



# SPEC<sup>®</sup> MPIL2007 Result

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## Intel Corporation

Endeavor (Intel Xeon E7-4890 v2, 2.80 GHz,  
DDR3-1600 MHz, SMT on, Turbo off)

SPECmpiL\_peak2007 = Not Run

SPECmpiL\_base2007 = 4.78

MPI2007 license: 13

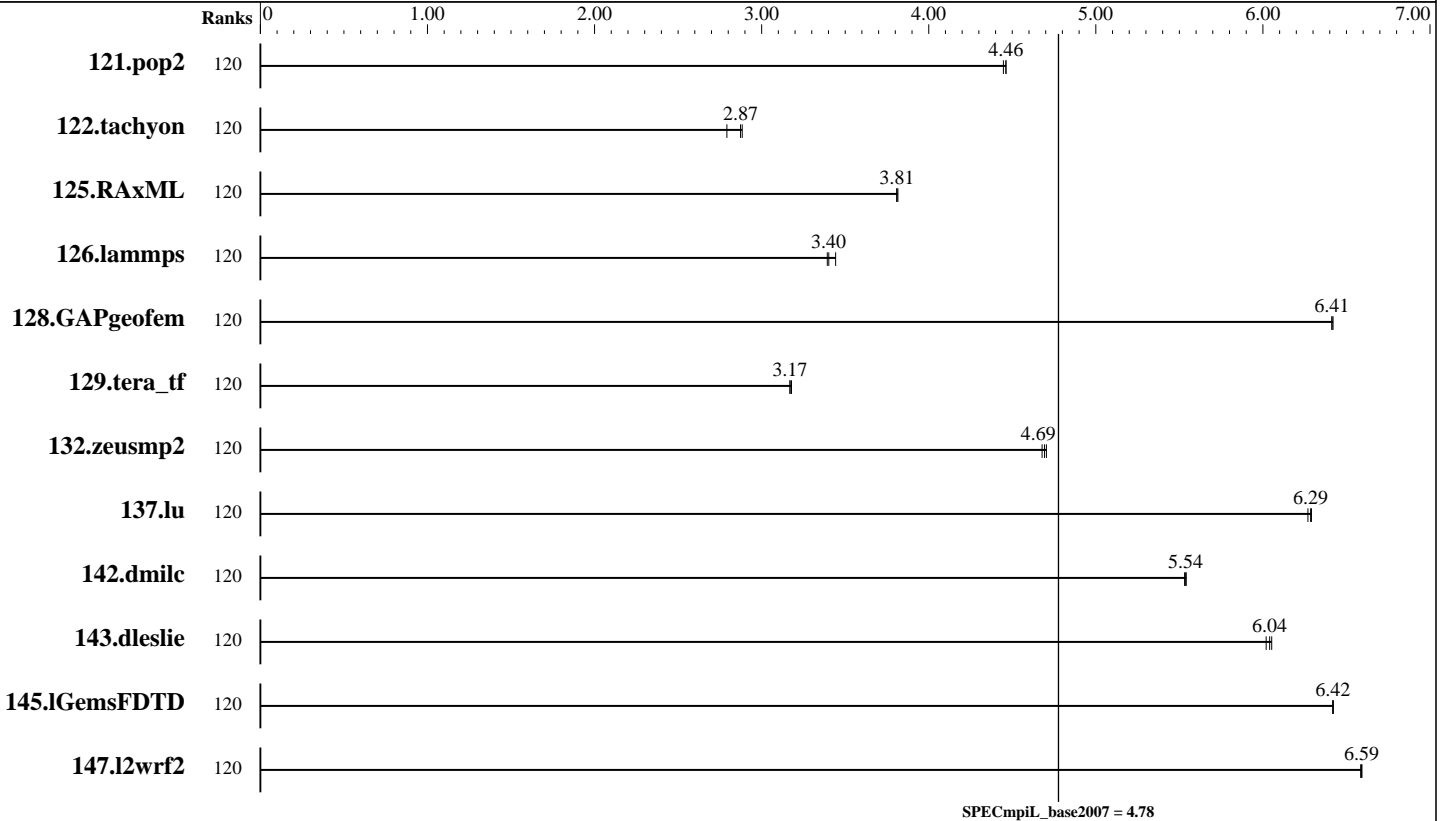
Test sponsor: Intel Corporation

Tested by: Pavel Shelepugin

Test date: Feb-2014

Hardware Availability: Feb-2014

Software Availability: Dec-2013



## Results Table

Benchmark	Base							Peak						
	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Ranks	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
121.pop2	120	875	4.45	872	4.46	<b>872</b>	<b>4.46</b>							
122.tachyon	120	696	2.79	674	2.88	<b>676</b>	<b>2.87</b>							
125.RAxML	120	767	3.81	<b>766</b>	<b>3.81</b>	765	3.82							
126.lammps	120	725	3.39	714	3.44	<b>723</b>	<b>3.40</b>							
128.GAPgeofem	120	<b>925</b>	<b>6.41</b>	924	6.42	925	6.41							
129.tera_tf	120	347	3.17	<b>347</b>	<b>3.17</b>	346	3.18							
132.zeusmp2	120	451	4.70	<b>452</b>	<b>4.69</b>	453	4.68							
137.lu	120	<b>669</b>	<b>6.29</b>	670	6.27	668	6.29							
142.dmilc	120	<b>665</b>	<b>5.54</b>	665	5.54	666	5.53							
143.dleslie	120	<b>513</b>	<b>6.04</b>	515	6.02	512	6.05							
145.lGemsFDTD	120	687	6.42	<b>687</b>	<b>6.42</b>	687	6.42							
147.l2wrf2	120	<b>1245</b>	<b>6.59</b>	1244	6.59	1246	6.58							

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

Standard Performance Evaluation Corporation

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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: 2  
 Total Chips: 8  
 Total Cores: 120  
 Total Threads: 240  
 Total Memory: 1 TB  
 Base Ranks Run: 120  
 Minimum Peak Ranks: --  
 Maximum Peak Ranks: --

### Software Summary

C Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728  
 C++ Compiler: Intel C++ Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728  
 Fortran Compiler: Intel Fortran Composer XE 2013 for Linux, Version 14.0.0.080 Build 20130728  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 MPI Library: Intel MPI Library 4.1.3.045 for Linux  
 Other MPI Info: None  
 Pre-processors: No  
 Other Software: None

## Node Description: Endeavor Node

### Hardware

Number of nodes: 2  
 Uses of the node: compute  
 Vendor: Intel  
 Model: S4TR1SY4Q  
 CPU Name: Intel Xeon E7-4890 v2  
 CPU(s) orderable: 1-4 chips  
 Chips enabled: 4  
 Cores enabled: 60  
 Cores per chip: 15  
 Threads per core: 2  
 CPU Characteristics: Intel Turbo Boost Technology disabled, 8.0 GT/s QPI, Hyper-Threading enabled  
 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: 38400 KB I+D on chip per chip, 38400 KB shared / 15 cores  
 Other Cache: None  
 Memory: 512 GB (32 x 16 GB 2Rx4 PC3-12800R-11, ECC)  
 Disk Subsystem: 2 x 300 GB SAS HDDs  
 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 1.5.3.1  
 Adapter Firmware: 2.10.0  
 Operating System: Red Hat EL 6.4, kernel 2.6.32-358  
 Local File System: Linux/ext2  
 Shared File System: NFS  
 System State: Multi-User  
 Other Software: Platform LSF 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:	7.2.0		
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:

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 4x16-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 60/120/240/480 ranks.

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

Information can be found at: <http://www.platform.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-AVX-I -no-prec-div

C++ benchmarks:

126.lammps: -O3 -xCORE-AVX-I -no-prec-div

Fortran benchmarks:

-O3 -xCORE-AVX-I -no-prec-div

Benchmarks using both Fortran and C:

-O3 -xCORE-AVX-I -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.html](http://www.spec.org/mpi2007/flags/EM64T_Intel140_flags.html)

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

[http://www.spec.org/mpi2007/flags/EM64T\\_Intel140\\_flags.xml](http://www.spec.org/mpi2007/flags/EM64T_Intel140_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).

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