firmware: 2.31.5050  
 Operating System: Red Hat EL 6.5, kernel 2.6.32-358  
 Local File System: Linux/xfst  
 Shared File System: NFS  
 System State: Multi-User  
 Other Software: IBM Platform LSF Standard 9.1.1.1



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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 MSX6025F-1BFR		
Switch Model:	Mellanox MSX6025F-1BFR		
Number of Switches:	46		
Number of Ports:	36		
Data Rate:	InfiniBand 4x FDR		
Firmware:	9.2.8000		
Topology:	Fat tree		
Primary Use:	MPI traffic		



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## Interconnect Description: Gigabit Ethernet

### Hardware

### Software

Vendor: Force10 Networks, Cisco Systems  
 Model: Force10 S50N, Force10 C300, Cisco WS-C4948E-F  
 Switch Model: Force10 S50N, Force10 C300, Cisco WS-C4948E-F  
 Number of Switches: 13  
 Number of Ports: 48  
 Data Rate: 1Gbps Ethernet, 10Gbps Ethernet  
 Firmware: 8.3.2.0, 12.2(54)WO  
 Topology: Star  
 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.

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 2x8-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 28/56/112/224/448 ranks, 2 switches for 896 ranks, 4 switches for 1792 ranks,

8 switches for 3584 ranks.

IBM Platform LSF was used for job submission. It has no impact on performance.

Information can be found at: <http://www.ibm.com>

## Base Compiler Invocation

C benchmarks:

mpiicc

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## Base Compiler Invocation (Continued)

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 -xCORE-AVX2 -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xCORE-AVX2 -no-prec-div

Fortran benchmarks:

-O3 -xCORE-AVX2 -no-prec-div

Benchmarks using both Fortran and C:

-O3 -xCORE-AVX2 -no-prec-div

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

[http://www.spec.org/mpi2007/flags/EM64T\\_Intel140\\_flags.20140908.html](http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.20140908.html)

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

[http://www.spec.org/mpi2007/flags/EM64T\\_Intel140\\_flags.20140908.xml](http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.20140908.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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